



Working Paper #12

Maryrose Bredhauer
King's College London
November 2016



Images: James Millington, landscapemodelling.net

Transformative Adaptation in Informal Settlements: The Case of Kounkuey Design Initiative in Kibera, Nairobi.

Maryrose Bredhauer

2016



This Working Paper is based on a dissertation submitted as part of a MSc in Environment and Development at King's College London.

Abstract of Study

This study assesses the scope for transformative adaptation in Kibera informal settlement, Nairobi. Adaptation discourse theories and Pelling et al's (2015) 'adaptation activity space' framework provide the conceptual context within which this study aims to assess the transformative impact of adaptation strategies adopted by Kibera's residents and community groups, non-governmental organisations (NGOs), the Government of Kenya, and other organisations and institutions operating in the settlement. The qualitative methodology adopted in this study targets the work of Kounkuey Design Initiative, an NGO that partners and collaborates with impoverished residents in Kibera to design and implement participatory projects. The findings of this dissertation are that, while incremental adjustments dominated adaptation strategies in Kibera, local and small-scale transformations were found within and between all components of the 'adaptation activity space' framework, and require increased and improved stakeholder engagement, coordination and collaboration in order to increase the scale of impact towards transformational adaptation.

Contents

Abstract.....	3
List of Figures and Tables.....	6
Acknowledgements.....	6
1. Introduction.....	7
1.1 Research Questions.....	8
1.2 Paper Presentation.....	9
2. Literature Review.....	9
2.1 Adaptation Discourse and Transformative Adaptation.....	9
3. Methodology.....	12
3.1 ‘Adaptation Activity Space’.....	12
3.2 Sampling Methods and Interview Participants.....	14
3.3 Field of Research.....	15
3.3.1 Kounkuey Design Initiative.....	17
3.4 Obstacles.....	18
4. Results and Analysis.....	19
4.1 Discourse (Popular and Policy).....	19
4.1.1 KDI’s Development Discourse.....	19
4.1.2 Government Planning and Political Discourse.....	20
4.2 Individuals (Values and Identity).....	21
4.2.1 Transformative Learning.....	22
4.2.2 Community Perception and Trust.....	23
4.2.3 Contemporary Priorities vs. Intergenerational Equity.....	23

4.3 Behaviour (Practices and Routines)	24
4.3.1 Behaviour Change for Health and Environment.....	24
4.3.2 Reformation of At-risk Youths.....	25
4.4 Institutions (Regulatory and Cultural)	25
4.4.1 Formal Institutions.....	26
4.4.2 Informal Institutions.....	27
4.4.3 Relationships between Formal and Informal Institutions.....	27
4.5 Technology (Material and Organisational)	28
4.5.1 Material Innovations.....	29
4.5.2 Organisational Innovations.....	30
4.5.3 Gender Equality and Women’s Empowerment.....	32
4.6 Livelihoods (Production and Labour Processes).....	33
4.7 Environment (Biotic and Abiotic).....	34
4.7.1 Sewer Line Construction and Failure.....	35
4.7.2 Kenya Slum Upgrading Project (KENSUP).....	35
4.7.3 Climate Change.....	37
4.8 Cross-cutting Interactions / Interactions between Spheres.....	38
4.8.1 Land Ownership and Tenure.....	38
4.8.2 Livelihood-Ecosystem Sustainability.....	39
4.9 Scaling-up Transformation.....	40
4.9.1 Scaling-up KDI’s Transformative Impact.....	40
5. Conclusion.....	41
List of References.....	43

List of Tables, Figures and Photos

Table 1: Attributes of Adaptation for Resistance/Resilience, Incremental Adjustment and Transformation

Figure 1: ‘Adaptation Activity Space’

Figure 2: Map of Kibera

Photo 1: View of Kibera, 2016 (cover).

Photo 2: KDI’s Productive Public Spaces Project Site 1, Kibera, 2016.

Photo 3: Mud construction at KDI’s ANWA school upgrading project site, Kibera, 2016.

Photo 4: Reformed Kibera youth outside his recycling business kiosk, Kibera, 2016.

List of abbreviations

CBO	Community-based Organisation
CCN	City Council of Nairobi
KENSUP	Kenya Slum Upgrading Project
KDI	Kounkuey Design Initiative
M&E	Monitoring and Evaluation
NGO	Non-governmental Organisation
NYS	National Youth Service
UN-Habitat	United Nations Human Settlements Programme
WATSAN	Water and Sanitation

Acknowledgments

I would first like to thank my thesis advisor, Professor Mark Pelling of the Department of Geography at King’s College London, for steering me in the right direction and opening up the opportunity of conducting field-based research. I would also like to thank Kounkuey Design Initiative, particularly the staff members that participated in my research, who provided the passionate input that allowed my research experience to be as enriching and exciting as it possibly could have been. Finally, I would like to thank Kibera’s community leader participants for warmly welcoming me to their neighbourhoods, and lending me their time and valuable insights.

INTRODUCTION

The rapid rate of urbanization experienced in the developing world is seriously exceeding the management and financial capacities of most African cities to provide adequate services to their inhabitants, leading to the deteriorating living conditions of the urban poor (Cohen, 2006; Fekade, 2000). The challenge of achieving sustainable urban development is particularly difficult in Africa, as rapid population growth is met with inadequate provision of affordable housing, resulting in the expansion of squatter settlements (Cohen, 2006; Fekade, 2000). This failure of public urban land management has been attributed to the restrictive and outdated land-use control and regulatory standards and unreformed tenure arrangements, as well as the limited success of public housing programs and upgrading services in meeting the housing needs of the burgeoning urban populations (Fekade, 2000). These inefficiencies of public land management in Africa are made up for by the informal sector, in which low-income urban households circumvent the outdated and inhibitive formal urban planning regulations to improvise and create their own parallel structures and procedures. African states' initial attitude towards the self-initiative of low-income urban households was hostile and neglectful; however, while unacknowledged and illegal, the informal housing sector has proven to be responsive and adaptive in providing the majority of the urban population with buildable urban land (Fekade, 2000).

In Kenya, a third of the urban population is living in poverty (Charles, 2010). World Bank figures suggest that by 2020, urban poverty will represent almost half of the total poverty in the country (Oxfam GB, 2009). Nairobi, just like many colonial administrative cities in Africa, grew to have an endemic slum problem. Over the past seventy years, successive regimes have implemented draconian measures in attempts to deal with Nairobi's 'slum problem', however they did nothing to remove the root causes for their existence, failing to adequately address the gross urban poverty that is still prevalent today (Zwanenberg, 1972). Currently, over 60% of Nairobi's urban dwellers live in slum settlements, where they live under deplorable life-threatening conditions characterized with poverty, inadequate food and shelter, physical overcrowding, unsafe drinking water, poor sanitation and extreme deprivation of basic human needs (Omambia, 2010; Pascal & Mwendu, 2009; Charles, 2010). The capital city faces severe infrastructure needs, which are further exacerbated by climate change impacts, such as water supply fluctuations and slum flooding (Figueiredo & Perkins, 2013). In Nairobi, basic urban

service provision is allocated to the local government, the City Council of Nairobi (CCN). While the CCN retains the main responsibility over basic urban service provision, it has moved from being a sole provider towards becoming a facilitator over other actors, shifting to a public-private-partnership (PPP) approach (Carlsson, 2013). While this serves middle- to high-income areas well as people are able to pay for the services and proper infrastructure, it fails to do the same for low-income areas with low levels of infrastructure and socio-economic conditions, such as informal settlements, highlighting the need for a different approach. This situation is likely to worsen as Nairobi continues to expand as a center for East Africa, and stresses the urgent need for policies and programs that appropriately address the root causes of urban poverty.

RESEARCH QUESTIONS

This research sought to uncover what adaptation discourses inform development in the informal settlement of Kibera, in Nairobi, how it translates in practice, and assess the scope for transformative adaptation. Research was focused through, and facilitated by, a local non-government organization (NGO), Kounkuey Design Initiative (KDI), and sought to fulfil the following research objectives:

RO1: Identify dominant and alternative discourses on development and adaptation in Kibera, particularly of the NGO of focus.

RO2: Identify practices, processes and relationships that contribute towards transformative adaptation in Kibera, particularly of the NGO of focus.

RO3: Provide policy and program suggestions and areas for further research to contribute towards pursuing a transformative agenda in Kibera, with possible transferability to other informal settlements

The NGO of focus for this study is Kounkuey Design Initiative (KDI), an international partnership that specializes in participatory urban planning, landscaping, architecture and engineering. According to their website (<http://www.kounkuey.org/>) KDI partners and

collaborates with impoverished residents in Kibera to design and implement low-cost, high-impact and sustainable projects that improve their quality of life and transform their communities, and KDI empowers communities to address the major challenges they face by enhancing community ideas with technical innovation and connecting them to resources. Through this research, I wish to identify KDI's practices, processes and relationships that contribute towards or block transformative adaptation. It is hopeful that this research could help reveal where and how transformative changes might take place, both through KDI's work as well that of other actors and institutions.

PAPER PRESENTATION

The following section reviews adaptation discourse literature, specifically relating to transformational adaptation, and justifies the legitimacy of this study in progressing a transformational agenda in development. The third part of this dissertation focuses on the research framework and data collection methods employed, and justifies the use of the 'adaptation activity space' framework in the analysis of opportunities and challenges for transformative adaptation. Results and analysis will then be presented in relation to the 'adaptation activity space' components, with policy and program recommendations, suggestions for further research, and other conclusions throughout. Finally, part five offers a conclusion to the research objectives, a judgement made relating to the scope for transformative adaptation in Kibera informal settlement, and summarises the transformative potential of KDI's work in the settlement.

LITERATURE REVIEW

ADAPTATION DISCOURSE AND TRANSFORMATIVE ADAPTATION

Transformation as an adaptive response to climate change offers a tool to decision-makers to extend concerns from the proximate causes of risk to address the structural root causes (Pelling 2011; Pelling et al, 2015). This research will assess how KDI and other development actors contribute to transformative adaptation in Kibera towards more equitable and sustainable

development, through a critical reflection on the relationships, structures and processes that drive their work. To achieve the first research objective, adaptation discourse will be classified into three forms of adaptation: resistance/resilience, incremental adjustment/transition, and transformation (Pelling, 2011; Pelling et al, 2015). It will be anticipated that, while KDI and other development actors in Kibera may not be deliberately conceptualizing adaptation into these three forms, their practice subconsciously translates into them. The three forms of adaptation are described in the table below:

Table 1: Attributes of adaptation for resistance/resilience, incremental adjustment/transition, and transformation

Adaptation discourse	Goals	Advantages	Disadvantages
Resistance/resilience	Functional persistence in a changing environment through increased investment in existing development pathways, infrastructure, institutions and practices	Allows for ‘business-as-usual’	Generates hidden vulnerabilities in systems structures
Incremental adjustment/transition	Marginal changes in infrastructure, institutions and practices that foster flexibility, fulfill capacity, and realize full potential through the exercise of rights within the established regime,	Allows for flexibility and enables re-organization without causing major systemic disruption	Does not allow for challenges to the underlying values and assumptions that give rise to systemic vulnerability

	while not directly threatening systems integrity		
Transformation	Fundamental change to the functioning of systems through the reconfiguration of the structures of development and a change in the overarching political-economy regime	Allows deep-rooted causes of risk and vulnerability to be addressed as part of a reorientation of development pathway towards social justice and sustainable development	Risks undermining the stability of economies, ecosystems, or societies. The poorest may be most exposed to the transactions costs of transformation in the short term

(Adapted from Pelling et al, 2015; Pelling, 2011)

A consensus on which form is required for a particular issue is not easy, as their relevance will vary between contexts and viewpoints. Therefore, they should not be viewed on a prioritized scale. In fact, different forms of adaptation are likely to be taken up simultaneously at different levels, by different actors. It is also not easy to distinguish between them as they can influence each other. For example, resilient and transitional adaptations may feed into transformative adaptation by highlighting wider issues, building capacities and weakening barriers for reform; and transformative adaptation will include a critical reflection on existing institutions and practices working at the resilience and transition levels. However, not all actions may be complementary, and success in one form of adaptation may inhibit progress in other forms. For example, the technical and organizational innovations required for resilient adaptation are constantly pushed as a solution to climate change risks by donors and government because they suppress deeper changes in institutions and values that shape development, are less politically challenging, and do not challenge the status quo. Additionally, resilience initiatives are often quicker to implement than transitional and transformational adaptation, allowing donors to appear more visible in their climate change adaptation efforts (Pelling, 2011). While there is currently growing literature on the resilient and incremental adaptation, there is a lack of attention on transformative adaptation in theory and practice, perhaps as it challenges the status

quo through its analysis of power and interests, and threatens those who benefit from current systems and structures (O'Brien, 2012). Consequently, the current framing of adaptation research fails to engage with the real 'adaptive challenge': to question the beliefs, assumptions, values and interests that create the behaviors, structures and systems that contribute to anthropogenic climate change, environmental problems and social vulnerability, and there is a need to develop a critical body of research on the conscious creation of development alternatives. While this research will consider all three forms of adaptation, the main focus will be on transformation. By focusing on transformation, this research aspires to contribute to an understanding on how to avoid the vulnerability and marginalization of Kibera's future generations, by understanding how deliberate transformations of systems and society could be targeted and scaled-up for more equitable and sustainable future development (O'Brien, 2012).

METHODOLOGY

ADAPTATION ACTIVITY SPACE

In order to identify the practices, processes and relationships through which transformative change is contained or transmitted, this research will use Pelling et al's 'adaptation activity space' framework (2015) to analyse the flows, blockages and interactions between system components. This framework helps to answer the question of how and where transformation might emerge and spread through the adaptation process, and to identify potential blockages and challenges that will need to be addressed or overcome.

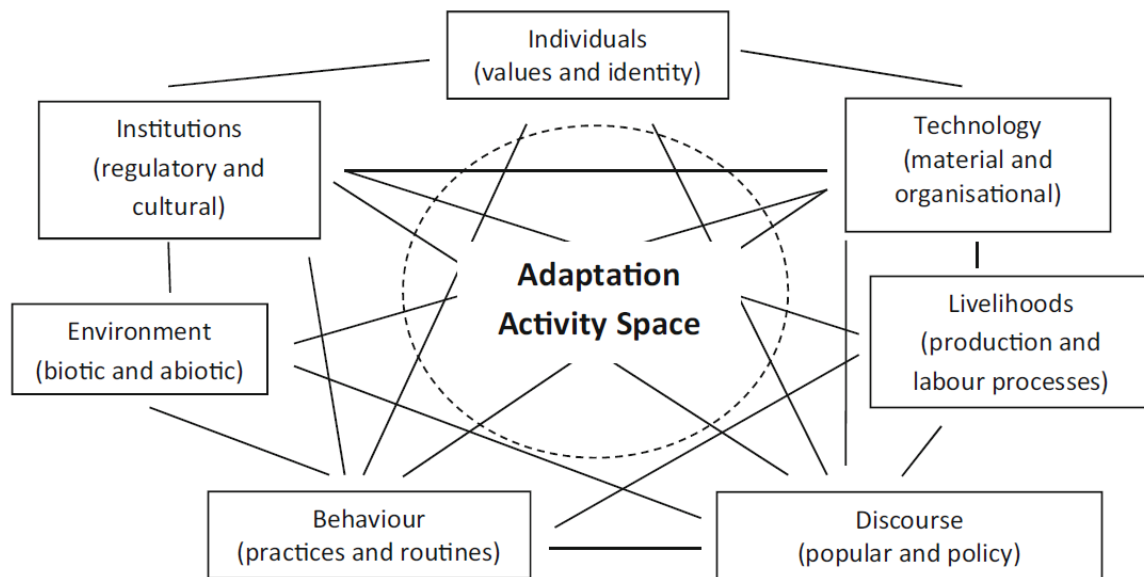


Figure 1: 'Adaptation Activity Space'

Source: Pelling et al (2015)

The components of the 'adaptation activity space' framework above can be briefly be described as the following:

- **Discourse (popular and policy):** Cognition, practices and procedures of conceptual models that place boundaries on material interventions.
- **Individual (values and identity):** Changes to the acts or processes by which individuals acquire knowledge.
- **Behaviour (practices and routines):** Recognising that adaptive capacity is reproduced through everyday activity, this component looks at how routine behaviour and everyday acts embody power, instantiate and reproduce values, and allow institutional systems to persist.
- **Institutions (regulatory and cultural):** Acknowledges the regulation and facilitation of social behaviour and the reproduction of power asymmetries through formalised legislation, guidelines and administration or informal experiences and cultural norms.
- **Technology (material and organisational):** Material interventions and innovation in organisation structure and function.
- **Livelihoods (production and labour processes):** The skill sets and entitlements that shape individual and household asset profiles, and the associated production and labour processes that describe the modes of economic reproduction available to those at risk

- **Environment (biotic and abiotic):** Acknowledges the importance of internal interactions and coevolution within the environmental realm for adaptation to climate change.

(Pelling et al, 2015)

Utilizing a systems understanding and a political-ecological epistemology, this framework not only helps to identify the spaces in which transformation can take place, but also guides an analysis of flows, blockages and interactions between system components to identify the power-laden relationships through which non-linear (transformative) change may be contained or transmitted. Each activity sphere is capable of transformation both internally as well as in response to changes in surrounding spheres; and by sharpening an understanding of the construction and interactions between activity spheres, this framework can have deep implications for programs and policies. Using this research framework, I will assess the scope transformative adaptation in Kibera, with the potential to provide input to improving policies and programs towards more equitable and sustainable development. It is anticipated that the Kibera context will be highly complex, with people, institutions, resources and activities interacting in dynamic ways, and therefore requires an understanding of key processes, procedures and interactions that influence urban risk governance in the locality (Desouza & Flanery, 2013). The enhancement or suppression of particular feedback flows, and the creation of opportunities for different types of learning and cooperation (through self-organization, tighter feedback systems, and improved social capital), conditions suitable for emergent, citizen-driven resilience responses can be nurtured, with the potential to lead to urban systems becoming more or less innovative or adaptive (Desouza & Flanery, 2013). By conceptualizing Kibera's urban risk governance as a complex adaptive system, reducing it into components, and evaluating process dynamics, this research could potentially reveal the feedback flows that have the potential to contribute towards transformative adaptation, which could serve to further equitable and sustainable development in Kibera by informing the planning, designing and managing of policies, projects, processes and relationships.

SAMPLING METHODS AND INTERVIEW PARTICIPANTS

The data for this research was collected through semi-structured key informant interviews with KDI staff (8) and Kibera community leaders (4), as well as project site observations from site visits to Kibera (4). Furthermore, secondary sources provided by KDI were used to triangulate

and strengthen primary research findings. The research required three weeks of field work in Nairobi in July-August 2016 and assistance and facilitation of interviews and site visits by KDI staff, including translation of community leader interviews from Swahili to English.

FIELD OF RESEARCH

Kibera is Nairobi's oldest and largest informal settlement, covering 550 acres and located 7 kilometers southwest of the city center (Deacon, 2012). The settlement was originally a military reserve allocated to retired Sudanese members of the Kenya African Rifles, known as 'Nubians' (Zwanenberg, 1972; Neuwirth, 2005; Montgomery, 2005). Because residents do not own the land on which they live, they might be evicted at any time and live in difficult, uncertain and often dangerous conditions with poor life chances (Deacon, 2012). The snaking Mombasa-to-Kisumu railway line bisects the settlement and Kenya railways own much of the land. The Kenyan government is currently implementing infrastructure construction projects in the settlement, including roads, housing and sewer lines, which has led to the displacement of many slum-dwellers (Deacon, 2012; Montgomery, 2005; Fernandez & Calas, 2011). Floods, particularly flash floods, and landslides are frequent, the unemployment rate is very high, and food insecurity is common (Pascal & Mwende, 2009; Mulligan et al, 2015; KDI, 2102).



Figure 2: Map of Kibera

Source: Google Maps (2009)

Poor sanitation and inadequate water supply is a daily challenge for Kibera residents. In the settlement, the major types of sanitation facilities, which most people are accustomed to, are latrines (Charles, 2010). The population uses sanitation practices that involve the direct handling of human waste, which increases the spread of infectious disease (Omambia, 2010). When Kibera is hit with flooding, the much-relied-on latrines overflow, further deteriorating the already fragile environmental and health conditions (Charles, 2010). The worsening state of sanitation can be attributed to inadequate planning and governance, including the corruption of Kibera's water governance (Charles, 2010; Birongo & Quyen, 2005). Many claim that water governance corruption and ineffective PPPs have led to many of the water problems that Kibera faces today, such as the lack of availability and affordability of water (Birongo & Quyen, 2005). It has been suggested that in low-income and informal contexts, communal sanitation facilities may be the only feasible sanitation option (Schouten & Mathenge, 2010). Historically, Kibera residents were not involved in water and sanitation projects, and this lack of

involvement has led to high dissatisfaction levels and negative attitudes (Charles, 2010). Additionally, community-based initiatives need support from local authorities to be sustainable and efficient (Carlsson, 2013). This highlights the need for two-way dialogue and collaboration between communities/CBOs and authorities/government. Additionally, the fact that Kibera residents' perceptions and attitudes towards investing in better sanitation behavior is affected by their insecurity of tenure, low level of education, and inadequate socio-economic, infrastructural and physical entitlements (Omambia, 2010), highlights the need to address structural root causes of Kibera residents' vulnerability and marginalization. Arguably, a more participatory approach needs to be adopted, the community should be involved at every level, and better governance from local leaders, project developers and other stakeholders are required for sustainable results in overcoming waste management and sanitation issues (Charles, 2010; Carlsson, 2013). Currently, the CCN call the CBOs their key stakeholders and are becoming increasingly dependent on them, but still exclude them in decision-making processes, or in having any substantial influence or power (Carlsson, 2013). The CCN are also not recognizing the value of having regular and formal contact with CBOs, while CBOs strongly wish for their voice to be heard, highlighting the need for improved communication. In Kenya, policies and laws are in place to ensure public participation, encouraging the civic society to actively participate in service delivery, however this has not been followed in practice (Carlsson, 2013).

KOUNKUEY DESIGN INITIATIVE (KDI)

KDI partners and collaborates with Kibera residents to develop and implement low-cost, high-impact built environment design solutions (such as communal sanitation facilities) that improves their quality of life and empowers community members. KDI operates on the beliefs that participatory planning and design is key to sustainable development, and provides a good social institution through which to consider the practical implications of adopting particular adaptation discourses, and to assess the scope for scaling-up potentially transformative adaptation measures for increased and sustained impact.



Photo 2: KDI's Productive Public Spaces Project Site 1, Kibera, 2016. The site houses a community centre/school, water tanks and kiosk, dry sanitation facility, small business kiosks, stove area, play area for children, and meeting space for local community groups. Furthermore, it is located alongside the Nairobi River Dam (managed and maintained by the New Nairobi Dam Community Group), acting as a low-density flood buffer to protect residents and improve waterway health.

OBSTACLES

Conducting field work involved fewer challenges than expected as KDI provided support on all aspects of data collection. Working from KDI's office, amongst KDI staff and in close vicinity to Kibera, allowed for flexibility in conducting interviews and site visits. KDI provided security during site visits and Field Officers translated community leader interviews from Swahili into English.

RESULTS & ANALYSIS

Results are presented in relation to ‘adaptation activity space’ components, with important cross-cutting issues and interactions presented thereafter.

DISCOURSE (POPULAR & POLICY)

The ‘discourse’ activity sphere considers the understandings, conceptual models, and underlying development priorities that influence adaptation pathway choices (Pelling et al, 2015). Exploring this activity sphere involves investigating which adaptation discourse (resistance, incremental adjustment or transformation) dominantly informs intervention choices and what might change an actor’s adaptation discourse towards a more transformative agenda.

KDI’S DEVELOPMENT DISCOURSE

As the KDI team is made up of mostly technical professions that focus on construction and physical design (architects, urban planners, engineers, etc.), KDI's interventions tend to be physical landscape-driven projects, however they also incorporate economic empowerment and social cohesion elements as part of their processes of community engagement and ensuring sustainability. Staff interviews revealed that although KDI is made up of staff members of differing fields and expertise, their perspectives converge at KDI's methodological philosophy, which holds deep community participation central in everything they do. KDI understands the importance of participation in their work, not just with communities but also within the organization itself, as ideas and learning are exchanged freely and confidently within what respondents describe as a ‘democratic’ process of decision-making (KDI, 2012). Arguably, this case illustrates the possibility of converging the differing perspectives and priorities of professionals in different fields, towards a common consensus and commitment to a process, highlighting the importance of development discourse understanding and agreement in ensuring effective team work. Of course, as with any NGO, KDI’s adaptation pathways are also influenced by donors. KDI has received considerable funding from donors such as Welthungerhilfe, SwissRE and the Rockefeller Foundation, to implement projects in areas

including flood resilience, urban agriculture, and open data technology for water and sanitation (WATSAN Portal), respectively. In this way, the development discourse of KDI's donors have influenced KDI's intervention pathways, as they move towards addressing issues of disaster risk reduction, urban food security, and the use of open data. While outside the scope of this study, donors' adaptation discourse should be researched further in order to understand the rationale behind intervention choices, and to identify opportunities and challenges for influencing donors to choose more transformative pathways.

Generally, KDI's work is mostly made up of incremental adjustments rather than transformations, and the local scale in which they are operating limits their transformational impact. However, staff members assert that they are constantly questioning systems and structures, and that their work has the potential to be more transformative with more opportunities to scale-up their interventions to build a network of projects across Kibera. This idea of a 'Kibera network' is central to KDI's long-term vision. While the fundamentals of the incremental adjustment adaptation discourse do not challenge systemic vulnerability through its commitment to functional persistence, it is still possible for incremental adjustments made at scale to have transformative impacts (Pelling et al, 2015). This is where some of KDI's transformative potential lies. While KDI's direct object of change is the physical environment and communities of Kibera, they also indirectly target other actors and institutions to change their approaches by providing 'best practice' examples of community engagement in an informal settlement.

GOVERNMENT PLANNING AND POLITICAL DISCOURSE

Government planning and political discourse was a recurring topic of conversation in all interviews, and staff respondents identified it as the biggest blockage to transformational change, as well as one of the most important transformative changes required in Kibera. Respondents suggested that public-policy-driven development in Nairobi is not informed by an appropriate long-term planning discourse, and requires more community engagement, deeper research and sustainability considerations (Mulligan et al, 2015). Other staff members attributed this short-sightedness to the short election cycles; claimed that government officials and politicians mostly work to benefit themselves, their family or their ethnic groups while in office; and advocated for increased government accountability.

“Rather than focusing on the real issues or true community needs, high-level politicians will only implement projects that will guarantee further re-election, or will often try to manipulate the planning and implementation processes for personal gain” – KDI staff member.

Throughout all interviews and informal discussions during field work, the issue of political motives continuously surfaced, with several respondents suggesting that these motives are influenced by the corrupt nature of the government system. While more research into the political and development discourses of Kenya’s government officials and politicians is beyond the scope of this study, the strong consensus in perceptions of a short-sighted, unsustainable and self-interested development planning discourse of the government reveals the need to transform the political discourse in Kenya for increased accountability. Strikingly different from KDI’s strong commitment to a development discourse of community participation for sustainability, many staff highlighted the challenge to influence the government’s development discourse to be more participatory and sustainable, and viewed this as one of their main long-term challenges.

“It’s a difficult process, and KDI are trying to learn the best approaches for government engagement that would lead to improved government accountability” – Tatu Gatere, Kenya Country Director, KDI.

KDI’s PPS network project has already experienced some success in influencing the approaches of institutional actors in Nairobi, who hold the potential, and have the responsibility, to scale-up positive change (KDI, 2015). Refining KDI’s government engagement process, just as they have refined their community engagement process, could be a potential opportunity for contributing towards transforming government planning and political discourse towards more sustainable and equitable development.

INDIVIDUALS (VALUES & IDENTITY)

The ‘individual’ activity sphere considers relationships between self and society as well as relations with nature through the production and reproduction of identity and values (Pelling

et al, 2015). Transformation within this activity sphere includes fundamental changes to the processes by which individuals attain the knowledge that contributes towards their perceptions, reasoning and emotions. Incorporating educational theories of critical reflection and critical thinking, transformation within this activity sphere can be achieved through ‘transformative learning’, which changes an individual’s way of thinking or frame of reference, allowing them to problematize the context in which they live rather than accepting the systems and structures that sustain their vulnerability (Pelling et al, 2015).

TRANSFORMATIVE LEARNING

KDI's community engagement processes involve a lot of educational components, such as workshops and meetings, in which KDI staff disseminates information about local development and environment to residents in order to build awareness and capacity. KDI helps the community to solve their problems, include other members of the community, and manage project site facilities, including any income-generating activities. Illustrating their participatory philosophy, staff respondents iterate that knowledge transfer through their community engagement process is two-way, as Kibera's community groups also educate staff on the problems and issues in Kibera. Through this knowledge transfer, KDI’s community engagement processes influences the 'individual' activity sphere, as it fundamentally changes the way in which both Kibera's residents and KDI staff acquire knowledge, resulting in changed perceptions and reasoning, and allowing for the reproduction of new values and identities. KDI’s community engagement facilitates ‘transformative learning’ as the process allows all participants to critically reflect and problematizes the context in order to turn it into an object of change. Community leader respondents expressed a great gratitude to KDI for allowing them to enact change in their communities through this process, and further advocacy of this sort of participatory community engagement is required in order to scale-up transformative adaptation within this activity sphere.

“KDI has uplifted the lives of the people in my area, uniting them to work together, and helping us to start thinking about the possibilities of how our lives could be improved” – Julius Marengo, Chairman of Andolo Bridge Community Group.

COMMUNITY PERCEPTION AND TRUST

Community perception and trust was identified by respondents as one of the biggest development challenges, as well as one of the biggest blockages to transformational change in Kibera. Respondents described how the proliferation of incidences of corruption as well as inadequate and unsustainable community engagement have led to a loss of faith and trust in development initiatives and actors amongst Kibera's residents, which have negative implications on project success.

“If the community is not happy with the engagement process, if they feel like the process is taking too long or that they haven't been adequately engaged, then they can lose trust in both the project as well the organisation implementing it”

– Tatu Gatere, Kenya Country Director, KDI.

Respondents highlighted the need for deeper participatory practices in order to build trust, community ownership, and ultimately the sustainability of development interventions. Results illustrated interactions between the individual and behavior activity sphere, highlighting the need for addressing issues of community perception and trust towards more sustainable and equitable, and therefore transformative, adaptation.

CONTEMPORARY PRIORITIES VS. INTERGENERATIONAL EQUITY

One of the challenges with participatory methodologies is that there are often tensions between contemporary priorities and issues of intergenerational equity, and communities tend to prioritise their immediate risks while discounting the importance of addressing future or irregular risks (Pelling et al, 2015). To address this issue, Pelling et al (2015) suggests a two-way sensitisation process between communities and practitioners, so that communities can understand the importance of addressing future risks while practitioners can better understand and appreciate the community's more immediate concerns. Staff respondents expressed difficulties in asking community groups to think about the future, and the need for constant engagement to build an appreciation for sustainability.

“People in Kibera are worried about their day-to-day needs, and do not have much space to think about their future. We engage with communities and try to

get them to think about the structures, environment and systems in which they live, so that they can begin to understand the sustainability issues in their needs”
– Jamilla Harper, Associate Director, KDI.

Discussions illustrated the ways in which KDI works to sensitise Kibera’s residents to understand the need to address future risks through sustainable development, as well as staff understanding and appreciation for the immediate concerns of Kibera’s residents. In this way, individual transformations of both parties are taking place community engagement, as perceptions and understandings are transformed through participatory knowledge-sharing processes that produce new relations with society and nature.

BEHAVIOUR (PRACTICES & ROUTINES)

The ‘behaviour’ activity sphere considers how discourse, identity and values are naturalised through everyday actions that become routine, and recognises that these routine behaviours reproduce adaptive capacity as they reproduce values, embody power, and allow for the persistence of institutional systems (Pelling et al, 2015). Transformative adaptation within this sphere can be achieved through seemingly isolated incremental acts only if those acts are expressions of deeper changes in social relations or relations to nature (Pelling et al, 2015), illustrating interactions with the individual activity sphere. This activity sphere was prioritized the highest for transformational adaptation by most staff respondents. Respondents described how KDI’s community engagement processes encourages positive behavior change by encouraging community members to work and think as a group, therefore discouraging maladaptive or damaging practices.

BEHAVIOUR CHANGE FOR HEALTH AND ENVIRONMENT

The most prominent example of behavior change discussed in interviews was the changing of daily routines and practices that influence health and the environment, particularly waste management, sanitation and hygiene. Staff respondents described how the lack of systemic and infrastructural support has resulted in the naturalization of maladaptive practices as residents lack any viable alternatives. Respondents described how the introduction of organizational

support, such as education and awareness workshops as well as community clean-up days, and the construction of physical infrastructure, such as sanitation blocks and community centres, has facilitated positive behavior change within the project site areas, including improved waste management, sanitation and hygiene practices and routines. Results suggest that if the natural and built environment is improved through more infrastructural and organizational support, communities in Kibera would continue to be inspired to collaborate and take pride in their surroundings (Mulligan et al, 2015), changing practices towards safer, healthier and more sustainable behaviour.

REFORMATION OF AT-RISK YOUTHS

Another prominent example of behaviour change throughout this study was the reformation of at-risk youths who were engaging in criminal/illegal acts. Results revealed efforts by KDI to reform the negative behaviours of youth in Kibera through engagement and mentoring. In return for positively contributing to KDI's projects, providing security to their neighbourhoods and engaging with other community activities, youths are provided with a small financial incentive, which discourages them from engaging in criminal acts as a source of income. Results revealed that a lot of KDI's staff live in Kibera and are active leaders and role models in their communities, and it is this close integration with the community that has been instrumental to KDI's success of building trust and strong influence on youth behaviour in the settlement. Additionally, high youth unemployment was regularly cited by respondents as one of the main reasons why many youths in Kibera get involved in criminal acts, as they seek alternative sources of income. This highlights the importance of addressing the issue of youth unemployment in order to systematically address youth crime in Kibera.

INSTITUTIONS (REGULATORY & CULTURAL)

The 'institutional' activity sphere considers how institutions, both formal and informal, facilitate social behaviour, reproduce power imbalances, and regulates the reproduction of behaviour and power through either formal structures or as cultural norms (Pelling et al, 2015). Institutional structures and the level of strength and strategic leadership influences an institution's ability to contribute towards effective adaptation, as does the interaction between

formal and informal/cultural institutions (Pelling et al, 2015). When asked to identify actors and institutions that influence Kibera's development and urban risk governance, respondents identified government ministries, NGOs and community groups as the most influential. Respondents indicated that the Chiefs and other local government authorities hold a considerable amount of power when it comes to Kibera's local development, as projects require their approval before implementation. Many NGOs operate in Kibera and were identified by respondents as having a strong influence on development in the settlement, however the transformative potential of their interventions are questionable. Results revealed that most of Kibera's cultural and social groups meet regularly to share information and provide support to group members, with some of these groups engaged in savings and loans activities. Respondents generally perceived the institutional context in Kibera to be stable but sensitive, weak in their impact, rigid in bureaucracy and operations, and highly uncoordinated in intervention design and implementation, attributing poor systems learning and high transaction costs of adaptation attempts to institutional rigidity and lack of strategic leadership.

FORMAL INSTITUTIONS

Most respondents attributed a lot of Kibera's issues to poor planning and lack of commitment to development by formal institutions, and advocated for either the reformation of bureaucratic structures, or the strengthening of institutions through capacity-building in order to enact more structural change (KDI, 2016). This highlights the question of whether adaptation for resistance can help to build the institutional stability required for transformational experimentation, or whether temporary institutional instability from reform is required for transformations to occur (Pelling et al, 2015). While most respondents advocated for better coordination and improved development discourse amongst formal institutions, conclusions about whether this would be achieved through structural strengthening or structural reform were not made. Results revealed the isolated nature of most interventions in Kibera, both by government ministries and NGOs, and it was suggested that better coordination within and between institutions would allow for the collaboration of expertise and resources, and increase intervention impact through a more holistic, multi-scalar and sustainable approach (Mulligan et al, 2015). Most of KDI's work is at the local-level, engaging with communities and local government authorities, such as Chiefs and District Officers. Staff respondents described how KDI works to build good relationships with government ministries and parastatal companies, whom appreciate the nuanced local understandings that KDI contributes to discussions, and how KDI continuously seek to connect

to larger infrastructural projects in Kibera through engagement with government. In this way, KDI works to influence government planning towards a more locally engaged approach, and to connect their projects to formal government infrastructure to increase project impact and sustainability. Although seemingly incremental, if made at scale, these efforts have transformative potential through the fundamental changing of government planning and the scaling-up of locally transformative interventions.

INFORMAL INSTITUTIONS

Interviews revealed the varying strengths of Kibera's cultural and social groups between neighbourhoods, and respondents described their sensitivity to issues of trust both within the group as well as with external actors. A possible recommendation for transformative adaptation in Kibera is to engage in trust-building activities in order to strengthen stability and allow for the experimentation required for transformation (Pelling et al, 2015). However, potential power imbalances within community groups would need to be researched further in order to avoid issues of 'elite capture' (Cannon, 2008).

RELATIONSHIPS BETWEEN FORMAL AND INFORMAL INSTITUTIONS

KDI works to formalise stronger structures within community groups in order to ensure sustainability not only of project sites, but also of the group itself. Community group formation and strengthening was identified by most community leader respondents as an area that was most positively impacted by KDI's work in Kibera. In order to scale-up their impact on informal institutional strengthening, KDI's long-term vision of a 'Kibera network' will link all their projects across the settlement to facilitate community group communication, coordination and support, in the hope to increase intervention effectiveness and impact.

While there is some form of dialogue between formal and informal institutions through the Chieftancy, results revealed that this channel of communication mostly functions only to address personal, household or neighbourhood conflicts, is often painstakingly slow, and that community groups are often neglected in any larger scale government planning processes (KDI, 2012). Alternatively, KDI acts as a networking link between stakeholders, helping government and communities to engage with one another in the hope to improve relationships, share ideas and plans, and obtain support from both parties, towards more sustainable and

equitable solutions (KDI, 2012). Staff respondents see the coming year as an opportunity to facilitate more meetings between community members and government officials due to the upcoming election and increased government motivation, however election-period development rhetoric needs to be followed-through and government accountability needs to increase in order for any of these meetings to translate into practice.

TECHNOLOGY (MATERIAL & ORGANISATIONAL)

The ‘technology’ activity sphere includes both material and organisational technology. While material transformation is possible through the introduction of new physical technologies, organisational transformation is possible through restructuring or by bringing in new voices, methodologies or practices (Pelling et al, 2015). The improvement of organisational technology is of particular importance to transformation, as operating procedures will need to be adapted to better suit the non-linearity and varied speeds of change that are often associated with transformative change, which requires changes in methodology, investments in capacity and the development of new skills (Pelling et al, 2015). Pelling et al (2015) describe the organisational features required to support transformational change, such as reflexive decision-making, continuous monitoring, change management, action-learning, the navigation of internal processes of individual and organisational change, and a supportive environment that is conducive to experimentation. Additionally, as the greater inclusion of marginalised groups into decision-making systems is considered as an organisational innovation (Pelling et al, 2015), this too falls under organisational technology. When asked to prioritise the activity spheres for transformative action, staff respondents placed ‘technology’ high on their list, often describing how technological improvements allow people to expand their minds and develop new ideas and innovations. This prioritisation of technology is not surprising, as KDI’s interventions in Kibera introduce material technology in the form of physical construction and information technologies, as well as material technology in the form of community group strengthening and facilitating stakeholder coordination. KDI’s technological innovations in Kibera can be seen as an aggregation of incremental adjustments towards transformation, as they open the scope for experiments and have the potential to influence decision-making systems that determine structural vulnerability.

MATERIAL INNOVATIONS

Kibera's residents construct small-scale low-cost structural adaptation, usually serving as flood protection, however these autonomous adaptation efforts tend to be of poor quality (Mulligan et al, 2015). KDI introduces material innovations to Kibera in the form of low-cost physical infrastructure and engineering solutions. Staff respondents revealed that Kibera's residents attempt to autonomously replicate their engineering designs, however they tend to do it incorrectly. In order to assist these individual adaptation efforts, KDI transfers design, engineering and construction skills to the community by teaching their building techniques to local labourers. Additionally, as constructing with locally sourced materials is key to local autonomous replication, KDI has begun to experiment with mud and sand construction, as opposed to concrete or stone. By bringing in new methodologies for construction practices, empowering local residents through construction skills transferal, and building on the local practice of autonomous adaptation, KDI contributes towards incremental adjustments in Kibera by building the capacity of local communities to construct better quality small-scale and low-cost structural adaptations to their homes and neighbourhoods. While it has been argued that incremental adjustments within the current conditions of insecure housing and land tenure serve to reinforce systems and structures that perpetuate vulnerability (Mulligan et al, 2015), transformative potential can be seen in the restructuring of methodologies and practices, and further research is required to identify opportunities and challenges of scaling up these incremental adjustments of small-scale structural adaptation interventions in order to enact more transformational change.



Photo 3: Mud construction at KDI's ANWA school upgrading project site, Kibera, 2016.

ORGANISATIONAL INNOVATIONS

KDI has developed a successful participatory approach to project design and implementation in Kibera (KDI, 2012). While capacity building of community groups can be seen as incremental changes, respondents argue that for many community members, working as a group and claiming ownership and responsibility for projects represent a 'total transformational shift'. In spite of Kibera's complex and challenging environment, KDI found a process that allowed them to successfully implement projects unlike any other organisation before – a process that is community-driven and is rooted in a firm commitment to 'deep' participation – which in itself can be seen as an organisational innovation. While the transformative impact of KDI's participatory approach can be seen on a local-scale, the potential to up-scale its transformative impact lies in sharing their knowledge and methods with other institutions and actors. The KPSP projects provide evidence and concrete examples on the effectiveness of community-driven processes and how to engage informal communities in integrated projects (Mulligan et al, 2015).

KDI staff interviewees described the supportive and collaborative decision-making environment within KDI's operations, which allow them some room for experimentation.

“We throw up many ideas and take risks in our decision-making, and even if our experiments fail, the lessons learned from the process ensure that the failed experiment was not a complete loss, but will contribute towards future successes” – Jamilla Harper, Associate Director, KDI.

While KDI staff feel like they have the freedom to experiment, they described it as a “limited freedom” as they are still accountable not only to donors but also to the community. Staff respondents expressed the importance of carefully considering the impacts a failed experiment would have on the fragile relationship of trust held with community groups and members. KDI's willingness to experiment can also be seen in their external engagement with other organisations and individuals. KDI staff welcomes yearly volunteers from Engineers Without Borders and researchers from academic institutions, and perceives this external presence as an opportunity to reflect on their work and to try new things. This engagement with external voices and willingness to consider new approaches has arguably deep transformative potential, as ‘science’ is restructured through technical innovation (Pelling et al, 2015). Staff respondents described how, while they quantitatively monitor the income-generating businesses at their project sites, their monitoring and evaluation (M&E) processes as usually very informal and qualitative. While quantitative accounting and auditing evaluations are made for project site visits, results revealed that KDI usually assesses intervention impact through qualitative indicators such as community acceptance, general site conditions (maintenance), community ownership, the growing capacity of community partners, and scalability of projects (KDI, 2015). Some staff respondents expressed that changes need to be measured better through an improvement of KDI's M&E processes and capacity in order to more holistically understand the positive as well as potential adverse impacts of their projects. While KDI does engage in reflexive decision-making based on continuous monitoring of community groups and project site businesses, their processes of change management could be improved through more investment in M&E capacity and the development of new M&E skills. Another operational constraint to transformational adaptation, identified by staff respondents, was that of donor requirements, including timelines. Respondents describes how KDI's process requires timelines to be constantly adjusted as the end product evolves through community engagement,

and packaging KDI's projects within the neat timelines so often desired by donors is a challenge.

“KDI does not sell a specific product to donors, but sells a process of community participation and co-design” – Jamilla Harper, Associate Director, KDI.

Staff respondents find that most funding opportunities available require very strict timelines, which they feel is at a mismatch with their process. This highlights the need for funding structures and donor expectations to be adapted to accommodate more transformational change.

GENDER EQUALITY AND WOMEN'S EMPOWERMENT

Respondents revealed a general consensus on the understanding of the importance of including women in decision-making processes and encouraging gender equality. However, despite this general consensus, views on the current state of the empowerment of women in Kibera varied, with some respondents claiming that women are “not taken seriously”, are not given the chances to be in decision-making roles, and that they find it hard to encourage women to take up leadership roles; while others claimed that women in Kibera are adequately empowered, with many holding key positions in communities. Additionally, results revealed that, despite the strong involvement of women in the maintenance and sustainability of project facilities, there is a usual lack of women in the initial stages of community engagement. As foundational decisions are made in the first stages of engagement, this could represent a lack of women's voices in determining what form the intervention will take. The discrepancy of accounts and the concern of lacking female engagement in the first stages, highlights the need for further research on gender equality and women's empowerment in Kibera and the identification of strategies to increase women's participation in the first stages of the project cycle.

LIVELIHOODS (PRODUCTION & LABOUR PROCESSES)

The ‘livelihoods’ activity sphere captures the modes and relations of economic production available, as well as the entitlements and skill sets that make up individual and household asset profiles (Pelling et al, 2015).

Poverty, low income, unemployment (particularly of youths), lack of jobs, lack of access to opportunities and education, and lack of financial capital to pursue aspirations, were identified by respondents as some of the biggest development challenges in Kibera. As a result, Kibera’s residents usually resort to pursuing livelihoods in the informal sector or, as is the common case with youths, in criminal/illegal activities. Staff respondents identified the ‘livelihoods’ activity sphere as an important priority for transformative adaptation, describing how the improvement of job opportunities and education would increase the capacity and potential of Kibera’s residents to achieve more and improve their lives. Respondents identified the lack of access to, and attainment of, formal education, qualifications and employment, due to lack of financial capital, adequate educational infrastructure and services, and lack of opportunities, as one of the largest barriers to improving livelihoods in Kibera. The savings and loans activities of Kibera’s community groups help to build economic and social resilience, and allow individuals to borrow the financial capital required to establish small businesses in the absence of formal financial services (Mulligan et al, 2015), however interview responses revealed that the constant strain on income experienced by most of Kibera’s residents makes it very hard for community group members to contribute their monthly savings and loans contribution. Interview discussions revealed the relatively limited pathways for Kibera’s residents to pursue a livelihood in sport or creative industries. Respondent suggestions to the multiple issues relating to livelihoods in Kibera included educational scholarships, skills training, career support and guidance, financial support, and improved infrastructural support in the form of schools and social amenities. These solutions would arguably provide increased access to education and the nurturing of diverse livelihoods aspirations. For example, educational, sporting and cultural facilities could serve to nurture interests and hobbies that could potentially become a source of income, provide safe spaces for positive socialisation that could strengthen networks and prevent youths from engaging in crime, facilitate mentorship and leadership programs for increased community cohesion and individual ambition, and provide local jobs in initial construction as well as in ongoing teaching/coaching and facility maintenance.

Additionally, low-density spaces attached to such facilities could serve as flood buffers along riparian zones, preventing flood risk and improving the environment. However, due to Kibera's issues of land tenure and unplanned high-density growth, there is little open space to accommodate for such facilities (KDI, 2015), and highlights the need to address the underlying issue of land ownership and tenure in order to facilitate such developments. Furthermore, the issue of livelihoods extends beyond the local scale and is influenced by national economic and industrial policies and programs. Further research is required on the modes and relations of economic production in Nairobi in order to identify the challenges and opportunities towards creating more jobs, as well as assessment on the viability of supply- and demand-led livelihood and education policies and programs.

ENVIRONMENT (BIOTIC & ABIOTIC)

The 'environment' activity sphere recognises that ecological, physical and chemical systems are integrated with social and technological systems through coevolution (Pelling et al, 2015). Generally, the polluted condition of Nairobi's rivers reflects the anthropogenic activities that lie along the waterways, as they are used as conveyance for uncollected waste from informal settlements, industrial activities and over-flowing sewers (KDI, 2012). While the installation of formal infrastructure systems provides one solutions to address waste management, the challenging context of unplanned urban growth in a dense settlement such as Kibera provides little space for infrastructure installation and can be prohibitively expensive (KDI, 2012).

Results revealed an understanding of the interrelated nature of ecological, physical, chemical, social and technological systems, with respondents advocating for more structural support to help address environmental issues in Kibera. Respondents revealed the multiple ways in which KDI has helped to improve the natural and built environment in Kibera, including community cleaning initiatives, landscaping solutions for water and waste management, the provision of small-scale infrastructural support, and environmental awareness and education campaigns. Additionally, staff respondents described how the placement of KDI's projects in multiple locations along the riparian zone help to reduce point pollution to contribute towards river rehabilitation. Results revealed the ways in which government-led interventions aiming to

improve the natural and built environment have often led to failure and conflict due to poor planning and community engagement.

SEWER LINE CONSTRUCTION AND FAILURE

One of the most discussed example of this was the construction of a sewer line by the government and Athi Water Services Board in 2014-2015, which cleared informal structures from large stretches of the Ngong river's riparian zone (Mulligan et al, 2015). Respondents explained how the residents that were temporarily displaced to allow for construction have rebuilt their homes on top of the new sewer line, which was allowed by government in order for the project to proceed without adequately dealing with the contentious issue of displacement, and illustrates a missed opportunity to relocate residents away from the high-exposure area and to improve the riverine environment (Mulligan et al, 2015). Respondents also described how the sewer line is not functioning as a result of Kibera's residents dumping rubbish in the manholes, and actually sits below the flood level of the area, putting local households at risk of being inundated with sewerage in times of flood. This case illustrates the common occurrence for large infrastructure projects in Nairobi to miss opportunities to address climate risks through more integrated solutions (Mulligan et al, 2015), and highlights the need for more holistic and realistic government planning and implementation (including adequate environmental and social assessments) in order to understand the complex system dynamics involved.

KENYA SLUM UPGRADING PROJECT (KENSUP)

Another frequently cited government-led infrastructure development was the Kenya Slum Upgrading Project (KENSUP) led by a partnership between the Government of Kenya and UN-Habitat, and established in 2000 (KDI, 2012). Respondents frequently cited this development as having both positive and negative impacts, and could be seen as an example of how efforts towards transformation can potentially undermine stability (Pelling et al, 2015). Many respondents reported on how, while the project is premised on a good idea of provision of better housing, the government's relocation processes caused considerable conflict and insecurity (Mulligan et al, 2015), have not considered Kibera's 'communal' way of life, and has 'torn apart the social fabric of Kibera'. These judgements seemed to stem from the government expectation on residents to pay an amount of money in order to access the new

housing which ultimately marginalises the poorest from accessing the new housing, a design that does not consider the communal nature of Kibera society, and the need for many of Kibera's small business to operate from resident's homes. Multiple discussions on this topic revealed that Kibera's residents are unhappy about the isolated and high-rise nature in which the new apartments are designed as it does not allow for the social interaction between neighbours which community leaders expressed was a highly valued element of life in Kibera, and does not accommodate for the operation of small businesses that thrive through ground-level interactions. Respondents argue that these processes have led to the displacement and homelessness of residents, the disruption of businesses, and the disintegration of social ties that are characteristic of Kibera's strong social capital.

“In the case of the Slum Upgrading developments, the government completely restructured neighbourhoods, creating high-rise buildings in a society that flourishes on 'networked residential ground circulation economies' - hawkers and small-scale businesses that operate from their homes, the community groups that are formed through the interactions between neighbours and facilitated by the communal style of living in Kibera, and the strong links of social capital as people build support systems to help sustain themselves and their neighbours through the challenges they may be facing” – Bukonola Ngobi, Urban Design Coordinator, KDI.

With the removal of these networks, the recent Slum Upgrading housing developments in Kibera require residents to have the capacity to create new social and economic structures, a flexibility that marginalised populations arguably do not have. One KDI staff respondent advocated for government projects such as this to consider building on existing networks and social frameworks, rather than breaking them apart, which they argued is one of the most crucial aspects of social development. Interview respondents attributed the apparent failure of the government-led housing developments in Kibera to a lack of appropriate community engagement and adequate research. Respondents claimed that while the government attempted some form of engagement with stakeholders, the participatory process did not go 'deep' enough, not enough time was invested in understanding the context, community objections and concerns were largely ignored, and the complex dynamics of the informal settlement was not adequately considered in planning, design and implementation.

The sewer line and KENSUP cases illustrate the lack of adequate environmental, social and economic assessment, as well as the lack of community engagement, in the planning process of government-led infrastructure projects (Mulligan et al, 2015), and suggests the need to revise and transform the structures and operations in which government design, implement and monitor such projects. Otherwise, government projects will continue to waste great opportunities to implement positive, and potentially transformative, development. While the municipality has been making improvements to the policy framework and physical development of infrastructure, they still struggle to provide sustainable and equitable results in Kibera (KDI, 2012).

CLIMATE CHANGE

When asked to discuss the implications of the increasing risks of impacts from climate change in Kibera, respondents identified storm water/flood management, waste disposal, network infrastructure, river rehabilitation, re-housing, and community education and capacity building as areas that require more attention. Respondents advocated for the need to incorporate flood resilience, sustainability and climate change considerations into government planning; the provision of proper drainage channels; adequate waste collection to prevent dumpsites in waterways; the rehabilitation of waterways, including addressing point pollution and river erosion; land reclamation along rivers to prevent high density housing in flood zones; the use of public space and vegetation as flood buffers; and awareness and education campaigns to promote more adaptive behaviours and strategies. Responses highlighted how climate risks are interrelated with broader issues of vulnerability, and advocated the need for adaptation measures need to be integrated with longer-term development issues (Mulligan et al, 2015). Pelling et al (2015) suggest that the scales and sites experiencing adaptation, and the preferences between the three forms of adaptation, may shift as climate change unearths new uncertainties. Results suggest that the issue of flood risk has begun to be elevated to the level of national concern, particularly given the recent huge rainfall events in Nairobi. If the issue of flood risk is in fact accredited more importance on a national scale, this could possibly open up opportunities for more sustainable development and transformative adaptation, through an alignment of political motives and individual values, and therefore influences on policy discourse, planning practices, institutional reform, and technological innovation.

CROSS-CUTTING ISSUES / INTERACTIONS BETWEEN SPHERES

The powerful adaptive potential of the influence, and movement of information, between activity spheres (Pelling et al, 2015), highlights the need to more closely examine the interactions and flows between activity spheres as well as any cross-cutting issues.

LAND OWNERSHIP AND TENURE

An issue that cuts across all activity spheres, and was frequently cited in interviews as one of the biggest development challenges in Kibera, as well as one of the major blockages to transformational adaptation and sustainable development, was that of land ownership and tenure. Results revealed that, while the land in Kibera is technically government-owned, many other actors also claim ownership to parts of land in Kibera, including the Nubian community, land and structure owners, and business owners. Landlords were identified by respondents as some of the most influential stakeholders in the development of Kibera, as they determine the boundaries within which residents and organisations can improve homes or build community facilities. Results revealed the influence that the underlying issue of land ownership and tenure has had on household adaptive capacity, particularly in the provision of adaptive infrastructure and on autonomous structure investments and upgrading (KDI, 2012).

“If you build something on land in Kibera and someone else gets the title deed to that land or comes to claim the land, then anything you have constructed on it belongs to them” – Amos Wandera, Field Coordinator, KDI.

Some respondents suggested community ownership of projects as a potential solution around the issue of land and tenure insecurity, however this can be seen as an incremental adjustment that does not challenge the underlying structures and systems of land ownership and tenure, and further research is required to assess the effectiveness of community owned facilities in informal settlements to enact transformational change.

LIVELIHOOD-ECOSYSTEM SUSTAINABILITY

Pelling et al (2015) identified the interaction between livelihood sustainability ('livelihood' activity sphere) and ecosystem stability ('environment' activity sphere) as key for adaptation. Many respondents described how the Ministry of Devolution used to operate a garbage collection programme, whereby they employed the National Youth Service (NYS), of which many of Kibera's youth are a member, to clean drainages in Kibera. Respondents described the positive effects this programme had on improving the environment in Kibera towards more hygienic and sanitary conditions, and advocated for the renewal of the project. Respondents described how, although the government's garbage collection programme has since ended, the idea of garbage collection businesses as a source of income for Kibera's youth has remained in Kibera, and many youth groups still engage in such activities. As of 2015, 21 groups were operating in Kibera, collecting recyclables or composting food wastes for sale to generate income (KDI, 2012; Mulligan et al, 2015). The scaling-up of this interaction should be investigated further. However, it was also explained that although this service exists, many people in Kibera do not use it because they are still able to throw rubbish into drainages and waterways free of charge. This highlights the need for awareness raising, educational and behaviour change initiatives that could help individuals to understand the negative environmental (and health) impacts of dumping rubbish in waterways, as well as the need for waste management systems/infrastructure and capacity building initiatives that could provide systemic support to address waste dumping.



Photo 4: Kibera resident outside his recycling business kiosk, Kibera, 2016.

SCALING-UP TRANSFORMATION

According to Pelling et al's (2015) 'adaptation activity space' framework, transformative interactions across scales are especially powerful, and in fact some opportunities for transformative adaptation only arise when interventions are made at scale, such as that of discourse, individual, institutions or technology. Therefore, through multi-scalar adaptation approaches or by scaling-up small-scale transformative adaptation, transformative interactions and adaptation pathways can emerge, coevolve and spread quite powerfully.

SCALING-UP KDI'S TRANSFORMATIVE IMPACT

When asked to discuss development and adaptation in Kibera, KDI identified the ability to enact large-scale change as one of the biggest challenges. Respondents described how KDI generally operates at the local scale, developing effective methods and processes of community engagement through local projects that have meaningful local impact. However, respondents also acknowledged the need to operate at a larger scale in order to enact transformational

change. Therefore, in attempts to increase the scale of their impact, KDI constantly works on linking with government and tries to influence government planning discourse and practices by advocating the use of community engagement processes; providing government with useful local information; and facilitating communication and collaboration between government and Kibera's communities. Additionally, through KDI's 'Kibera network' idea, rather than having many isolated incremental interventions, KDI's projects will be networked into a 'corridor' of interventions, with potential for settlement-wide impact. KDI's settlement-scale aspirations of rehabilitating the river, reducing flood risk, and networking the settlement through public spaces, has the potential to be transformational not only in Kibera, but also in other informal settlements with similar dynamics and complexities. As most urban informal settlements across the world are located along a city's drainage pathways or waterways (Parikh et al, 2012; Mulligan et al, 2015), there is some potential for KDI's network idea to be applied to other informal settlements, however transferability would need to be determined on a case-by-case basis. Pelling et al (2015) posits that the scaling-up of transformation could potentially be undermined if transformation at the local level is lacking. However, as KDI's interventions tend to primarily focus on transformation at the local level, efforts to scale-up their transformative impact should not be undermined, but in fact be strengthened by a solid foundation of local transformation.

CONCLUSION

Adaptation in Kibera, conducted by a multitude of individuals, organisations and institutions, are informed by all three forms of adaptation discourse (resistance, incremental adjustment and transformation) (Pelling et al, 2015), sometimes simultaneously. Arguably, most of KDI's transformative potential was found in their processes of participatory community development, which serves as an organisational innovation with strong influences on all other activity spheres and opens spaces for potentially transformative adaptation strategies, albeit at a relatively local scale. By strongly advocating their community-driven participatory processes and acting as an example of 'best practice' for community development in an informal setting, KDI works to transform both the popular and policy discourse on development and adaptation in Kibera. By facilitating educational and awareness-raising workshops and meetings, KDI works to transform the values and identities of Kibera's residents and local government by encouraging

the changing of perceptions, reasoning and emotions towards more transformative adaptation strategies. By introducing alternative pathway choices and providing infrastructural support through their PPS projects, KDI encourages more sustainable and equitable practices and routines amongst Kibera's residents. By strengthening and advocating for the organisational structures that facilitate democratic practices in the decision-making of local development, KDI works to rebalance power and facilitate the reproduction of behaviours towards more sustainable and equitable institutions and cultural norms. Through community capacity building and skills transferral, KDI facilitates local innovations of technology and livelihoods to allow for Kibera's residents to improve the conditions in which they live through small-scale upgrading measures or income-generation activities. And finally, through their landscape-driven physical infrastructure projects, KDI improves the natural and built environment of their project sites, which influences individual and community values, identity, practices and routines. While this list of KDI's transformative potential in Kibera is not exhaustive, it illustrates the powerful interactions and flows between activity spheres. While incremental adjustments dominated, transformational potential was found within and between all components, often requiring increased and improved stakeholder engagement, coordination and collaboration in order to increase the scale of impact and address the underlying causes of vulnerability, highlighting the importance of partnerships in influencing transformational change. While transferability of research findings to other informal settlement contexts would require further research, results presented here highlights areas for increased focus and research in order to pursue a more transformational agenda.

List of References

- Birongo, J. M. & Quyen Le, N. (2005) *An Analysis of Water Governance in Kibera, Kenya*, Roskilde University Centre.
- Cannon, T. (2008) *Reducing People's Vulnerability to Natural Hazards: Communities and Resilience*, UNU-WIDER Research Paper No. 2008/34.
- Carlsson, M. (2013) *A Case Study of the Relationship between the City Council of Nairobi and Community Based Waste Management Organisations*, Lund University.
- Charles, K. H. (2010) *Safeguarding Sanitation in High Population Density Urban Settlements: A Case Study of Kibera Slums, Nairobi Country*, Kenyatta University.
- Cohen, B. (2006) Urbanization in Developing Countries: Current Trends, Future Projections, and Key Challenges for Sustainability, *Technology in Society*, 28: 63-80.
- Deacon, G. (2012) Pentecostalism and Development in Kibera Informal Settlement, Nairobi, *Development in Practice*, 22(5-6): 663-674.
- Desouza, K. C. & Flanery, T. H. (2013) Designing, Planning and Managing Resilient Cities: A Conceptual Framework, *Cities*, 35: 89-99.
- Dimova, M. (2010) *Re-examining the 2007-2008 Post-election Violence through Longer-standing Youth Mobilisation Patterns in the Slum Area of Kibera, Nairobi*, Utrecht University.
- Fekade, W. (2000) Deficits of Formal Urban Land Management and Informal Responses Under Rapid Urban Growth, *Habitat International*, 24: 127-150.
- Fernandez, R. F. & Calas, B. (2012) The Kibera Soweto East Project in Nairobi, Kenya, *Les Cahiers d'Afrique de l'Est*, IFRA Nairobi, 2011: 129-146.

Figueiredo, P. & Perkins, P. E. (2013) Women and Water Management in Times of Climate Change: Participatory and Inclusive Processes, *Journal of Cleaner Production*, 60: 188-194.

KDI (2012) *Site, Settlement, Watershed: Nairobi River Basin Baseline Report*, Kounkuey Design Initiative: Los Angeles & Kenya.

KDI (2015) *Kenya Brochure 2015*, Kounkuey Design Initiative: Los Angeles & Kenya.

Mansuri, G. & Rao, V. (2012) *Can Participation be Induced? Some Evidence from Developing Countries*, Policy Research Working Paper 6139, The World Bank.

Montgomery, M. R. (2005) Book Review of *Shadow Cities: A Billion Squatters, a New Urban World*, by Robert Neuwirth, *Population and Development Review*, 31(2): 373-376.

Mulligan, J., Harper, J., Kipkemboi, P., Ngobi, B., Collings, A. (2015) Community-responsive Adaptation to Flooding in Kibera, Kenya, *Engineering Sustainability, 2016*, Institution of Civil Engineers (ICE).

Neuwirth, R. (2005) *Shadow Cities: A Billion Squatters, a New Urban World*, Routledge: New York.

O'Brien, K. (2012) Global Environmental Change II: From Adaptation to Deliberate Transformation, *Progress in Human Geography*, 36(5): 667-676.

Oxfam GB. (2009) *Urban Poverty and Vulnerability in Kenya*, Oxfam GB Kenya Programme.

Omambia, A. N. (2010) Sanitation in Urban Slums: Perception, Attitude and Behaviour: The Case of Kibera, Nairobi-Kenya, *Journal of Environmental Sciences and Engineering*, 4(3).

Pascal, P. & Mwendu, E. (2009) A Garden in a Sack: Experiences in Kibera, Nairobi, *Urban Agriculture Magazine*, 21: 38-40.

Pelling, M. (2011) *Adaptation to Climate Change: From Resilience to Transformation*, Routledge: London & New York.

Pelling, M., O'Brien, K. & Matyas, D. (2015) Adaptation and Transformation, *Climatic Change*, 133: 113-127.

Schouten, M. A. & Mathenge, R. W. (2010) Communal Sanitation Alternatives for Slums: A Case Study of Kibera, Kenya, *Physics and Chemistry of the Earth*, 35: 815-822.

Zwanenberg, R. (1972) *History and Theory of Urban Poverty in Nairobi: The Problem of Slum Development*, IDS Discussion Paper No. 139.



The contents of this Working Paper reflect the views of the author only and not those of the UK Department for International Development or the Economic and Social Research Council.