

RESILIENCE IN THE FACE OF INSURGENT URBANSISM

A case of Nairobi, Kenya



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If I have seen further it is by standing on the shoulders of Giants – Sir Isaac Newton.

To my giants, James and Mary Maina.

Declaration of Authorship

I, hereby, declare that the Master Thesis presented is my original work and that the results are a representation of my own investigation. It has not been previously submitted, in part or as a whole, to this or any other university. All information derived from work done by others has been acknowledged, to the best of my knowledge, in the text and the list of references.

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Abstract

Resilience is an emerging discourse in urban theory and through this paper, the researcher aims to explore its ability to produce gainful results in cities having both formal and informal planning practice. The emergence of this discourse coupled with the increasing research into insurgent planning practice in Southern cities has presented a unique and important opportunity to understand resilience through the lens of rapidly developing cities and more specifically through the eyes of their most vulnerable citizens, the urban poor. To answer the research question, Nairobi, Kenya, a city where insurgent planning practice contributes to more than 60% of the urban fabric, will be used to answer the question of which tools would be necessary to improve projects aimed at increasing the resilience of insurgent neighbourhoods.

This thesis, through the analysis of two separate projects, KENSUP developed by the Kenyan government and the Bio-centres developed by Umande Trust, will analyse how the denial of the constitutional rights - as stipulated by Article 43. Section (1) "The Constitution of Kenya," (2010) - to health, housing, water and security in urban informal settlements has prevented the urban poor from achieving resilience against everyday vulnerabilities. More specifically this paper dives into how different stakeholders equip the communities in insurgent settlements to overcome their challenges and improve their livelihoods. With Nairobi just recently joining the Rockefeller 100 Resilient Cities network, it is a good opportunity to delve into the deeper issues that would better achieve resilience especially for its most vulnerable communities and subsequently for the city at large. Interviews, observations and literature review focusing on the projects and their impacts on Kibera, are analysed to provide targeted results. In addition to this, the projects are evaluated against an international index to gauge how they perform based on international standards. The analysis of the results will be presented through identified tools citing best practices around the world that could help improve the projects under research.

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1. PROBLEM FORMULATION

1.1. Introduction

This century has seen a significant shift of urban growth from the global North to the global South with mega- and meta-cities being increasingly observed in the developing South with approximately 90% of the urban growth expected in low and middle-income countries (United Nations, 2014). This has inevitably led to a rise in unconventional planning practices (Roy, 2005). There is an increasing percentage of urban residents living in unplanned, overcrowded settlements with little or no access to basic services (Vanessa Watson, 2012). Slums in Southern cities¹ have transformed from the urban anomaly once described by Peter Marris (1979) into the norm. According to UN-Habitat (2003) estimates, over 30% of the urban population in Southern cities lives in slums. This figure rises to 72% in sub-Saharan Africa as the population transitions from rural to urban-based populations. Shocking statistics from the 49 least developed countries indicate that a much larger population may live in slums with records of 99.4% reported in Ethiopia and up to 98.5% in Afghanistan. This transition has been faced with many difficulties as “cities have neither been able to plan for nor to keep pace with this transformation” (Shrestha and Aranya, 2015).

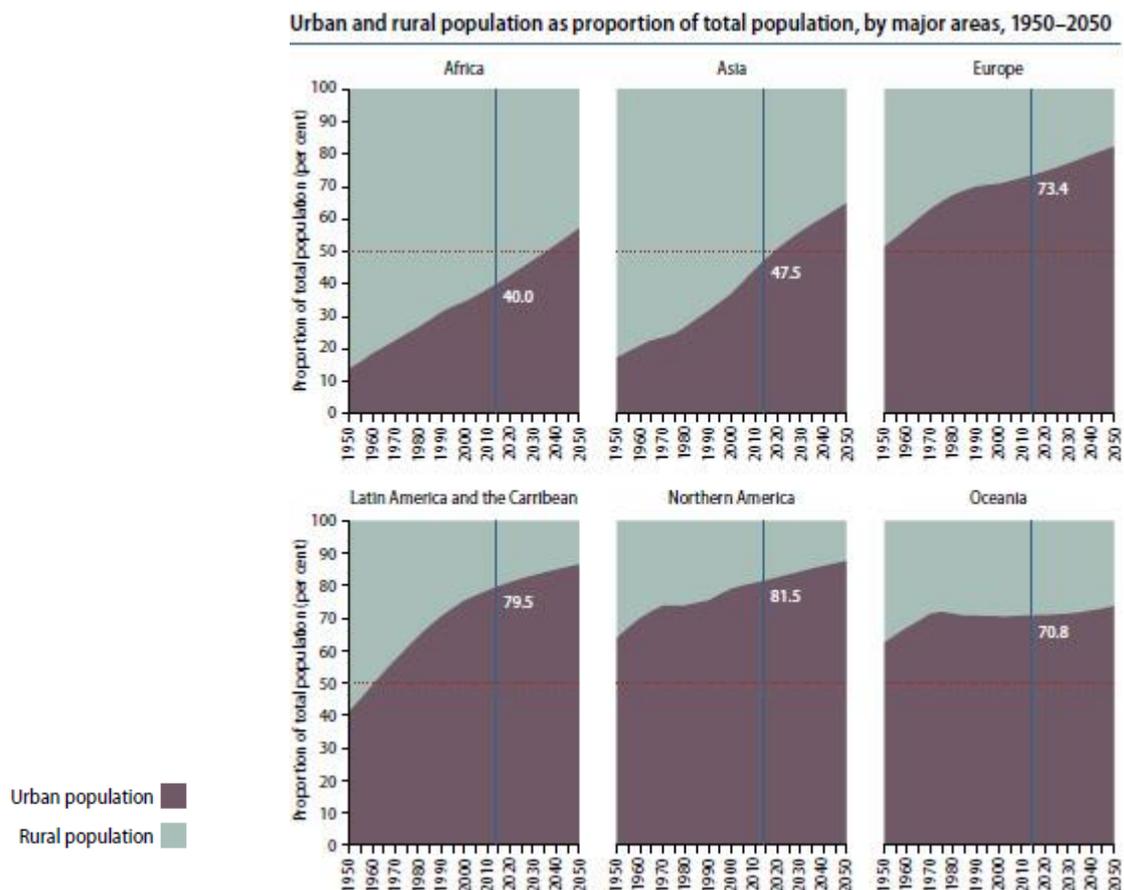


Figure 1: Global Urbanisation trends (Source: World Urban Prospects - United Nations, 2014; 8)

As the world continues to urbanise, sustainable development challenges will be increasingly concentrated in cities in lower middle-income countries where urbanisation is fastest (United Nations, 2014). The development of unconventional settlements, especially by the urban poor, has therefore

¹ Southern cities are cities that are developing in what is known as the global South i.e. Africa, East and South-East Asia and Latin America.

led to the rise of 'slums'² which has led to initiatives focused on eradication as opposed to redevelopment. One such initiative was the basis for the 2003 UN-Habitat agenda 'cities without slums' by the year 2020. Such campaigns have implied that cities, especially Southern cities, can rid themselves of informal settlements. However, scholars such as Gilbert, (2007) find this concept quite unrealistic as the numbers continue to grow. Nevertheless, as the populations increase in slum developments, so do the vulnerabilities they face which become a problem not only for the citizens within the settlement but for the city within which the settlements are located (UN-Habitat, 2003). The reduction of these vulnerabilities, therefore, becomes critical to the survival of the whole urban space. The problem this paper will address therefore is how vulnerabilities arising in insurgent urbanism in the global South can be reduced to ensure that the whole city remains resilient.

1.2. Resilience, Insurgence Urbanism and the Civil Society in Southern Cities

1.2.1. Insurgent Urbanism

Unfortunately, the narrative of slum eradication often driven by international organisations has been and continues to be the basis of many national agendas of slum upgrading; even as these organisations start to appreciate the difficulties arising from slum eradication and recognise slum developments as independent typologies of human settlement (UN-Habitat, 2016). Whatever the case may be, the Rio+20 United Nations Conference on Sustainable Development, "The future we want", acknowledges that both the plight of the urban poor and the need for sustainable cities are matters of great urgency. This is best seen in the Sustainable Development Goals (SDGs) committed to reducing poverty (SDG-1), promoting sustainable cities and communities (SDG-11) and strengthening implementation partnerships (SDG-17) which are also the main areas of concern in this research. Habitat III paper (2016, art. 25) has committed even further in stating that:

"[We] recognize that the growing inequality and the persistence of multiple forms and dimensions of poverty, including the rising number of slum and informal settlement dwellers, is affecting both developed and developing countries, and that the spatial organization, accessibility, and design of urban space, as well as infrastructure and basic service provision, together with development policies, can promote or hinder social cohesion, equality, and inclusion."

However, the process of poverty alleviation through slum reduction, especially in urban areas in the Southern cities, has brought with it several problems. These problems develop as hundreds of millions of urban poor in developing cities around the world continue to live in unsafe environments that face multiple threats and increased vulnerability to both natural and man-made risks (World Bank, UN-Habitat, 2008). With slum development being equated to poverty (Roy, 2005), there is an unfair understanding of what slums are and more so, what they require. One description by Mike Davis, (2006) is quite revealing in its description as he argues that, "these 'urban badlands' are the territory from which insurgency will spring." implying that slums are not only poor but dangerous to the city.

However, insurgency³ within slum development in and of itself is not entirely a bad thing. The urban poor due to the neglect from the legal and formal processes have had to depend on insurgent planning practices to define their spaces (Miraftab, 2009; Velychko, 2013; Shrestha and Aranya, 2015). Planners such as Hall and Pfeiffer, (2000) have either used these practices to radicalise the concept of slums or

² The term slum – brought back by development agencies in the 1990s - has been heavily criticised by the research community as it is equated with severe poverty, crime and stigmatisation from formal authorities.

³ Insurgence in this paper derives its definition from Hall and Pfeiffer (2000), as "(a) city without any reference whatsoever to the whole bureaucratic apparatus of planning and control in the formal city next door"

like De Soto, (2000) romanticise insurgent planning practice to a point where no real change is effected. Instead, planners should study how and by whom such settlements are planned and implemented. The different rules and regulations governing the urban poor and the urban elite also attribute to insurgent urbanism as the poor strive to create a space for themselves separate from the formal, legal system. The concern here is what role the formal system plays in promoting insurgent planning practices.

Misrepresentations and assumptions of slum developments have led to a more critical review of urban studies in Southern cities. Until very recently, a significant amount of the dominant literature and research has been generated in Northern cities and has not taken into account the realities and processes of urbanisation in the global South (Parnell and Oldfield, 2013; Roy, 2002). The dominant processes governing urban knowledge production always pose a danger of either misappropriated, distorted or underdeveloped ideas when applied in cities with varying urbanisation processes (Roy, 2005). It is, therefore, important that current theories be diversified and adapted towards the growing urban inequalities, varying political concerns and diverse planning practices experienced in different types of urban environments. It has been observed in Southern cities that traditional authority, religion and informality are as relevant to the urban landscape as any other modern urban theories and policies (Parnell and Robinson, 2013; Sanyal, 2005; Watson 2013) which defer from the urban theory developed from the Chicago School model⁴ of urban growth which promotes a more clinical⁵ approach to planning.

Efforts have therefore emerged to develop concepts more fitting to the specific characterisation of the South. John Friedmann, (1987), one of the early critics of the Chicago School model, redefined planning as a link from knowledge to action in the public domain through four major traditions: social reform, policy analysis, social learning and social mobilisation which are applied in developing the theory of insurgent urbanism. Friedmann (1987; 2003) defines insurgent planning as self-declared and voluntary, achieved through active participation and aims at the expansion of the space of democracy:

“What insurgent planning does is to rework radical planning to reflect the selective definition and celebration of civil society and citizen participation and the challenges it poses to socially transformative planning practices in the specific context of neoliberal global capitalism.”
(Friedmann, 1987: 391)

This early definition has not gone unchallenged as urban theory develops in the South. Many Southern scholars are redirecting the dialogue of slums from being merely reactive to embracing a more productive approach. According to Miraftab (2009), insurgent planning can be better described as radical planning practices that respond to the complexities of dominance, inclusion and participation. He derives this definition from earlier research by Sandercock (1998) and Yiftachel (2006) who have been key in developing the discourse surrounding insurgent urbanism and the colonisation of planning theory in the global South. Insurgent planning practice has therefore emerged as an idea for counter-hegemonic urban planning in the Global South which advocates for a bottom-up approach to collective action (Shrestha and Aranya, 2015). Insurgent planning in the global South involves largely re-evaluating the ideals that have been passed down to planners from the colonial era to a different and more radical planning style that better suits the current conditions (Miraftab and Wills, 2005).

The core ideology of insurgent planning practice is that it seeks to achieve real and substantive inclusion of the marginalised urban communities (Shrestha and Aranya, 2015). Planners should, therefore, seek to understand both the urban form and systems and the socio-spatial and political processes which

⁴ The Chicago model, was defined by Robert Parks as an organisation of the city based on (a) the spatial distribution of people and the institutions affected (b) the resource base, land values, and the means of transportation and communication. Usually following a concentric circle model. This model has been the basis of many modern and post-modern urban plans.

⁵ Formal planning in this paper will be guided by the clinical approach promoted by the original Chicago School model (1920s/30s) which focused on solving social urban problems through functional urban planning developed by professionals and strictly dictated by formal urban regulations which did not encourage the role of human sociology in the development of society and urban space (Maina & Hsiao, 2016)

shape the informal space (Vanessa Watson, 2012). Insurgent urbanism questions the legitimacy of expert knowledge and emphasises on a different kind of planning that bring grassroots communication, developed through the traditions outlined by Friedmann (refer to pg. 3) to the forefront of the planning process (Habermas and McCarthy, 1987). As Donald Krueckeberg, (1995) points out, by planners focusing on where things belong, they often forget to ask to whom they belong. Communicative planning is inclusive, empathetic and open which balances out the power differences between the varied stakeholders (Vanessa Watson, 2012).

However, insurgence planning is being used to delegate the responsibility of poverty to the poor themselves (Roy, 2005). The war on poverty in third world countries has adopted a more Northern approach which identifies poverty by the physical failures of space as opposed to a failure of systems (Modarres, 2003). The discourse maintained in urban theory, therefore, is that the only responsibility of legal authorities is to formalise properties and legitimise insurgent economies. This creates the unrealistic illusion that ending informalisation could inadvertently end poverty (De Soto, 2000). Gilbert (2007), also notes that by confusing the physical problems of poor quality housing with the characteristics of people living there, slum upgrading programmes⁶ often end up displacing the most vulnerable groups leading to increased overcrowding elsewhere and even those who end up getting legal rights quickly sell off their rights for a profit to avoid the extra costs arising from legalisation. Additionally, formalisation has made the land, housing and services less affordable to the original residents, existing commercial and social relationships are severed, and journeys to work become longer (Ezekiel, 2013; UN-Habitat, 2003; Payne, 2000).

Experience in many cities has demonstrated that demolition of slums in order to 'help' people has not been as successful as expected (Gilbert, 2007). Slum upgrading plans tend to simplify much more complex situations by assuming homogeneity of people and condition. It is difficult to generalise what slum conditions are since standards differ not only between cities - especially between Northern Cities and Southern Cities - but also significant differences are observed between classes within the city. Auyero, (1997) states that in many cases, slum upgrading can be like "rearranging the chairs on the deck of the Titanic". It may be well intentioned but it often solves superficial problems where the policies focus on redevelopment of space as opposed to the improvement of people's capacities and livelihoods.

1.2.2. The Civil Society

Ignoring the real issues affecting informal neighbourhoods has created a vacuum which has been filled by civil societies and Non-Governmental Organisations (NGOs) to provide services which should otherwise have been provided by the state. This has become critical since insurgent urbanism does not just affect the poor but also provides essential services to the elite in many cities in the South (Roy and AlSayaad, 2004). In the 1990s, a new generation of poverty alleviation programs rose in popularity globally with plans such as self-help housing, micro enterprises and community initiatives (Roy, 2005). Despite some of these initiatives exhibiting varying successes, informality is still viewed by most governmental organs as a local issue only solved by local solutions. However, Batliwala (2002), establishes in her research on transnational actors, that many grassroots movements by poor and marginalised groups are defying the narrow focus of locality. This globalisation of local issues is increasingly shaping both international and national policies.

⁶ Slum upgrading is the process of delivering place-based environmental and social improvements to the urban poor, including land tenure, housing, infrastructure, employment, health services and political and social inclusion (Corburn and Sverdlik, 2017). UN-Habitat states that physical upgrading which improves access to basic services has proven to improve livelihoods. Project identified expressly state their aim as improvement of livelihoods through physical interventions. In theory, slum upgrading projects should be part of the broader urban vision.

Although civil society and NGOs have stepped in to help insurgent communities reduce their vulnerabilities, they are conceptualised by the state which ultimately defines the extent that they can effectively assist insurgency efforts (Watson, 2002). Nevertheless, civil society, in which NGOs and social movements are a part of, is an increasingly popular concept in the democratic and political reforms in Africa (Allen 1997). This has been further reiterated by Cox, (1999) who states that those disadvantaged by the globalisation of world economies seek alternatives through civil society groups as they are a system distinct from the state and often in conflict with it. The challenge, however, comes in their transparency and accountability as NGOs and civil societies tend to have their obligations to the community overshadowed by their obligations to their financial donors (Roy, 2002; Edwards 1999). Additionally, the growing relationship of civil movements and the political class has blurred the real reasons that created the need for the movements in the first place (Batliwala, 2002). Evaluation of civil society action has shown weaknesses in performance as many NGOs take on a 'top-down' approach which ends up not reaching the most vulnerable communities (Marcussen, 1996). The concern, therefore, becomes whether the relationship of NGOs with donors and governmental organisations affect help or threaten resilience of the urban poor.

Miraftab (2009), however, insists that civil society is important as it helps to distinguish the insurgent space defined by grassroots actions of marginalised communities and allied civil societies from the invited or formal space usually dictated by regulations and laws. Hearn, (2001) counters however that because of the interventions mentioned by Batliwala, the autonomy once enjoyed by civil society is diminishing as they rely more on external organisations. The current paradigm in Africa points towards civil societies and governments creating closer relationships, as donors and international organisations demand partnerships to ensure equity and accountability. These partnerships could lead to undermining the solutions created by insurgent planning practices instead of challenging the existing social and political status quo (Katz, 2006).

On the flipside, the lack of governmental support could prevent development ideas from being fully institutionalised and therefore slow down the positive processes being driven by insurgence (Watson, 2002). Civil society as envisioned by Gramsci, (1971) should fill the space between the dominant and the marginalised classes with the aim of challenging the existing social order. Part of filling up this space is through networking and opening of communication channels to a variety of populations and organisations which successfully leads to the implementation of different ideologies and action strategies (Khagram, 2002; Diani, 2003). Communicative planning is a key highlight through most of the literature on insurgent urbanism and civil society. For this reason, civil societies remain ingrained into the fabric of insurgent communities and become the necessary voice in advocating for inclusion.

1.2.3. The Resilience Discourse

One important role that civil societies play is in the reduction of vulnerabilities in informal settlements. These vulnerabilities are often marginalised causing the communities to organise themselves through civil society networks (Katz, 2006). Nonetheless, even as the power of civil societies in insurgent communities grows, emerging concepts of planning such as sustainability, liveability and resilience continue to develop and evolve within the formal parts of cities. These concepts could be the key to strengthening the capacity of local communities, deliver much needed basic services and support economic activities. This, therefore, raises the question of whether the elimination of insurgence significantly improves the living standards of the whole city especially seeing that it is completely ingrained in many cities in the global South.

One of the emerging urban discourses that can be used to build an argument for insurgence is urban resilience⁷. This is due to its focus on social inclusivity⁸, inclusive urbanisation and advocating for equal right to the city⁹ (Kuecker, n.d.). Resilience also ties into the ongoing discourse of sustainability and liveability in its overall goal of improving livelihoods of urban citizens. Levin et al. (1998) note that resilience is the preferred way to think about concepts of sustainability in both social natural systems. According to research from the Resilience Alliance¹⁰, a system can be considered resilient if it has an adaptive capacity and is robust i.e. has the ability to manage shocks and stresses without further adaptation (Perrings, 2006). The concept of resilience is, therefore, important in that it becomes a necessary condition for long-term urban sustainability while at the same time promotes urban concepts that improve the everyday living experience of the citizens.

Resilience theory has the challenge of defining urban equality and equity to ensure that all citizens are accounted for and involved¹¹. ICLEI¹² publication on resilience (2016), states that urban resilience should always consider a bottom-up approach when considering secure housing, access to basic services and inclusive governance, issues that are also key drivers in insurgent urbanism and civil society. These considerations are key in changing how local governments communicate with their marginalised citizens. A participatory process addresses the power imbalances within the city framework and provides a space in which the insurgent communities are actively engaged. This creates an important channel to understand how vulnerabilities are acquired and consequently dealt with across different classes in cities.

Of the 100 resilient cities chosen by the Rockefeller Foundation, 48 are Southern cities indicating they are keen on participating and driving the global resilience discussion. Southern cities have also been involved in shaping conversations in bodies such as ICLEI, UN-Habitat and the Resilience Alliance creating platforms in which these cities can direct the dialogue towards their own realities. While it is important to recognise the differences between urbanisation trends in the global North and global South, it is just as important to appreciate that urban concepts and theories must be adapted towards city-specific realities.

1.3. Finding the gaps

This research recognises that poverty is not a preserve of the global South and neither is insurgent planning. However, by focusing the concept and scope of resilience on urban inequalities and the different dynamics shaping developing cities, these theories can be used to challenge global systems of urban processes. A wide range of conditions such as poverty, informality and traditionalism, that occur in everyday life in cities in the South, can be fully incorporated into modern urban theory by analysing urban practice in rapidly developing cities (Parnell and Robinson, 2013). Insurgence, therefore, ceases to be a misappropriated Western concept but becomes a part of the planning practices that are

⁷ Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience. (Rockefeller 100 Resilient Cities Framework, 2013; ICLEI, 2015)

⁸ The Resilience framework is built on four essential dimensions of urban resilience: Health & Wellbeing; Economy & Society; Infrastructure & Environment; and Leadership & Strategy. (Rockefeller 100 Resilient Cities Framework)

⁹ 'The right to the city' is an idea that was first proposed by Henri Lefebvre in his 1968 book *Le Droit à la ville* and later redeveloped by David Harvey as the freedom to make and remake our cities and ourselves by considering the common good over the individual good.

¹⁰ The Resilience Alliance is a research organization that focuses on resilience in social-ecological systems as a basis for sustainability.

¹¹ Refer to 'Understanding Resilience and its Effect on Cities'. Maina and Hsiao (2016), Unpublished

¹² ICLEI - Local Governments for Sustainability is a global network of more than 1,500 cities, towns and regions committed to building a sustainable future through sustainable, low-carbon, resilience, resource efficient and productive initiatives.

constantly borrowed and replicated across borders around the world. The issue of resilience within insurgent planning communities through their interaction with the organisations surrounding and supporting them, therefore, become key in shaping these new theories. This should, however, be carried out most critically because as Hearn, (2001) notes, partnerships created between governments, NGOs and donor funders have the potential of limiting innovative solutions necessary to reduce vulnerabilities in disadvantaged and marginalised communities.

The paper will aim to understand what tools are necessary to achieve resilience qualities in Southern cities developing under insurgent urbanism.

To further understand this topic, the following questions shall be applied to the case studies:

- What are the 'stubborn realities' facing insurgent urbanism?
- Where are formal planning practices in Southern cities failing in controlling the vulnerabilities found in insurgent neighbourhoods?
- How do partnerships between civil society, citizens and legal authorities develop urban resilience in insurgent communities?
- How can the slum upgrading process be integrated into the overall workings of the city?

The paper continues its discussion into three parts. The first part will describe the methodology that the researcher uses to build onto the already developed theory presented in chapter 1. The second part will look deeper into the question of how resilience and vulnerability are exchanged in a dual city with both formal and insurgent planning practices. It will also focus on how civil societies, NGOs and national and local authorities interact to either increase or reduce these vulnerabilities. This will be carried out through desk review and interviews. This section will also assist in clarifying the challenges that may arise from these planning processes by focusing on two case studies: one developed through formal slum upgrading processes and the other through insurgency efforts. The case studies will provide perspective and a real-life analysis on the subject. Finally, the paper will conclude with lessons learnt and some recommendations that could be applied in further studies.

2. DATA COLLECTION AND ANALYSIS

'... the power of dominant discourses can be challenged at the level of dialogue; through the power of knowledgeable, reflective discourse; through good arguments; and through the transformations that come as people learn to understand and respect each other across their differences and conflicts' (Healey, 1999: 119).



This research has adopted a qualitative approach based on both primary and secondary data collection. A grounded theory approach has been applied to secondary data collection alongside a more open-ended and exploratory primary data collection to understand both theoretical and practical linkages between insurgence, resilience and the civil society. There was a lack of sufficient information especially for the specific case study that would have allowed for a comprehensive study without applying the more exploratory approach.

The empirical evidence was conducted through field research based on a case study in Nairobi, Kenya. The fieldwork was carried out from March – April 2017. Data was collected mainly through open-ended, semi-structured interviews and observation. The conclusions that are drawn from this case study, together with information gathered from secondary sources, will be used to reflect on the concept of urban resilience and its relation to insurgent practice and to form conclusions on the results arising from the interaction between civil society, citizens and the government. However, although the researcher expects that the conclusions from this study can be generalised to inform other similar situations, separate studies in other cities and developments may reveal other conclusions not captured by this study.

The selection of the case study for the master’s thesis research fieldwork was based on evaluating the ‘success’ of a development project (in this case, an NGO-led water and sanitation project and a government-led upgrading project) where a partnership/governance approach was adopted.

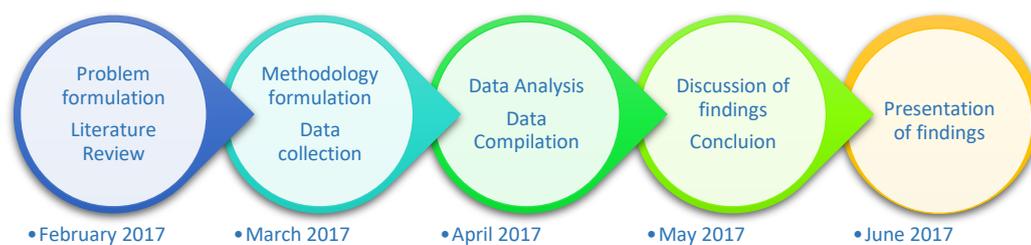


Figure 2: Research Design with timelines (Source: Author's own, 2017)

2.1. Hypothesis

This study is based on the following broad hypothesis: Successful slum upgrading must consider the current socio-economic state of the settlement and aim to eradicate the negative attributes while improving the positive attributes.

2.2. Assumptions

- Poverty, and social and economic exclusion are the main drivers of slum development in Kenya;
- Many of the slum dwellers in Kibera do not have the economic capacity to move to more formal neighbourhoods and any intervention towards improving physical environment must be accompanied by one or more economic interventions;
- There are already within the settlement, innovations that have been developed that can be tapped to increase resilience.

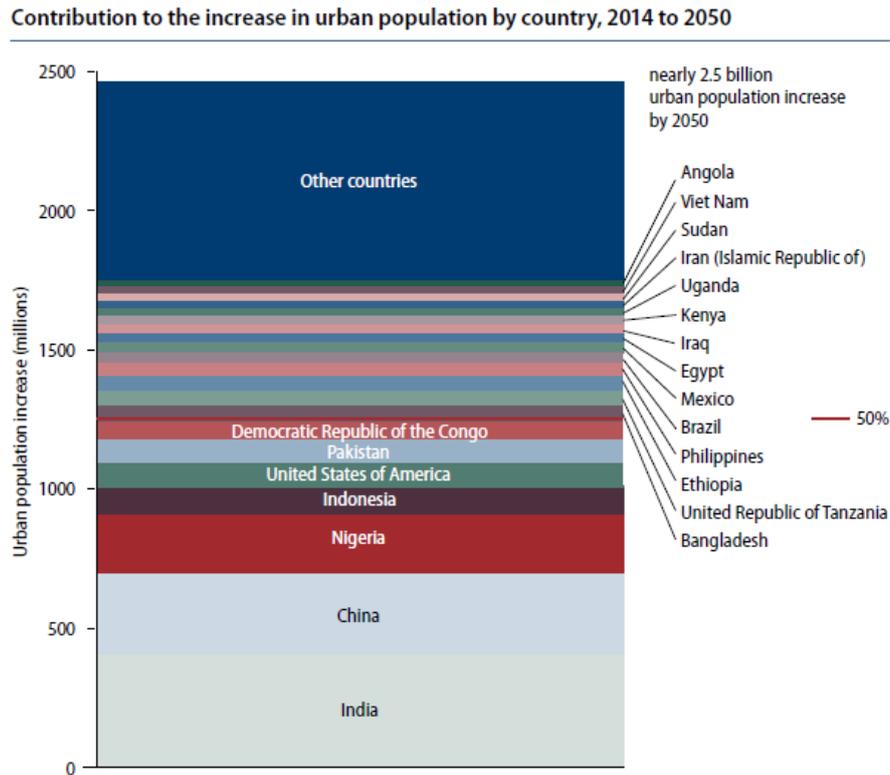
2.3. Data Collection Methods

2.3.1. Case Studies

The case was chosen based on whether a city was within a highly urbanising country in the lower-middle-income economic bracket in Sub-Saharan Africa; whether the city was involved in the global

resilience discussion; whether the city portrayed strong characteristics of dual planning systems; and finally, whether insurgent planning within the city was influenced by civil society organisations.

According to the World Urbanisation Prospects report (United Nations, 2014), the future increase in the world’s urban population by 2050 is expected to be highly concentrated in just a few countries (see fig. 3). Of the countries highlighted in the figure below, eight of them are in sub-Saharan Africa (Angola, Sudan, Uganda, Kenya, Ethiopia, United Republic of Tanzania, Democratic Republic of Congo and Nigeria). Of those identified, only Sudan, Kenya and Nigeria fall within the lower-middle-income bracket as defined by the World Bank (<http://data.worldbank.org/income-level/lower-middle-income>).



Note: The countries shown are projected to contribute 25 million or more to the global urban increment between 2014 and 2050. The category “Other countries” includes countries with urban increments of less than 25 million each.

Figure 3: World Urbanisation Prospects (Source: United Nations, 2014; 12)

The cases were further narrowed down to cities that are already involved in the resilience discussion. Only Nigeria (Enugu and Lagos) and Kenya (Nairobi) have cities selected in global frameworks such as 100 Resilient Cities. Although all three cities display both insurgent and formal planning practices within their city boundaries, Nairobi had the added advantage of also being involved with the ICLEI ‘Resilient Cities’ network and of hosting the UN-Habitat headquarters which is driving the ‘Cities without Slums’ agenda. These two added factors made it a better option to provide the necessary information for this research.

The research will specifically focus on physical slum upgrading projects occurring in Kibera, the largest slum in Kenya, developed under a partnership approach but are also being implemented or have the intention of being implemented in other slums. The first is a government run project, KENSUP, the largest slum upgrading project to date and the only one to explicitly include a partnership approach in implementation. The second is a community driven projects focusing on Water and Sanitation. This is because of the 72 registered CBOs and NGOs in Kibera, 27 have ‘improvement of water and sanitation’ as part of their core mandate (Ochieng and Matheka, 2007). Of the three major NGOs working in the study area contacted, only Umande Trust was available for interviews.

2.3.2. Interviews

One-on-one, semi-structured interviews were carried out on three levels. The first was of the residents living within the case study area, the second was with the civil society organisations (CBOs¹³, NGOs, INGOs¹⁴) working within these communities and the third was with national and local governments. All interviews inquired on perceptions of the current laws governing both projects, perception on the improvement of livelihoods and perceptions on the partnerships arising.

Due to the varying levels of trust of the residents, a convenience, non-probability sampling method was used to determine the interviewees. The five interviews with the community leaders were voluntary and based on referrals from Umande Trust. Information from the fifth interview demonstrated that little new information would arise from further interviews. Additionally, 10 residents were randomly selected from the five villages and the government developed neighbourhoods. Although the general theme of the interviews was maintained, a more relaxed story-telling approach was taken. This provided information that would otherwise have been lost through a more formal format. Many of the interviews were carried out in Kiswahili unless advised otherwise, as the most comfortable communication language in the area.

Besides the residents, one person each from the Ministry of Land, Housing and Urban Development (Slum Upgrading Department), the Nairobi County Council (local government) and UN-Habitat (Slum Upgrading Branch) were interviewed. The interviews were semi-structured and open-ended and varied depending on their role and involvement. The individuals were selected due to their knowledge of the study area, have knowledge of the organisations working in the area and also of the projects being studied. The interviews with the organisations were carried out in English. Two government employees in charge of the day-to-day running of the government-run projects were also interviewed to gain a better understanding of the Ministry's work.

The varied responses ensured that more reliable data was available for an in-depth comparative study. This research recognises that different settlements are characterised by different factors and therefore has no intention of generalising the unique conditions of each specific community or their process of insurgent planning but to seek an understanding of common issues that may be prevalent in other slums.

2.3.3. Literature Review

Secondary data was used in the initial development of the work, to verify primary data and as additional information to build the discussion. Both locally and internationally produced project documents, government-produced data, research papers and authorised grey literature were used. The overall literature was not restricted and included all accessible global research in the urbanisation of Southern cities. However, the data used to frame the case studies, was taken from country reports by the World Bank and United Nations, and statistics and documentations produced through the Kenya Bureau of Statistics and the Ministry of Lands, Housing and Urban Development (MLHUD). Only country documents produced after 2004 were used as a resource as that was the year both projects analysed officially began.

2.3.4. Observation

Observations were carried out together with field notes and photographs which were then later compared to the data collected from the literature review and interviews. The main observations were on how the residents interacted with the projects. This was used to understand the utility that these projects provided to the residents of the area and whether the partnerships created really improved the livelihoods of the residents. Another issue that was under observation was the visible changes

¹³ CBO – Community Based Organisations: non-market and non-state organisations outside of the family in which people organize themselves to pursue shared interests in the public domain (UNDP).

¹⁴ INGOs – International non-governmental organisations such as the World Bank, United Nations, Red Cross (ICRC), etc.

between those with access to the project and those without access to determine if there were significant changes in behaviour and planning.

2.4. Data Organisation and Analysis¹⁵

All information collected from all three data collection methods described in Sec 2.3 underwent three levels of analysis. The first level involved breaking the information down into potentially meaningful segments of data to separate the relevant and irrelevant data. The second level involved finding the recurring themes and pattern running through the relevant data. Lastly, the third level involved making inferences from all the groups in all the modes of data collected to generate comprehensive and reliable conclusions.

The field work was mostly done during working hours and therefore most of the interviews done in the settlement were of male adults, all over 30 years old. It was difficult to gain insights from women who mostly worked outside of the study area. The analysis, therefore, did not use codes relying on age, gender or income. Themes and recurring patterns in the interviews were based first, on the respondents own words, second, the researcher's observation and lastly, from the literature. All the information was peer reviewed before publishing of findings.

The case studies also underwent a preliminary level of analysis due to the comparative nature of the study. In this preliminary phase, a within-case analysis was carried out in which each case was assumed to be a comprehensive case on its own and analysed as such. The cases will then be analysed against each other to identify change in the vulnerability indicators (see sec 3.3). The literature used was from the City Resilience Index (CRI) developed by The Rockefeller Foundation and ARUP, (2015) and compared against information from UN-Habitat's Kibera Post-Project Assessment Report (2014) to identify the key elements that must be addressed.

The performance of each project will be tested against the CRI to test if it meets internationally set resilience standards in urban settlements (see fig. 4). The results will illustrate if a project has attained the resilience dimensions of health and well-being (social resilience); economy and society (economic resilience); infrastructure and environment (environmental resilience) and leadership and strategy (institutional resilience) and identify the impact of both government and civil societies' projects, outline the shortcomings and the successes of each separate project and develop synergies. Application of the CRI is based solely on the information collected during this research and at the point at which each project has reached to date. Further research would be required to measure resilience over time.

¹⁵ Information developed from (Merriam, 1998); (Yin, 1994); (Miles and Huberman, 1994)

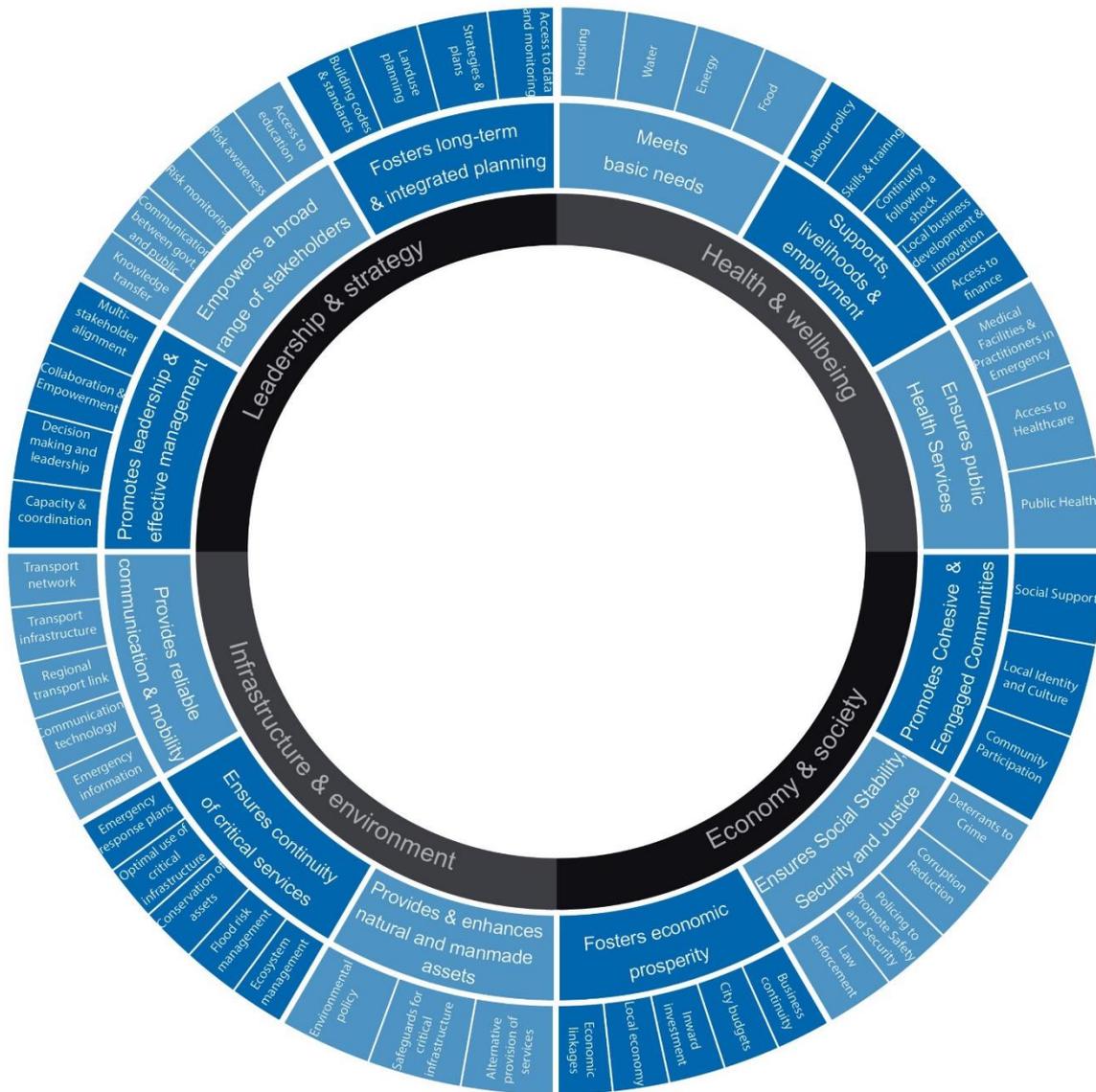


Figure 4: The City Resilience Index (www.rockefellerfoundation.org)

2.5. Data Reliability and validity¹⁶

Due to the nature of the study, the researcher expects some margins of error. However, in order to reduce these margins to the minimum, the validity and reliability of the information collected was developed against the following:

- (i) Clarification and justification: The aim of this research was clearly defined at the introduction of this paper and the methodology outlined to ensure complete transparency of data. Given the constraints of these research which included but are not confined to finances and time, the above-described methodology was viewed as the best possible option to answer the research question.
- (ii) Procedural rigour: All data collected through interviews and observation was documented. It was made available for peer review to ensure that the information was relevant to the work and transparent in its purpose. Interviews were done by the researcher accompanied by an individual well known to the community. This served a dual purpose of ensuring

¹⁶ The general information was inferred from (Golafshani, 2003) and Kitto et al., (2008)

information was transparent that may arise from researcher bias and, eased trust between the interviewer and interviewee. In cases where the researcher had to attend interviews alone, such as with the Ministry and NGOs, the transcripts were made available to the interviewees for the same reasons outlined.

- (iii) Sample representativeness: The sampling methodology applied has been discussed in detail in section 2.1.2
- (iv) Interpretative rigour: All information collected, whether negatively or positively portraying the theory and cases in question has been applied to build the discussion of this paper. Extensive, state-of-the-art literature review has been carried out and documents analysed against each other to ensure that the information collected during the field work is properly framed.
- (v) Reflexive and evaluative rigour: The research has strived to maintain all requirements of research ethics as explained in section 2.6. Researcher bias was acknowledged and all information is peer-reviewed for consistency. Information provided through interviews is altered only in as much as is necessary to ensure its proper understanding.
- (vi) Transferability/generalisability: The relevance of the findings of this paper have been discussed and all limitations have been outlined to the best ability of the researcher. The findings from this paper may be applied to future studies in urban communities facing similar circumstances.

2.6. Research Ethics

The research was carried out under high ethical research guidelines laid out by the Belmont Report (Office of Human Research Protections, 1979). All interviews in the settlement were conducted with the necessary informed consent and anonymity was maintained to protect them from any possible exploitation or vulnerabilities. No information has been knowingly used that would compromise the values and interests of the community. No unauthorised intellectual property was used. In addition to this, the researcher was careful to ensure that no information was plagiarised or fabricated to maintain the integrity of the findings.

3. BUILDING RESILIENCE – A CASE OF NAIROBI

“...to those on the outside (policy advisors, government officials and so on), slums may have been impenetrable, threatening blights of squalor on the urban landscape. To those living within, whether supporting people during a transition to a higher aspiration, or sheltering people who have lost hope, the slums have been, and are, home.

(UN-Habitat, 2003)



Urbanisation in Kenya has proceeded at an incredible pace leading to an increase in the urban population from 750,000 in 1962 to 9.9 million in 1999 with the greatest increase observed post-1989 brought about by an increase in rural poverty (Kenya Government Printer, 2004). United Nations Population Fund (UNFPA) predicts that Kenya will experience steady urban growth of approximately 4.2% placing the urban population at just over 55 million people by 2050 accounting for almost 60% of the total population. Despite these figures, Kenya is still considered under-urbanised when compared to other countries within its economic group such as Bangladesh, Zimbabwe and Mozambique. If properly managed, this slower development is expected to aid economic growth of the country pushing it from a lower-middle to an upper-middle income economy.

Unfortunately, the current rate of urbanisation has overwhelmed the capacity of local and national authorities to direct physical growth and provide the necessary services to all its citizens (UN-Habitat, 2008). Predictably, Kenyan urbanisation has been accompanied by challenges such as inadequate shelter, unemployment, environmental degradation, poverty, poor infrastructure and social facilities. Many of these challenges have been manifested in the rapid increase of insurgent settlements where a majority of the urban residents now live. In the past, these insurgent settlements were viewed as eyesores and policies were developed to either ignore them or eradicate them completely. Regardless of the policies, the urban slums continue to grow and with them the persistent problems that arise from their presence in formal urban centres¹⁷ (Kenya Government Printer, 2004). This growth is expected to continue into the foreseeable future.

The last Kenya Population and Census data in 2009 indicated that Nairobi had a population of 3.2 million. Current estimates indicate an increase of almost 1 million people in the last 8 years and is expected to rise to 14.2 million by 2050 accounting for 25% of the total urban population of Kenya. Of the 4 million Nairobi citizens, approximately 60% are documented to live in neighbourhoods that are characterised as slums. However, the slums occupy only 5% of the residential area (see fig. 5) or 1.62% of the total land area in Nairobi (Weru et al., 2005). This land disparity has been and continues to be a source of debate and conflict in the conversation surrounding slum upgrading and poverty reduction.

¹⁷ Urban centres in Kenya are defined as market centres, towns, municipalities and cities with a minimum population of 2000 people.

3.1. Nairobi: A Dual City

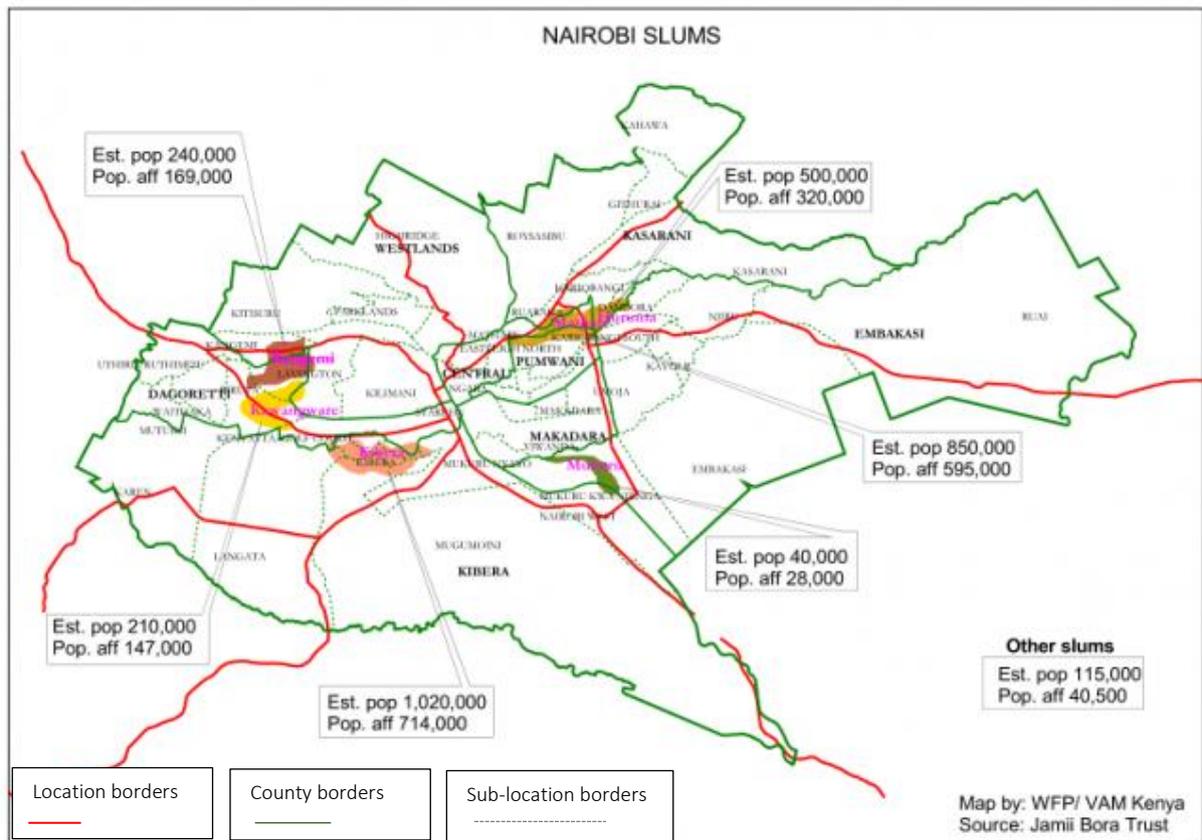


Figure 5: The map of Nairobi indicating the location of major slum developments and their estimated populations. (Source: Jamii Bora Trust, 2008)

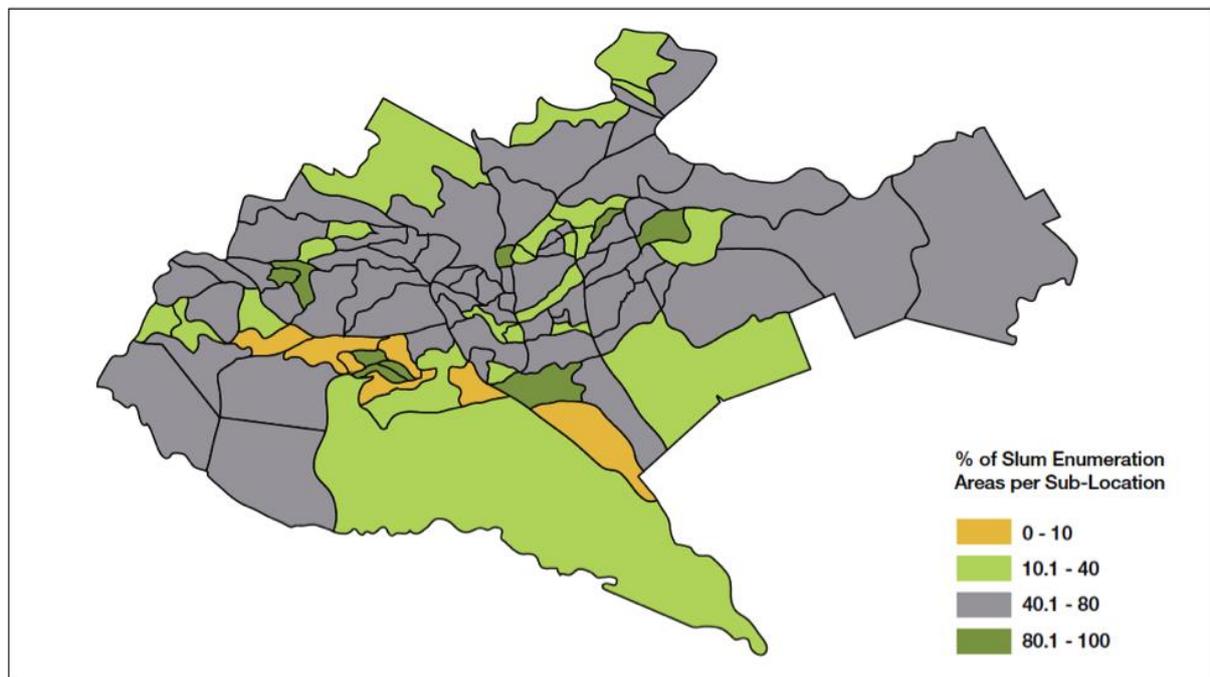


Figure 6: Nairobi enumeration zones according to the 2009 census indicating slum occupation. (Source: African Population and Health Research Centre (APHRC), 2014)

Nairobi developed as a service centre for the British Railway connecting the Kenyan coast to Kampala. To restrict rural to urban migration, the first pass law system was established and a masterplan was drawn with distinct racially exclusive zones; British, Indian and African zones defined both class and race. The Africans were relegated to live in 'native reserves' at the edge of the city, where they were separated by ethnic groups and provided temporary accommodation and minimal services. After 1963, post-independence brought with it increased rural-urban migration as people moved to the city in search of wage labour. Unfortunately, the inherited zoning system defined the planning systems in Nairobi with the 'native reserves' transforming to informal settlements. Since 1963, there have been several efforts to formalise the slums through major slum clearance projects despite growing poverty and inequality (Ekdale, 2004).

According to the Kenya's National Statistics Bureau (KNSB, 2009), Nairobi is currently divided into 4,700 Enumeration Areas (EAs), of which 1,263 are categorised as EA5, or slums¹⁸, which are characterised by substandard housing and poor infrastructure (see fig. 6). The mean household size in slums is 3.0m² with an average 1.2 rooms. A high percentage of these are occupied by a single person with an average age of 35 years. Compared to other major African slums, Nairobi slum dwellers have significantly higher levels of education with 79% having completed basic primary education and 31% attaining a high school education. There is a 26% unemployment rate with only 25% recorded to have regular or consistent employment (The World Bank, 2009). Approximately 66% of the residents have neither electricity nor piped water connections to their households' and only 3% are living in houses constructed with permanent materials. Additionally, only 8% of the residents in Kibera own their own homes creating a high house occupancy turnover with median stays of three years per house and six years for a family. Only 37% of the residents feel safe in their surroundings. However, 89% of residents reported to have health facilities and 88% reported to have public or private school facilities within or near their settlement (Un-Habitat, 2008).

Kibera, located South of Nairobi occupies an estimated area of 233 Ha (2.33 km²) and is considered the largest slum development by population numbers in Nairobi and arguably in Africa. It was first developed as a holding site for retired Sudanese (Nubian) soldiers who had served in the British Army (Ekdale, 2004). It was expected that the Nubians would grow old and eventually leave. However, being foreigners, as they grew older they were unable to move to the 'native reserves' and developed more permanent residences in Kibera which they were later granted as an unofficial pension (Mukeku, 2014). It was not long thereafter that the growth of Kibera became intolerable to the government. After losing a court case (explained in note 21) brought forward by the Nubians, the administration agreed to tolerate Kibera's existence but did nothing to develop it (Ekdale, 2004).

Kibera now consists of 12 villages with an estimated 17,956 structures and a population of 170,070 (official 2009 census). However, referring back to fig.6, census numbers in slums are sometimes extrapolated due to the fluidity in population and the difficulty in accessing some areas (Un-Habitat and UNEP, 2010). Some NGOs such as www.kibera.org, mapkibera.org who work within the Kibera have provided figures of 200,000-270,000 people. Umande Trust has pointed out that many organisations have been accused of manipulating the numbers for their own benefit and places the population to approximately 400,000. One example of this manipulations was seen when Joe Biden (former Vice President, USA) visited Kibera and the official White House website reported a population of 1.5 million. A number that was even exaggerated in relation to the official UN-Habitat estimation of 2011 of 700,000 inhabitants.

¹⁸ According to KENSUP, slums in Kenya are defined as settlements that display to a certain extent the following characteristics: inadequate access to safe water, social facilities and electricity, poor sanitation and housing conditions (substandard housing), insecure tenure, high densities and overcrowding, unplanned settlement patterns, uncoordinated development, environment degradation, insecurity and crime, poverty and unemployment.



Figure 7: The 12 villages of Kibera. (Source: Map Kibera Project. Downloaded on 24/04/2017)

3.2. The ‘Stubborn realities’ of insurgency

Insurgent planning tends to grow under the skin of many cities and varies within cities and even within neighbourhoods in income, infrastructure, human capital and vulnerability. It is, therefore, difficult to examine any urban theory without reflecting on the policies or the urban theories that govern a city (Parnell and Robinson, 2013). The stubborn realities of the global South as explained by Yiftachel can be used as indicators of resilience in insurgent planning practice. However, in the same way, insurgent practice cannot be generalised across countries, neither can the stubborn realities experienced within them. In the case of Kibera, studies undertaken by different researchers have revealed several stubborn realities that have persisted and require critical review (Chege, 2013; Manula et al., 2015; Mukeni, 2014)

The change in the state of stubborn realities could essentially be applied a measure of resilience in insurgent urbanism. Various urban challenges identified that require specific efforts from the various invested stakeholders include inadequate shelter, unemployment, delinquency, crime, unavailability of clean water, inadequate drainage and sanitation, lack of adequate public transport, environmental degradation and urban poverty. In research carried out by UN-Habitat in Kibera, the respondents identified insecurity, sanitation, housing and health care as the four most difficult issues they deal with on a daily basis (UN-Habitat, 2014a). During this research, water and sanitation, insecurity, land tenure and lack of adequate housing were identified as the key vulnerabilities faced by the respondents (see fig. 25). These realities not only affect Nairobi but are comparable to global rankings. According to Fig. 8 below water and sanitation ranks highest in the global vulnerability index. However, no single vulnerability can be solved in isolation and a complete risk profile of an area must be mapped to ensure that overall resilience is achieved. It is for this reason, that the four major vulnerabilities identified will serve as a departure point for a comprehensive resilience strategy for Kibera.

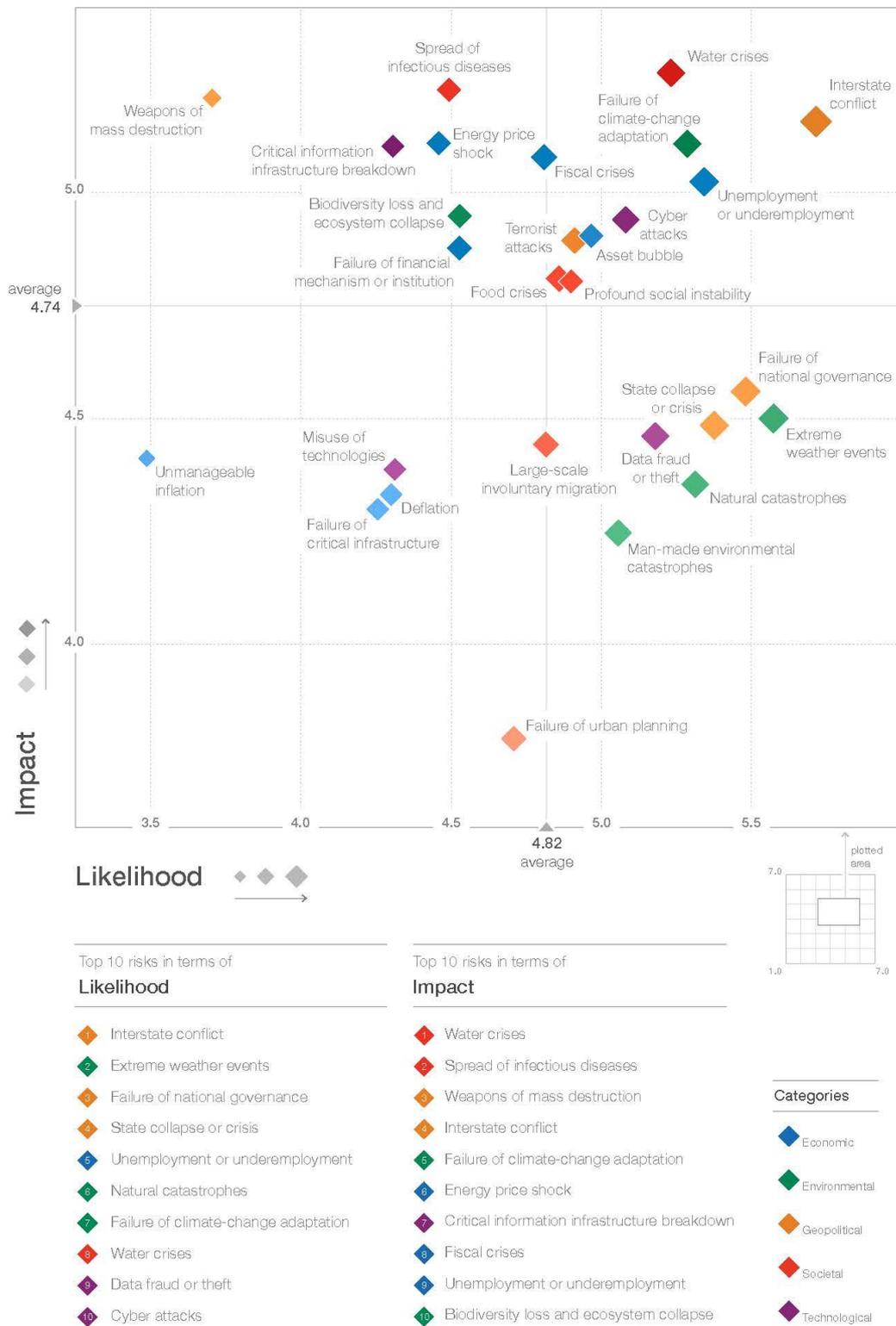


Figure 8: Global Risk Perception (Source: World Economic Forum, 2015)

3.3. Vulnerability Indicators in Kibera

Observation shows that life in Kibera remains vibrant despite the lack of proper physical infrastructure. This observation has been validated by the study carried out by WEF (See fig. 8) which indicates that failure in urban planning practice does not rank high in the overall risk perception of urban citizens. This indicates in part that resilience within the slum can be achieved with minimal disruption of the general urban planning practices. Research carried out by UN-Habitat, (2014b) highlights some positive aspects enjoyed by the residents of Kibera which should be considered when designing upgrading projects to ensure that the social character of the settlement is not eroded.

Code assigned	Summary of comments recorded.
Affordability	Includes the affordability of life in general – specifically, food, housing, labour, commodities, education, rent, infrastructure, health care (free), social interactions, and school (free). Often “life is cheap” was explicitly used.
Community	Includes “living with many people”, “the spirit of living many as one”, easy to socialize often, having good neighbours, family members being present, many languages, many different kinds of people to interact with, intermarriages with different tribes and so on.(Descriptors used: harmonious, unity and so on.)
Proximity	Includes comments about the distance from Kibera to the Central Business District (CBD) and the Industrial Area being ideal for access to work opportunities. Also includes being near to family and schools.
Simplicity	Includes comments about lifestyle, freedom, and relaxation being aspects of “the simple life”.
Business	Includes shared experiences of doing business in Kibera, describing it as “easier than in other places” and that there are a wide assortment of businesses to choose from (i.e. there is both access to businesses and the ability to run a business). The “availability of everything” was also included.
Services	Includes NGOs, water, electricity, support groups, and the Resource Centre that was initially part of KENSUP.

Figure 9: Coding carried out of the positive aspects of living in Kibera as articulated by residents (Source: UN-Habitat, 2004b)

Nevertheless, the Cities Alliance¹⁹ has determined that the measure of urban progress is based on two basic criteria: The proportion of people with access to improved sanitation and the proportion of people with access to secure tenure. It is therefore important to note that some areas within the slum villages present higher levels of these core vulnerabilities and would require radical physical interventions. These vulnerabilities are not only contained in the settlement but have caused ripple effects to the rest of the city. A reduction of these vulnerabilities will be beneficial to both the Kibera residents as well as the rest of the city.

3.3.1. Poor sanitation and lack of adequate clean water

World Economic Forum, (2015) has pinpointed the water crisis as the top global risk based on impact to society (as a measure of devastation). In Kibera where water connections are few, the area suffers from both inadequate water supply and poor sanitation. Additionally, there is the threat of water contamination from broken pipes and leakages (Binale, 2011). The sewer network provided to date has been inadequate and this is observed by the state of rivers and roads within the slum which receive most of the overspill from sewers. Infrequent water supply and lack of maintenance have also increased incidences of constant leakages and illegal connections. Water merchants have taken advantage of the water connections and sell water at a higher rate to the settlement residents than government provided water (See fig 11).

¹⁹ The Cities Alliance is a global partnership comprising of national governments, multilateral institutions, local governments, INGOs, private sectors and universities aimed at poverty reduction and urban sustainable development. (www.citiesalliance.org)

Inaccessibility to toilet services due to distance and insecurity has created a practice in Kibera known as ‘flying toilets’, especially in the night time. This involves defecating into a polythene bag and tossing it to the nearest open space (Aubrey, 2009). According to the residents, a combination of the failures of poor water and sanitation have also led to cholera and dysentery outbreaks, children missing school and food due to lack of clean water and reduced incomes as higher fractions of household income are redirected towards purchasing clean water. In areas where the supply of proper water and sanitation facilities have been constructed, there is visibly improved livelihoods of the adjacent residents.



Figure 10: Children playing next to rivers that act as open drainage lines (a) while others drink directly from burst municipal pipes (b) (Source: www.challengeaid.org)

The topography of the settlement also adds to the poor water and sanitation supply. Kibera is built in a valley that lies within the Ngong’ river basin with two other river channels cutting across Kibera. Man-made hills created by dumped loose material and waste disposal also increase the complexity of the terrain. This creates some difficulty in laying down proper infrastructure and has increased chances of flooding in dwellings located closer to the channels during heavy rains. In addition to this, the natural movement of drainage downstream has turned the river basin into an area of increased pollution of both solid and liquid waste. These factors, together with poor ventilation of housing are a leading cause of air-borne and water-borne diseases.



Figure 11: Water vendors selling water at a premium in the settlements. (Source: Author)

3.3.2. Social marginalisation and exclusion

A common complaint voiced by the residents in Kibera is the lack of recognition as legitimate citizens by both the local and the national government. Despite the population numbers within the slum, Kibera residents have fewer government provided facilities such as schools, public health facilities, social halls, etc. Referring to fig 24, many of the facilities found in the settlement are provided by private investors, NGOs and religious institutions (Mukeyu, 2014). Access to public facilities is further reduced by the travel distance and the expected levies which further erodes the income set aside for basic needs. In facilities such as public schools, steep competition with children from the formal neighbourhoods further marginalises the settlement children. A study carried out in 2002 by Seureca, Runji and Partners identifies 65 informal schools within the settlement area which supplement the six larger public primary schools located on the outskirts of Kibera. There are also several private clinics and pharmacies within the settlement. However, since informal facilities are not subject to the mainstream legal requirements, many are ill-equipped with personnel and equipment.

The residents and NGOs located in the area have also noted the irregularity with which the local and national government officials frequent the area. They expressed a sense of abandonment and have developed a hostile attitude towards the government over time. The lack of basic infrastructure and poor maintenance of what is already existing amplifies this hostility further. Although slum dwellers represent a majority of the residents in Nairobi, the development of urban slums is still not featured in the national budget, 2017 and is obscured under terms such as ‘urban renewal’ projects. Additionally, the reluctance of the national government to release Kibera land to the local government has reduced their ability to invest in the area especially since schools, social halls and most health facilities²⁰ are under the local government mandate.

3.3.3. Insecure land tenure

Kibera is in the unfortunate position of unclear land tenure regulations (Mukeyu, 2014). Land tenure in the area remains largely insecure with the Nubians having been settled by the Government albeit without any titles, while other communities joined later informally. Secure tenure has created a lot of debate and conflict between the residents and the national government as land acquisition in most parts is not legally recognised. Due to the initial land allocation process that occurred between 1918-1928²¹, Kibera can be repossessed by the government as the need arises (See fig 12). This has been observed recently with the construction of major infrastructural projects that have left an increasing number of residents homeless and added to political discord. This also explains the temporary state of the construction by the residents. A state described by UN-Habitat, 2014 as ‘permanent temporariness’. The political atmosphere within Kibera accompanied by the citizen’s sense of belonging and community has created a permanence that the infrastructure does not fully illustrate.

²⁰ Only level 5 referral hospitals are under the direct mandate of the National Government. Level 1-4 hospitals are under the mandate of the County government (“The Constitution of Kenya,” 2010).

²¹ A commission set up in 1932, ‘The Carter commission’ passed a verdict that in as much as the government has the right to house the Nubian soldiers who fought for Britain in World War I, the Nubian community would not be expected to live there forever. The presumption was that once the original Nubians passed on, there would be no new population to replace them (Mukeyu, 2014). This ruling is still currently upheld.



Figure 12: A bird's eye view of the stalled construction of 'The Missing Link' road connecting Kilimani to Langata. (Source: Johnny Miller, Reuters Foundation)

The reluctance by the national government to transfer the land to Nairobi county government has also created uncertainty in both the institutions and the public. This leaves the county government with restrictions on which development measures they can take. For this reason, the county cannot allocate a dedicated budget towards the renewal of the settlement. The denial of basic services that was first used as a deterrent to new entrants into Kibera is now institutionalised through stalled parliamentary bills and ignored presidential directives (Joireman and Vanderpoel, 2010). The land tenure situation in slums is further amplified when the 200,000 houses promised annually by the government target the middle-class housing shortage despite studies into human settlement and housing indicating more pressing problems within low-income communities (Musyoka, 2012, K'Akumu, 2004).

Tenants therefore constitute almost 92% of the total Kibera population with only 5% being owner occupied. Many landlords are not residents in Kibera and claim ownership of the shacks and structures without laying claim to the land (Research International, 2005). Due to the illegality surrounding the whole settlement, tenants have no legal recourse for wrongful eviction or rent increases that occur change daily. This ownership structure extends to open spaces and public facilities which can be 'bought' and valued. However, the residents understand that the government has ultimate ownership of the land and keep their investments to simple and inexpensive structures usually without extra services like water or electricity.

3.3.4. Crime, insecurity and civil unrest

Insecurity and crime are a real and present problem in slums. One resident explained that there is a preference by many residents to live in areas which do not require them to trespass into other villages as they go to work as that is when they are most vulnerable. The location of private and public facilities also reflects population concentration around the edges. Although there is no clear data on crime occurrences in Kibera, many researchers, (including during this research) have observed crime during research. Crime and insecurity include theft of goods, risk associated with fire outbreaks and personal threats.

In this discourse of insurgency, dynamics of local politics and context matter (Checkel, 2011). Visiting Kibera during an election year (2017) provides context to the differences in political discourse between the city's formal and informal areas. There is a stronger emphasis by local NGOs and the residents on the promotion of peace with constant rallies and workshops running across the settlement. Violence during election periods is a great threat to human life and infrastructure²² and is a continuous threat to the socio-economic welfare of the settlement. Most projects carried out in Kibera take this into account and are expected to understand the forces that dictate the internal political culture.



Figure 13: Graffiti on various walls around Kibera calling out for peaceful elections. (Source: kiberawallsforpeace.tumblr.com)

3.4. Effects of On-going Upgrading Projects on Kibera's Resilience

Slum upgrading does not occur in a green field and any interventions done within Kibera must consider the existing planning structure and patterns of life. The two projects selected for this chapter have a common goal of holistically improving the livelihoods of the Kibera population by utilising the existing stakeholders. However, they have different implementation approaches which have produced varying results. The results explained here have been derived from primary data collected through interviews and project documentation and observations of the different villages.

3.4.1. The KENSUP Project: A Government Perspective

The Habitat II Conference on Human Settlement (1996) challenged governments to use shelter development as a tool to break the vicious cycle of poverty, homeless and unemployment. Housing was considered the most holistic approach to increase the resilience of the urban poor and make lasting improvements to the livelihoods of millions of slum dwellers. In 2001, the government of Kenya through the MLHUD created the Kenya Slum Upgrading department mandated with development and the redevelopment of urban slums.

In line with the Habitat II directive, a settlement in Kibera -Soweto East (see Fig. 7) was selected to pilot a major slum upgrading project. The KENSUP project aimed to address several challenges: overall improvement of livelihood, legalisation and regularisation of land and social integration. The KENSUP Implementation Plan outlined a financial requirement of KShs. 884 billion (approx. €7.6 billion) and with this, the department of physical planning embarked on the challenge of designing a masterplan of multi-level density development and infrastructure that reflected the varied house unit sizes contained within the settlement while still emulating the formal neighbouring areas. The strategy produced and later implemented focused on creating sustainable and holistic conditions that could be applied

²² Information based on varied newspaper articles from 2001-2017 (Daily NATION Kenya, The Telegraph UK, New York Times USA, Standard Newspaper Kenya)

country-wide through harnessing political will, creating appropriate policies, enhancing research capacity and developing appropriate infrastructure (Un-Habitat, 2008).

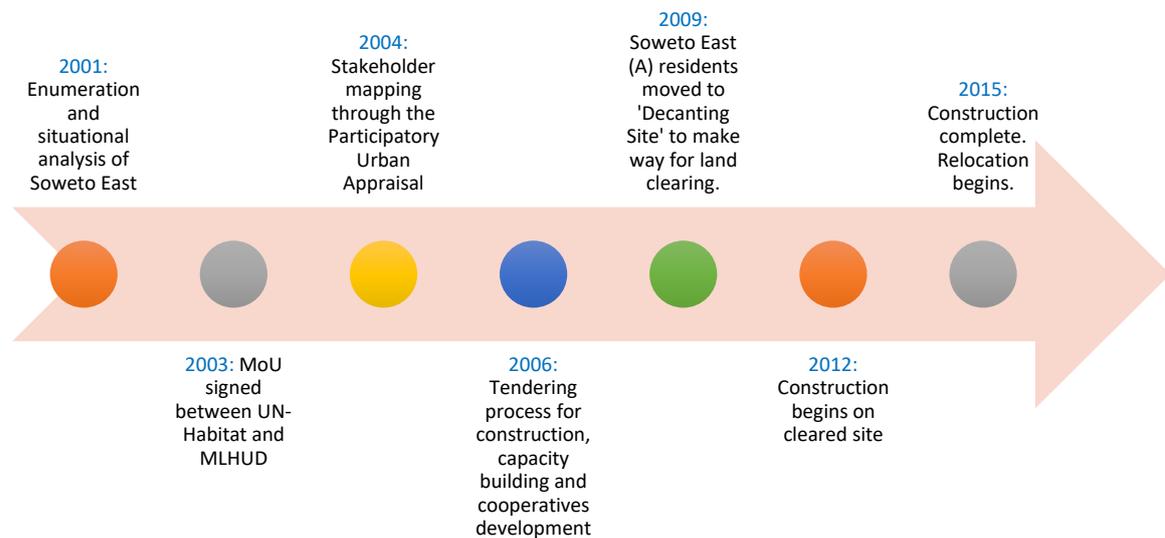


Figure 14: Timeline analysis of the KENSUP Soweto Project (Source: Author)

3.4.1.1. KENSUP and the existing settlement

The first step taken was an enumeration analysis which divided Soweto East into four separate sections (A, B, C, D) which identified the number of people per household, number of rooms owned/rented per household, age, education levels and occupation and afterwards each person was given a special identity card. Several parameters were put in place to overcome the fluidity of the residents within a settlement which included that a resident must have physically lived in the settlement for at least two years. These parameters, therefore, excluded 'absentee landlords' who owned houses but did not live in the settlement.

The success of KENSUP primarily relied on community organisation and mobilisation. In 2006, a programme was created that focused on the formation, training and capacity building of cooperative movements within informal settlements. The cooperative movements helped the residents to grow their savings that would later be used to facilitate ownership and management of the houses to be developed, safeguard the interests of the residents from socio-economic and political forces and, ensure residents' full participation, ownership and sustainability of the upgrading process (Kenya Government Printer, 2004). After the cooperatives were set up, a new challenge arose of finding a holding ground that provided the displaced residents access to their places of employment, schools and social facilities without increasing costs which created a limited radius of consideration. Since the land around Kibera was very limited, The Kenya Prisons Department loaned out land for a temporary holding site (decanting site) for a 4-year period.

In 2009, the displacement process began for the residents of section A into 600 newly built units with a rental value of Ksh. 700 (€ 6), a cost significantly lower than the rent they paid in the settlement (approx. € 21) aimed to incentivise the community to save. The government, however, did not anticipate the project delays that have retained people in the decanting site 8 years later. When relocation to the new neighbourhood began in mid-2015, many beneficiaries stated that they had already spent their

savings on competing demands and were unable to raise the required Kshs. 100,000 (€ 860) which would serve as the first down payment on the house (and the accompanying property rights). The KENSUP regulations do not have a contingency for this and the settlement residents have either remained in the decanting site or moved back to the slums. This has stopped further redevelopment as the decanting site is fully occupied. The government reacted by retracting services like water, sanitation and waste collection (see fig.15). The residents, according to the neighbouring Kenya Prisons, have reverted to using flying toilets as a solution to the sanitation problem. As a reaction to these challenges, many residents have stopped paying rent further increasing the on-going animosity between the settlement and the government.



Figure 15: (a) The abandoned borehole that was to provide water to the decanting site. The area has now become a solid waste dumping site. (b) Overflowing sewer lines. Occasionally, the residents would clear it up themselves. (Source: Author)

Aside from the down payment, the beneficiaries needed to prove that they were part of the original enumeration campaign and had been saving with the cooperatives to get one of the 800 housing units in the aptly named 'Canaan Estate'. They also had to an agreement with KENSUP that the owner could not legally sell his house for a period of 25 years. This condition was specifically put to prevent gentrification experienced in similar projects in the past (Ekdale, 2004). However, there is evidence that some residents are renting out their houses and moving back to the settlement which would still lead to a gentrified neighbourhood as the new tenants begin customising their surroundings. Other beneficiaries have 'sold' their identity cards and cooperative rights which has created an institutional nightmare.



Figure 16: View from the entrance of the new 'Canaan' estate. (Source: Author)

However, even with the challenges experienced, the overall perception of the new development remains positive as more residents accept the outcomes of the project (fig. 17/18). On the other hand, the social cost of the project has not been as carefully developed. One of the residents mentioned a sense of foreignness when using facilities such as the social hall. With their peers still living either in the settlement or at the decanting site, they did not feel comfortable holding meetings in the new facility. There is also no official inclusion to any settlement residents outside of the beneficiary group which creates a new level of marginalisation given the length each project would take to implement.

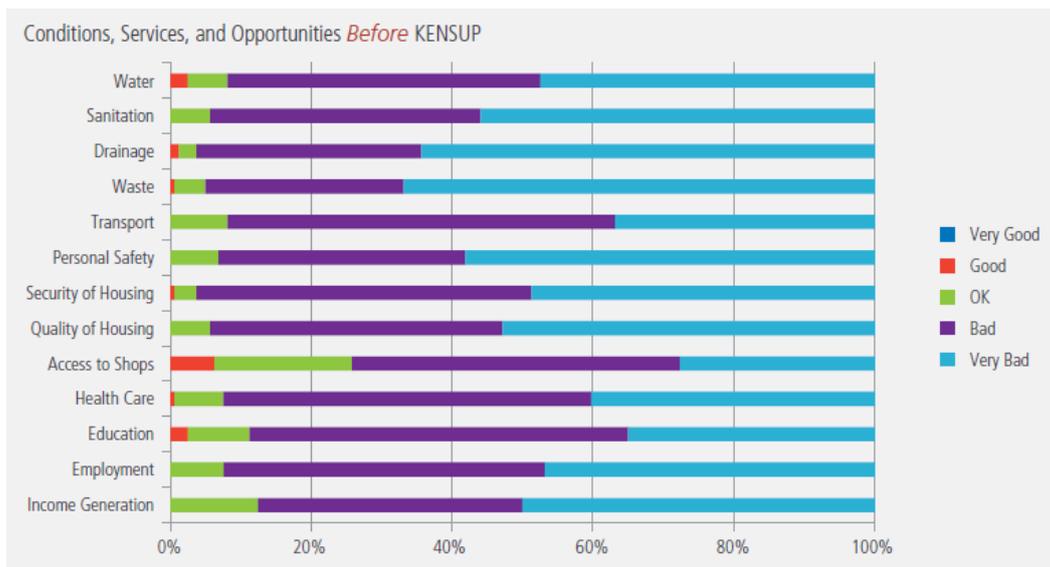


Figure 17: Perspective on living conditions before the KENSUP project began. (Source: UN-Habitat, 2004b)

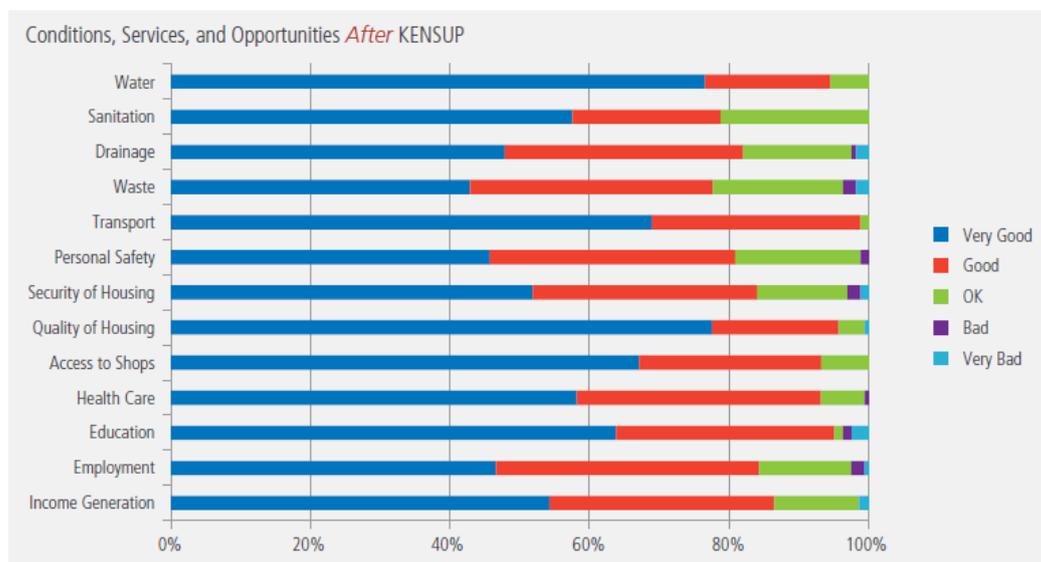


Figure 18: Perspective on living conditions expected after the project was completed. (Source: UN-Habitat, 2014b)

3.4.1.2. Partnership dynamics

Partnerships were critical in this project as there was existing suspicion and mistrust by the residents of the government's intentions. In 2003, the government got into partnership with UN-Habitat in its Participatory Slum Upgrading Programme (PSUP) to collaborate in the formulation and implementation of the national slum upgrading strategy to improve the livelihoods of 1.6 million urban households by 2020. In 2004, UN-Habitat assisted in a Participatory Urban Appraisal (2004) to map out the

stakeholders within the settlement. This involved identification, capacity building and awareness raising of the local community, local NGOs, CBOs, different government facilities and the private sector. This exercise was to encourage project buy-in and ease implementation. However, since inception of the project, relations between UN-Habitat and KENSUP seem to be strained with KENSUP claiming that the UN organisation did not hold up its end of the partnership agreement and UN-Habitat attributing it to a change in government in 2012 which led to a change in leadership structure at the Ministry which reprioritised slum upgrading.

The appraisal in 2004 however led to the most important partnership of the project: between KENSUP and the Settlement Executive Committee (SEC), a committee formed to represent the project beneficiaries (Mokua, 2014). The Kibera Soweto SEC is mandated primarily to mobilise and sensitise the community and to communicate the beneficiaries' needs back to KENSUP. They also identify interesting areas of capacity building which would improve livelihoods. Although SEC members should only hold the position for 4 years, reports on the ground indicate that SEC members have not been changed since the project began. Karari, (2009) states that this may be due to a fundamental failure in the constitution of the committee which he claims was undemocratically elected and overwhelmingly run by certain groups. Moreover, once SEC members are allocated housing in the new estate, few continue with community advocacy. A study by Kusienya, (2010) indicates that the SEC did not have enough responsibility or resources given their unique understanding of the socio-economic characteristics. Their ability to accurately predict the community decisions has not been exploited which has created gaps in execution and slowed acceptance of the process. Furthermore, the lack of resources in an already strained economic situation has greatly demoralised its members (Mokua, 2014).

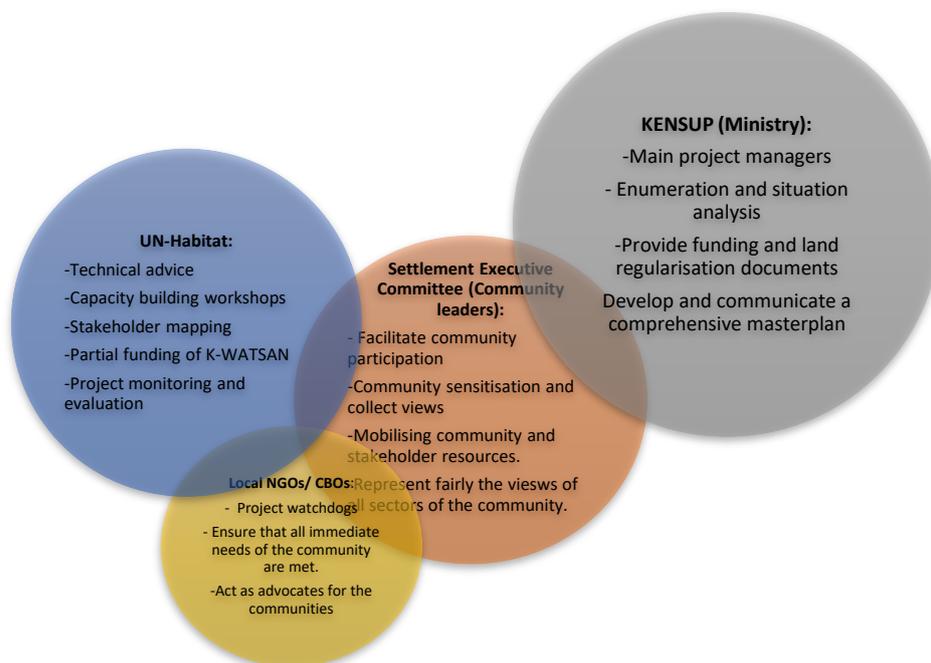


Figure 19: Stakeholder engagement and roles in KENSUP (Source: Author)

Upgrading cannot be effective without economic empowerment with most residents operating small informal and unlicensed businesses which earn less than €100 a month and are constantly targeted by corrupt authorities (Karari, 2009). Interviews revealed that KENSUP's economic empowerment revolves around computer literacy and construction of market stalls (kiosks). Computer training was carried out in conjunction with CISCO who ran a centre at the decanting site which has since shut down (fig. 20c). A resident who taught at the centre explained that the government stopped providing funding for

operation and maintenance leading to the centre closing its doors. Complaints from NGOs/ CBOs involved in the transition about the implications of these initiatives by the government have caused them to be sidelined from ongoing KENSUP discussions.



Figure 20:(a) Illegal connections by water merchants are done through the security wall and are the only water solution. (b) women sell goods and vegetables within the compound in the same way they did in their previous settlement. (c) A forgotten sign outside the CISCO centre (Source: Author)

One of the partnership shortcomings observed is the lack of involvement of other governmental organisations that would have led to the project having a greater impact. With a current Nairobi health estimate of 21.6 beds per 100,000 people and a doctor:patient ratio of 15.3:100,000, a project of this size should have considered the development of a health centre to cater for the growing population in Kibera (Kenya National Health Sector Service Providers, 2010). This could have been facilitated in partnership with the Ministry of Health and would have benefitted both the project beneficiaries as well as the surrounding settlement inevitably reducing the pressure in the nearby public hospitals: a change that would have affected the rest of the city as well. Another key government partnership would have been with the Ministry of Education. The current teacher:student ratio is 1:56.6 (2012 national data) which is far below the global average of 1:23.7. The project would have gone a long way in increasing access to basic education to the settlement. However, by focusing on housing, the residents may continue to face challenges accessing health and education.

3.4.1.3. Integration to the urban fabric

Unlike many projects in Kibera, the design and construction of Canaan estate were done in accordance with the Kenyan Law governing buildings (cap 525) which has provided the residents with a sense of security since the houses meet the required standards to protect them from disasters such as fires and flooding. Regularisation of land has also been achieved through allotment letters which has integrated the residents to the greater Nairobi culture and identity through the creation a new rental market in Kibera for outsiders. Beneficiaries have noted that they are now able to comfortably rent out especially to the students from the nearby Riara University since it is relatively affordable with rents of up to Kshs.



Figure 21: (a)The new commercial kiosks that are being developed under the KENSUP project. (b) roadside street vendors on the road leading to the new neighbourhood constructed under the KENSUP/K-WATSAN project. (Source: Author)

15,000 (€130). This has increased the economic capacity of the beneficiaries especially as many of them find the expected Kshs. 6000 (€50) mortgage monthly repayment too steep.

There is also a proposed commercial centre which is expected to provide access to a wider market which was initially inaccessible to the settlement residents. One interviewee stated that this would increase the number of products she can sell as they catered to a wider market. Moreover, problems with services like water and sanitation can now be resolved using formal channels which was an impossibility in the village's previous state. Other softer social changes observed were a more pronounced sense of citizen recognition that is missing within the Kibera settlement and peace of mind that allows the residents to pursue different activities without fear of eviction or opportunistic crime that is still threatening the informal part of the settlement.

3.4.1.4. Institutional gaps

Firstly, under the current regulations, Kibera residents are not protected under the Squatters Act or the Land Acquisition Act (Cap 295 of The Laws of Kenya, 2009) which provides guidelines for compensation after the compulsory acquisition of private land by the government. Several court cases have been brought forward by 'absentee landlords' demanding compensation for income lost from their demolished property and by the residents demanding for resettlement funds causing delays in the project progress. However, the confusing Carter Ruling (note 22) is still upheld yet the lack of legal documentation still gives the government the official right to evict.

Additionally, even with the emphasis on community engagement, there is still reflections from previous plans developed in the 1970s and 1980s which promoted clearance and resettlement over social and economic engagement. It is difficult to ascertain the depth or effectiveness of community participation in this project. Several residents expressed that they felt that their needs were immaterial to the progress of the project. An assessment carried out by Joseph Senteu (2006) reported that "the KENSUP institutional structure and arrangements, though capturing the spirit of the vision, mission and goals, have not adequately captured the core of the programme – the community". This leads to concerns such as: what happens to the displaced people who cannot afford to be resettled? What are the plans for the new rural immigrants who have no financial capabilities to live in more affluent neighbourhoods? How will the existing businesses be relocated to the new facilities? What would happen to the rest of the settlement after the pilot project is completed?

Secondly, there is a lack of communication between government departments leading to Ministries carrying out projects that undermine or replicate each other's efforts. Caesar Handa (2006), reported that poor communication exists even within KENSUP with different teams unclear on their role and how they should relate to other organs. Politicians in the area tend to use this confusion to gain votes and create chaos. Beyond the KENSUP project, there have been isolated interventions carried out throughout the settlement which have included improved toilet blocks, expansion of sewer lines, provision of water supply lines (see fig. 22). However, many of these projects have little input from the community or the slum upgrading department which has led to the projects failing. There are also conflict with the Kenya Prisons due to miscommunication which has led to eviction of residents to make way for prisons' staff. This is increasing frustration and mistrust of the government in Kibera.



Figure 22: Stalled 'Waiguru toilets'. This was a WATSAN initiative throughout the Kibera settlement started by the Ministry of Devolution ca. 2014. It involved building of roads, sewers and ablution blocks. Political discontent and rumours of corruption clouded the project. (Source: Author)

Thirdly, the architects and engineers engaged in the project did not consider the original spatial planning unit used in the settlement²³. This planning unit dictates how residents relate to each other, solve problems and interact with the outside world and is usually occupied by a specific ethnic group. The disruption of these planning units has become a cause of internal social conflict in the decanting site. Criticism from researchers (Centre of Housing Rights and Evictions, Pamoja Trust), point out that the slum upgrading process should have been approached as an improvement on living conditions as opposed to recreating a new environment. Mukeni, (2014) further adds that upgrading efforts must reflect residents' aspirations and needs by considering their existing social and economic networks. In his research, he notes that the plans as they were laid out and later implemented are technocratic solutions trying to conform the living conditions in the settlement to its surrounding neighbours.

Lastly, there is frustration expressed by the local government about its lack of involvement in this project which could leave it underserved. A strong partnership is needed with the Nairobi County Council so that they can intervene especially in the decanting site which is currently considered a national government facility. Furthermore, the local government is running a similar department which is working in other settlements in the city. It only seems logical to combine efforts and share resources. For example, research carried out by (UN-Habitat, 2014b) showed that most vendors in Kibera preferred to sell their goods by the roadside rather than move into the city council kiosks (which are quite similar to the KENSUP kiosks) due to the legal expectation of monthly rent and business costs given their current profits. This is information that could have guided the KENSUP project and raises the issue of how the formal businesses will impact the informal small-scale businesses that are the source of income in many slum households.

Although KENSUP insists that the projects will continue, there is little clarity on a way forward given the current barriers. With continuous rumours of high-level corruption within the Ministry and within the KENSUP management structure, it is unlikely that the project will continue as smoothly as anticipated. Additionally, with a 3-6 year window to upgrade the current population, it is unlikely future project will affect the current residents or even be sufficient for the growing numbers. These challenges have also increased the fear that the situation in the decanting site might follow them to their new homes. The focus on creating internationally acceptable spaces has missed the opportunities created by the existing way of life.

²³ A 'plot' is the planning unit used in Kibera which is a collection of houses surrounding a courtyard with shared facilities and often owned by a single landlord (Mukeni, 2014).

3.4.2. Bio-centres Innovation: A grassroots perspective

United Nations declared 2005-2015, the decade of fresh water and basic sanitation (UN General Assembly, 2005). Preventable water-borne diseases kill approximately 1.6 million children annually while girls and women in Kenya spend an estimated 40 million hours annually looking for water which translates to approximately \$324 million in lost income (Bill and Melinda Gates Foundation, 2010). Improved sanitation increases productivity, improve school attendance and increases dignity especially to women and girls. For the impact of water and sanitation to be fully felt in insurgent settlements, the complete value chain as shown in fig. 23 must be implemented. The management of wastewater and residual waste is as critical as the provision of water and sanitation services (Binale, 2011).

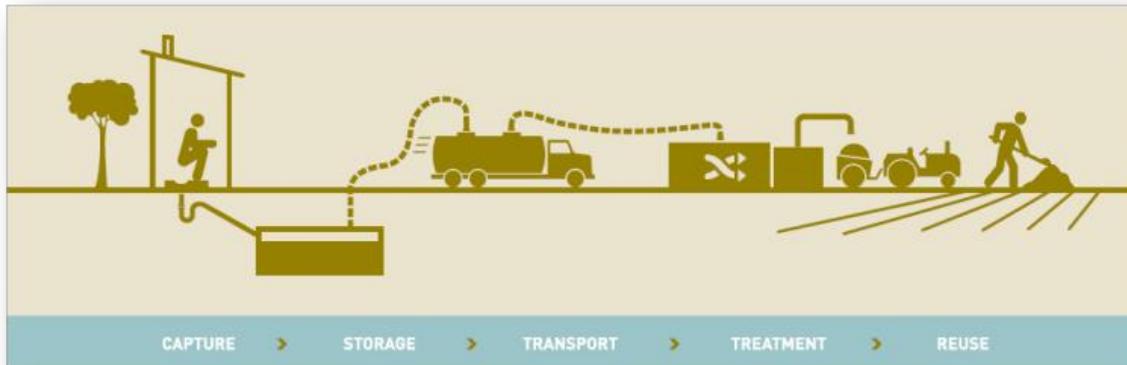


Figure 23: The Water and Sanitation Value Chain (www.gatesfoundation.org)

Civil society, and more so NGOs, play a key role in the implementation of water and sanitation projects in Kibera. First, they act as mediators between the urban poor and the authorities since they have gained trust with both parties and can articulate the challenges facing the urban poor in a way that can be comprehended by government agencies and other upstream actors (Otiso, 2003). Additionally, they facilitate the mobilisation and consolidation of the social capital in the slums that can be used as a force for confronting the structural and policy-related issues (Mukenku, 2014).

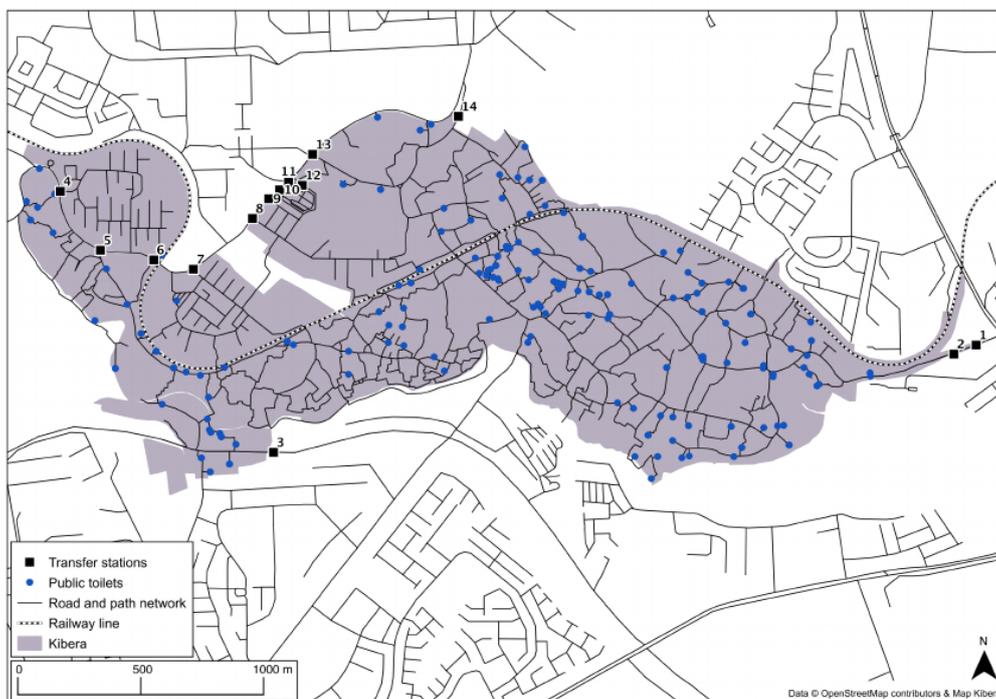


Figure 24: Map of Kibera showing the location of public toilets and the possible transfer stations of the waste. (Source: Kennedy-Walker et al., 2014)

3.4.2.1. Partnership dynamics

Umande Trust initially began as an advocacy group focused on social justice. By 2004 they had identified a gap in water and sanitation as the largest cause of injustice and indignity in the settlement not directly involving violence. They, therefore, started on the assumption that the observed challenges could be solved through the strategic use of resources that could then be a gateway to solving the other core vulnerabilities. Their main aim is therefore to provide sustainable innovative solutions that captured the complete water and sanitation value chain in urban settlements. They operated under the guiding principles of equity, affordability, environmental effectiveness and sustainability (Binale, 2011).

There was recognition early in the programme that strong partnerships were necessary to pool resources and capacities. As the consultations in the settlement progressed, Umande together with other NGOs noted that much of the discussion revolved around poor sanitation and the spread of water and air-borne diseases(see fig. 25). Around the same time, there was ongoing mass eviction through land grabbing by developers in several slums in the city. This generated a partnership between several local NGOs who distributed the urgent issues in the slums based on their individual competences (See fig. 26).

Figure 25: Recommendation made by residents on expected improvements to the settlement. (Source: UN-Habitat,

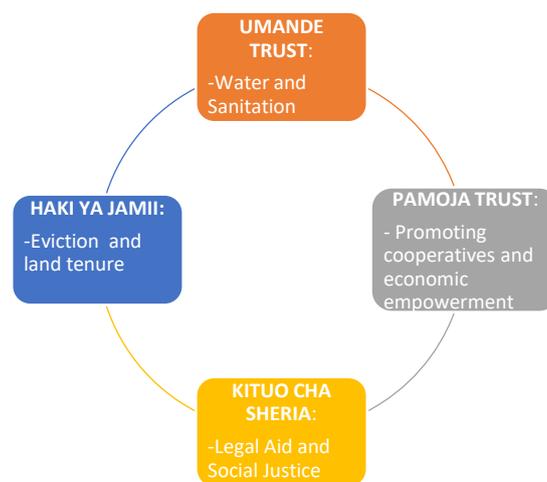
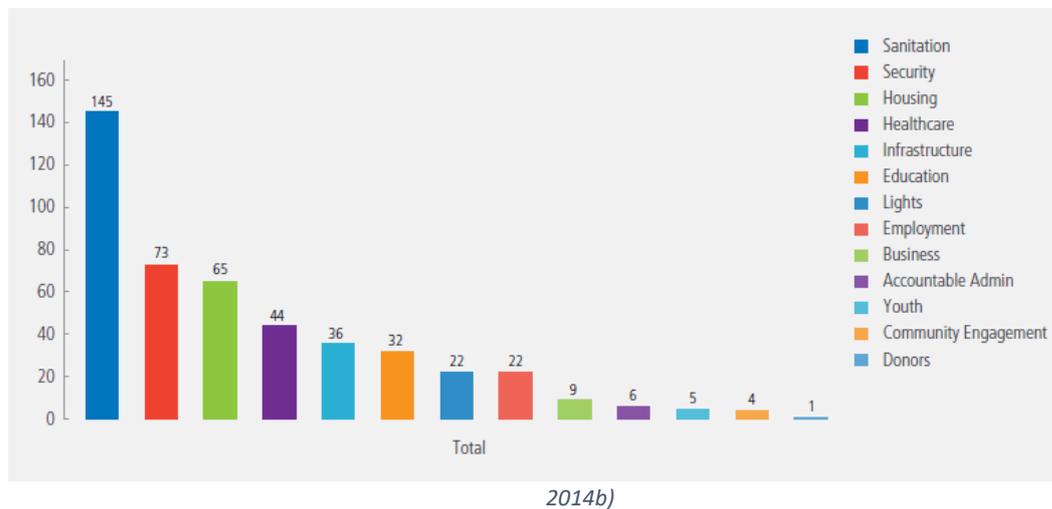


Figure 26: Division of labour through multi-lateral partnerships. (Source: Author)

To address the specific challenge of sanitation, Umande became part of a partnership between the Kenyan government and French Development Agency (AFD) titled “Nairobi Water Sewerage Emergency Physical Investment Programme” (NWSEPIP) which gave Athi Water Services Board (ASWB)²⁴ the mandate to develop strategic guidelines for water and sanitation in informal settlements. The activities started with a survey to determine the number of users per facility, the demand and perceptions of the price points, existing sources of water and sanitation, distance from the available facilities and their costs (Binale, 2011). The analysis led to the design of the first bio-centre in 2006/7. (see fig. 27). The analysis indicated that a model bio-centre would have an average cost of Kshs. 1.2 million (€ 10,350) and serve between 500-1000 users a day (approx. 200 households).



Figure 27: (a) The exterior of the three-storey TOSHA bio-centre (b) The water point at the bio-centre (Source: Author)

This naturally led to partnerships between Umande and community self-help groups. The partnerships were based on type of membership (women, youth, disabled), registration with the authorities and the availability of land either through the group or through allocation from the Kibera county representative. The selected groups underwent training in basic water and sanitation, eco-sanitation, bio-sanitation and biogas cookers (Binale, 2011) to develop a localised form of the community led total sanitation (CLTS)²⁵. The trained leaders then trained the beneficiaries on correct use and benefits of the facility. This ensured that the groups could carry out their own operation and maintenance and this enhanced their sense of ownership and improved relationships between the settlement and the service providers. In the five facilities visited, there was at least one member of the executive committee overlooking the management and operations. There has also been further capacity building in governance, budgeting, procurement, budgeting and supervision. There were, however, issues during implementation as the initial design only had one floor for showers and toilets which the community found inadequate and therefore demanded a second floor for meeting rooms which increased cost. However, the extra space has been a good source of residual income (see fig.32) Additionally, there was theft of construction material and money, political violence that destroyed infrastructure and difficulties in supervising many groups with different needs and understanding.

As the projects progressed, research and development became a key area of partnership. First through the University of Cranfield, who introduced the gulper exhauster technology - a manually operated pump that scooped latrine and toilet waste - used in both the newly constructed toilets and the older

²⁴ Athi Water is one of the eight Water Boards under the Ministry of Environment, Water and Natural Resources created to bring about efficiency, economy and sustainability in the provision of water and sewerage services in Kenya

²⁵ Community Led Total Sanitation (CLTS) is an innovative methodology for mobilising communities to eliminate open defecation (OD). Communities are facilitated to conduct their own appraisal and analysis of open defecation (OD) and take their own action

unserviced toilets. Before the introduction of the technology, residents used toilets until full and then moved on to a new location to construct a new one. This was unsustainable as open space in Kibera is highly competitive. Umande also partnership with UN-Habitat who introduced the ‘vacuutank’, an exhauster truck previously piloted in Dakar. Unfortunately, in both cases, the terrain and the state of the roads were not conducive for the transportation vehicles and most areas could not be reached without unfortunate accidents.

After several attempts at evacuating and transporting waste, Umande partnered with researchers at the University of Nairobi to develop technology that would turn the remaining solid waste to useful fertiliser for the community. It was however discovered that 85%-90% of the solid waste produced is contaminated by cysts and bacteria. Research indicates that the bacteria and cysts attached themselves to the leaves of vegetables which are detrimental to human life (Manula et al., 2015). The continuing partnership with the University is working on an appropriate treatment plant which will end up being an additional cost to the community. Nevertheless, communities along the rivers are using the solid waste to grow maize, bananas and sugar cane which are not affected by the cysts.

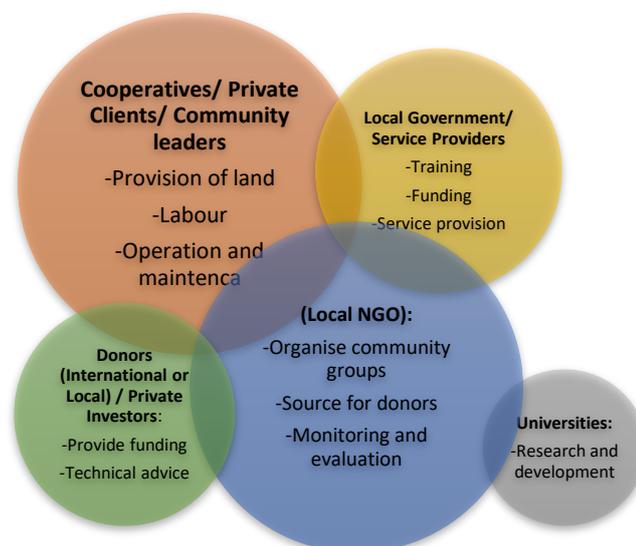


Figure 28: Stakeholder engagement in one stop shop (Source: Author)

3.4.2.2. Relationship with the existing settlement

From 2004-2006, Umande focused on advocacy, awareness creation and linking residents to service delivery organisations. Initial advocacy work was necessary to repair the broken relationship between the residents and the providers which prevented services from entering the settlement. Therefore, in the first few years, most of the work focused on bringing local organisations like Nairobi Water and Sewerage Company²⁶ (NWSC), ASWB and the Community Development Fund together with the residents to explain their plans for the settlement, create awareness on the right to water, the right to clean environment and the citizen right to the urban space. The design was inspired by similar projects

²⁶ Nairobi City Water and Sewerage Company is the primary water service provider to Nairobi and its metropolitan areas.

in New Delhi, India and typically have a biogas chamber underground; toilets, showers and cooking spaces on the ground level; and a rental space on the first level (Fig 28) (Aubrey, 2009).

In the years that followed, Umande has facilitated the construction of 83 bio-digesters nation-wide in 5 informal settlements in Nairobi (Korogoshi, Kibera, Mathare, Kibagare and Mukuru), 19 of them located in Kibera (see fig.30). Based on an earlier situational analysis, users pay Kshs. 5 per visit to the facility or can opt for a monthly fee of Kshs. 150 (€1.30). There are visible changes observed in the surrounding environment as well with less flying toilets observed. Health specifically among women and children has improved with fewer incidences of dysentery and cholera reported.

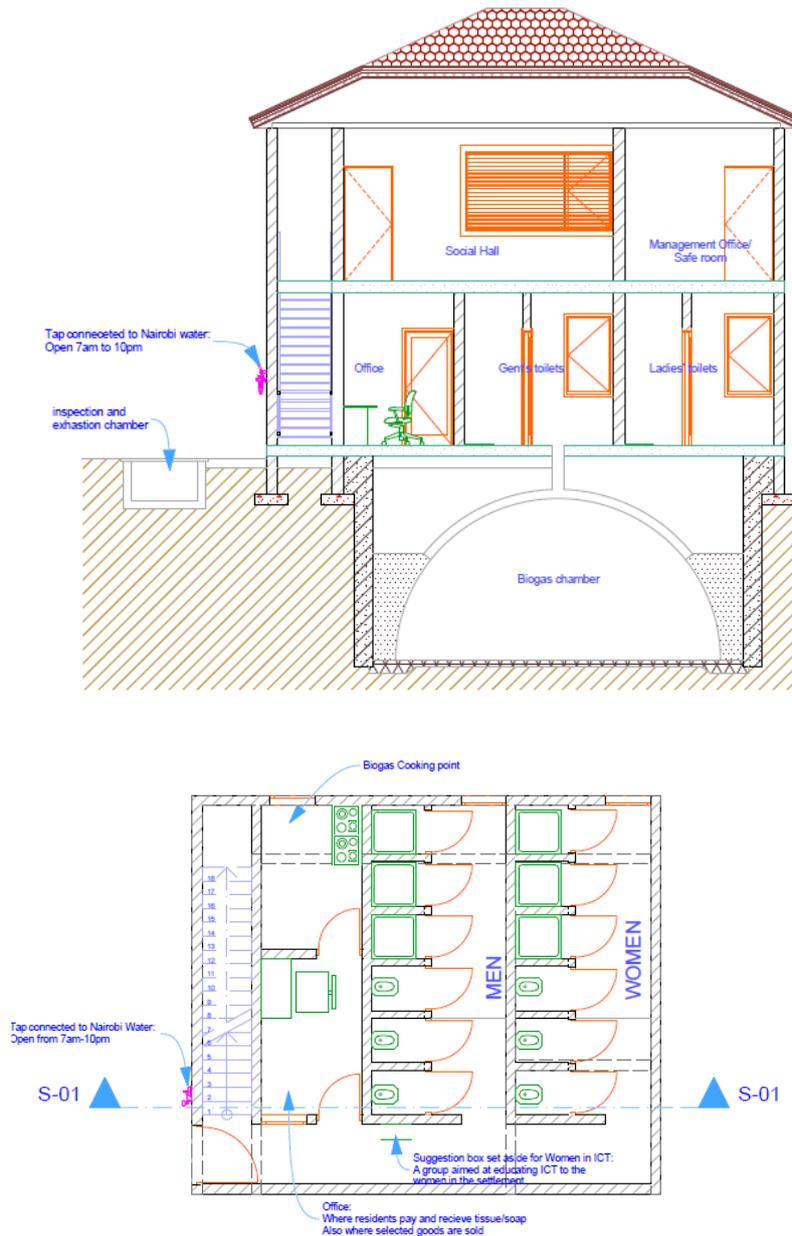


Figure 29: Representation of the Soweto East Bio-Centre showing the different sections of the facility. (a) Cross-section (b) Ground floor plan. (Source: Author)

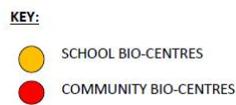
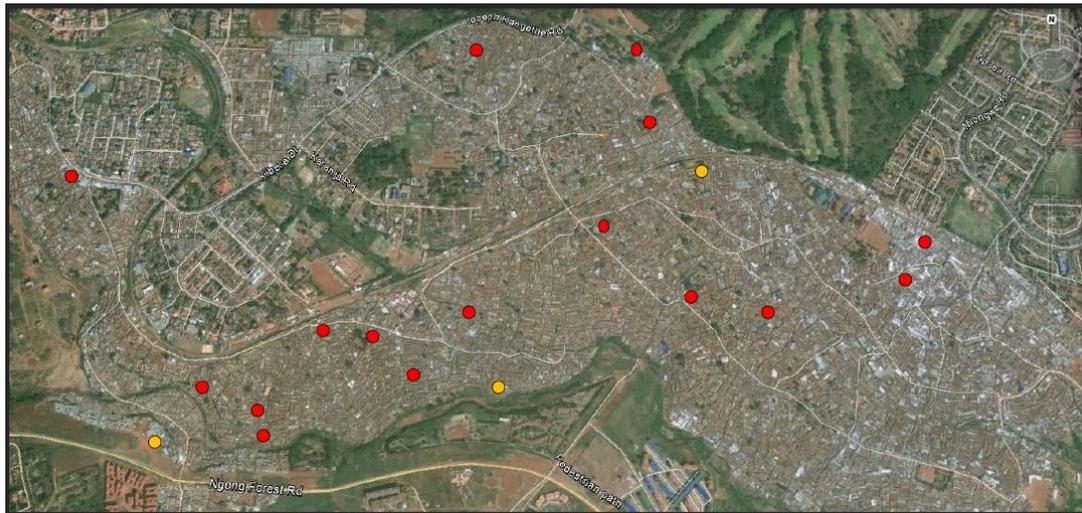


Figure 30: Map of Umande bio-centres in Kibera as of 2014. (Source: <http://umande.org/>)

One of the benefits of the bio-centre has been in providing a sustainable business opportunity for the self-help groups in Kibera. Discussions with some of the leaders indicate that the centres make Kshs. 25,000- 100,000 a month (€215-860) from the showers and toilets alone. This is money that can be reinvested, directed into financing loans and goes into operation and maintenance. One bio-centre showed an annual profit in the range of Kshs. 280,000 (€2,500) which it distributed as dividends to its members. These figures, however, have not provided a profitable model to attract more banks to engage with informal settlements. In recent years, Umande has created a self-sustaining loaning product, The Sustainability Development Fund (SANDEF) to ensure sustainability of the projects if external funding is lacking. It is however challenged by the poor repayment from the self-help groups which threatens any external funds directed into SANDEF.

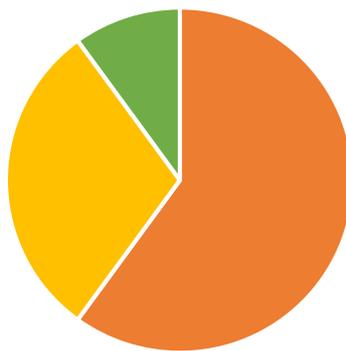


Figure 31: Division of profits from operations (Source: Author)

Construction of bio-centres has developed innovative approaches in brick making and dome construction which has increased the skill sets of the community and increases their potential earning capacity (Binale, 2011). A new cashless payment was also developed to assist in innovative pricing methods. However, it relied on government support which was not forthcoming (Manula et al., 2015). On some visited facilities, solar lamps and ethanol stoves were being sold (See fig. 33). Sales people said it was easier to reach the community at the bio-centres and often used this platform. The stoves together with the biogas have reduced incidences of respiratory diseases as residents reduce their use of charcoal (WHO, n.d.). The bio-centres also perform a critical role in peacekeeping and run peace programmes bringing together different youth and ethnic leaders to interact with politicians and attend social integration trainings. This is an important role as Kibera experiences massive displacement and violence during election periods.



Figure 32: Three different facilities with their separate income raising facilities. (a) a box and board used by the Women in ICT (b) Advertisement for a soccer game at one of the halls (c) a library open to the youth (Source: Author)



Figure 33: (a) Salespeople selling cleaning products negotiate prices at the bio-centre. (b) A woman uses the biogas cookers at the bio-centre. (Source: Author)

Results from a study carried out by Binale, (2011) showed that beyond the provision of privacy, security has improved as the blocks are more accessible, increased awareness as more landlords include ablution blocks in their properties and have reduced the amount of time women devote searching for water, therefore, increasing their economic capacity. Additionally, many of the bio-centres were built on brownfields that were originally either abandoned, unserviced toilets or overflowing with solid waste. Another benefit to the community has been the reduction of effluent to the existing sewer lines which brought vermin and caused diseases as the biogas digestion process is recorded to produce significantly less liquid waste with almost 90% fewer pathogens (Aubrey, 2009). Umande has also initiated the open defecation free zone that assesses how effective the bio-centre is in a 60-100m radius which provides insights for improvement (Manula et al., 2015).

3.4.2.3. Integration to the urban fabric

Although there is no direct integration to the city observed, indirect integration was observed such as the residents can shower and do their laundry more frequently and at convenient times which is a more acceptable attribute. This allows them to get to work clean and on time. The women who run vegetable selling businesses have also become more popular as their hygiene levels have increased. The cleanliness of the environment in the settlement and increased security has allowed it to be more accessible to the rest of the city. The danger of theft, especially in the daytime, has reduced as the community around the bio centre are more protective of their environment. In this way, many households usually leave behind their water containers and go about their day saving hours that were spent guarding their property or looking for water. The restored dignity especially of the environment has given the residents confidence to start innovative businesses in affordable premises.



Figure 34: Residents leave their containers during the day at the Soweto East Bio-Centre. (Source: Author)

The centres have also provided an opportunity for the residents to interact with national, local and private organisations that affect them through town hall meetings allowing them to be more vocal on the issues affecting them, especially regarding politics and justice. However, as infrastructure remains poor and the sewer systems remain limited, many parts of the settlement remain isolated to the city.

3.4.2.4. Institutional gaps

Land tenure remains a present issue in the implementation of bio-centres. One of the key requirements of the groups is that they must present proof of ownership from the area authority which provides some form of legality. Support from the local government also provides an extra layer of protection of the land. However, the self-help groups expressed fear of eviction and demolition should the national government come calling. The only law governing the bio-centres is the Water Act (2002) through the support from the Ministry of Water which regulates it. This has been assisted by the close relationship that Umande keeps with AWSB and the Ministry. To ease the development process, Umande Trust obtains block approvals on behalf of the community groups. Although this will not prevent compulsory displacement by the government, it prevents a more immediate threat of demolition by local officials. However, research showed that local officials hardly ever visited the site making the threat redundant. Lack of tenure also prevents groups from using their facilities as assets to acquire bank loans.

Another major threat is the corruption that faces many projects in the settlement. There is emerging concern about corruption in the NGO sector which has created mistrust among stakeholders (Harsh et al. 2010; Smith 2010). Reyna and Cassiman, (2012) pointed out that “Kibera is a great business, especially for western NGOs and the Kenyan Government. It’s a theatre. It is profitable to sustain

Kibera... some cents might end up in Kibera.” With limited government intervention in the greater parts of the settlement, NGOs have filled the role of the state in both service provision and corruption. With NGOs channelling about €200 million annually (Obiyan, 2005), there is growing evidence of inflated costs, doctored invoices, kickbacks to officials and fictitious projects. Umande eluded to the difficulty of running a clean NGO with pressure from some government and donor officials which threaten their effectiveness. There is also the fear of reduced international funding in Southern countries due to external global factors such as the current refugee crisis which has fuelled corruption incidences (Kimemia, 2014). Furthermore, land grabbing carried out by corrupt official government representatives remains a threat to the community with reported cases of arson and violent evacuation by gangs hired to clear attractive sites.

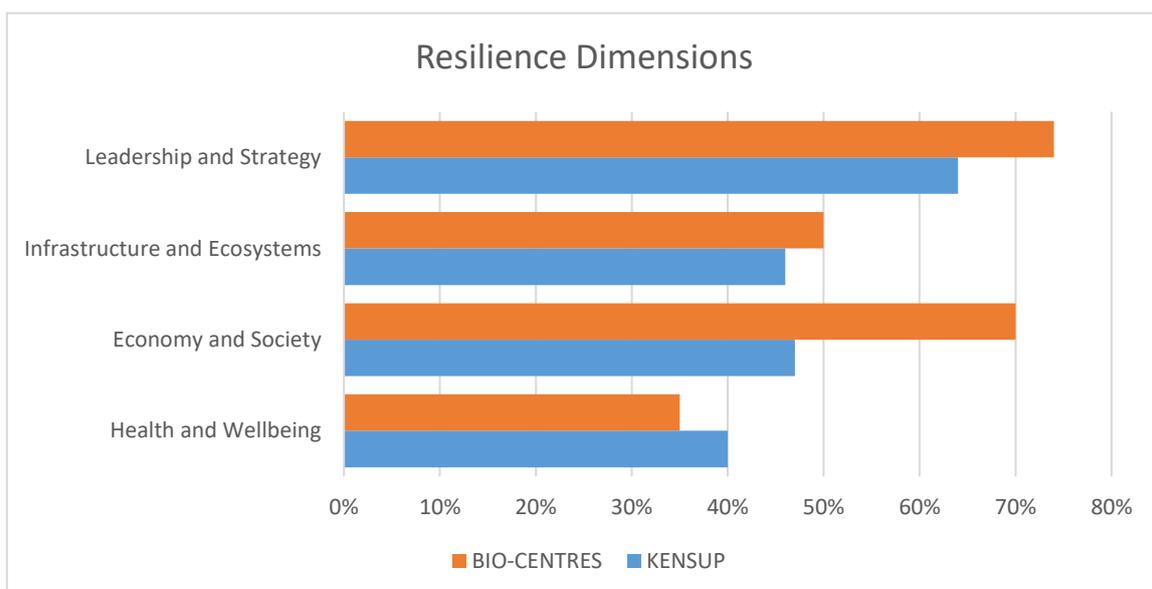
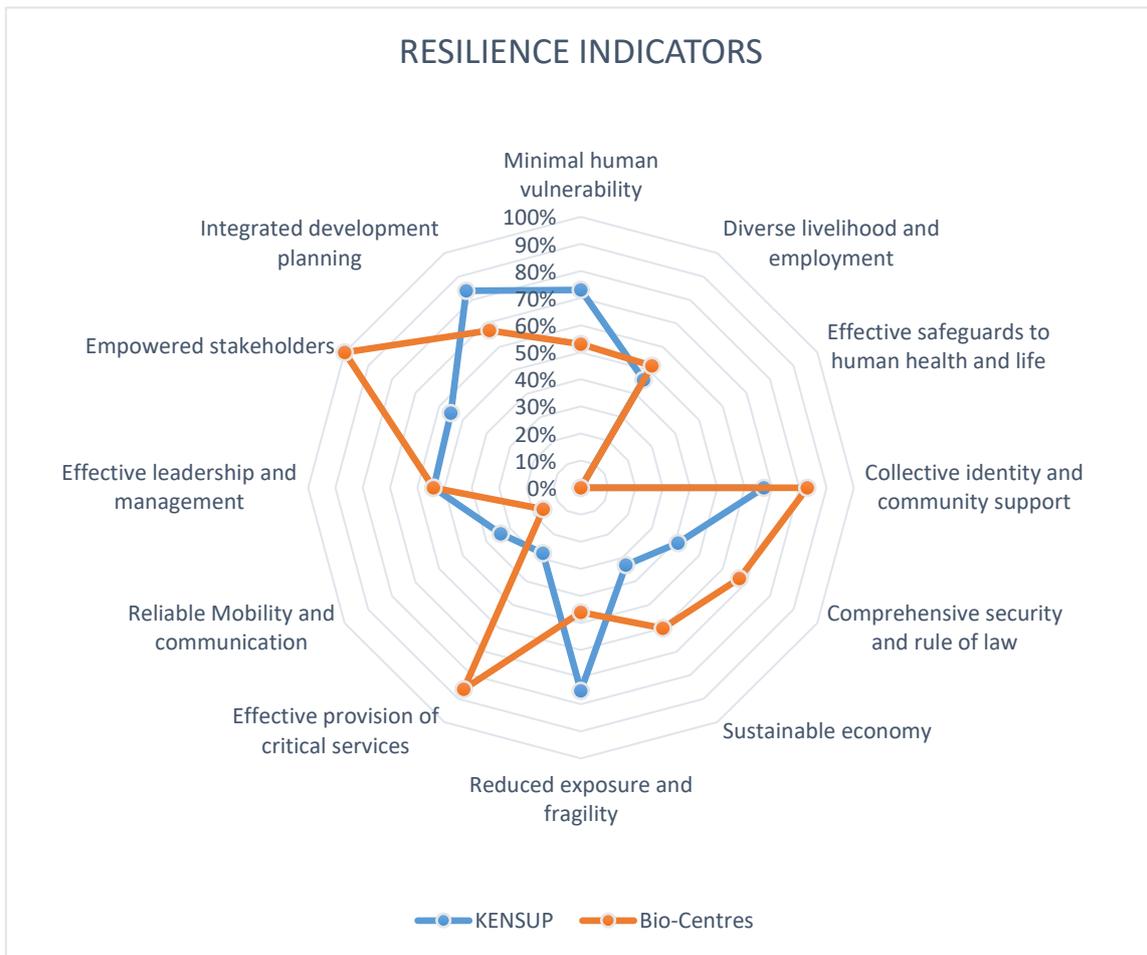
NGOs in Kenya are self-regulating according to The NGO Act 19 of (1990) which means they are bound only by the expectations and terms provided by their partners, whether donors, international organisations or governments, who are all bound by varying institutional ethics and regulations. Many of these ethics are not bound by any government framework which would control communication, funding and code of conduct (Reyna and Cassiman, 2012). This often makes NGOs more of managers of external donors instead of agents of change which jeopardises the projects and the community. Umande has tried to overcome external friction by creating a separate community organisational structure with several committees (executive, business management, tendering and audit) that hold each other accountable therefore reducing incidences of external interference as well as corruption.

Despite the criticism on the lack of government support in Kibera, discussion with both the local and national government officials indicated that there is conscious effort to recognise and support ongoing upgrading efforts. Any organisation planning on carrying out work in Kibera must register officially with the local government. It is important to note as well that by the NGOs own account it is only through the support of the local government that Umande has been able to empower the people in the settlement.

3.4.3. Resilience Analysis of KENSUP and the Bio-Centres

Based on the information presented, both projects seem to have similar strengths and weaknesses. However, looking at the results, the bio-centres seem to have a more positive resilience impact. This could probably be attributed to the project’s very deliberate involvement of the community and even though the projects are not of the scale of KENSUP, the impacts as perceived by the users are higher. Additionally, within the same time frame, 2004-2017, KENSUP has had the potential reach of 6000 people while the bio-centres have had a potential impact on 10,000 people. Given the budgetary allocations, the technical commitments and the legal requirements, the grassroots approach to achieving resilience seems to present better results than a government-driven approach. The only dimension that the government has had an advantage in is in health and well-being. This has been linked to their ability to quickly and efficiently provide infrastructural and professional facilities. However, their overall low score in that dimension is based on the lack of direct investment in health. Although both projects effectively improved health and thus quality of life, the CRI emphasises on direct provision of health care and emergency medical services and not on the indirect benefits that accrue from the presence of the projects. The KENSUP project scored low on economy and society as its business facilities are still under construction and the exact impact of the project cannot be determined

at this time. Nevertheless, the location of the new facilities may be able to attract people outside the settlement which could increase the opportunities for the settlement residents.



4. TOOLS FOR BUILDING RESILIENCE IN INSURGENT SETTLEMENTS

Resilience in Nairobi, like many Southern cities, should focus on basic human vulnerabilities and local innovations that subsequently arise. As the classical resilience discourse emphasises on recovery and stability, one wonders if maintaining the status quo is desirable in defining Southern resilience with its current social, political or economic systems or if it would leave many of its citizens at a disadvantage (Seeliger and Turok, 2013). Therefore, in defining resilience of Southern cities, affordability, co-production and sustainability are key in the maintenance and adaptation of vital functions which would ensure the livelihoods of the most vulnerable are improved while also improving more affluent groups.

Resilience in Southern cities can, therefore, be defined as the city's ability to uplift all its citizens across all four dimensions to the level where they can comfortably overcome everyday challenges.

Given the results, the following tools were identified as key in improving resilience in insurgent settlements that would then increase resilience in whole cities.

4.1. Ownership

Upgrading is a socio-economic venture and cannot be carried out successfully without community involvement, embracing the local culture and social cohesion. However, until very recently, ownership has not been a top priority when undertaking upgrading projects in many insurgent settlements. This has not only been evidenced in Nairobi, but forced evictions have been recorded in settlements in Afghanistan, Cambodia, Egypt, India and Rwanda (Marx et al., 2013). By denying citizens right to ownership, they are also denied the right to resilience as they cannot adapt their environment to the shocks and stresses they face. However, the results have shown a paradigm shift towards more inclusive processes which have improved the benefits accrued by the citizens.

This research indicates that ownership can be developed in different ways: through economic, social or legal empowerment (or a combination). By creating a participatory framework, a section of society that is often forgotten feels part of developing policies and outputs that are reflective of their lives and values. A good example can be drawn from the Future Proofing Cities framework applied in Bangalore and Mudrai, India, which has used a participatory planning process in urban settlements to develop ways to diagnose and act on climate risk in urban areas (World Economic Forum, 2015). Additionally, participatory processes open the positive realities of settlements to the rest of the city. An assessment report on the Participatory Slum Upgrading Programme (PSUP) in 35 African, Caribbean and Pacific countries points out that engaging the slum dwellers as citizens and not statistics created more positive perceptions from the formal city and has led to development of ideas that are applied to the whole city (European Union, 2016). The report showed that even in Nairobi, the more involved citizens feel in effecting change, the more willing they are to invest and sustain that change.

It can be concluded from this research that civil societies have a better grasp on engaging the community than the government. This is possibly because they are small enough to maintain continuous personal contact with the community and have far fewer bureaucratic restrictions that slow down implementation. However, the government has the institutional framework to guarantee legal ownership that is just as important as any other social capital. Unfortunately, the continuous power plays have prevented these seemingly natural synergies. The desire to only invest in massive capital projects has been a deterrent to creating these synergies. According to UN-Habitat, (2014b), the state often refuses to acknowledge that changes experienced by any one community are vitally important to that community and are valid in their own right.

4.2. Enabling institutional and governance structure

As mentioned in the introduction, many Southern cities are victim to inherited colonial laws that make it difficult to create proper mechanisms necessary to achieve overall urban resilience. However, as insurgent settlements gain more recognition as part of the urban planning system, governments have begun enacting regulations that specifically cater to insurgent planning practices. These include mechanisms that facilitate joint decision-making, resolve disputes and encourage innovations which reinforce trust and ownership. Creating enabling regulations has shown to have residual benefits that affect the entire city. In cities like Maputo, Mozambique, where half of the citizens live below the poverty line, the Public Private People Partnership for Climate Compatible Development (4PCCD) has developed a partnership between the citizens and the policymakers to ensure that all the citizens voice their opinions on climate change plans (UNFCCC, 2014). The policies that have been enacted in the process have benefited the whole city by reducing flooding incidences through targeted waste disposal systems and environmental education programmes. In Lagos, Nigeria, the implementation of a Bus Rapid Transit system that initially targeted the urban poor has not only reduced CO² emissions but reduced travelling time for many citizens and consequently made the city more liveable.

The correct governance framework also has a significant impact on how policymakers and civil societies develop plans and regulations to make them more inclusive and targeted to specific needs. Many issues affecting the projects in Nairobi settlements are caused by weak institutional framework which makes project implementation difficult and limits success. The main question arising from the KENSUP project is “If the government is able to provide legal rights of ownership in the new development built on previously demolished land, what is preventing them from providing legal rights to the rest of the settlement?” Weak institutions are what has developed unnecessary segregation through resilience programs that target only small sections of society. As demonstrated in the Nairobi case, a weak framework prevents access to basic services, finance and legal services. Given the scope and scale of the challenges of urban poverty and inadequate shelter, it can be inferred that formal interventions are a necessary condition to improved livelihoods.

4.3. Accessible financial systems

The economy is an important factor of sustainability and subsequently of resilience. As the neoliberal models of economics start showing limitations with their self-regulating market forces, as seen in the 2008 global financial crisis, these same models may not be the best for cities where many of the citizens are in constant threat of abject poverty and may therefore not recover from an unexpected shock to the current system. Neo-liberal economics are experienced even in settlements like Kibera where property prices are affected by the effects of supply and demand same as in any other part of the city even as the acquisitions remains illegal.

Both projects discussed require extensive financial resources to successfully implement them to a point that they can be considered to have significantly increased the resilience of the citizens. These finances according to officials on both sides are becoming increasingly limited. Therefore, more localised home-grown solutions would stimulate local economies and ensure that the citizens are cushioned from global forces and the projects remain sustainable. However, the use of the resources once secured remains an issue of debate. Concerns raised by UN-Habitat and Umande question whether construction of the new neighbourhood was the best way to utilise the KENSUP budget. The government seems to lack the desire to commit funding to projects that they are not directly spearheading. Although it has the financial capacity to run large resilience projects, more innovative and inclusive solutions are necessary to have maximum impact. An important case to consider would be the Participatory Budgeting Mechanism in Brazil where citizens directly engage with policymakers to set priorities for the city budgets (World Bank, 2008). This has effectively directed public funds to more pro-poor initiatives

and increased government accountability. Access to public funding also encourages private funding agencies to commit to urban improvement projects which ends up reaching a much larger citizen base than the constant reliance on donor funding.

4.4. Effective Partnerships

Upgrading insurgent planning practices in the global South is a complex process that requires partnerships and networking amongst key stakeholders to develop innovative solutions to problems through advocacy, support and execution. Partnerships extend the reach, resources and legitimacy of a programme and are required between public and private spheres, government and community, government and civil society, community and the civil society and amongst government agencies. Successful coordination of partnerships eliminates opportunism, overcomes conflicts, improves the governance process, maintains focus on the important issues, develops of economic and employment opportunities and recognises existing diversities. Even in developed countries like Germany and United Kingdom, these partnerships are being established to face the changing urban composition brought about by globalisation and migration (Friebeck, 2007).

Partnerships are perhaps even more critical in developing countries which do not have strong enough institutions to deal with the rapidly changing urban landscape. A study by Corburn and Sverdlik, (2017) shows that “successful initiatives are often driven by state-community partnerships that originate from the government’s recognition of the rights and legitimacy of slum dwellers”. In Kibera, partnerships between the government, cooperatives and economic empowerment organisations have seen a massive growth in the savings and investments of the settlement residents. In a similar situation in Colombia’s Favela Barrio, state-sponsored slum upgrading initiatives were carried out through partnerships with the residence that recognised the rights and legitimacy of the residents (Marx et al., 2013). Partnerships, especially with the state or the city, have been known to help in integrating small-scale projects with limited impact and made them more effective in improving the livelihoods of the beneficiaries.



Figure 35: Ideal partnership arrangement given their unique capacities. (Source: Author)

5. CONCLUSION

Kibera is an accumulation of decades of planning neglect creating a fine balance between the demolition of physical structures and the preservation of culture which is critical in creating a vibrant urban community. NGOs embrace community participation which is bound to resonate with the existing setting in the slums and incorporate elements that the community is more comfortable with (Mukeku, 2014). However, there is only so much change that even the most well-meaning civil societies can impart. A complete overhaul of how insurgence is viewed and thereby generated can only be shifted by combined efforts from multiple stakeholders, proper regulatory frameworks and a clearly thought out financial mechanism.

Evidence shows that the vulnerabilities faced in the slums can be systematically and constructively addressed through the available socio-ecological systems (UN-Habitat, 2014b). The residents have come to accept their environment and are making changes towards their own self-improvement. The bio-centres are one example of the capacity of the settlement residents given the right resources. It is by no means the only project they have developed and evidence is seen throughout the settlement of how far a little assistance goes in improving livelihoods. Beyond the physical improvements, it is important to note that both projects have increased varying levels of resilience. An ideal situation would require the civil society, research organisations, the governments and the community to find a partnership structure that would not only have the greatest impact on the community but integrate both the formal and insurgent halves. In the current structures, there are challenges of power and resources that have strained partnerships and subsequently affected the community negatively. This has been a thorn in government upgrading projects creating challenges of replication and sustainability of even the smaller projects. Given the current situation, there is a likelihood that the KENSUP project will remain a standalone project. There are lessons to be learnt and exchanged between the NGO projects, who have mastered the art of quick replication and the government which has strong structures and regulations necessary to carry out massive projects.

The resilience discourse in insurgent settlements is also affected by the shift of the global conversation from eviction and neglect to more positive policies such as self-help housing, on-site upgrading and enabling and right-based policies (UN-Habitat, 2003). International organisations are encouraging Southern cities to enact appropriate policies which would enable slums to become financially and socially included by creating opportunities for security of tenure, economic empowerment, and improved housing. The accepted best practice for housing interventions in developing countries is UN-Habitat's PSUP which encourages holistic neighbourhood improvement approaches that consider health, education, housing, livelihoods and gender. This should give clear direction for donors and the civil society to engage with the settlements in a way that is most beneficial to the beneficiaries and reduce the incidences of NGOs viewing the settlement as a funding mechanism. The challenges in the settlement should be viewed as opportunities necessary to develop lasting solutions and not just as vulnerabilities.

Further research is needed on how the above-mentioned characteristics of ownership, finance, institution and partnership can be leveraged to create a meaningful impact not just on the city's image, which has been a driving force of slum upgrading agendas, but specifically on the people who are constantly facing the challenges arising from unregulated insurgence. There is global evidence that the application of one or two of the characteristics has made strides in improving the livelihoods of the citizens. Application of all four is bound to increase liveability and reduce the growing poverty gap occurring in many cities around the world.



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7. APPENDIX

7.1. Kibera Population estimates 2003 (per village) ²⁷

Village	No. of Structures	Approx. No. of Households per Structure	Population estimate	Estimated Area (Ha)	Population density (persons per Ha)
Gatwekera	2,217	5	55,425	28.557	1,940
Kambi Muru	424	5	10,600	7.758	1,366
Kianda	1,344	5	33,600	15.764	2,131
Kisumu Ndogo	1,105	5	27,625	16.987	1,626
Laini Saba	2,103	5	53,250	23.682	2,248
Lindi	1,818	5	45,450	26.213	1,733
Makina	2,769	5	69,225	42.666	1,622
Mashimoni	905	5	22,625	12.159	1,860
Raila	914	5	22,850	7.797	2,930
Silanga	1,730	5	43,250	22.445	1,926
Soweto East	2,149	5	53,725	21.379	2,512
Soweto West	622	5	15,550	7.088	2,193
TOTALS	18,127		453,175	232.495	2,007

7.2. Interview Results

Organisation	Number	Male	Female
Ministry of Land, Housing and Urban Development (KENSUP)	3	3	0
UN-Habitat (Slum Upgrading Unit)	1	1	0
Nairobi County Council	3	1	2
Umande Trust	3	2	1
Community Group Leaders	7	7	0
Residents	10	8	2
Settlement Executive Committee	1	1	0

*All interviewees were over the age of 18 years. Of all the interviewed residents, only the 2 women had not attained at least a secondary education.

²⁷ The numbers vary depending on the documentation. This was the most complete data found during the research and was derived from the tender document sent out by the KENSUP for cooperative and economic empowerment consultation (2006)

7.2.1. Modes of development of slums as prepared by the Ministry of Land, Housing and Urban Development, Kenya

TOWN	MODE OF DEVELOPMENT (IN PERCENTAGES)			
	Full Redevelopment	Partial redevelopment		
		Site and service with core units	Basic infrastructure services, plot secure tenure and a slab	Basic infrastructure services, plots and secure tenure
Nairobi City	30	20	20	30

(Kenya Government Printer, 2004)

7.2.2. KENSUP Results

7.2.2.1. Resilience Index Parameters (KENSUP)²⁸

GOALS	INDICATORS	NOT CONSIDERED (0)	POOR (0.33*x)	AVERAGE (0.67*x)	GOOD (1*x)	
HEALTH AND WELLBEING	Minimal human vulnerability (73%)	Safe and affordable housing (20%)				
		Adequate affordable energy supply (20%)				
		Inclusive access to safe drinking water (20%)				
		Effective sanitation (20%)				
		Sufficient affordable food supply (20%)				
	Diverse livelihood and employment (46%)	Inclusive labour policies (20%)				
		Relevant skills and training (20%)				
		Local business development and innovation (20%)				
		Supportive financial mechanisms (20%)				
		Diverse protection of livelihoods following shock (20%)				
Effective safeguards to human health and life (0%)	Robust public health system (25%)					
	Adequate access to quality healthcare (25%)					
	Emergency medical care (25%)					
	Effective emergency response services (25%)					
ECONOMY AND SOCIETY	Collective identity and community support (67%)	Local community support (25%)				
		Cohesive communities (25%)				
		Strong city-wide identity and culture (25%)				
		Actively engaged citizens (25%)				
Comprehensive security and rule of law (41%)	Effective systems to deter crime (25%)					
	Proactive corruption prevention (25%)					
	Competent policing (25%)					
	Accessible criminal and civil justice (25%)					

²⁸ The results calculated here are based solely on the results and perceptions expressed in the course of this research. Further information on the individual projects and more importantly on the indexing tool may give different results.

INFRASTRUCTURE AND ECOSYSTEMS	Sustainable economy (33%)	Well-managed public finances (20%)							
		Comprehensive business continuity planning (20%)							
		Diverse economic base (20%)							
		Attractive business environment (20%)							
		Strong integration with regional and global economies (20%)							
	Reduced exposure and fragility (75%)	Comprehensive hazard and exposure mapping (25%)							
		Appropriate codes, standards and enforcement (25%)							
		Effectively managed protective ecosystems (25%)							
		Robust protective infrastructure (25%)							
	Effective provision of critical services (28%)	Effective stewardship of ecosystems (20%)							
		Flexible infrastructure services (20%)							
		Retained spare capacity (20%)							
		Diligent maintenance and continuity (20%)							
		Adequate continuity for critical assets and services (20%)							
	Reliable Mobility and communication (34%)	Diverse and affordable transport networks (25%)							
		Effective transport operation and maintenance (25%)							
Reliable communication technology (25%)									
Secure technology networks (25%)									
LEADERSHIP AND STRATEGY	Effective leadership and management (54%)	Appropriate government decision-making (20%)							
		Effective coordination with other government bodies (20%)							
		Proactive multi-stakeholder collaboration (20%)							
		Comprehensive hazard monitoring and risk assessment (20%)							
		Comprehensive government emergency management (20%)							
	Empowered stakeholders (55%)	Adequate education for all (33%)							
		Widespread community awareness and preparedness (33%)							
		Effective mechanisms for communities to engage with the government (33%)							
	Integrated development planning (84%)	Comprehensive city monitoring and data management (25%)							
		Consultative planning process (25%)							
Appropriate land use and zoning (25%)									
Robust planning approval process (25%)									



7.2.2.2. Kibera Soweto Settlement Executive Committee

Landlords	Tenants	Widows and orphans	CBOs	NGOs	FBOs	Physically Challenged	Youth	Ex-officio (Chief, area councillor)	TOTAL
2	5	1	1	1	1	1	2	3	18

(Mokua, 2014)

7.2.2.3. KENSUP Proposal for Monitoring and Evaluation Plan

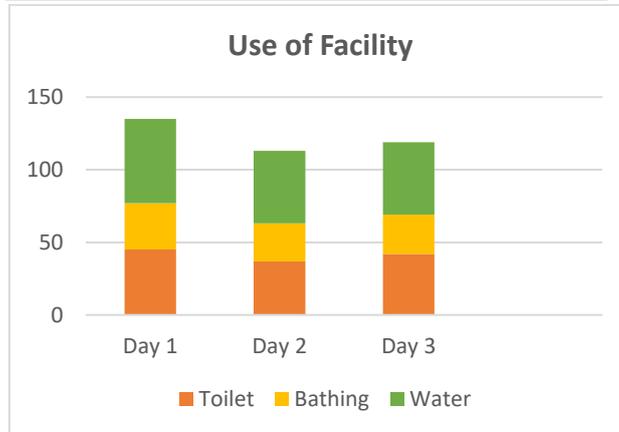
Objective	Indicator and Type	Benchmarks	Collection frequency (monthly, quarterly, yearly)	Data Source (report, survey, other)	Who is responsible to collect and analyse information	Who will use the information	What will be done with the information (specify uses in monitoring and/or evaluation)	Critical assumption

(Kenya Government Printer, 2004)



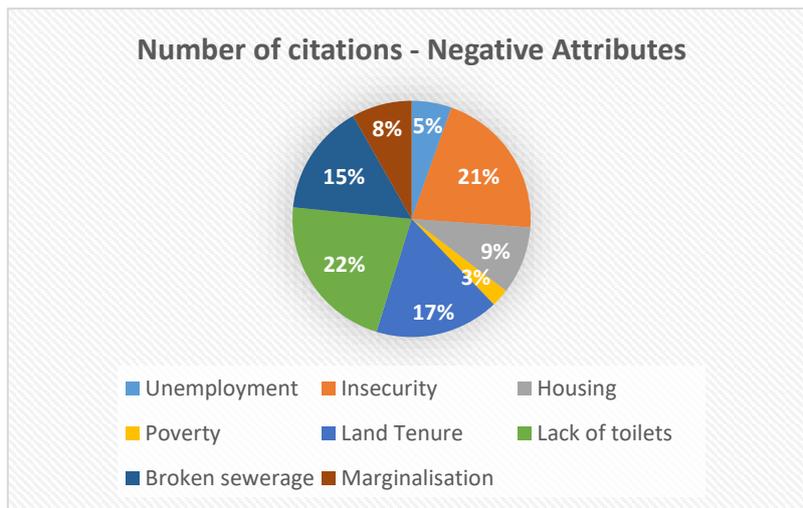
7.2.3. Bio-Centre Results

7.2.3.1. Number of users observed over a three-day period

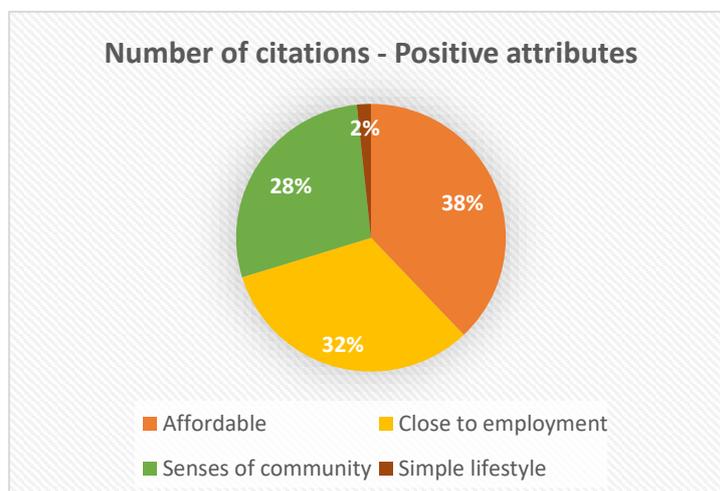


*All observations were carried out during the day between 09.30hr to 13.00hr

7.2.3.2. Number of citations of vulnerabilities during interviews



7.2.3.3. Number of citation of qualities they enjoy in Kibera



7.2.3.4. Resilience Index Parameters (Bio-Centres)

	GOALS	INDICATORS	NOT CONSIDERED	POOR	AVERAGE	GOOD	
HEALTH AND WELLBEING	Minimal human vulnerability (53%)	Safe and affordable housing (20%)					
		Adequate affordable energy supply (20%)					
		Inclusive access to safe drinking water (20%)					
		Effective sanitation (20%)					
		Sufficient affordable food supply (20%)					
	Diverse livelihood and employment (52%)	Inclusive labour policies (20%)					
		Relevant skills and training (20%)					
		Local business development and innovation (20%)					
		Supportive financial mechanisms (20%)					
		Diverse protection of livelihoods following shock (20%)					
	Effective safeguards to human health and life (0%)	Robust public health system (25%)					
		Adequate access to quality healthcare (25%)					
		Emergency medical care (25%)					
Effective emergency response services (25%)							
ECONOMY AND SOCIETY	Collective identity and community support (83%)	Local community support (25%)					
		Cohesive communities (25%)					
		Strong city-wide identity and culture (25%)					
		Actively engaged citizens (25%)					
	Comprehensive security and rule of law (67%)	Effective systems to deter crime (25%)					
		Proactive corruption prevention (25%)					
		Competent policing (25%)					
		Accessible criminal and civil justice (25%)					
	Sustainable economy (60%)	Well-managed public finances (20%)					
		Comprehensive business continuity planning (20%)					
Diverse economic base (20%)							
Attractive business environment (20%)							
Strong integration with regional and global economies (20%)							
INFRASTRUCTURE AND	Reduced exposure and fragility (46%)	Comprehensive hazard and exposure mapping (20%)					
		Appropriate codes, standards and enforcement (20%)					
		Effectively managed protective ecosystems (20%)					
		Robust protective infrastructure (20%)					
	Effective provision of critical services (86%)	Effective stewardship of ecosystems (20%)					
		Flexible infrastructure services (20%)					
		Retained spare capacity (20%)					

