The Relevance and Transferability of Design Codes for Slum Upgrading - The Case of Kisumu, Kenya

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Abstract

There is debate as to whether slum upgrading standards should be specific to each individual slum or common across all projects. To inform this debate, an exploratory, qualitative, comparative case study was undertaken, which involved transferring a slum upgrading design code designed for Accra, Ghana to analyze its potential applicability for Kisumu, Kenya. A slum upgrading design code is a made up of interrelated slum upgrading standards.

The study determined that while design codes could be relevant across different slum settings, consideration of a variety of issues was needed before applying it to a specific context. With respect to the literature, the study's findings support both the context-specific and common approaches to creating slum upgrading standards. Thus, slum upgrading programs should include context-specific standards in order to meet the specific needs of people living in slums and common standards to support the scaling-up and replication of successful slum upgrading projects.

Keywords: slums; slum upgrading; design codes; urban planning

For Leah and Kai

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List of Acronyms

Term	Definition
AFD	French Agency for Development
CBO	community-based organization
KENSUP	Kenya Slum Upgrading Program
KIPs	Kampung Improvement Programs
KISIP	Kenya Informal Settlement Improvement Project
KIWASCO	Kisumu Water and Sewage Company Ltd.
KUP	Kisumu Urban Project
MCI	Millennium Cities Initiative
MDGs	Millennium Development Goals
NGO	non-government organization
SANA	Sustainable Aid In Africa International
UN EGM	United Nations Expert Group Meeting

Glossary

Term	Definition
Design Code	A compilation of interrelated design standards used to guide urban development (Talen, 2009; Carmona et al., 2006; Marshall, 2011).
Illegal Settlements and Subdivisions	A human settlement located on former agricultural land that has been subdivided and/or built upon without government approval (UN Habitat, 2003, p.82).
Inner-city Slums	A human settlement located in the central area of a municipality and includes privately held buildings that have deteriorated overtime due to a lack of maintenance (UN Habitat, 2003, p.82).
Public Good	Anything that provides a benefit to everyone and the availability of which is in no way diminished by its simultaneous enjoyment by others (Todaro & Smith, 2012, p.486).
Sites and Services	Projects that involve governments subdividing vacant public land into housing plots and installing primary infrastructure such as roads, water and sanitary lines, drainage, electricity, and waste disposal (Fedakde, 2000, p.137).
Slum	An area that combines, to various extents, the following characteristics (restricted to the physical and legal characteristics of the settlement and excluding the more difficult social dimensions): inadequate access to safe water, inadequate access to sanitation and other infrastructure, poor structural quality of housing, overcrowding, and insecure residential status (UN Habitat, 2003, p.12).
Slum Clearance and Public Housing	Projects where slums are removed and residents are relocated to new housing developments (Rondinelli, 1990; Abbott, 2002, p. 306).
Slum Estates	A human settlement that can be found in many different locations and are composed of public and industrial workers housing that has deteriorated due to neglect by the government or a company that owns them (UN Habitat, 2003, p.81).
Slum Upgrading	The extension of physical and social services, and the construction of housing in slum settlements (Abbott, 2002; Davis, 2004; Gulyani & Bassett, 2007).
Squatter Settlements	Human settlements situated on land that has been illegally occupied by people that have constructed their own dwellings (UN Habitat, 2003, p.82).

1. Introduction

A slum is a human settlement comprising of rudimentary or deteriorating structures with limited access to basic services and infrastructure (UN Habitat, 2003). Addressing the living conditions of slum settlements is a high priority in present international human development efforts (United Nations, 2010). Slum upgrading has been claimed to be an appropriate approach to improving the quality of life of those residing in slums (Gulyani & Bassett, 2007; Butala et al., 2010). Slum upgrading entails the extension of physical and social services, and the construction of housing in slum settlements (Abbott, 2002; Davis, 2004; Gulyani & Bassett, 2007). Nevertheless, slum upgrading projects in Africa have been hindered by the insistence of municipalities to apply inappropriate and generic citywide standards (Fekade, 2007, p.147; Gulyani & Bassett, 2007, p.498; Das & Takahashi, 2009, p.214). There is agreement among planning analysts that alternative standards need to be established specifically for slum upgrading to successful implement such projects (Fekade, 2007; Gulyani & Bassett, 2007; Das & Takahashi, 2009). However, there is debate as to whether these standards should be specific to each individual slum or common across all projects (Fekade, 2000; Gulyani & Bassett, 2007; Das & Takahashi, 2009).

To inform this debate, an exploratory, qualitative, comparative case study was undertaken. The case study involved transferring a slum upgrading design code designed for Ghana, Accra to analyze its potential applicability for Kisumu, Kenya. A slum upgrading design code is made up of interrelated slum upgrading standards. Given the heterogeneity of slums, it was hypothesized that the slum upgrading design code would not be transferable and that this exercise would help to illuminate why and how slum upgrading standards should be context-specific.

2. Justification

The Millennium Development Goals (MDGs) were adopted by the United Nations with the intention of reducing global poverty and improving the quality of life of the world's poor (Payne, 2005). Target 11 of the MDGs specifically aims to improve the lives of at least 100 million people living in slums worldwide by 2020 (United Nations, 2001). This target demonstrates that addressing the living conditions of slums is a high priority in present international human development efforts. Addressing this issue comes at a time when more than 60% of the urban population in sub-Saharan Africa lives in slums (United Nations, 2010).

There is evidence that slum upgrading can lead to improved health outcomes, a reduction in flooding, security of land tenure, improved household savings, reduced incidences of crime, and increased land and housing values (Gulyani & Bassett, 2007; Butala et al., 2010). Nevertheless, slum upgrading projects in Africa have been hindered by the insistence of municipalities to apply inappropriate and generic citywide standards that typically date back to the colonial era (Fekade, 2000, p.147; Gulyani & Bassett, 2007, p.498; Das & Takahashi, 2009, p.214). This can be an issue as the neighbourhoods that are often involved in slum upgrading projects cannot physically comply with these standards as the space required for road right-of-ways may not be available, the existing housing may not conform to the building code, and the plots may be too small for additional structures or services (Fekade, 2000, p.147; Gulyani & Bassett, 2007, p.498-499). In addition, accommodating these standards can significantly increase the cost of slum upgrading projects and lead to the demolition of dwellings and the relocation of residents (Gulyani & Bassett, 2007, p.498-499).

It is argued that a context-specific standard should reflect the needs of slum residents while a common standard is perceived to support the replication of successful slum upgrading projects (Fekade, 2000; Gulyani & Bassett, 2007; Das & Takahashi, 2009; Banes, 2001). The intention of this study was to determine whether slum

upgrading standards should be context-specific or common across different slums in Africa. A slum upgrading design code was transferred from two slum settlements in Accra, Ghana to another in Kisumu, Kenya to achieve this objective. A design code is a compilation of interrelated design standards used to guide urban development and design codes have been claimed to be an appropriate approach to improving the lives of those living in slums (Talen, 2009; Carmona et al., 2006; Marshall, 2011). As a slum upgrading design code is essentially a collection of slum upgrading standards, it allows for a variety of different slum upgrading standards to be tested simultaneously to resolve the research question.

3. Background

The following provides background to the main themes considered in this study. First, a brief review of slums is used to develop a working definition for the term. Second, previous approaches to improving the lives of people living in slums are explored including slum clearance and the provision of public housing, the addition of sites and services, and slum upgrading. This juxtaposition illustrates the differences between slum upgrading and other approaches. Third, the attributes of design codes are summarized and their application to the African context are presented.

3.1. Slums

The term "slum" has evolved over time and has taken on various levels of significance in different countries. "Slum" first appeared in the London street language in the 1820s and was derived from the word "slump" which referred to the marshy lands that factory workers' housing was located upon (Huchzermeyer, 2011, p.5). By the end of the 19th century, the British would commonly use "slum" to describe unhealthy, insecure, and densely populated areas of a city that housed lower class citizens in poor quality structures (Huchzermeyer, 2011, p.5; UN Habitat, 2003, p.9). At that time, the British government also institutionalized the term to identify areas of a city that were considered unsuitable for human habitation and thus appropriate for demolition (Huchzermeyer, 2011, p.5; UN Habitat, 2003, p.9). The British exported the word to its colonies, but it has taken on different meanings depending on the country (Huchzermeyer, 2011, p.7).

In addition, slums can take on many different forms (UN Habitat, 2003, p.81). *Inner-city slums* are located in the central area of a municipality and include privately held buildings that have deteriorated overtime due to a lack of maintenance (UN Habitat, 2003, p.81). *Slum estates* can be found in many different locations and are composed

of public and industrial workers housing that has deteriorated due to neglect by the government or a company that owns them (UN Habitat, 2003, p.81). *Squatter settlements* are situated on land that has been illegally occupied by people that have constructed their own dwellings (UN Habitat, 2003, p.82). Finally, *illegal settlements and subdivisions* are developments located on former agricultural land that has been subdivided and/or built upon without government approval (UN Habitat, 2003, p.82).

Slums also evolve overtime (Fekade, 2000, p.127). With respect to *squatter settlements* and *illegal settlements and subdivisions*, the starting stage is where agricultural land on the periphery of a city is converted into residential housing (Fekade, 2000, p.127). Eventually, the slum attracts large numbers of people, land prices rise, and homes are upgraded or expanded to accommodate the new demand (Fekade, 2000, p.142). The final stage is where land is sold to developers who construct high-density apartment buildings (Fekade, 2000, p.142).

Despite the heterogeneity of slums, attempts have still been made to create a universal definition in order to identify and measure the prevalence of these settlements. The United Nations Expert Group Meeting (UN EGM) on Slum Indicators held in Kenya in 2002, produced one of the most widely recognized definitions:

> An area that combines, to various extents, the following characteristics (restricted to the physical and legal characteristics of the settlement and excluding the more difficult social dimensions): inadequate access to safe water, inadequate access to sanitation and other infrastructure, poor structural quality of housing, overcrowding, and insecure residential status (Gilbert, 2007, p.699; Huchzermeyer, 2011, p.7; Dagdeviren & Robertson, 2011, p.486; UN Habitat, 2003, p.12).

The UN EGM's definition is focused on the physical and legal aspects of slums and avoids consideration of the social and political issues that that may be associated with such environments (Huchzermeyer, 2011, p.7). While recognizing that it is impossible for any definition to capture the heterogeneity of slums, the EGM's definition will be used as the basis for this study (Gilbert, 2007; Huchzermeyer, 2011). This will allow for the research to be focused on the physical layout and improvement of slums which is the central interest of design codes, permit cross-country comparisons, and provide an entrance into the wider discussion regarding the potential for slum upgrading

initiatives to achieve improvements in the living conditions of 100 million slum dwellers worldwide by 2020 as per MDG Target 11 (Gilbert, 2007; Huchzermeyer, 2011).

It needs to be recognized that the term “slum” does hold negative connotations for many cultures (Gilbert, 2007, p.702). However, alternative terms do not capture the heterogeneity of slums. For example, “spontaneous”, “irregular”, and “informal” cannot be used to describe *inner-city slums* or *slum estates,* which were originally planned settlements (Gilbert, 2007, p.704-05). As a more objective and equivalent word was not available, the term “slum” was used in this study.

3.2. Slum Clearance and Public Housing

Governments have initiated a number of different strategies in an attempt to improve the quality of life of those living in slums (Rondinelli, 1990; Abbott, 2002). At one end of the spectrum is slum clearance and public housing where slums are removed and residents are relocated to new housing developments (Rondinelli, 1990; Abbott, 2002, p. 306). Due to its perceived success in developed countries during the post-World War II period, slum clearance and housing was applied to developing countries from the 1950s to the 1970s (Abbott, 2002, p.306; Werlin, 1999, p.1524). However, this strategy was later judged to have had serious drawbacks. First, the construction of public housing could not meet the demand for dwellings nor keep pace with the establishment of new slums (Fekade, 2000, p.137). Ironically, the United Nations determined that during the 1970s this strategy was actually contributing to the lack of housing as more low-income dwellings were being destroyed than were being built (Werlin, 1999, p.1523). For example, the demolition of 49 slums and the displacement of approximately 40,000 people by the Nairobi City Council in 1970 led to an increase in housing demand, a reduction in the housing supply, and a surge in rents in existing slum settlements (Werlin, 1999, p.1524). Second, slum clearance and housing was identified as being extremely costly for national governments to implement due to the high building standards that were being followed (Fekade, 2000, p.137; Werlin, 1999, p.1523). Third, the public housing built usually ended up being occupied by people of the middle and upper classes rather than low-income earners (Fedakde, 2000, p.137). Fourth, these schemes also limited access to employment because public housing was situated far

from employment centres and self-employment activities were prohibited in the buildings (Fedakde, 2000, p.137). Finally, slum clearance and public housing initiatives were also considered extremely disruptive to slum dwellers as governments often forced residents out of communities by demolishing their homes, thus leading to protests and violent confrontations (Dagdeviren & Robertson, 2011, p.491; Rondinelli, 1990, p.164, Werlin, 1999, p.1524). As a result of these deficiencies, the World Bank turned to a two-pronged approach to improving the living environments of slums in the 1970s: sites and services, and slum upgrading (Abbott, 2002, p.306).

3.3. Sites and Services

Sites and services projects involve governments subdividing vacant public land into housing plots and installing primary infrastructure such as roads, water and sanitary lines, drainage, electricity, and waste disposal (Fedakde, 2000, p.137). The idea is that costs can be recovered through the sale of plots to individuals who will construct their own dwellings (Fedake, 2000, p.137). When applied in various contexts, however, this approach, ran into a number issues. In the planning stages, it was expected that funding would continually flow from governments and international donors for these projects, but finances became progressively less over time (Fedake, 2000, p.137). Furthermore, these schemes were still relatively costly due to bureaucratic inefficiencies and adherence to relatively high building standards (Fedake, 2000, p.137). Failure to recover costs post-construction caused many of these developments to fail (Das & Takahashi, 2009, p.217). Similar to slum clearance and public housing, most of the plots did not go to low-income residents (Fedake, 2000, p.137). Reflecting this issue is the Migosi Site and Services scheme in Kisumu, Kenya that was implemented by the World Bank and the Government of Kenya (UN Habitat, 2005, p.45). This project entailed attaining land and subdividing it into serviced plots that were sold to low-income groups (UN Habitat, 2005, p.45). However, most of the original inhabitants sold the plots to medium and high-income earners (UN Habitat, 2005, p.45). Finally, sites and services schemes were not very widespread as it was often difficult to find suitable land (Werlin, 1999, p.1523). By the mid-1980s, there was a shift away from sites and services towards “enabling strategies” that put an emphasis on the market provision of housing, which is further discussed below (Fedake, 2000, p.139).

3.4. Slum Upgrading

Slum upgrading was the second prong of the World Bank's approach to improving the lives of slum dwellers from the 1970s to 1990s. This approach was promoted as costing considerably less than either slum clearance and public housing or sites and services schemes (Werlin, 1999, p.1524). In addition, slum upgrading was seen as a way of limiting disturbances to slum dwellers and avoiding the application of high municipal construction standards (Werlin, 1999, p.1524; Dagdeviren & Robertson, 2011, p.491; Fekade, 2000, p.138). As a result, many developing countries initiated slum upgrading programs with the support of the World Bank from the early 1970s to the end of the 1990s (Dagdeviren & Robertson, 2011, p.491).

The World Bank and US AID initiated the first slum upgrading projects in tandem with sites and services schemes (Gulanyi & Bassett, 2007, p.489-490). These projects focused on the largest cities with the most chronic housing shortages (Gulanyi & Bassett, 2007, p.489-490). The proposals covered large geographical areas and segments of the population (Gulanyi & Bassett, 2007, p.489-490). The upgrading plans were multi-sectoral and ambitious as exemplified by the Zambian First Urban project, which include the provision of land tenure, infrastructure and facilities, housing production, income generation, and community empowerment initiatives (Gulanyi & Bassett, 2007, p.489-490).

By the mid-1980s, however, slum upgrading projects in Africa began to be scaled back for two main reasons. First, a new philosophy emerged that believed that governments should not be a provider, but rather an enabler of housing production (Gulanyi & Bassett, 2007, p.489-490). The "enabling strategy" entailed governments assisting private sector builders through such actions as supporting the improvement of building materials and construction methods, providing training, guaranteeing loans and securing tenure (Harris & Gilis, 2003, p.178). This approach was based on the premise that the private sector could provide affordable housing more efficiently than the public sector (Harris & Gilis, 2003, p.178). Second, the World Bank began to question the long-term sustainability of their projects due to the resulting poor maintenance, cost overruns, and lack of community capacity (Dagdeviren and Robertson, 2011, p.491). There were also difficulties in cost recovery, delays in infrastructure development,

lengthy land-titling processes, and corruption (Dagdeviren and Robertson, 2011, p.491). Subsequently, government support for slum upgrading was restricted to the provision of public infrastructure as this was seen as a “public good”, whereas housing was left to the private sector to provide (Gulanyi & Bassett, 2007, p. 490-491).

The reduction in government activity in slum upgrading provided the opportunity for a diversity of actors to become involved in these schemes. These groups included international and local non-government organizations (NGOs), community-based organizations (CBO), the private sector, and citizens themselves (Gulanyi & Bassett, 2007, p. 491; Das & Takahashi, 2009, p.213). Their various contributions to slum upgrading were generated by a lack of trust in governments’ abilities to deliver effective slum upgrading programs (Dagdeviren & Robertson, 2011, p.492). In many ways, these groups subsequently turned what was a technocratic process into one that was more collaborative, participatory and reflective of a community’s context (Gulanyi & Bassett, 2007, p. 491; Das & Takahashi, 2009, p.213). Nevertheless, the neighbourhoods covered were smaller in size and the upgrades were limited to one or two sectors such as water or sanitation (Gulanyi & Bassett, 2007, p. 490; Dagdeviren & Robertson, 2011, p.492). Overall, slum upgrading in Africa in the mid-1980s and through the 1990s was limited to small areas, included participatory processes, and mainly focused on infrastructure provision and securing land tenure (Gulanyi & Bassett, 2007, p. 491).

While slum upgrading waned as a popular policy in the 1990s, interest in this strategy quickly remerged at the end of that decade (Gulyani & Bassett, 2007, p.486-487). This was because it was finally recognized that the world was rapidly urbanizing and that a large proportion of the urban population lived in slums (Gulyani & Bassett, 2007, p.486-487). As a result, the Cities Alliance was formed in 1999 through a partnership between the World Bank and UN Habitat and whose membership now includes thirteen national governments, two international non-government organizations, and the European Union (Cities Alliance, 1999, p.12, Cities Alliance, 2013). One of its priorities has been to support slum upgrading programs around the world with a target of improving the lives of 100 million slum dwellers by 2020; a target that was incorporated into the Millennium Declaration and became MDG Target 11 (United Nations, 2000; United Nations, 2001). The result is that the Cities Alliance has now provided assistance for slum upgrading projects in at least 40 different countries (Cities Alliance, 2013).

UN Habitat and the World Bank have also initiated their own individual projects. With respect to UN Habitat, their Local Finance Facility provides one-time grants to fund upgrading projects in Ghana, Indonesia, Sri Lanka and Tanzania (UN Habitat). Furthermore, they have the Participatory Slum Upgrading and Prevention Programme, which is to support slum upgrading capacity building of government agencies and key stakeholders in 30 countries (UN Habitat, 2009). In regards to the World Bank, they have been providing financing for slum upgrading projects in Africa, Asia, and South America (Mehta & Dastur, 2008). Some of their latest projects appear to be scaled-up and multi-sector versions of those undertaken during the 1990s with a focus on the provision of infrastructure, public participation, capacity building for government officials, and slum prevention (Mehta & Dastur, 2008). No independent analysis of these new projects and programs were found in the literature. The amount of recent activity by international organizations in slum upgrading strongly suggests that it has again become a globally accepted approach in improving the lives of people living in slums.

The renewed interest in slum upgrading is certainly understandable considering its identified benefits. For example, a review of health insurance claims made between 2001 and 2008 in Ahmedabad, India found that upgraded slums experienced an 18% decrease in claims for waterborne illness in an average year (Butala et al., 2010, p.935, 939). In the same city, it was discovered that the attitude of slum residents towards municipal officials improved after they delivered a successful upgrading program (Davis, 2004, p.309). Waterborne diseases were determined to have dropped by half because of the Bustee Improvement Programme in Calcutta, India (Werlin, 1999, p.1524). In Manila, Philippines a slum upgrading program that began in 1975 was identified to have led to improved housing, better environmental conditions, increased business opportunities, more public facilities, and enhanced social interaction (Werlin, 1999, p.1525).

Africa countries have also experienced benefits from slum upgrading. The cost of water had been significantly reduced after water pipes were installed in a slum in Mombasa through the Kenya Second Urban Project (Gulyani and Bassett, 2007, p.497). Under the Community Infrastructure Upgrading Project in Ghana, flooding was minimized through improved drainage and crime was reduced because of the installation of street lighting (Gulyani and Bassett, 2007, p.497). In Dar-es-Salaam, Tanzania, a

transportation and drainage slum upgrading project resulted in marked improvements in environmental conditions and an increase in housing and property values (Gulyani and Bassett, 2007, p.497). These positive results demonstrate that slum upgrading has the potential to improve the quality of life of people living in slums.

Notwithstanding the benefits, there are risks in undertaking slum upgrading projects including gentrification, the deterioration and abandonment of infrastructure, and lack of cost recovery. Gentrification occurs in slums where area improvements result in a higher demand for housing, leading to a rise in land values, giving landlords the opportunity to raise rents, which finally force the original low-income residents to leave due to the unaffordability of the neighbourhood (UN Habitat, 2003, p.173). There is debate regarding whether gentrification is a positive or negative consequence of slum upgrading (Gulyani & Bassett, 2007, p.504; UN Habitat, 2003, p.173). For some, gentrification translates into a threat of eviction for renters and those without secure tenure (UN Habitat, 2003, p.173). To prevent evictions it is believed land-titling should be a vital component of slum upgrading (UN Habitat, 2003, p.173). Alternatively, others hold that gentrification is an indication that slum upgrading is actually working as higher property values provide landowners with a valuable asset that they can sell, invest in, or use as collateral (Gulyani & Bassett, 2007, p.504). According to this view, more slum upgrading has to take place in order to provide all citizens with access to valuable property (Gulyani & Bassett, 2007, p.504).

The deterioration and abandonment of installed infrastructure and facilities can occur after slum upgrading (Werlin, 1999, p.1528). This can be a result of municipalities neglecting the upkeep of installed infrastructure in order to reduce their budgets (Werlin, 1999, p.1528). Another cause is the initial installation of low quality infrastructure in order to lower project costs and the consequent deterioration of this infrastructure (Werlin, 1999, p.1528). In addition, the construction of the facilities may have been undertaken without appropriate supervision and completed by unskilled labour, or contractual arrangements may have been compromised due to corruption (Werlin, 1999, p.1528). Furthermore, users have abandoned facilities when they have been situated in locations that did not respond to their needs (Werlin, 1999, p.1526).

Cost recovery has been incorporated into some slum upgrading programs as a means to reduce project expenditures, to allow for the expansion of infrastructure, to pay for operation and maintenance, and to indicate demand for services (Gulyani & Bassett, 2007, p.499). Recouping expenditures has in the past been undertaken by demanding payment from the individual or municipal beneficiaries for capital, operation, and maintenance costs after the development is completed (Gulyani & Bassett, 2007, p.499-503; Werlin, 1999, p.1529). However, cost recovery has been shown to be difficult where users are not satisfied with the upgrades, the community's responsibilities were not sufficiently communicated, there is a lack of political will to enforce payment, or there is a cultural belief that government should subsidize services or provide them for free (Gulyani & Bassett, 2007, p.499-503; Werlin, 1999, p.1528-1529). As a result, a number of projects are now requiring payment before their implementation, which may delay or block their advancement (Gulyani & Bassett, 2007, p.499-503; Werlin, 1999, p.1528-1529).

None of the above risks should prevent slum upgrading from being used to improve the living conditions of slums. With respect to gentrification, establishing housing cooperatives, limiting the width of roads to make them less attractive for owners of private vehicles and expanding slum upgrading programs to increase supply may mitigate this issue (UN Habitat, 2007, p.19; Gulyani & Bassett, 2007, p.504; Silas, 1992, p.40). In regards to the deterioration and abandonment of installed infrastructure, slum upgrading projects should make allowances for the cost and responsibility of the future operation and maintenance of the infrastructure (Banes, 2001, p.52). In addition, the demand of residents for such services should be resolved before moving forward with construction to ensure acceptance (Gulyani & Bassett, 2007, p.499). Cost recovery issues can be mitigated by determining community priorities and their willingness to contribute to the desired facilities (Gulyani & Bassett, 2007, p.499). Furthermore, offering residents sufficient information on their responsibilities will allow them to make informed decisions on whether they wish to financially contribute to a project (Gulyani & Bassett, 2007, p.499). This demonstrates that associated risks can be mitigated in order to attain the full benefits of slum upgrading.

3.5. Design Codes

Various rules, regulations, and requirements have influenced the design and construction of cities over time (Ben-Joseph, 2005; Imrie & Street, 2009). These standards have come in many forms including land use zoning ordinances, building codes, environmental legislation, engineering standards, and design codes (Ben-Joseph, 2005; Imrie & Street, 2009). As mentioned, design codes are a compilation of interrelated design standards used to guide urban development. Design codes stand out from other requirements, as they are intended to have a direct, rather than an incidental, impact on urban form (Talen, 2009). The following outlines the attributes of design codes. It should be noted that the term "design code" has been found in the literature to be a synonym for "urban codes" and "form-based codes" (Marshall, 2011; Carmona et al., 2006; and Talen; 2009).

In terms of format, design codes come in written or graphic form and are laid out in a manner that demonstrates the relationship between the various design components (Marshall, 2011, p.229-230; Carmona, 2006, p.286). The presentation of the relationship between components is in contrast to more modern design guidance, such as land use ordinances, which typically consider each component in isolation of the other (Marshall, 2011, p.235). In addition, the components found in a design code are presented diagrammatically in order to dictate direction rather than a final detailed design for a particular location (Marshall, 2011, p.229).

Practically any structure found in the urban environment can be controlled by design codes (Marshall, 2011, p.228; Carmona et al., 2006, p.252). These include streets, public spaces, and buildings (Carmona et al., 2006, p.252). Other components are plot dimensions, car parking, and landscaping (Carmona et al., 2006, p.252). In addition, design codes can regulate land uses, settlement size, and sustainability benchmarks (Carmona et al., 2006, p.252). Essentially, design codes are appropriate for "specifying the three-dimensional design components of a development" (Carmona et al., 2006, p.281).

While design codes standardize certain components of the city, they allow for variation in areas not governed by them (Talen, 2009, p.155; Marshall, 2011, p.5). This leads to urban forms that are organized but also diverse in character (Marshall, 2011, p.6). This quality of design codes is considered a way of balancing the interests of the community, as dictated by the design code, with those of the individual citizen (Marshall, 2011, p.6).

Enforceability is an important attribute of design codes (Talen, 2009, p.146). Unlike voluntary design guidelines, design codes are intended to be obligatory for developers and builders (Talen, 2009, p.146). Enforcement is either undertaken by the government through planning policy or by landowner through their property rights (Carmona et al., 2006, p.280).

Design codes have a range of purposes. These include achieving a level of health and safety, promoting a certain design philosophy, or realizing a utopian vision (Marshall, 2011, p.228; Talen, 2009, p.156). Other purposes include protecting property values, attaining social control, and lowering construction costs (Talen, 2009, p.156). Aesthetic quality and controlling land uses are additional purposes (Talen, 2009, p.156). Essentially, design codes can be used to achieve a variety of different ends.

Design codes are different from plans. Specifically, design codes offer standards that can be applied across different spaces whereas plans provide a blueprint for a particular urban form, in a specific location, and a process for its implementation (Marshall, 2011, p.6, 230). While design codes and plans have different attributes, they typically work together to shape the urban environment (Marshall, 2011, p.6, 230). Specifically, design codes extend the policies of the plan to regulate other aspects of a development (Marshall, 2011, p.230). However, there is debate as to whether design codes are always associated with plans or whether codes alone can guide development (Marshall, 2011, p.230; Carmona, 2006, p.286).

Two main types of design codes exist. There are “top-down” plan-based codes that, as mentioned, are specifically created to extend the policies of a plan (Marshall, 2011, p.178, 230). Alternatively, there are “bottom-up” normative design codes that have been generated based on cultural norms and customs (Marshall, 2011, p.178;

Talen, 2009, p.152). While their bases are different, it has been suggested that "top-down" and "bottom-up" design codes can work together to create new urban forms that reflect the character of existing neighbourhoods (Marshall, 2011, p.178).

Design codes have been used throughout history and across the world to guide the development of urban areas. From the past, there are examples from Asia where the Vastu Vidya design codes of India served as the basis for the layout out of Jaipur in 1727 and where design codes have been in use in Kyoto, Japan since the 15th Century (Marshall, 2011, p.83, 120). In the United Kingdom, design codes were used to rebuild London after the Great Fire of 1666 and for the expansion of Glasgow and Edinburgh in the 17th Century (Marshall, 2011, p.14, 33). In South America, there was the 1527 Law of the Indies that was applied to Spanish Latin America to define the layout of settlements in the colonies (Marshall, 2011, p.59).

Design codes have also been used the modern era. They have been integrated into the French planning system to govern development, whereas the United Kingdom has been attempting to do the same (Marshal, 2011 p.177; Carmona et al, 2006). In the United States, organizations have been established to support the use of design codes including the Congress for the New Urbanism and the Form-Based Codes Institute, and model design codes, such as the SmartCode, have been promoted (Talen, 2009, p.155-156; Carmona et al., 2006, p.217). Prominent developments that have been guided by design codes include Seaside, United States and Poundbury, United Kingdom, which have both been identified as revivals of traditional town planning in their respective countries (Carmona et al, 2006, p.216).

Design codes have also been suggested as an approach to improving the lives of slum dwellers in Africa (Marshall, 2011). This is based on the observation that *squatter settlements* and *illegal settlements and subdivisions* in Sub-Saharan Africa have been laid out in a similar fashion to the ancestral villages of the residents (Marshall, 2011, p.186). In both cases, intimate social spaces have been created by the orientation of buildings, the numerous footpaths that permeated settlements support pedestrian movement and housing is made of materials found in the surrounding environment (Marshall, 2011, p.180-200). Other similarities between African villages and slums

include dwellings that are designed to allow for future additions, the practice of animal husbandry and agriculture, and a mix of land uses (Marshall, 2011, p.186).

It is believed that this normative African design code could be translated into formal guidance for sites and services and self-help schemes (Marshall, 2011, p.200). Such a design code could require buildings to include a mix of uses, frame open space and pathways, and support expansion (Marshall, 2011, p.194). Steyn has argued that such design codes could be flexible so as to allow structures to be built using local and innovative building materials, for example (Marshall, 2011, p.194). One idea is that the urban expanse could be divided by roads into “superblocks” that establish recognizable community precincts which mimic the “intimacy and human scale” of a village (Marshall, 2011, p.184, 194). Modern requirements could also to be included in the design code such as streets to accommodate taxis and minibuses as well as commercial trade (Marshall, 2011, p.194). It has been recommended that such codes be presented through simple attractive drawings that residents can follow and community advisors can enforce (Marshall, 2011, p.194).

Design codes have many potential benefits. They can deliver quality development by establishing minimum benchmarks and common principles within a well-organized guiding framework (Carmona et al., 2006, p.284). Design codes can also achieve certainty of results as they bring stakeholders together early on in the process in order to incorporate expectations and resolve issues (Carmona et al., 2006, p.284). Due to the interrelation between components, design codes offer a collaborative framework for design professionals to integrate their ideals (Marshall, 2011, p.234-235). It is also speculated that this form of regulation can empower individuals in the designing and building of their own homes, augment public participation in the planning process due to the visual accessibility design codes, and facilitate collaboration and consensus-building (Marshall, 2011, p.233).

Nevertheless, design codes also have limitations. First, they do not necessarily lead to a more efficient development process and can require considerable time, resources, and expertise to produce (Carmona et al., 2006, p.284). Care also needs to be taken to ensure that design codes reflect their associated contexts and norms, are rationally conceived, and are flexible enough to mitigate unanticipated circumstances

(Talen, 2009, p.157). Otherwise, a design code may provide inappropriate guidance that results in an undesirable urban form (Talen, 2009, p.157). There is the potential that this urban form will be “monotonous” or “bland” in character due to the standardization of elements (Carmona et al., 2006, p.237; Marshall, 2011, p.8). There is also the belief that design codes are overly restrictive and thus limit innovation and creativity (Carmona et al., 2006, p.237; 252). Others have suggested that design codes are only suitable for producing neo-traditional development that reflect the style of neighbourhoods built before World War II (Carmona et al., 2006, p.225). One final concern is that design codes are not applicable to urban areas that have been built-out (Ben-Joseph, 2005, p.203).

None of the above risks of using design codes preclude their application to slum upgrading. Many of these limitations are inherent in the preparation of any planning document such as resources, reflection of norms, and consideration of flexibility (Marshall, 2011, p.8). Other risks are focused on aesthetics quality, which some may argue is essentially irrelevant in slum upgrading where the intention is to achieve measurable improvements in quality of life rather than some form of self-expression (Abbott, 2002, p.213; Marshall, 2011, p.8). With respect to the perception that design codes are not suitable in built-up areas, there is evidence that design codes have been used successfully in existing communities such as preserving the character of traditional neighbourhoods in France and in Kyoto, Japan (Marshall, 2011, p.133).

4. Literature Review

There is agreement in the literature that alternative standards need to be established specifically for slum upgrading in order to successfully implement such projects (Fekade, 2007; Gulyani & Bassett, 2007; Das & Takahashi, 2009). However, there is debate as to whether these standards should be specific to an individual slum or common across all projects (Fekade, 2007; Gulyani & Bassett, 2007; Das & Takahashi, 2009). It is proposed that through public participation, a series of benefits could be realized from setting context-specific standards (Fekade, 2007, p.148; Gulyani & Bassett, 2007, p.498-9). These standards could reflect the enforcement capabilities of the local government and even allow for the administration of such standards to be delegated to residents (Fekade, 2007, p.148). Context-specific standards could also mirror community needs and priorities and thus better ensure acceptance of the upgrading intervention (Gulyani & Bassett, 2007, p.498-9). Finally, cost recoveries and long-term maintenance could be achieved if context-specific standards were designed to reflect the willingness of users to contribute to constructing and maintaining the envisioned infrastructure (Gulyani & Bassett, 2007, p.498-9).

Alternatively, a common standard has been found to support the replication of successful slum upgrading projects (Das & Takahashi, 2009, p.215). The Kampung Improvement Programs (KIPs) in Indonesia is one of the most prominent examples of a slum upgrading program that has been scaled-up and replicated (Das & Takahashi, 2009, p.215). This program was first undertaken by the Dutch colonial government in the 1920s and 1930s and was later reinitiated by the Indonesian government in 1969 (Das & Takahashi, 2009, p.215; Banes, 2001, p.50). The program expanded from Surabaya and Jakarata to hundreds of cities and provided basic services to at least 7 million people over a 30-year period (Das & Takahashi, 2009; p.215; Fekade, 2000, p.138; Banes, 2001, p.50).

The three main factors identified for the replication of KIPs are the incorporation of indigenous design, strong political support for the project, and the strict adherence to national design and cost standards by the various project teams (Das & Takahashi, 2009, p.215; Buckley & Kalarickal, 2006, p.62). With respect to the design standards, they governed the construction of roads, footpaths, drainage, water supply, sanitation, and community facilities (Silas, 1992, p.37; Buckley & Kalarickal, 2006, p.62). Furthermore, the standards were devised to be flexible and simple in order to accommodate the range of conditions found in various slum environments (Silas, 1992, p.37; Banes, 2001, p.50). In addition, the standards minimized costs, limited disruptions and demolition, and allowed for the rapid implementation of slum upgrading projects (Banes, 2001, p.50). The program was credited with leading to improvements in education, reduction of household size, and higher levels of employment (Buckley & Kalarickal, 2006, p.62). In addition, water-borne diseases and child mortality were reduced (Buckley & Kalarickal, 2006, p.62). Furthermore, the KIPs were implemented at a low cost and with minimal gentrification (Das & Takahashi, 2009, p.215).

Notwithstanding these successes, the replication of the KIP approach across different contexts did have several limitations. The deterioration of established infrastructure and services was common in KIPs due to poor operation and maintenance (Banes, 2001, p.52). This situation occurred because local authorities did not have the capacity to maintain all the newly created public facilities that they had inherited in a short span of time (Banes, 2001, p.52). In addition, there was negligible cost recovery leading to highly subsidized projects, which discouraged self-sufficiency (Banes, 2001, p.50). The process was also very technocratic and managed by government officials, which limited public participation in the process (Das & Takahashi, 2009, p.215; Banes, 2001, p.50).

The literature suggests that there are equal trade-offs between applying context-specific and common slum upgrading standards. Specifically, common standards support the replication of slum upgrading projects while context-specific standards may limit it. Alternatively, context-specific standards encourage public participation, local enforcement of standards, cost recovery, and long-term maintenance of infrastructure, while this is less likely with the application of common standards.

5. Methodology

An exploratory, qualitative, comparative case study was applied to test whether slum upgrading standards should be context-specific or common across all projects. This was undertaken by transferring a slum upgrading design code, which is a compilation of various slum upgrading standards, from Accra Ghana to Kisumu, Kenya. The methods employed to determine the relevance and transferability of the slum upgrading design code included first interviewing key stakeholders experienced in slum upgrading projects in Kisumu; second, cross-referencing the slum upgrading design code with the upgrading priorities of residents in a slum in Kisumu; and third, a hypothetical exercise in extending the policies of a slum upgrading plan using the slum upgrading design code developed in Accra. The following provides specifics on the case and the methods applied.

5.1. Case Study

The exploratory, qualitative, comparative case study approach was employed to determine the relevance and transferability of design codes in slum upgrading. It was necessary to undertake a comparative case study in order to generate empirical data for which to base judgement on whether a design code can be commonly applied across contexts. Essentially, a case study provides a way of testing the theory of design codes' replication and concurrently determining whether slum upgrading standards should be context-specific or common across projects. The next sections provide background on the various elements of the case and the rationale for their inclusion.

5.1.1. Selection of a Slum Upgrading Design Code

Urban Development in Accra, Ghana: An Implementation Toolkit (toolkit) was identified as a slum upgrading design code (Kurtak & Daher, 2011). This document is a

project of Columbia University's Millennium Cities Initiative (MCI), the Earth Institute, and the Graduate School of Architecture, Planning, and Preservation (Kurtak & Daher, 2011). With an invitation from the Accra Metropolitan Assembly, Ghana, Columbia University focused its work on the informal settlements of Ga Mashie and Nima East (Kurtak & Daher, 2011). Ga Mashie is located adjacent to the Accra Central Business District and could be characterized as an *inner-city slum* (Kurtak & Daher, 2011, p.10). Nima East is located approximately 5 kilometres northeast of the Central Business District and could be considered an *illegal settlement and subdivision* (Kurtak & Daher, 2011, p.10). While some services and employment opportunities exist within each of these neighbourhoods, they do not fulfill the overall requirements of the residents (Kurtak & Daher, 2011, p.10).

To assist these communities, Columbia University created a slum upgrading toolkit with the intention that the small-scale projects envisioned could be implemented periodically, in different combinations, without the need for large investments (Kurtak & Daher, 2011). The overall goal of the toolkit is to create more economically, environmentally, and socially sustainable communities (Kurtak & Daher, 2011, p.1-2). It should be noted that while the document was specific to Ga Mashie and Nima East, the authors claim that the tools could be "replicated and scaled-up" and therefore potentially transferable to other slums (Kurtak & Daher, 2011, p.1-2). MCI is currently searching for investors and other organizations to build many of the projects imagined in the toolkit (P. Cunha, personal communication, November 26, 2012).

The toolkit includes thirty-five different tools, which are grouped first into types and then into categories (Kurtak & Daher, 2011, p.19-20). The three types of tools are infrastructure, community and spatial facility (Kurtak & Daher, 2011, p.19-20). The infrastructure tools are intended to resolve infrastructural issues and include six categories: water, drainage, toilet, waste, energy and circulation (Kurtak & Daher, 2011, p.22). The social tools are intended to empower individuals in the community and include four categories: social, education, health and industry (Kurtak & Daher, 2011, p.22). They are essentially social programs but could be considered land uses, as they would require space to operate (Kurtak & Daher, 2011, p.22). The spatial facility tools demonstrate how the infrastructure and social tools can be systematically brought together and include four categories: services, housing, market and community.

With respect to the format, the social tools are described in text whereas the infrastructure and spatial facility tools are presented both textually and graphically (Kurtak & Daher, 2011). Each of the infrastructure and spatial facility tools are introduced by the provision of a general description, a flowchart demonstrating how they can generate a solution to a problem, a schematic diagram and an example project (Kurtak & Daher, 2011). The document ends with a series of studio projects, which demonstrate how the tools could be applied in a real environment (Kurtak & Daher, 2011, p.20).

This slum upgrading toolkit has many of the same qualities as a design code. It provides guidance for the design and layout of components found in the urban environment. The components are presented in a written and graphic format with a demonstration of how they relate to each other. The text and images are diagrammatical, rather than a blueprint, and thus do not dictate a final outcome and allow for a certain amount of flexibility in terms of implementation. Part of the intention of the toolkit is to achieve an ideal form that raises the economic, environmental, and social sustainability of the community. While it is not explicit in the document, enforcement could by undertaken by the municipality through development control or by non-government organizations (NGO) or donor country through their contractual agreements with a builder (Carmona et al. 2006, p.224). Considering the toolkit holds many of the same attributes as a design code, this document was selected as an appropriate slum upgrading design code to determine if slum upgrading standards should be context-specific or common across all projects. From this point forward, the toolkit will be referred as the MCI design code.

5.1.2. Case Study Site: Kisumu, Kenya

Kisumu, Kenya was selected as the case study site for testing the transferability of the MCI design code. Kisumu is located on Lake Victoria and approximately 340 km northwest of the nation's capital, Nairobi. With a population of 404,160 in 2009, Kisumu is the third largest city in Kenya (Maoulidi, 2012, p.10). The economy is based on the production of primary products such as crops, livestock and fish, the processing of sugar and flour at local mills and services in wholesale, distribution and retail (KPMG, 2008, p.9). The spatial form of Kisumu includes a formally planned city centre surrounded by a

ring of slum neighbourhoods as shown in Figure 1 (UN Habitat, 2005). The slum neighbourhoods are believed to accommodate approximate 60% of the municipal population (Maoulidi, 2012, p.8; UN Habitat, 2005, p.16).

Eight different slum neighbourhoods are located within Kisumu where vehicular access is limited, a large proportion of housing is constructed of mud walls and reused corrugated iron sheets, and piped water and sanitary servicing are inadequate (UN Habitat, 2005). The outer ring includes six of the slums: Nyalenda “A” & “B”, Manyatta “A” & “B”, Obunga and Bandani (UN Habitat, 2005). These areas were originally rural villages, but overtime they evolved into slum neighbourhoods (UN Habitat, 2005, p.18). One of the factors that led to this outcome was the decision by the British colonial government in 1908 to prevent Black Africans from residing in the formally planned portion of the city (UN Habitat, 2005, p.16). In need of accommodation, these villages were attractive to Black Africans as they allowed individuals to live in a rural setting while being within walking distance of employment in the city (UN Habitat, 2005, p. 18). As a result, the larger plots were subdivided into smaller and smaller parcels that were either gifted to or inherited by family members who desired to live in the area (UN Habitat, 2005, p. 18). As plots were received, the new owners would obtain freehold titles for their land, which is unlike the formal city where most of the land is public leasehold (UN Habitat, 2005, p.19). The subdivision of land in these settlements was so extensive that the plots ended up being too small to support agricultural activities (UN Habitat, 2005, p.19). Another factor was that the reduction of the Kisumu town boundary in 1930 to exclude the outer ring neighbourhoods (UN Habitat, 2005, p.18). Subsequently, the settlements grew in a haphazard fashion and without servicing, as they did not need to comply with the Kisumu’s development controls (UN Habitat, 2005, p.17). It was not until 1972 that the Kisumu city boundary grew to absorb these areas and by that time 50% of the municipal population resided in the outer ring communities (UN Habitat, 2005, p.17).

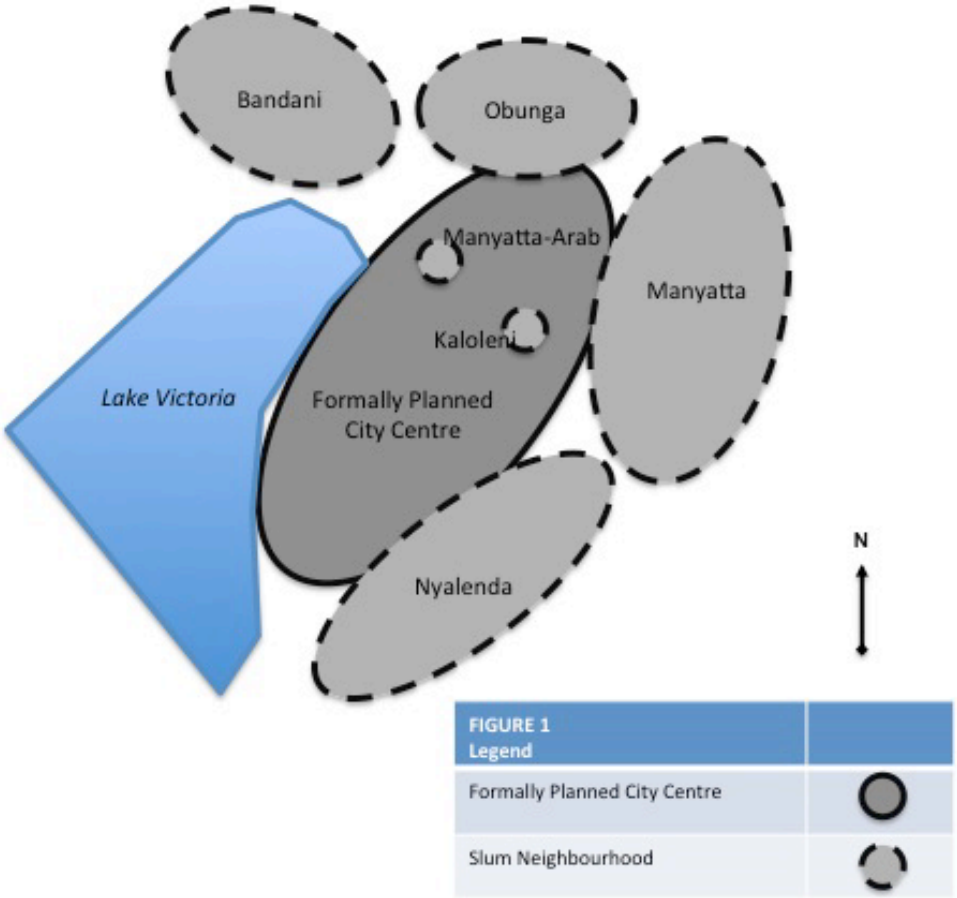

Figure 1. Kisumu, Kenya

The final two slums are Manyatta-Arab and Kaloleni, which originally were *squatter settlements* situated within the formal city (UN Habitat, 2005, p.39). However, the residents were later granted a temporary licence to occupy the land, and more recently some have been able to attain land titles (UN Habitat, 2005, p.39). The settlements are small in terms of population and area relative to the other slums (UN Habitat, 2005, p.39).

Some of the slum neighbourhoods of Kisumu have been subject to upgrading schemes. Manyatta "A" and portions of Manyatta "B" benefitted from the World Bank's Urban II slum upgrading programme in the 1970s, which involved the construction of schools, health clinics and markets, the paving of roads, and the introduction of water and sanitary lines, and proper drainage (UN Habitat, 2005, p.36). Further upgrades to Manyatta "B" and Nyalenda were envisioned however the funding for the program was not continued (UN Habitat, 2005, p.31). It should be noted that the upgrades led to gentrification where rents increased, housing was improved and low-income earners were replaced with middle-income earners (UN Habitat, 2005, p.37).

There have been several other upgrading projects undertaken in Kisumu. More recently, the Kisumu Water and Sewage Company Ltd. (KIWASCO) has been implementing their *Delegated Management Model* that entails extending main water lines to the slums in order for individuals and organizations to establish private water points and sell water to residents (UN, Habitat, 2005, p.64). Furthermore, the NGOs Sustainable Aid In Africa (SANA) International and Africa Now have undertaken water and sanitation initiatives and Umande Trust has established several bio-centres, which use human bodily waste to create gas for cooking (UN, Habitat, 2005, p.55; R. Swake, personal communication, May 28, 2013). In Manyatta-Arab and Kaloleni, the Municipal Council of Kisumu provided electricity, streetlights, road improvements and social halls while the community constructed schools (UN, Habitat, 2005, p.46).

Multi-sector slum upgrading programs have recently returned to Kisumu. The *Kenya Slum Upgrading Program* (KENSUP) is an initiative of UN Habitat and the Government of Kenya (UN Habitat, 2007). KENSUP started in 2004 in Kisumu with the intention of securing tenure, improving housing, increasing incomes and establishing physical and social infrastructure through a participatory process (UN Habitat, 2007). In

the first phase, the main slum specific achievements of the program was the completion of a background document and an action plan, and the establishment of a slum upgrading secretariat and a steering committee at the municipal council (UN Habitat, 2007). In the next phase, KENSUP supported various upgrading projects relating to drug dispensaries, toilets, fences, schools, social halls, roads and markets in Bandani, Obunga, Kaloleni, Manyatta, Nyalenda and Manyatta-Arab (Nodalis, 2009, p.128). In addition, the program established housing cooperatives in Nyalenda and Bandani (Nodalis, 2009, p.128). It should be noted that KENSUP has been mainly limited to upgrading existing facilities as funding was not made available for the required purchase and/or expropriation of land for the construction of new infrastructure (Nodalis, 2009, p.61; P. Nyamita, personal communiciation, May 27, 2013).

Another program is the *Kisumu Urban Project* (KUP), which is intended to run from 2010-2014 and is funded by the French Agency for Development (AFD) (Nodalis, 2009, p.9). The focus of KUP is to support the municipality in financial management, capacity building, planning and urban management and service delivery (Nodalis, 2009, p.13). With respect to service delivery, the program has established strategic action plans[1] for slum upgrading in Nyalenda, Kaloleni, Bandani and Obunga (Nodalis, 2009, p.13). The action plans include capacity building, the rehabilitation of existing facilities and the introduction of new infrastructure (Nodalis, 2009, p.69-71). KUP is at the contracting stage and intends to rollout its first initiative in June 2013 (P. Nyamita, personal communiciation, May 27, 2013).

The latest program is the World Bank's *Kenya Informal Settlement Improvement Project* (KISIP), which commenced in 2011 and is expected to end in 2016 (Government of Kenya, 2011, p.1). The programs of KISIP include institutions and program management, tenure security, infrastructure and service delivery and urban growth management (World Bank, 2011, p.iii). Kisumu is involved with this program but it is unclear in what capacity and according to World Bank's website no projects have been commenced to date (Government of Kenya, 2011, p.16; World Bank, 2013).

[1] These are not physical slum upgrading plans that identify the locations of proposed interventions (Nodalis, 2009).

Kisumu's prominent slum populations and experiences with slum upgrading programs have generated a diverse and large local knowledge base with respect to slums and slum upgrading. Groups involved with slums and slum upgrading in Kisumu include the municipality, NGOs, international agencies, professors and community leaders. Through this case study, the existing local knowledge of Kisumu's slum upgrading experiences and potential was accessed through purposive and semi-structured interviews. These interviews generated key insights into the relevance and transferability of slum upgrading design codes.

5.1.3. Testing Design Code Transferability: Obunga Slum

The Obunga slum was selected for cross-referencing the MCI design code with community priorities and extending a slum upgrading plan. This community is shown in Figure 2**.** Obunga has a population of approximately 8,600 and occupies an area of approximately 1.4 square kilometres, resulting in a population density of approximately 6,200 people per square kilometre (Maoulidi, 2012, p.11). The neighbourhood is located northeast of the formal area of Kisumu and forms part of the slum belt that surrounds the city (Google Maps, 2013). Obunga is made up of four sub-areas including Central, Kamakowa, Kasarani and Sega Sega (Maoulidi, 2012, p.11).

Obunga's urban form reflects that of an *illegal settlement and subdivision*. The landholdings are mainly freehold where the original agricultural plots have been successively subdivided and usually registered with title deeds (UN Habitat, 2007, p.33). However, the structures have been mainly built without government permits over the years (UN Habitat, 2007, p.33). The small parcels have in turn been converted into informal rental housing units (UN Habitat, 2007, p.33).

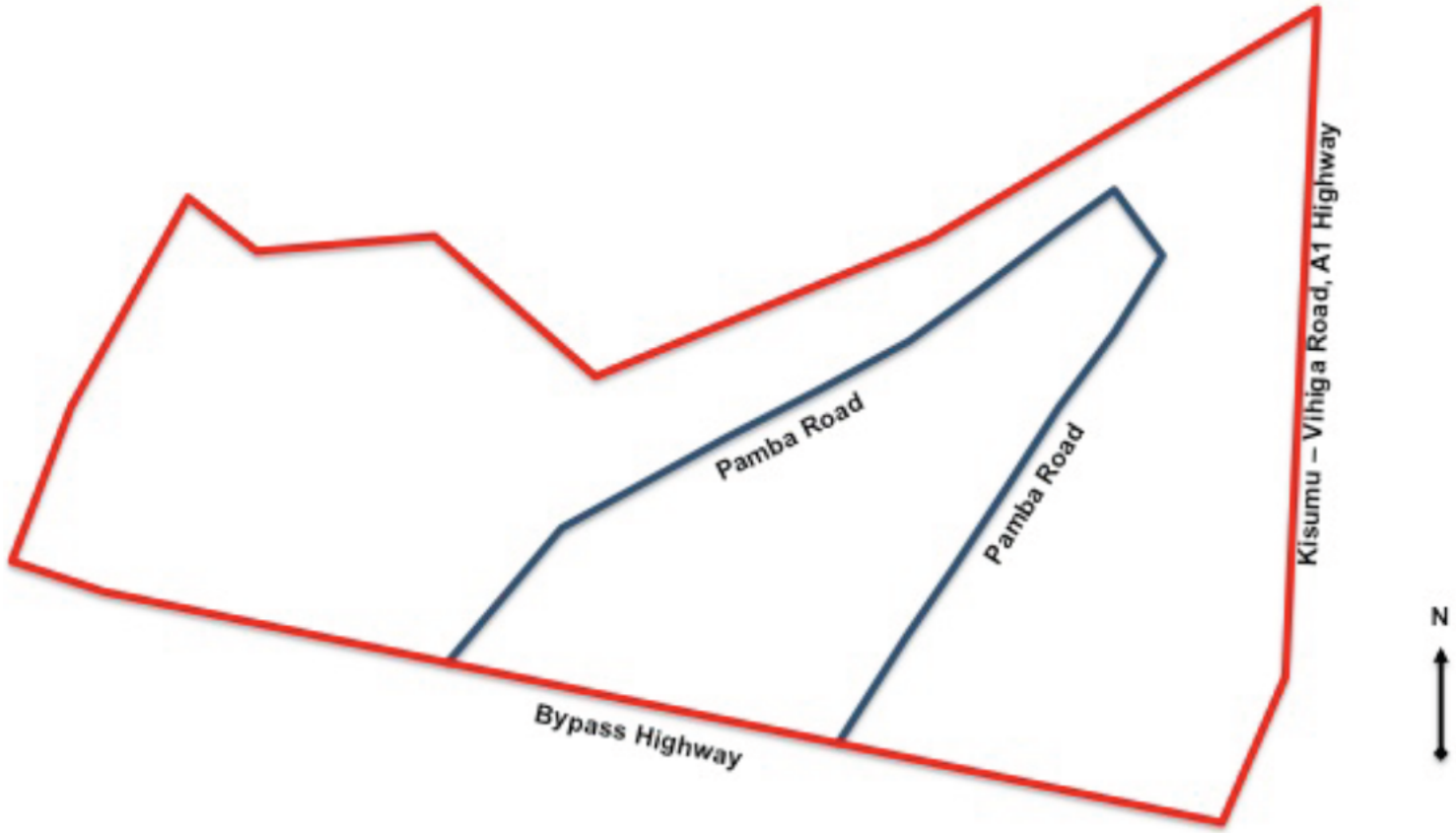

Figure 2. Obunga

A limited number of services are provided within Obunga. In terms of access, the Pamba Road loops through the community, providing access to a series of secondary roads and pathways (Google Maps, 2013). However, all the transportation arteries in Obunga are unpaved dirt roads that inadequately accommodate drainage (UN Habitat, 2007, p.34). It was observed that commercial activities are located mainly along the Pamba Road, at the Nyawita Market and along the A1 Highway. There are drug dispensaries in the community, however only two medical clinics (Maoulidi, 2012, p.26). Education facilities are limited to two private primary schools, Josana Academy Primary School and the Bridges School, as the closest public schools are located outside of the community (Maoulidi, 2012, p.23). Main waterlines have been extended into Obunga by KIWASCO, under the *Delegated Management Model*, where contractors maintain the secondary lines and sell drinking water to residents (Maoulidi, 2012, p.29). Electrical lines have been established, but the majority of the population are not connected due to the high cost (Maoulidi, 2012, p.29; Ministry of Lands, 2006, p.10). It was also observed that that Obunga includes a number of churches, a community hall and a bio-centre established by the NGO Umande Trust as shown in Figure 3. In regards to security, there are no streetlights or police posts within the neighbourhood.

With respect to the individual plots, each landlord has attempted to maximize their rental income by fully building out their parcels of land (UN Habitat, 2007, p.34). Approximately half of the housing was made of mud and stick walls with corrugated metal roofs (Maoulidi, 2012, p.20). Other materials observed included walls made of brick, corrugated metal sheets and concrete. It was seen that many parcels offered a pit latrine/bathhouse and a shallow borehole for bathing, washing clothes and dishes and in some circumstances, drinking. Solid waste is either burned or buried on site, or is dumped indiscriminately into the surrounding environment (Maoulidi, 2012, p.33). It was noticed that the quality of the development on each plot, in terms of construction material and services, gradually improved from west to east. Figure 4 characterizes many of the plots in Obunga.

Figure 3. Obunga Bio-Centre

Figure 4. Residential Plot in Obunga

The Obunga living environment has posed significant challenges to the community. With limited formal employment opportunities, most people work in the informal sector including the selling of food, operating shops, tailoring/textile production, illegal brewing of alcohol and the operating of bicycle taxis (Maoulidi, 2012, p.35). In addition, stormwater drainage is inadequate and drains are often clogged by garbage (Maoulidi, 2012, p.29, 34). This results in flooding during the rainy season, the overflow of pit latrines, the contamination of boreholes and stagnant pools of water (Maoulidi, 2012, p.29, 34). This situation has led to the spread of diseases including diarrhea, cholera and malaria (Maoulidi, 2012, p.32). Accessibility is also inefficient in Obunga due to the poor state of the roads, which limits public transit and the transport of goods (UN Habitat, 2007, p.34). Furthermore, residents must travel considerable distances to reach public schools and hospitals (Maoulidi, 2012, p.23, 36). Insecurity is considered to be relatively high because of the lack of police posts and streetlights, (UN Habitat, 2007, p.35). The accumulated outcome is that 52.5% are considered poor under the Multi-Dimensional Poverty Index and 55.6% of the residents live below the poverty line, which is living on less than a $1.50US per day (Maoulidi, 2012, p.20).

To resolve many of the issues facing Obunga, the Ministry of Lands Department of Physical Planning led a collaboration with the Kisumu Municipal Council, the NGO Pamoja Trust, Maseno University, the residents of Obunga and several other stakeholders to create the *Obunga Local Physical Development Plan 2006 – 2011* (Obunga Plan) (Ministry of Lands, 2006, p.ii-iii). The Obunga Plan presented a program for the upgrading of the Obunga settlement over the 2006 - 2011 period (Ministry of Lands, 2006). The document is divided into five sections: planning process, current realities, development strategies, operational strategy and conclusion and recommendations (Ministry of Lands, 2006). The plan also includes an *Integrated Spatial Plan*, which identifies the location of the proposed interventions (Ministry of Lands, 2006).

It should be noted that the Kisumu Municipal Council did not approve the Obunga Plan for several reasons. First, the Council did not see it as necessary to formally endorse the document as the Ministry of Lands has the responsibility for preparation and approval of such plans under the *Physical Planning Act* (J. Abuya, personal communication, July 9, 2013). Second, the Council did not want to incur costs for the

purchase of freehold lands for public facilities (J. Abuya, personal communication, July 9, 2013). Finally, it was anticipated that the upgrading and the purchasing of land would lead to strong community opposition due to the potential need for expropriation and forced removal of residents (J. Abuya, personal communication, July 9, 2013). Nevertheless, Pamoja Trust was in the process of reviving the Obunga Plan by consulting with the community to reconfirm their upgrading priorities in 2013.

Obunga was selected to be part of this case study for three main reasons. First, it was understood to be one of the slums in Kisumu to have least benefitted from previous slum upgrading programs (UN Habitat, 2005, p.32-33). This would allow the greatest number of slum upgrading standards to be tested and produce the least amount of conflict with existing upgrades. In addition, Pamoja Trust's consultations with the residents produced a list of community priorities for which to cross-reference the MCI design code. Finally, the existence of the Obunga Plan allowed for the policies of the plan to be hypothetically extended by the MCI design code. These methods would allow the relevance and transferability of slum upgrading design codes to be determined as further outlined in the next sections.

5.2. Methods

5.2.1. Interviews

Fixed-question-open-response interviews were employed to access the slum upgrading knowledge base of key informants in Kisumu and their opinions on the relevance and transferability of design codes for slum upgrading. Fixed questions were used to organize the questions in a way that allowed for the responses of the different participants to be easily compared (Weiss, 1994, p.12). The responses were open-ended to capture the various perspectives of the interviewees (Weiss, 1994, p.9).

The interview process involved first requesting key stakeholders experienced in slum upgrading through e-mail and phone to participate in the study. Groups contacted including NGOs, international aid agencies, municipal officials, university professors and local community leaders. In total, nine individuals were interviewed with each participant being asked nine questions, which can be found in Appendix A. These questions

explored each individual's and organization's experiences with informal settlements, their slum upgrading challenges, their familiarity with design codes and whether a design code would benefit their organization's slum upgrading activities. The MCI design code was used as a prompt for two of the questions. The overall intent was to determine if design codes were judged to be relevant and transferable to Kisumu.

The following provides background on the organizations that participated in the interviews. Two local NGOs and one international aid agency were interviewed. Alfred Adongo represented SANA International, which undertakes hygiene promotion and the provision of water and sanitary services to communities in Nyanza Province, including the slums of Kisumu. Rose Swake represented Umande Trust whose organization focuses on the construction of bio-centres in Kisumu slums. Merciline Oyier represented Cordaid and the Urban Matters program, which was created by the Government of Netherlands and acts as a slum upgrading coordinator in Kisumu[2].

Three officials from the City Council of Kisumu were interviewed. Absalom Ayany is the Director of the City Planning & Architecture Department, which is responsible for planning policy and development control, as well as KUP. Patrick Nyamita has been involved in KUP and is a Project Works Inspector for the Housing & Development Department, which delivers and manages public housing projects and was the lead for KENSUP. Adrian Ouma is the Director of City Engineer's Department, which provides and maintains all public infrastructure and ensures that all structures are built according to the appropriate building standards.

Two university professors and one community leader were interviewed. Isabella Asamba is a professor at Maseno University and her research focuses on access to infrastructure and public participation for poorer households. Franklin Mwango is a professor at Maseno University and his background is in architecture, environmental design and alternative building materials for slum dwellings. Joshua Agwenr

[2] The Urban Matters program includes the participation of the City Council of Kisumu and several NGOs (M. Oyier, personal communication, May 28, 2013). Urban Matters has organized the various City departments and NGOs under five thematic areas including housing, sanitation/water, urban transport, livelihoods, and solid waste management to enhance collaboration and reduce duplication for implementing KUP (M. Oyier, personal communication, May 28, 2013).

represented the Obunga Residents Association whose organizations is an umbrella group for the sub-area associations, acts as a voice for the community and develops strategies to improve living conditions in Obunga.

5.2.2. Cross-Reference with Community Priorities

The NGO Pamoja Trust and the local community association held public meetings with the residents of the four sub-areas of Obunga from May 28 – May 31, 2013. The intention was to reconfirm the citizens' upgrading priorities before revising the Obunga Plan. As part of this study, the priorities of the residents for Central, Kamakowa and Sega Sega were recorded and compiled into one table. For this study, I then independently cross-referenced the community priorities with the MCI design code. A community priority was considered to correspond with a MCI design code standard where it offered a viable solution to the issue. It was acknowledged that the physical practicality of implementing such a slum upgrading standard would need to be further assessed. This method was applied to determine if the MCI design code was responsive to the societal norms of Obunga. To be relevant and transferable, design codes must correlate with the norms of the society for which they are being applied (Talen, 2009, p.157).

5.2.3. Extension of the Slum Upgrading Plan

An urban design exercise was conducted to determine the ability of the MCI design code to extend the policies of the Obunga Plan. To be relevant and transferable a design code must be able to extend an associated plan's policies (Marshall, 2011, p.230). This was first undertaken by cross-referencing the Obunga Plan and specifically the *Integrated Spatial Plan,* with the MCI design code. Where a MCI design code standard was found to be pertinent for a proposed upgrade, the location of the proposed upgrade was determined, site visits were conducted and site designs were prepared. The site designs were undertaken based on the guidance of the MCI design code

however where appropriate direction was not available the Obunga Plan and the *Physical Planning Handbook*[3] were referenced.

[3] This document offers a set of national urban design standards for planning purpose in Kenya (Ministry of Lands, 2007).

6. Results

6.1. Interviews

Very few of the participants were aware of the term “design code” or could say what a design code was. Nevertheless, the representative from Cordaid identified the *Building Code* as a type of design code while the Housing Project Works Inspector identified the *Building Code,* the *Physical Planning Act,* the *Architects and Quantity Surveyors Act* and the *Environmental Act*. Professor Mwango from Maseno University stated that he was familiar with design codes from his exposure to urban planning in the United States and Europe. He understood design codes to provide guidelines and minimum standards for housing, neighbourhoods and street types.

With respect to the MCI design code, none of the interviewees had ever seen the document until it was presented to them. Notwithstanding, the representatives from SANA International and Umande Trust and the City Planner appreciated the format and content of the document in terms of its clear steps, comprehensive approach, layout and visuals. Professor Asamba believed the MCI design code created order and a sustainable system while the interviewee from SANA International believed that a design code would be apt in assisting with coordination and the integration of projects and programs. The MCI design code was believed to be a way to guide and manage the slum upgrading process by the interviewees from Umande Trust, Cordaid, the Obunga Residents Association and Professor Mwango, but only the City Planner went as far to say that it could be used for planning, control and implementation. Finally, Professor Asamba and the Housing Project Works Inspector considered the MCI Design Code to be an appropriate public consultation tool.

Caution was offered in the application of the MCI design code. Professor Asamba believed that a consensus between all parties needed to be generated before its successful application. The Housing Project Works Inspector mentioned that the MCI

design code would need to confront the challenge of land acquisition and potential conflicts with existing standards and legislation. The City Engineering went further and noted that the municipality may need to expropriate private land in order to build the infrastructure envisioned in the document. The participants from Maseno University and SANA International emphasized that residents of slums involved in upgrading needed to take ownership of the design code in order to minimize risks and ensure the services are maintained. Finally, the community leader from the Obunga Residents Association noted that expert technical assistance would be required for the implementation the document.

Notwithstanding the above, the City Engineering was sceptical of the usefulness of the MCI design code. He did not see the need for the social and spatial facility design codes as he believed the municipality should not be involved with issues concerning private property. He agreed that the infrastructure section would be useful as he anticipated that the provision of such services would lead to a higher demand for the land, thus generating extra rental revenue for landowners, who subsequently would use the additional funds to improve their properties[4]. Furthermore, he believed that many of the projects offered in the document would be unsuitable in the African context. In reflecting on one of the energy design codes[5] for example, he noted that solar power fails in Africa due to dust that coats the panels.

Most participants did not trust that the MCI design code could be transferred to the Kisumu context. The two professors from Maseno University and the representatives from SANA International and Cordaid all suggested that the MCI design code was simply a baseline or a reference for developing a separate context-specific design code for Kisumu. Professor Asamba from Maseno University and the Housing Project Works Inspector held that the community needed to be consulted first to ensure acceptance before implementing the MCI design code. The Housing Project Works Inspector also added that the MCI design code needed to be piloted to confirm its appropriateness. Nevertheless, the City Planner suggested that the challenges being considered in the MCI design code were the same as those being faced in Kisumu.

[4] This appears to suggest a process of gentrification.

[5] *Energy 01 – Solar Panels* from the MCI design code.

Professor Mwango of Maseno University offered a way for a design code to include both context-specific and common standards. He postulated that a design code could incorporate a selection of minimum slum upgrading standards that could be universally applied across a country or region. The remaining slum upgrading standards would need to be context-specific standards and generated through a participatory process. He believed that the context-specific standards were necessary to ensure that the introduced facilities and infrastructure reflected the needs of the community and thus continued to be used and maintained.

6.2. Cross-Reference with Community Priorities

The ranked community priorities are shown in Table 1 for each sub-area. It is interesting to note that each sub-area raised practically the same issues even though the particular issue may have been ranked differently. Between Kamakowa and Sega Sega, the one difference is that Sega Sega included waste management as a priority. Compared to the other two sub-areas, Central did not mention a market, food security, HIV/AIDS, or land as priorities and did identify open boreholes as an issue. Overall, it demonstrates that the Obunga slum as a whole is generally dealing with the same challenges.

Table 1. Community Priorities

Sub-Area / Rank	Central	Kamakowa	Sega Sega
1	Roads/Drainage	Road Access/Drainage	Roads
2	Hospitals	Community Hall	Land (for Community Services)
3	Security	Security	Economic Empowerment
4	Employment/Empowerment	School	Hospital
5	Houses	Hospital	Education
6	Sanitation/Toilets	Market	Water & Sanitation
7	Schools	Water	Food Security
8	Water	Toilets	Security
9	Open Boreholes	Unemployment	Waste Management
10	Solid Waste Management	Food Security	Resource Centre
11		Poor Housing	HIV/AIDs
12		HIV/AIDs	Housing
13		Land (for Community Services)	Market

The community priorities were complied into one table and cross-referenced with the MCI design code. As shown in Table 2 below, a relevant MCI design code standard was identified for most of the community priorities. In certain cases, however an applicable standard simply did not exist to resolve the issue, such as security, schools and urban agriculture. In other cases, the standard did not fit the context and could not be applied. For example, the MCI housing standards demonstrate how concrete or wood compound housing could be improved; however the majority of housing in Obunga is comprised of narrow mud and stick structures. In the case of sanitation, the composting toilet design standard could not be used because local residents considered them culturally inappropriate[6]. Certain standards could not be applied, as they were very

[6] A composting toilet had been established in Obunga however it was abandoned and not used by the residents as they did not believe it was sanitary to use the compost for fertilizer (J. Agwenr, personal communication, May 29, 2013).

specific to the slum communities of Ga Mashie and Nima East in Ghana. For example, two of the market standards offered solutions for upgrading specific markets in the two Accra communities. While the MCI design code was relevant in most situations, new standards would still need to be established for certain priorities.

Table 2. Priorities Versus MCI Design Code

NEEDS	MCI DESIGN CODE STANDARDS
Roads	Circulation 01 – Service Paths Circulation 02 – Vehicle Roads
Drainage	Drainage 01 – Retain + Filter
Hospitals	Health A – Local Emergency Services Health B – Health Awareness Clinic
Security	Not Applicable – No Tool Available
Employment/Economic Empowerment	Education A – Daycare Education B – Job Training Education C – Technology Centre Industry A – Microbusiness Loans Industry B – Niche Production Association Market 02 – Market Module Market 03 – Meat Market Housing 03 – Mixed-Use
Housing	Housing 03 – Mixed-Use Social B – Microfinance for House Upgrades Social C – Home Building Technical Assistance Note: Housing 01 – Upgrade Compound and Housing 02 – Reconfigure Compound are not applicable as they are out of context
Sanitation	Toilet 02 – Biogas Method Toilet 03 – Sewerage Method Note: Toilet 01 – Compost Method is not applicable for cultural reasons
Water	Water 01 – Rainwater Harvesting Water 02 – Groundwater Wells

NEEDS	MCI DESIGN CODE STANDARDS
Solid Waste Management	Waste 01 – Collection System
Schools	Not Applicable – No Tool Available
Education (non-school)	Education A – Daycare Education B – Job Training Education C – Technology Centre Education D – Information Wall or Kiosk
Community Hall/Resource Centre	Community Centre 01 – Ga Mashie Community Centre 02 – Nima East
Food Security	Market 02 – Market Module Market 03 – Meat Market Note: There are no tools for urban agriculture
Land (for community services)	Service Cluster 01 – Private Service Cluster 02 – Public Service Cluster 03 – Market
Market	Market 02 – Market Module Market 03 – Meat Market
HIV/AIDs	Health A – Local Emergency Services Health B – Health Awareness Clinic
Open Boreholes	Water 01 – Rainwater Harvesting Water 02 – Groundwater Wells

6.3. Extension of the Slum Upgrading Plan

The *Integrated Spatial Plan* of the Obunga Plan was cross-referenced with the MCI design code. It was determined that several MCI design code standards were applicable for guiding the development of the health centre, the market, the public toilets, the street and drainage system and the waste collection point. However, no standards were available for the other anticipated upgrades including the tree nursery, the school, the industrial site, the playground, the chief's office and the police post. It should be

noted that other sections of the Obunga Plan proposed additional improvements to the community, but did not identify their location.

To determine the ability of the MCI design code to extend the policies of the Obunga Plan, the proposed sites for the health centre, the market and one of the public toilets were determined and visited as identified on Figure 5. In accordance with the Obunga Plan, the first site (Site 1) is intended to be 0.1 hectares in size and to accommodate a health centre[7]. The health clinic standard[8] was applied to design the health centre. According to the MCI design code, however this clinic is not to be stand-alone, but rather located with other social amenities in either of two community centres[9]. As a result, two community centre designs were created with the first being a four-storey building[10] and the second composed of eight modular structures[11]. These designs are shown in Figure 6 and Figure 7.

The second site (Site 2) is intended to accommodate a market on 0.4 hectares of land as per the Obunga Plan[12]. The modular market standard was applied to plan the proposed development[13]. The result was a market laid out using twenty-four modular structures[14] as shown in Figure 8.

[7] The site for the health centre was a relatively flat open field, next to the Bridges School and a church, and adjacent to the Pamba Road. Across the street was a commercial shop with a water point and the proposed police post. A waterline was located within the road allowance and the surrounding area included residential structures mainly made of mud and stick walls, and corrugated metal roofs.

[8] *Health A – Health Awareness Clinic* standard

[9] *Community Centre 01* or *02* standards

[10] 20mX30m four-storey building as per the *Community Centre 01* standard

[11] Eight 10mX7m modular structures in respect to *Community Centre 02* standard

[12] The site for the market was adjacent to the Pamba Road, which provided access to a series of commercial shops. Surrounding the location were residential buildings mainly made of mud and stick walls, and corrugated metal roofs.

[13] The standard applied was the *Market 02 – Market Module*. *Market 01* and *Market 04* could not be used at they were specific to markets that exist in Accra, Ghana. A separate design for *Market 03 – Meat Market* was not undertaken as it was discerned that it could be a module within *Market 02.*

[14] Twenty-four 10mX7m modular structures in accordance with the *Market 02* standard.

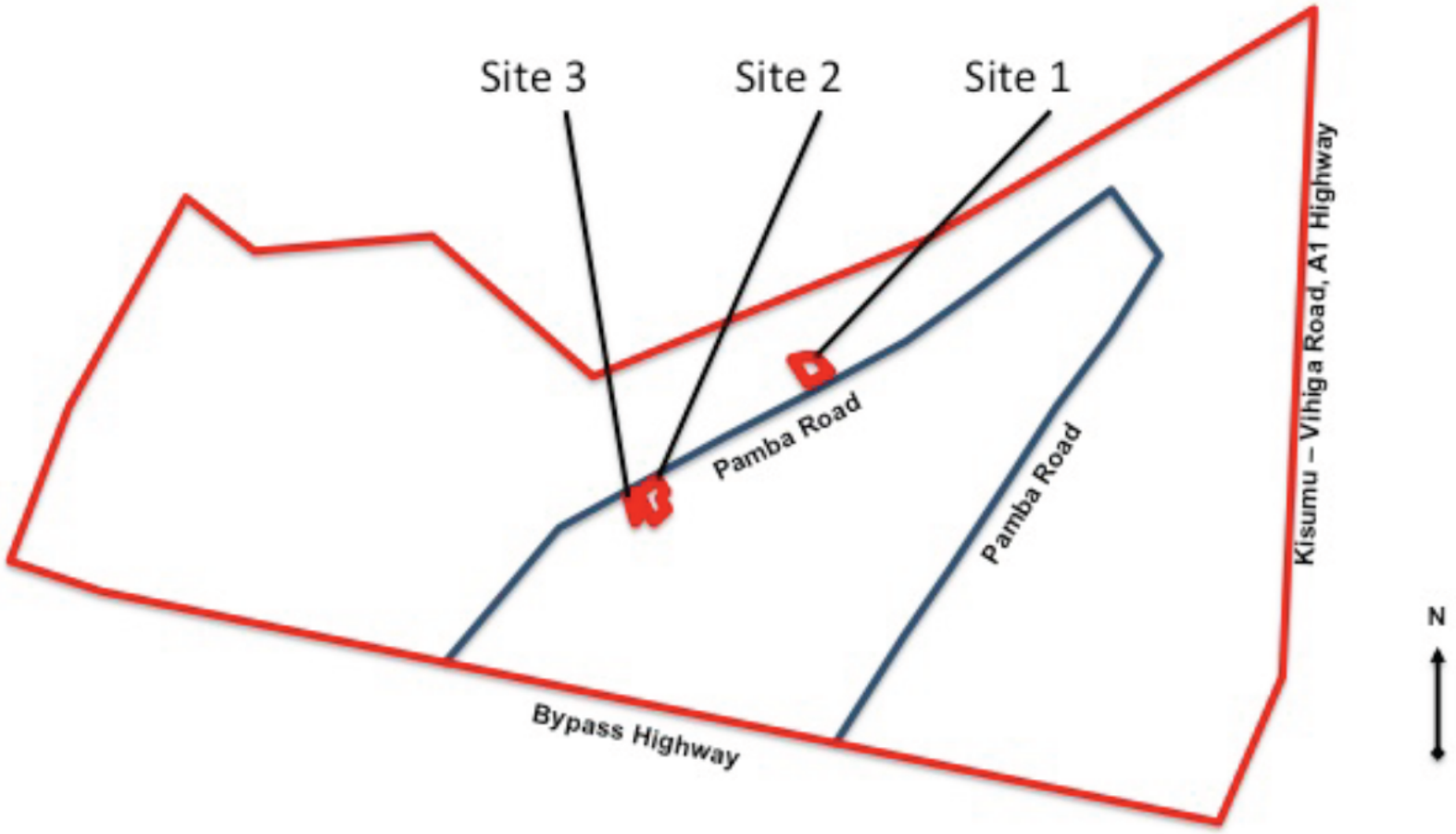

Figure 5. Site Locations

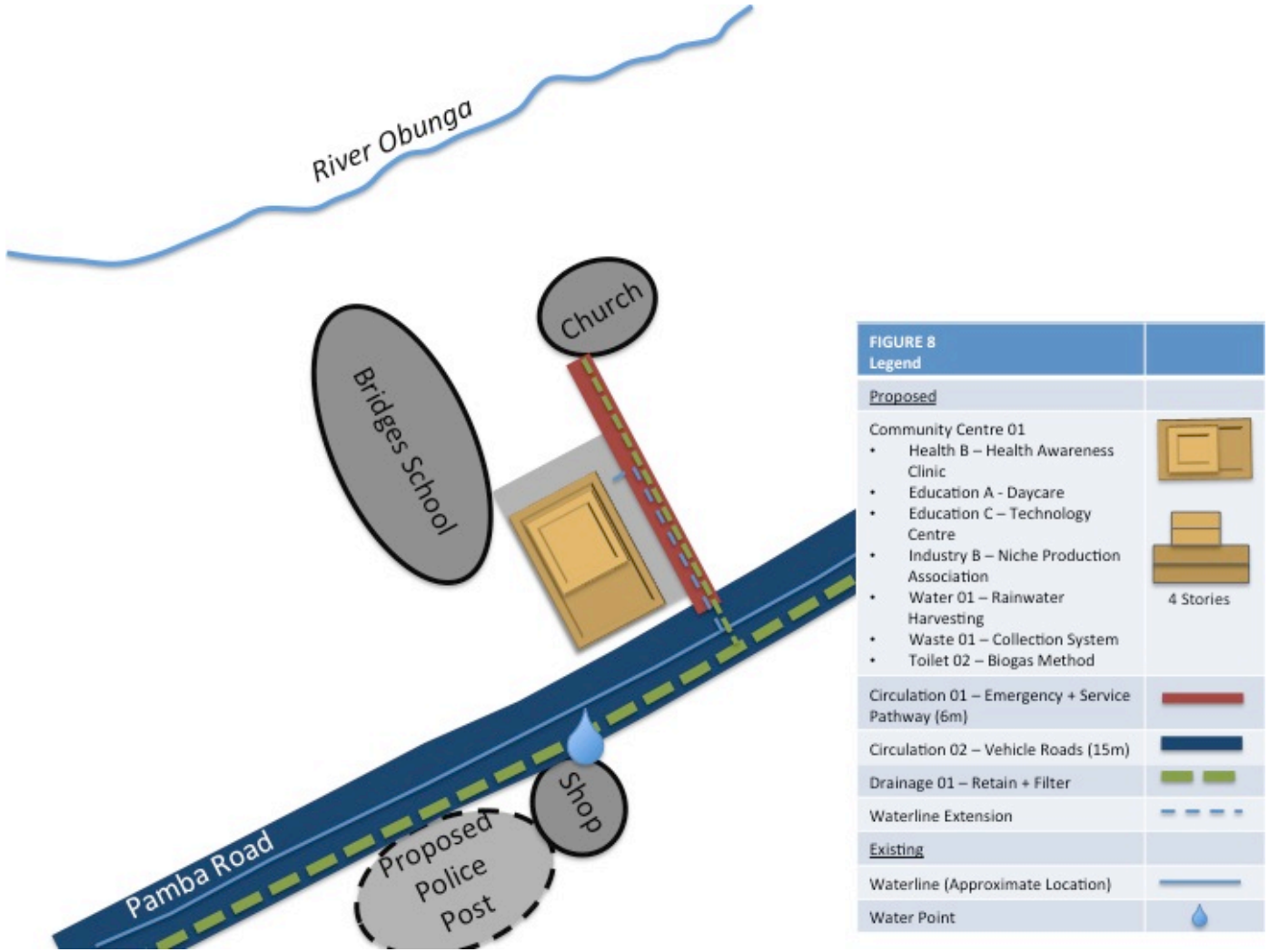

Figure 6. Site 1 Design – Option A

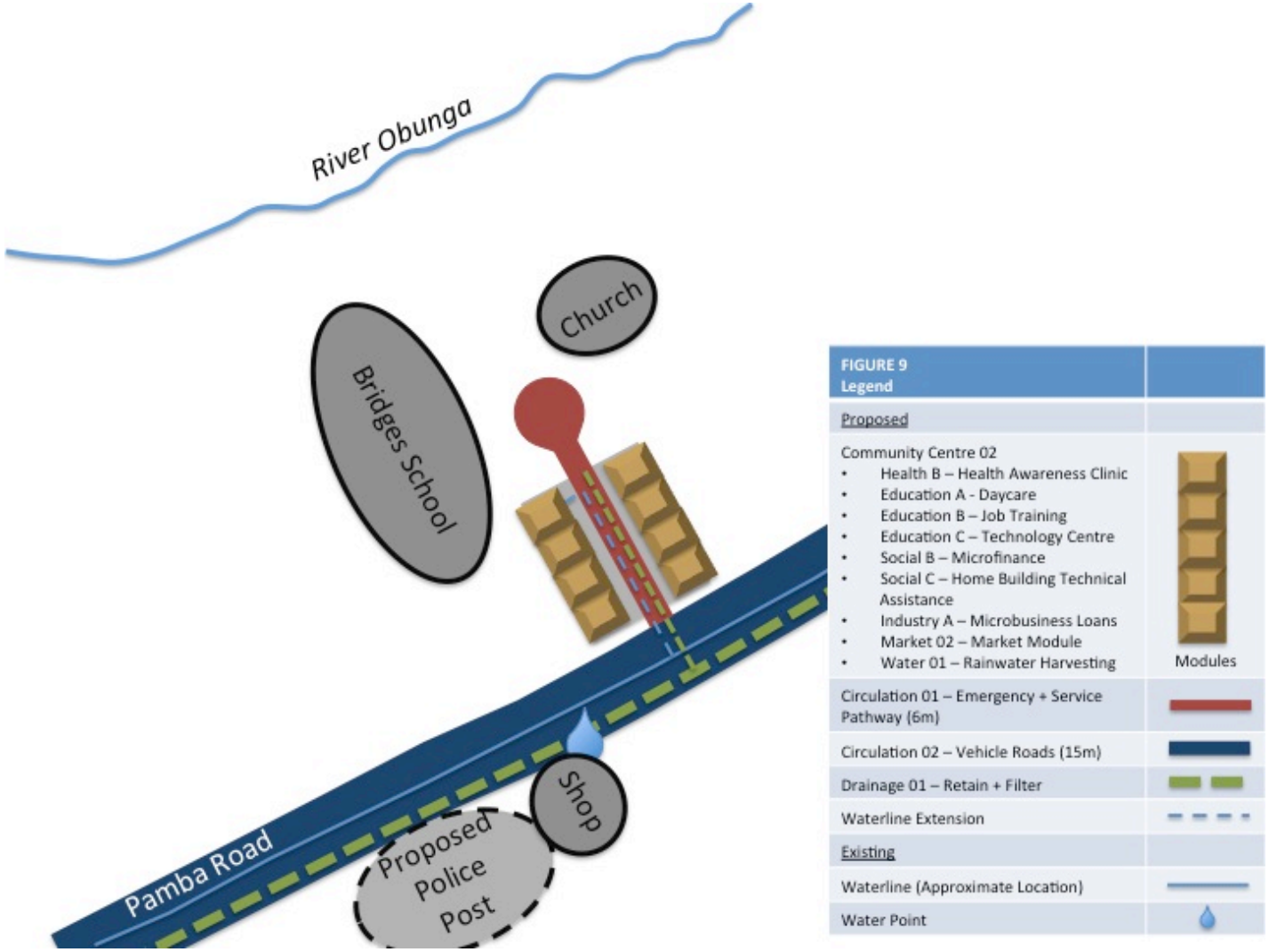

Figure 7. Site 1 Design – Option B

Figure 8. Site 2 and Site 3 Designs

The *Integrated Spatial Plan* identifies the location of three public toilets where each is to be approximately 0.03 hectares in size. The public toilet located nearest to the market was selected as the third test site (Site 3)[1]. The biogas toilet standard was selected to guide the design as this form of toilet had already been constructed in Obunga and was widely used (J. Agwenr, personal communication, May 29, 2013)[2]. The proposed public toilet facility[3] is shown in Figure 8.

In each of the proposals, upgrades to roads and drainage are presented according to the MCI design code[4]. It should be noted that the extension of existing waterlines to the proposed structures was presented even though there is no MCI design code for such an action. It was assumed that the budget for the constructed projects would include payment for the water connection fee.

For each of the three sites, application of the design code did not confront any physical constraints. However, to allow for the width of the envisioned road upgrades, it is anticipated that a number of structures would need to be removed from the right-of-way unless it is agreed that lesser standards[5] can be applied. The MCI design code does provide for areas removed as a result of demolition to be regained through the addition of a second storey, however this approach appears to be intended for compound housing made of concrete or wood and therefore not applicable to the Obunga context.

1 This location was adjacent to the Pamba Road, which provides access to a series of commercial shops. In the surrounding area were residential buildings mainly made of mud and stick walls, and corrugated metal roofs.

2 *Toilet 02 – Biogas Method* standard. *Toilet 01 – Compost Method* was not chosen as it was identified by a community leader as culturally unacceptable and *Toilet 03 – Sewerage Method* was not used, as the Obunga Plan did not consider the future extension of sanitary lines to this area.

3 A 10mX10m structure, which is the approximate the same size of the existing Obunga bio-centre.

4 Roads are designed according to standards *Circulation 01 – Service Paths* and *Circulation 02 – Vehicle Roads*. The road widths for these standards were not provided by the MCI design code and therefore appropriate widths were referenced from the *Physical Planning Handbook.* A 6-metre *Service Lanes* width was applied to *Circulation 01* and a 15-metre *Major Access Road* width was applied to *Circulation 02*. With respect to drainage, *Drainage 01 – Regain + Filter* was applied.

5 The road width standards are from the *Physical Planning Handbook* and not the MCI design code.

7. Analysis

7.1.1. Relevance

The interviews, the cross referencing of the community priorities with the MCI design code and the extension of the community plan all suggest that design codes are relevant for slum upgrading. With respect to the interviews, practically all the participants offered suggestions as to how the MCI design code could benefit slum upgrading. A number of the participants appreciated the document's ability to bring comprehension and order to the slum upgrading process. Certain participants consider the MCI design code as an appropriate public consultation tool and a way to scale-up slum upgrading projects. Others believed the MCI design code could guide and manage the slum upgrading process. One individual suggested that the document could coordinate and integrate slum upgrading programs and projects. All the benefits mentioned reflect the attributes of design codes found in the literature.

The two exercises undertaken as part of this study, the cross referencing of the community priorities and the extension of the slum upgrading plan, also demonstrated that design codes are pertinent for slum upgrading. First, a MCI design code standard was identified for almost every one of Obunga's slum upgrading priorities, which suggests that slum upgrading design codes can reflect the norms of those living in slums. Second, the MCI design code was found to be capable of extending the policies of the current Obunga Plan, which shows that slum upgrading plans and design codes can work together to deliver a slum upgrading program. Overall, this indicates that design codes can successfully guide slum upgrading as they have guided other developments.

While it was determined that design codes are relevant for slum upgrading, a number of different issues must be considered before applying a slum upgrading design code to the Kisumu context and indeed other locations. In accordance with the literature, the representative of the Obunga Residents Association noted that

implementation of the MCI design code would require expert technical assistance. However, of all the participants, only Professor Mwango could provide an appropriate description of a design code. Some suggested the *Building Code,* the *Physical Planning Act,* the *Architects and Quantity Surveyors Act* and the *Environmental Act* as examples but upon closer scrutiny, these documents do not coincide with the attributes of a design code[6]. This lack of awareness of design codes suggests that the necessary experience and expertise for creating and administrating a slum upgrading design code would not be available in Kisumu. Therefore, slum upgrading practitioners would need to be trained on the use of design codes before their implementation in Kisumu (Carmona et al., 2006, p.281).

The interviewees identified several other issues that could limit implementation of a slum upgrading design including existing legislation and standards, difficulties achieving consensus, lack of community acceptance, land acquisitions and gentrification. Notwithstanding, there may be ways to mitigate these challenges. For example, those preparing a slum upgrading design code could consult with those responsible for the relevant legislation and standards to ensure that their requirements do not undermine the implementation of the slum upgrading project (Carmona et al., 2006, p.281). Furthermore, all those involved in a slum upgrading process could be brought together at the beginning to achieve a consensus on what the design code will encompass (Marshall, 2011, p.233; Carmona et al., 2006, p.284). Also, community acceptance of a slum upgrading design code could be generated through a participatory planning process (Talen, 2009, p.157). With respect to the acquisition of land, this has been an issue for many slum upgrading projects in Kisumu (Nodalis, 2009, p.61; P. Nyamita, personal communiciation, May 27, 2013). Nevertheless, Umanda Trust's bio-centre projects demonstrate that it is possible to obtain land for upgrading purposes in

[6] Building codes cannot be considered a design code, as their influence on urban form is incidental (Talen, 2009, p.146; Government of Kenya, 1997). The *Physical Planning Act,* the *Architects and Quantity Surveyors Act,* and the *Environmental Act* are not design codes as none of them include standards, but rather processes and procedures (Government of Kenya, 1999, 2009, 2010).

Kisumu through community involvement[7] (R. Swake, personal communication, May 28, 2013). Finally, slum upgrading design codes should be sensitive to the possible gentrification of the targeted slum neighbourhood as a result of the proposed interventions. As mentioned, establishing housing cooperatives, limiting the width of roads to make them less attractive for owners of private vehicles and expanding slum upgrading programs to increase the supply may mitigate this issue (UN Habitat, 2007, p.19; Gulyani & Bassett, 2007, p.504; Silas, 1992, p.40). While there are challenges in implementing slum upgrading design codes, there are approaches to overcoming them.

7.1.2. Transferability

After reviewing the MCI design code, many of the interviewees stated that they did not believe that it would be possible to apply the MCI design code to Kisumu without modifications. The two exercises undertaken in this study produced mixed results on this question. Challenging the proposition that the MCI design code could not be applied to the Kisumu context was the finding that a significant number of the MCI design code's standards correlated with the upgrading priorities of the Obunga community. It was also demonstrated that the MCI design code could extend the policies of the Obunga Plan with respect to a health centre, a market, a toilet and drainage, without confronting any physical constraints. Yet, the exercises also provided evidence affirming the view that the MCI design code required modification in order to suit the context. As demonstrated with the cross-referencing of the community priorities and the extension of the slum upgrading plan, there were cases where slum upgrading standards simply did not exist to resolve the issue, they did not suit the situation, or they were culturally inappropriate. How can these varied results be reconciled?

The findings offer two main arguments: first, there is no one design code that can address every physical constraint found in any given slum; and second, there are cases where *individual* slum upgrading standards can be transferred from slum to slum. This observation appears to coincide with what Professor Mwango of Maseno University

[7] Before proceeding with the construction of a bio-centre, Umanda Trust required that the community members contributed the land, cleared the site, and established a management group (R. Swake, personal communication, May 28, 2013).

hypothesized during the interviews. He postulated that a national or regional design code with minimum standards could be established and when it was necessary to move beyond the government requirements, context-specific standards could be generated through a participatory planning process. This observation is closely related to the concept of incorporating "bottom-up" normative design codes with "top-down" plan-based design codes to guide development, where bottom-up design codes could be considered context-specific standards and top-down design codes could be considered common standards (Marshall, 2011, p.178). Overall, this suggests that a common slum upgrading design code can exist, but it is not one that is *all things to all slums*. Rather, it is composed of a limited number of common slum upgrading standards that have been proven to be transferable between slums, while allowing for context-specific slum upgrading standards to be "plugged in" and integrated into the whole of the document.

It is envisioned that the challenge with creating a design code that includes both context-specific standards and common standards will be determining which should be context-specific and which should be common. This case study and the literature offer insight into this issue. The MCI design code standards that were readily transferable[8] included those relating to transportation, drainage, sanitation, health, waste collection, and the establishment of markets. These upgrades could be described as having public good characteristics where a public good, in its purest form, is "anything that provides a benefit to everyone and the availability of which is in no way diminished by its simultaneous enjoyment by others" (Gulyani & Bassett, 200, p.507; Todaro & Smith, 2012, p.486). The MCI design code standards that were not readily transferable were those relating to the upgrading of housing[9]. This could be described as a private good as an individual dwelling is not beneficial to everyone, and its availability would be diminished if everyone simultaneously used it (Gulyani & Bassett, 200, p.490; Todaro & Smith, 2012, p.486). Therefore, standards governing public goods are more transferable

[8] MCI design code standards that were considered readily transferable were those that were applied in the extension of the Obunga Plan *and* corresponded to the priorities of the community.

[9] The MCI design code standard *Circulation 02 – Vehicles* was applied in the extension of the Obunga Plan. This standard provided for areas removed as a result of demolition to be regained through the addition of a second storey, however this approach appears to be intended for compound housing made of concrete or wood and therefore not applicable to the Obunga context.

and thus more appropriate as common standards. Alternatively, standards governing private goods are less transferable and thus more appropriate as context-specific standards. This argument is supported by the Indonesian KIPs' standards, which were used across hundreds of projects and focused on infrastructure with public good characteristics including roads, footpaths, drainage, water supply and sanitation (Gulyani & Bassett, 2007, p.507). In regards to the initial hypothesis, that the MCI design code would not be transferable as slums are heterogeneous, the findings demonstrate that certain slum upgrading standards are transferable as they have common good characteristics.

With respect to the literature, the findings support both the context-specific and common approach to creating slum upgrading standards. As demonstrated, certain slum upgrading standards are not transferable and as they only reflect the context for which they were developed. These are usually standards that govern components that have private good characteristics. Alternatively, some slum upgrading standards are transferable as they can be applied to various locations. These are typically standards that govern components that have public good characteristics. Thus there must be context-specific standards that reflect the needs and priorities of residents in order to ensure enforcement of standards, acceptance of upgrading interventions, cost recoveries and long-term maintenance of infrastructure. There also needs to be common slum upgrading standards as they assist in the scaling-up and replication of successful slum upgrading projects.

Lastly, how are conflicts to be resolved between context-specific and common standards? This brings us back to design codes. The participants' identified design codes as a way to bring comprehension and order to the slum upgrading process and to manage, coordinate and integrate slum upgrading programs and projects. This is supported by the literature, which considered design codes as a method for incorporating expectations and resolving issues, integrating ideals, and facilitating collaboration and consensus building. Therefore conflicts can be resolved by slum upgrading practitioners taking the desired context-specific and common standards through a design coding process to establish the appropriate interrelationship between the requirements and thus deliver a coherent slum upgrading project.

8. Conclusion

It is argued that a context-specific standard should reflect the needs of slum residents while a common standard is perceived to support the replication of successful slum upgrading projects. The intention of this study was to inform this debate by testing the transferability of a design code, composed of slum upgrading standards, from two slum settlements in Accra, Ghana to another slum settlement in Kisumu, Kenya. It was determined that design codes could be relevant across different slum settings. A slum upgrading design code was found to be capable of bringing comprehension and order to a slum upgrading process. A slum upgrading design code can be an appropriate public consultation tool and a way to plan the scaling-up slum upgrading projects. It can also guide and manage the slum upgrading process as well as coordinate and integrate slum upgrading programs and projects. Furthermore, slum upgrading design codes can reflect the norms of slum communities and it can extend the policies of slum upgrading plans. Overall, this suggests that design codes can successfully guide slum upgrading in various contemporary slum contexts.

While design codes are relevant for slum upgrading, it was found that a number of different issues must be considered before applying its requirements to a specific context. First, appropriate technical expertise need to be in place for the preparation and administration of a slum upgrading design code. Existing legislation and standards should be considered to avoid conflicts with the design code. Those involved with a slum upgrading project need to be brought together to achieve a consensus on the attributes of the design code. The community affected by a slum upgrading project should be consulted to ensure acceptance of the proposed standards. Finally, those implementing a slum upgrading design code must be sensitive to land acquisitions and gentrification.

This study's test of the transferability of a design code developed in one setting and applied to another revealed that a common slum upgrading design code can exist

even though slums are heterogeneous. However, such a design code is one that is composed of a limited number of slum upgrading standards that have been proven to be transferable between slums, while allowing for context-specific slum upgrading standards to be integrated into the whole of the document. This study also suggested that common standards should govern components that have public good characteristics, as they are more transferable across slums. Alternatively, context-specific standards should govern components with private good characteristics, as they are less transferable across slums. This study identified the design code process as a way to resolve conflicts between context-specific and common slum upgrading standards as design codes provide a medium for coordination, consensus building, and collaboration. Given that this is only one study, further comparative case studies should be conducted to confirm which slum upgrading standards are transferable and how conflicts between standards should be mitigated.

With respect to the literature, these findings support both the context-specific and common approaches to creating slum upgrading standards. Thus, slum upgrading programs should include context-specific standards in order to meet the specific needs of people living in slums and common standards to support the scaling-up and replication of successful slum upgrading projects. The context-specific standards should govern components with private good characteristics, as they are less transferable. Alternatively, the common standards should govern components that have public good characteristics, as they are more transferable. For each slum upgrading project, the desired context-specific and common standards should be incorporated into a design code in order to determine the relationship between the standards and mitigate any conflicts. It is envisioned that design codes with context-specific and common slum upgrading standards will deliver coherent slum upgrading projects that improve the quality of life of people living in slums across Africa.

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Appendices

Appendix A.

Questionnaire

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[redacted]

Questionnaire

Question 1: What is the background of you and your organization in regards to slum upgrading?

- What is your position in the organization?
- What is your level of expertise/training in slum upgrading?
- Has your experience always been with this organization?
- Has your organization always been involved with slum upgrading?
- Are you familiar with KENSUP- Kenya Slum Upgrading Programme of UN Habitat
- Are you familiar with KISIP-Kenya Informal Settlement Improvement Programme of the World Bank?
- Are you familiar with the Kisumu Urban Project of Agence Francaise de Developpment?
- What other slum upgrading programs in Kisumu are you familiar with?

Question 2: What are the biggest issues facing slums in Kisumu?

Question 3: Has your experience with slum upgrading been positive or negative?

- What specific challenges have you faced?
- Do you think others have shared your experiences?

Question 4: Are you familiar of any urban design standards for slum upgrading?

- Do you know of the history of their use in Kisumu?
- Were they used in your slum upgrading process?
- Has your experience been positive or negative?

Question 5: Are you familiar with what a design code is?

- Where and when did you first hear about a design code?
- Were they used in your slum upgrading process?
- How would you define a design code?
- What is your opinion of design codes?

Question 6: Are you familiar with Millennium Cities Initiative's slum upgrading design code (show document and guide person through it)?

- Where and when did you first become aware of the document?
- Are you familiar with anything that is similar?

Question 7: Do you see this document as being useful in the Kisumu context and to your slum upgrading program?

- Are there any specific tools that could be beneficial?
- How does this compare to other design standards that you are aware of?
- Do you see it improving the quality of slum upgrading?
- Do you see it being useful in developing a community vision?
- Do you see it minimizing negotiations on design standards?
- Do you see it delivering a more certain design?
- Could it guide the construction process?

Question 8: Have you tried to scale up your slum upgrading program?

- What happened when you tried to scale up?
- Did you face any challenges in scaling up your program?
- Would have a design code been helpful in scaling up?
- Would MCI's design code been helpful in scaling up?

Question 9: In consideration of what I have presented regarding design codes do you believe that they would benefit your slum upgrading program?

- Do you believe that design codes would result in a more efficient and effective slum upgrading process?