

**“KENYA SLUM UPGRADING PROGRAMME”;
An Analysis of Kibera Integrated Water, Sanitation
and Waste Management Project ”**

BY

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**A Research Project Submitted in Partial Fulfillment of
the Requirement for the Degree of Master of Arts in
Environmental Planning and Management (EPM)**

**Department of Geography and Environmental Studies
University of Nairobi
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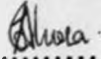
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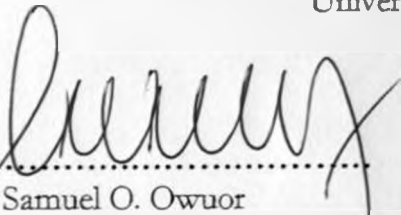
DECLARATION

This research project is my original work and has not been presented for a degree in any other university

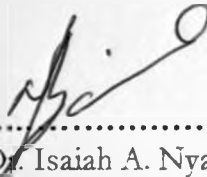


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DEDICATION

To God and to my country

ACKNOWLEDGEMENT

Although writing a research project is an individual undertaking, I would like to acknowledge the support I received from a number of individuals and institutions that contributed to the successful completion of this study. They are, however, not responsible for the mistakes, omissions or errors which remain in the final product. While it is difficult to mention all the individuals by name, I would like to take this opportunity to assure those whose names I fail to mention here that their contributions, in whatever form, were all greatly appreciated.

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ABSTRACT

Kenya has experienced rapid urbanization which has brought about many challenges, one of them being slum proliferation. This brings with it poor infrastructure delivery and a challenge in water and sanitation provision. Kenya, seeking to improve the lives of 5.3 million slum dwellers by 2020 (Kenya 2005) has set up a nationwide intervention in the slum areas. Kibera being one of the largest slum areas in Kenya was chosen as the pilot intervention site. This study was carried out in one of its villages- Soweto East- to determine the impact of the pilot intervention project (Kibera Integrated Water, Sanitation and Waste Management Project, K-WATSAN) being implemented by the Kenya Government and the UN HABITAT. Its main objective was to analyze the impact of the K-WATSAN intervention on the livelihoods of the residents. To achieve this objective the study utilized both secondary and primary sources of data and conducted a field study whereby questionnaires were administered in two villages- Lindi and Soweto East. The former acted as a control village as it had no intervention. Interview data was captured from selected respondents and was used to evaluate the livelihood, access to water and sanitation and community participation in the project. Content analysis and exploratory data analysis were used to analyze the data using statistical tools of descriptive measures and methods of central tendencies; further statistical analysis on some selected variables was carried out to analyze the intervention's impact. The results indicated that K-WATSAN project has had a positive impact on the lives of the Soweto East residents in terms of; improved access to water and sanitation situation; improved accessibility and environmental conditions; improved sources of income and livelihoods security. The project has also achieved its aim of encouraging community participation in capacity building, empowerment and training of community members through the various trainings and Youth Empowerment Programme present in the settlement. The principles of inclusion, partnerships and sustainability have been reinforced through greater awareness, participation and partnerships in slum improvement. The study thus concluded that K-WATSAN project has had a positive impact in Soweto East and recommended embracing of community participation and proper governance mechanisms for any successful slum intervention on access to water and sanitation.

TABLE OF CONTENTS

Declaration	ii
Dedication	iii
Acknowledgement	iv
Abstract	v
 Chapter 1: Introduction	 1
1.1 Statement of the research problem	1
1.2 Research questions	3
1.3 Research objectives	3
1.4 Research hypotheses	3
1.5 Justification of the study	4
1.6 Scope of the study	5
1.7 Literature review	5
1.7.1 A historical perspective of slums in Nairobi	5
1.7.2 Empirical studies on Kibera	8
1.7.3 Regulatory and policy framework	12
1.7.4 Examples of past slum upgrading efforts in Nairobi	25
1.8 The conceptual framework	28
1.9 Organization of chapters	30
 Chapter 2: The Study Area	 31
2.1 Kibera	31
2.1.1 Geographical characteristics	31
2.1.2 Historical background	31
2.1.3 Demographic and socio-economic characteristics	33
2.2 Soweto East village	34
2.3 Lindi village	35
 Chapter 3: Methodology	 36
3.1 The study set-up	36

3.2 Sources and methods of data collection	36
3.3 Sampling procedures	37
3.4 Data processing and analysis	38
3.4.1 Data processing	38
3.4.2 Data analysis	39
3.5 Study limitations	41
3.6 Characteristics of the sampled households in Soweto East	41
3.6.1 Household demographic characteristics	41
3.6.2 Household head migration history	43
3.6.3 Housing conditions and other amenities	44
3.6.4 Income and expenditure	45
3.7 Characteristics of the sampled households in Lindi	46
3.7.1 Household demographic characteristics	46
3.7.2 Household head migration history	47
3.7.3 Housing conditions and other amenities	47
3.7.4 Income and expenditure	48
 Chapter 4: Access to Water and Sanitation Situation in Soweto East and Lindi	 50
4.1 Soweto East	50
4.1.1 Access to water situation	50
4.1.2 Coping with periods of water scarcity	54
4.1.3 Access to water and household's health situation	55
4.1.4 Access to water and household's livelihood	55
4.1.5 Access to sanitation situation	56
4.2 Lindi	57
4.2.1 Access to water situation	57
4.2.2 Coping with periods of water scarcity	59
4.2.3 Access to water and household's health situation	60
4.2.4 Access to water and household's livelihood	60
4.2.5 Access to sanitation situation	61

Chapter 5: The Impact of Kibera Integrated Water, Sanitation and Waste Management Project	63
5.1 The Kenya Slum Upgrading Programme	63
5.2 The Kibera Integrated Water, Sanitation and Waste Management Project	66
5.2.1 Background information	66
5.2.2 Aim and objective of K-WATSAN	67
5.2.3 K-WATSAN project implementation	67
5.2.4 K-WATSAN project activities	68
5.2.5 Community participation in the project	72
5.2.6 Challenges of the project	78
5.3 The impact of the project on the livelihood of the households involved	79
5.3.1 Reported benefits of the project	81
5.3.2 Impact analysis: A comparison of Soweto East and Lindi	83
5.4 Hypothesis testing	86
 Chapter 6: Summary of Findings, Conclusion and Recommendations	 87
6.1 Summary of findings	87
6.2 Conclusion	88
6.3 Recommendations	88
6.3.1 Recommendations to policy makers	88
6.3.2 Recommendations to future researchers	89
 References	 91
Appendix	96

List of Figures

1.1 The institutional set-up of Water Act 2002	21
1.2 The conceptual framework	29
3.1: Occupational status in Soweto East	43
3.2: Migration history of household heads in Soweto East	43
3.3: Occupational status in Lindi	46
3.4: Migration history of household heads in Lindi	47

List of Tables

3.1: Data mining	39
3.2: Marital status in Soweto East	42
3.3: Monthly rent in Soweto East	44
3.4: Type of cooking fuel in Soweto East	45
3.5: Monthly income in Soweto East	45
3.6: Monthly rent in Lindi	48
3.7: Type of cooking fuel in Lindi	48
3.8: Monthly income in Lindi	49
4.1: Cost of water per day in Soweto East	50
4.2: Person responsible for fetching water in Soweto East	51
4.3: Time and duration spent on fetching water in Soweto East	51
4.4: Perception on selected sources of water in Soweto East	52
4.5 Mode of treating water in Soweto East	52
4.6: Regularity of water in Soweto East	53
4.7: Water borne disease prevalent in Soweto East	55
4.8: Type of sanitation facility in Soweto East	56
4.9: Cost of water per day in Lindi	57
4.10: Person responsible for fetching water in Lindi	58
4.11: Mode of treating water in Lindi	58
4.12: Regularity of water in Lindi	59
4.13: Water problems and associated coping mechanisms in Lindi	60
4.14: Water borne diseases prevalent in Lindi	60
5.1: Mode of awareness of the project	74
5.2: If consulted about the project	74
5.3: Consultation issues	74
5.4: Reported benefits of the K-WATSAN water and sanitation facilities	82
5.5: Other benefits of the K-WATSAN water and sanitation facilities	83
5.6: Comparison of Soweto East and Lindi: Selected characteristics	84

List of Maps

1.1 Informal settlements in Nairobi	6
1.2 Racial residential segregation (1948)	7

2.1 Kibera villages and study area	34
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List of Photos

4.1: A traditional pit latrine in Lindi	62
5.1: A sanitation block in Soweto East	69
5.2: Waste management situation in Soweto East	70
5.3: Blocks made by the Soweto Youth Group	74
5.4: Paving way for the spine road	77
5.5: Water access point in Soweto East	81
5.6: Water storage tank for the ablution blocks	81

List of Acronyms and Abbreviations

CBO	Community Based Organization
FBO	Faith Based Organization
K-WATSAN	Kibera Integrated Water, Sanitation and Waste Management Project
MDGs	Millennium Development Goals
NCC	Nairobi City Council
SAP	Structural Adjustment Programme
SEC	Settlement Executive Committee
UNEP	United Nation Environment Programme
YEP	Youth Enterprise Programme

CHAPTER ONE

INTRODUCTION

1.1 Statement of the research problem

Africa is urbanizing at a very high rate with an annual urbanization growth rate of 3.31% (2005-2010) and a projected increase in population from 373.4 million people in 2007 to 759.4 million in 2030. In fact 38.7% of Africa's population is living in urban areas (UN-HABITAT 2008c). Kenya is no exception. In 1962, only one out of every 12 Kenyans lived in an urban center. By 1999, the proportion of the urban population had increased to 34.5%, i.e. one out of every three Kenyans was living in an urban centre. Furthermore, during the 1989-1999 inter-censal period, the country's urban population had increased by 155% (GOK 2002). Today, the main growth factors are natural growth (more urban births than deaths), *in-situ* urbanization (the absorption of rural and peri-urban settlements in the spatial growth of a larger adjacent city) and, in some African countries, post-disaster returnee flows (UN-HABITAT 2008c).

The rapid urban growth brings with it numerous challenges such as urban environmental challenges which are further complicated by vulnerability to the negative effects of climate change; food and energy crises; urbanization of poverty and increasing inequality; urban informality leading to a weak urban service and infrastructure delivery base; poor governance which cannot meet the demands of the rapidly growing population; and the proliferation of informal settlements, popularly referred to as slums (UN-HABITAT 2008c).

According to the UN-Habitat, a *slum* is a place of residence lacking one or more of the following: durable housing, sufficient living area, access to improved water, access to sanitation and secure tenure. In other words, informal settlements are characterized by lack of basic services (sanitation facilities, water, waste collection system, roads, drainage, lighting, etc); substandard and inadequate housing conditions; overcrowding and high densities; unhealthy living conditions; insecure tenure; and poverty and social exclusion. In addition, these settlements are characterized by the worst environmental and sanitation conditions. It

is therefore perhaps not surprising that urban environmental problems claim an estimated one million African lives each year (UN-HABITAT 2008c). However, because of their affordability, these settlements attract a large number of (new) migrants. For example, in some of the fast-growing African cities, almost all of the current urban spatial growth is the result of informal settlements proliferation.

There are various strategies which have been adopted to improve the housing needs and conditions in Africa. These are forced eviction, resettlement, site and service schemes and slum upgrading programmes. Slum upgrading is currently fashionable to many governments and is receiving a lot of donor support. Indeed, it is a paradigm shift from the former restrictive and non-supportive policies of forceful slum clearance. The slum upgrading efforts are one way of achieving the Millennium Development Goals (MDGs). Kenya, for example, is currently implementing an ambitious Kenya Slum Upgrading Programme (KENSUP). Its main objective is to improve the livelihoods of people living and working in slums and informal settlements in Kenya's urban areas (UN-HABITAT 2007). Specifically, the programme aims at improving the lives of 5.3 million slum dwellers by 2020 (Kenya 2005). Currently, the programme is being piloted in Kibera's Soweto East village.

KENSUP has a number of component projects. Those that are currently being implemented include: cities without slums (slum upgrading programmes in major cities/municipalities); sustainable neighbourhood programme (in Mavoko); and the Kibera Integrated Water, Sanitation and Waste Management Project – the main focus of this study. This is, however, not the first upgrading effort in Kenya. Immediately after independence, the Sessional Paper No. 3 on National Housing Policy for Kenya noted that:

the government will also facilitate slum upgrading through integrated institutional framework that accommodates participatory approaches involving relevant stakeholders, particularly the benefiting communities while enhancing co-ordination at national level. Upgrading will take into account factors of ownership of land and structures, age of settlement, and affordability. Appropriate compensation measures will be instituted for disposed persons where necessary (Kenya 2004: 10).

In view of the above, the Government of Kenya has initiated a number of slum upgrading programmes with different successes and failures. For example, the Mathare 4A upgrading programme, the Korogocho slum upgrading programme, the Kibera highrise housing project and the Pumwani housing project, among others. Whereas these upgrading efforts have received much attention in academic research, there is still little information on the impact of these efforts on the targeted communities. This research aims to analyze the impact of Kibera Integrated Water, Sanitation and Waste Management Project on the livelihoods of the Soweto East residents.

1.2 Research questions

The study intends to answer the following research questions:

1. What is the nature and extent of Kibera Integrated Water, Sanitation and Waste Management Project?
2. What is the nature and extent of community participation in the project?
3. What is the impact of the project on the livelihoods of Soweto East residents?

1.3 Research objectives

The overall objective of this study is to analyze the Kibera Integrated Water, Sanitation and Waste Management (K-WATSAN) Project. The specific objectives that emanate from this broad objective are to:

1. Describe the nature and extent of Kibera Integrated Water, Sanitation and Waste Management Project.
2. Assess the nature and extent of community participation in the project.
3. Assess the impact of the project on the livelihoods of Soweto East residents.

1.4 Research hypotheses

1. K-WATSAN operations are of no consequence in the lives of Soweto East residents
2. K-WATSAN has had no impact in the livelihoods of the Soweto East residents.

1.5 Justification of the study

Slums in sub-Saharan Africa have received a number of interventions from the government, donor community and the civil society, including Non Governmental Organizations (NGOs), yet there is little that the slum residents can be proud of. There is need to analyze the impact of such interventions on the lives and livelihoods of the targeted residents. This is particularly important for KENSUP which is supposed to be replicated in other cities of Kenya. It is also important to note that some of the past upgrading efforts have failed because of lack of community participation, monitoring and evaluation, as well as accountability. For example, the Kibera highrise housing project which was meant for Kibera slum residents “failed” because of lack of community participation. The houses are now being occupied by “other people” (Personal communication – Kibera resident).

Slum upgrading efforts could be one way of realizing some of the MDGs. Of the eight MDGs, two directly address issues regarding slum population. For instance, the first goal seeking to eradicate extreme poverty and hunger is clearly articulated by MDG target number one, which aims at halving the proportion of people whose income is less than US\$ 1 a day between 1990 and 2015. Most of these people are found in the slums. If the slums are upgraded, the slum dwellers will be able to channel their energies elsewhere and use their incomes for food, as opposed to the current situation where they are paying high rents to poor quality housing.

The seventh goal, “to ensure environmental sustainability”, deals with the slum challenge through MDG target number 10 which aims at halving, by 2015, the population of people without sustainable access to safe drinking water, and target 11 which aims at achieving a significant improvement in the lives of at least 100 million slum dwellers by 2020. Slums which have undergone the process of upgrading are able to solve the problem of brown water and ensure its portability while providing sufficient amounts for the inhabitants. This is in line with the precautionary principle, since the slum dwellers’ improved lives means less damage to the environment that they live in.

Slum upgrading is also in line with the social pillar of Kenya's Vision 2030 of building a just and cohesive society that enjoys equitable social development in a clean and secure environment. Three key sectors have been identified. These are water and sanitation; the environment; and housing and urbanization – all linked to slum upgrading. In addition, the results of this project can be a sensitization on the benefits of a participatory approach to any slum upgrading venture, where there are extensive community consultations and involvement whilst at the same time ensuring that the basic minimum infrastructure is provided to the residents so that they may live in dignity.

1.6 Scope of the study

This study has limited itself to only one component project of KENSUP. That is, the Kibera Integrated Water, Sanitation and Waste Management Project being implemented in Soweto East village. The aim of the study is to analyze the Kibera Integrated Water, Sanitation and Waste Management Project, especially its impact on the livelihoods of Soweto East residents. To achieve this, a comparative survey was carried out in Lindi – an area with similar characteristics but without intervention.

1.7 Literature review

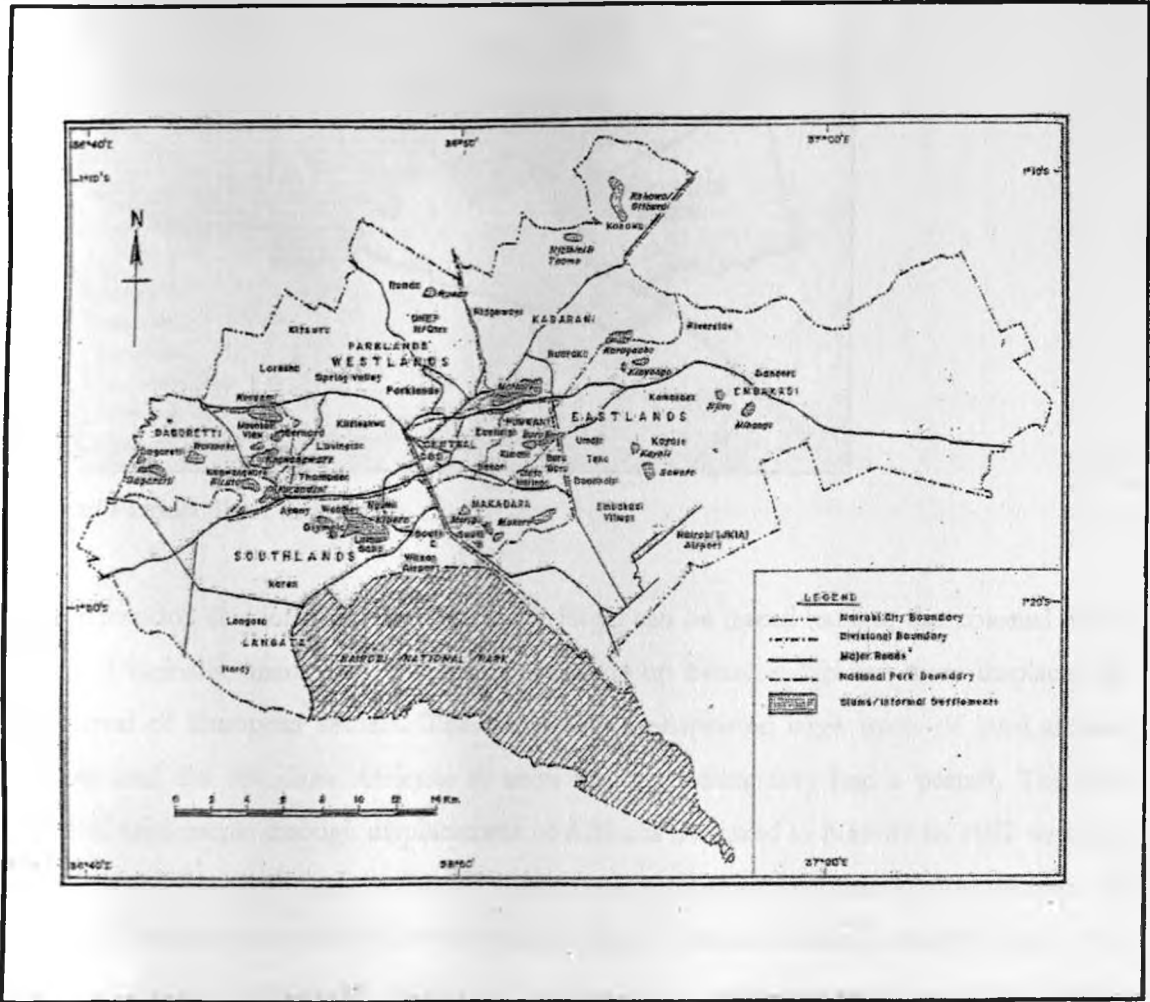
This section provides a review of the relevant literature that has informed most aspects of this study. The section begins by a historical perspective of slums in Nairobi. This is followed by empirical studies that have been carried out in Kibera. Thereafter, the section provides the existing regulatory and policy framework that may influence, in one way or the other, slum upgrading efforts in Kenya. Lastly, two examples of slum upgrading efforts in Nairobi are provided.

1.7.1 A historical perspective of slums in Nairobi

There are over 200 slums in Nairobi (Map 1.1). The four largest slums are Kibera, Mathare, Korogocho and Mukuru. The challenge of slums in the city is partly a legacy of the colonial policy of racial segregation – where Africans were balkanized in the poorly drained low-lying and flood prone eastern part of the city – while the Europeans occupied the western part.

During the colonial period, urban planning was based on government sanctioned population segregation, which created separate enclaves for Africans, Asians and Europeans (Map 1.2; Pamoja Trust 2007; Owuor & Mbatia 2008). Informal settlements developed mainly because of unbalanced allocation in housing resources and infrastructural needs of the separate sections.

Map 1.1: Informal settlements in Nairobi

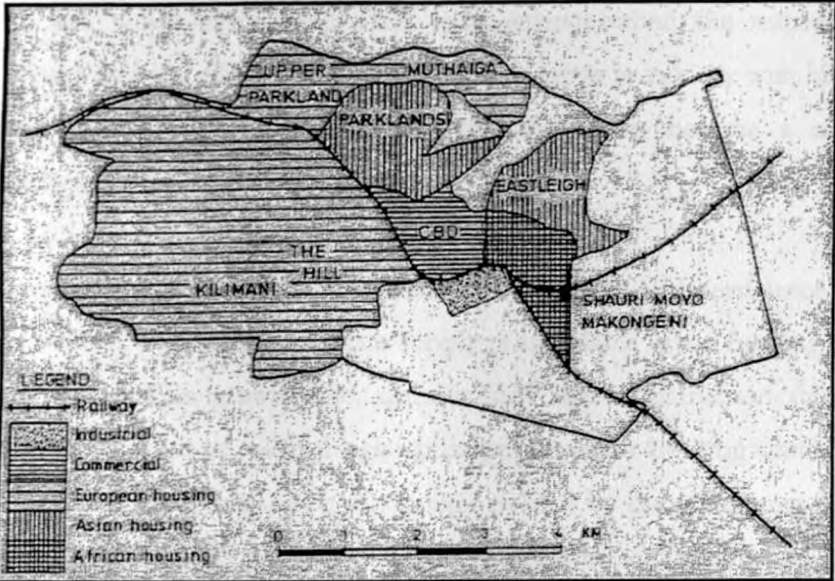


Source: Bocquier et al (2009)

Housing in the different sectors of the city varied to reflect the racially inspired political hierarchy. The white areas consisted of bungalows set in spacious gardens, the houses in the Asian quarters retained typically Indian architecture, while the houses for natives where

designed to specifically accommodate a migrant workforce and little else (Pamoja Trust 2007).

Map 1.2: Racial residential segregation (1948)



Source: Pamoja Trust (2007)

The perception that informal settlements are illegal can be traced back to the colonial era in Kenya. Originally, unauthorized settlements sprang up because Africans were displaced by the arrival of European settlers. The Europeans expropriated large tracts of land around Nairobi and did not allow Africans to enter the city unless they had a permit. The first informal settlements through displacement of Africans occurred in Nairobi in 1902 with the arrival of the European settlers (Majale 2000). Basic temporary accommodation such as the Pumwani housing scheme in 1923 was only provided to those Africans – mostly men – who were formally employed. This is because Africans were viewed as temporary sojourners in urban areas.

As the population increased and with lack of “legal” housing, the newly unemployed migrants were forced to find other alternatives – thus the emergence of informal settlements. However, the colonial government declared these settlements illegal, leading to forced

evictions and demolitions, legally sanctioned by laws such as Vagrancy Act and Public Health Act. For example, Kileleshwa was demolished in 1927 after European settlers in the surrounding areas complained that it was a breeding ground for crime and disease. The same fate befell Kariokor in 1931 and Pangani in 1938 (Macharia 1992). The housing situation became worse immediately after independence when the restrictive colonial laws were relaxed and the African man was allowed to move to the city with his family freely without a pass (Macharia 1992). Informal settlements soon became a normal Nairobi's urban landscape.

Several factors may explain the growth, proliferation and persistence of informal settlements in Nairobi. These are inadequate supply of affordable urban housing and residential land; the high population growth rate; unrealistically high construction standards and regulations, often a remnant of colonial legislation; private sector housing which caters for the high and middle income groups; lack of strategic policies by the government and the local authority; lack of political will to address issues of informal settlements and housing in general; and increasing urban poverty (UN-HABITAT 2008c).

1.7.2 Empirical studies on Kibera

Orwa (2009) analyzed the spatial expansion of Kibera over time as well as the environmental impact of the expansion. He used Geographical Information System (GIS) the land use and land cover changes in Kibera between 1976 and 2002. The study found that Kibera had been expanding over time due to high immigration rate which accompanied changes in land use and land cover, with the sprawl being mainly on the railway line and Mutuine River. According to study, the expansion of Kibera is soon encroaching into the neighboring forest – a clear environmental risk. In addition to destruction of the existing forest cover, overcrowding, settlement in precarious areas, increased susceptibility to community diseases and infections, and lack of clean water and sanitation – all contribute to the negative environmental impacts of the expansion of the largest settlement in Africa. The study made two recommendations which relate to the present study: (a) to put up low cost high rise buildings; and (b) to provide essential services, as well as water and sanitation facilities.

Kasuku & Akatch (2002) while analyzing the role of infrastructure in slum upgrading efforts argued that the cost of urban infrastructure services were too high, hence unaffordable to many urban dwellers due to low income levels and widespread poverty, further fuelling the proliferation of slum settlements. The study evaluated the previous housing, planning and development policies and found them to be inadequate in addressing the demand for housing, infrastructure and services in the slums. The study proposed a “package” approach and a complementary welfare perspective to meet housing and infrastructure needs for the poor. They recommended that taxes paid by the rich should be used in subsidizing infrastructure costs for the poor.

COHRE et al (2007) analyzed the right to water and sanitation in Kibera with an objective of collecting baseline data on availability, adequacy, affordability and accessibility of basic services. Special emphasis was laid on sanitation, water and garbage collection and in assessing the extent of the implementation by central and local government of their duties under human rights law to the people of Kibera. The revealed that there was an acute shortage of basic services in Kibera and that the residents were paying KES 100-150 per cubic metre of water, 10 times more than the price charged by the Nairobi City Water and Sewerage Company. The waste and sanitation services were also inadequate for the population that was ever increasing, with up to 150 people sharing the same toilet facility. The residents of Kibera re-use grey water which is poured into any “perceived” drainage system – leading to an environmental and health concern. This study came up with technical solutions and community-gearred recommendations for improving access to water and sanitation in Kibera.

Sikolia et al (1999) investigated the prevalence and associated risk factors of acute respiratory infections in Kibera. The study revealed that indoor pollution, smoke emissions, overcrowding and housing (type of walls and number of windows) played an important role in acquisition of acute respiratory diseases in Kibera. The study recommended that the community be exposed to health education and encouraged to have well ventilated houses

by opening the windows. On the other hand, the government should ensure that standard affordable houses with good ventilation and bigger sized rooms are available to the slum dweller, as well as community outreach programmes on health education.

According to Sichangi et al (2009) the high prevalence of poverty in Kibera and the state of their environment exposed the 'Kiberians' to high chances of vector contact and parasite infection. Furthermore, many of the residents traveled frequently to indigenous malaria endemic rural areas thus carrying the parasites with them back to Kibera. The study recommended preventive measures such as the use of nets and slum upgrading.

Birongo & Le (2005) looked into the water governance structure in Kibera by analyzing the factors that hamper Kibera's poor from accessing clean water. They analyzed this by looking at the current water supply structure, governance problems, the relationships between Nairobi Water Company and Maji Bora Kibera (a local NGO) and possibilities of solutions to improve the situation. The study further detailed water governance in Kibera, providing legal framework details, the regulative institutions and their interconnections while at the same time including the public participation factor in water distribution and provision channels, depicting a chaotic scenario comprising of unfair competition among the vendors, cartels and water lords. With this admission of chaos the study presents alternatives for improving the water governance chaos. For example, establishing a local water governance dialogue involving a broad participation; establishing bilateral dialogues between the two major actors (Nairobi Water Company and Maji Bora Kibera); and forming an association of water consumers.

Karanja & Ng'ang'a (2008) focused on women, hygiene and sanitation in Kibera slums because women's health reflects on the well being of the family. The study describes how nurses are important in helping slum women by providing suggestions on how to improve their sanitation and hygiene. The study describes the typical concerns of women regarding hygiene and sanitation and provides practical suggestions from the nurse's point of view to improve sanitation and hygiene in slums. The concerns cited were toileting; water; poverty;

problems caused by poor sanitation in Kibera, i.e. insecurity, lack of latrine space and fear of hiked rent prices due to presence of latrines; problems related to sexual practices; communicable diseases such as diarrhea, cholera and malaria; insecurity; and gender inequality. The study brought to the fore front the fact that failure of publicly financed health care delivery systems to cater for the poor in developing countries needed urgent attention. It emphasized that health sector policy's goal should be to reduce inequalities in the quality and availability of health services, safe drinking water, as well as sanitation and hygiene services. The study recommended that the nurse's role in advocacy, awareness raising and information exchange on gender issues is needed for the local authorities and technical designers. These should be done during visits to health care centers, in churches and during other community meetings, and that there should be a synergy between health ministries and other ministries to examine alternative delivery methods to curb the problems of sanitation and hygiene.

Noting the challenge of third world governments to provide adequate sanitation facilities for their ever growing population, Kagiri (2008) studied the use of sustainable technology to upgrade sanitation in Soweto East village of Kibera. The aim was to analyze the most feasible sustainable toilet technology to satisfy the community sanitation needs. She found that the causes of poor sanitation facilities in Kibera, as told by the respondents, were overpopulation; poor land tenure policies; resource mismanagement; low economic status; and mistrust among community members which created roadblocks to mobilization and sustainability. In addition, the study established that the community was aware of what constituted good and bad sanitation and who the most vulnerable group in accessing sanitation was. The community also knew what they wanted in a toilet, and specified the different technical aspects (security, lighting, spacious), social, economical and environmental aspects. From the study it was noted that some residents were willing to pay for sanitation, while others were not willing to part with any coin for that purpose. The study compared two technologies: the VIP (Ventilated Improved Pit latrine) and NOWAC (No Water Consumption). Both had various advantages and disadvantages. The study recommended

that any toilet technology should evaluate the cost of returns and reduce losses, as well as using limited space due to overcrowding in the slum.

Mulcahy and Chu (2007) used the Kibera Soweto East initiative to analyze the Kenya's slum upgrading programme. The study focused on the challenges posed by existing conditions, the various elements developed to address these challenges and the initial emerging issues and successes. The study identified a number of challenges in the implementation of the Kibera Soweto East slum upgrading programme, which need to be mitigated before a meaningful slum upgrading programme. These are physical challenges due to overcrowding (between 800,000 and 1.2 million people living on 630 acres) and lack of infrastructure; challenges of historic ownership patterns with no clear land policy contributing to slum development and land tenure challenges; environmental challenges (hilly, steep terrains and water bodies surrounding the settlement inhibit its expansion); economic challenges with almost three quarters of Kibera's households earning less than KES 10,000 per month; social challenges arising from the lack of mistrust in the government who have previously promised to upgrade the slum; and city governance challenges.

The study revealed that the government has already set up strategies to secure tenure status for the residents, improve community participation and housing development and improvement, and lastly set up a slum upgrading fund where the residents could get monetary resources to upgrade their dwellings. The study recommended enhancement of community participation; putting security of tenure on the fore front of any upgrading; efforts to understand the complexities of slum and city interconnections; and inclusion of poverty alleviation as one of the components in the programme.

1.7.3 Regulatory and policy framework

This section presents the global and national regulatory and policy framework that may influence, in one way or the other, slum upgrading efforts in Kenya. These are: (1) the global Cities Without Slums Action Plan; (2) Agenda 21; (3) Kenya's Vision 2030; (4) Sessional Papers on housing; (5) Sessional Paper No. 6 of 1999 on Environment and Development;

(6) National Environmental Action Plan of 1994; (7) Environmental Management and Co-ordination Act of 1999; (8) Water Act of 2002; (9) Public Health Act; (10) Local Government Act; and (11) the Physical Planning Act.

The Cities Without Slums Action Plan

The Cities Without Slums Action Plan is a joint effort between the World Bank and UN-HABITAT. The aim of the Action Plan is to help developing countries eradicate slums and mitigate the undesirable long term health conditions of the large and small cities. The Action Plan targets slum upgrading as opposed to forced evictions. It argues that with successful slum upgrading efforts, three vital processes occur simultaneously over time: the slum dweller becomes the citizen, the shack becomes the house and that the slum becomes the suburb or neighbourhood (Onyango et al 2005).

The Plan highlights six key actions that are necessary to meet its goal:

1. Strengthening in-country capacity by restructuring policy, regulatory, operating frameworks and legal or technical constraints; overcoming institutional bottlenecks; encouraging local commitment and resolve, including political understanding; and strengthening learning and training.
2. Preparing national and city upgrading programs by helping committed countries design upgrading programs to scale.
3. Supporting regional and global knowledge and learning that capture and share the varied approaches and local practices to get the job done better with the full involvement of the affected communities; organizing networks of practice; and fielding specialists to help countries and cities move to scale.
4. Investing in slums with appropriate basic infrastructure and municipal services identified, implemented and operated with the community.
5. Strengthening partner capacity to focus attention on the task, with emphasis on the resources, knowledge and tools to help governments and communities do the job well and at scale.

6. Leadership and political buy-in by the partners of the alliance to prioritize slum upgrading.

The Agenda 21

The Rio declaration for environment and development (1992) popularly known as the Agenda 21 is a programme of action highlighting the need to put human beings at the centre of any sustainable development. Human beings are the primary factors who control the well being of a particular environment, thus are entitled to a healthy environment where, among others, wastes are discharged and disposed off sustainably and water provision is reliable and portable (UNCED 1992). Most of the slums in sub-Saharan Africa are characterized by poor environmental conditions, including inadequate provision or lack of water and sanitation facilities.

Kenya Vision 2030

One of the objectives of Kenya's vision 2030 is to provide the country's population with adequate and decent housing in a sustainable environment. It argues that improvement in the quality of life of all Kenyans – the supreme goal of the vision – cannot come about if large sections of both the rural and urban populations are inadequately housed (Kenya 2007a). Presently, the Kenyan urban housing sector is characterized by large slums with poor sanitation, poor provision of water, poor quality of life, overcrowding, dense population and lack of privacy – all these conditions far much worse than in some rural areas. Furthermore, informal settlements houses about 60% of the urban population (Kenya 2007).

The Vision identifies two key challenges in urban development and housing: (1) inadequate capacity for urban and regional planning which leads to the emergence and proliferation of unplanned settlements; and (2) concentration of property development in the high-income residential areas. In view of these two key challenges, the vision proposes that the following projects be the principle vehicles for achieving housing and urbanization targets by 2012:

- Preparation and implementation of strategic development and investment plans in six metropolitan regions, namely, Nairobi, Mombasa, Kisumu-Kakamega, Nakuru-Eldoret,

Wajir-Garissa-Mandera, and Kitui-Mwingi-Meru. Similar plans will also be developed for special border towns and all other municipalities. KENSUP falls under this category.

- Position the city of Nairobi as an all-round globally competitive city in business and in tourism, and provide a high quality of life to all its residents. This aims at turning Nairobi into a 24 hour economy – the informal settlements included.
- Prepare a national land-use plan to facilitate better urban planning.
- Install physical and social infrastructure in slums in 20 urban areas to formalize slums while also permitting construction of permanent houses which will attract private investment.
- Produce 200,000 housing units annually by 2012 through a mixture of initiatives in order to fill the huge housing gap in the country.

Sessional Papers on housing

Kenya has had two important Sessional Papers on housing: the *Sessional Paper No. 5 of 1966/67 on the Housing Policy for Kenya* and the *Sessional Paper No. 3 of 2004 on the National Housing Policy*. After independence many more people migrated to the urban centres, especially Nairobi. This worsened the housing situation. The *Sessional Paper No. 5 of 1966/67* passed to address the problem. The Policy (Kenya 1966) recommended *inter alia* that the government:

- Adopt building standards that are commensurate with the people's economic conditions.
- Conduct research on cheaper building materials and incorporate self-help policies into housing production.
- Move away from colonial policy of bed-space provision.
- Integrate the roles of the public and private sectors in housing production.

For a long time, these general recommendations have guided the urban housing sector in Kenya. However, the performance of the housing sector, particularly the low-income sub-sector, has not been very encouraging (Macoloo 1998). According to Kenya (2007: 28):

Despite these interventions, the Kenyan housing sector is characterized by lack of affordable and decent rental housing options, low-level of urban homeownership of about 16%,

extensive and inappropriate dwelling units including slums and squatter settlements. It is estimated that a total of 150,000 housing units are required annually, yet only an estimated 35,000 are produced every year. The shortage of housing for low-income households is particularly acute in urban areas. Out of all housing units produced annually, only an estimated 6,000 units or 20% of the total number caters for this group. Inadequate production of low-income housing is due to lack of infrastructure and under-investment by both the public and formal private sectors.

These challenges have led to the recent *Sessional Paper No. 3 of 2004* on the national housing policy. This Policy (Kenya 2004) calls for:

- Developing and implementing the national housing policy and pursuing the enactment of an Act on housing to regulate the housing sector.
- Formulating and implementing the national housing development programmes to actualize the national housing policy.
- Promoting research and dissemination information on appropriate and low-cost materials, techniques and best practices.
- Coordination and the implementation of the Kenya Slum Upgrading Programme by involving stakeholders.
- Implementing the civil servants housing scheme.
- Harmonizing various by-laws and regulations inhibiting housing delivery.
- Review of tenancy legislation to harmonize with government policy on rental housing within the context of sustained rational economic and social development.
- Promoting effective private participation in construction of housing for middle and low-income groups.

In other words, the Policy directed the government to provide the maximum number of people with adequate shelter and a healthy environment at the lowest possible cost. The Policy has adopted an enabling strategy, guided by the principles of partnership and participation – some of the pillars in KENSUP. It is important to note that the Policy was a

response to the national housing strategy for Kenya of 1987-2000 (Kenya 1987). The Sessional Paper is expected to form the foundation of the national housing policy.

In addition, the national housing development programme of 2003-2007 (Kenya 2003) acknowledged the need to address housing development issues in the slums, especially infrastructure. To achieve this, the programme advocated for:

- The review of infrastructural standards to enable access to poor neighbourhoods.
- The facilitation of local authorities to access the requisite financial resources to finance the installation of basic services.
- The promotion of public private partnerships.
- The adoption of a labour intensive infrastructure development approach which includes use of local materials.

Sessional Paper No. 6 of 1999 on Environment and Development

The *Sessional Paper No. 6 of 1999 on Environment and Development* (Kenya 1999) focused on ways of ensuring that any sustainable development catered for the needs of the environment. It was a call for all ministries and developers to ensure, maintain, safeguard and preserve the integrity of the environment as they make their wealth and lead the country forward to be competitive in the new millennium. Some of the propositions put forward in the Paper are:

- Advocating for the rebirth of environmental impact assessments for any urban development project in order to relegate development to less fragile ecosystems while ensuring a sustainable relationship between human settlements and the environment.
- The need to upgrade and improve unplanned settlements and slum areas through the provision of basic services.
- The promotion of development strategies to ensure proper management, care and protection of the urban environment.
- The promotion of public awareness on the need for proper management and protection of the urban environment.

- The need for creating an enabling environment in which the central government, local authorities, financial institutions, private sector, community based organizations and individuals collaborate in creating an urban culture to manage, care, and protect the environment.
- The need for continuous education training programmes for the central government, local authorities and the local communities in urban environmental planning and management, as well as initiating public awareness campaigns amongst urban dwellers aimed at increasing their responsibility and care of the environment.

The National Environmental Action Plan of 1994 and 2009

Following the 1992 Earth Summit which called for nations to look for ways of embracing sustainable development, Kenya developed its first National Environmental Action Plan (NEAP) in 1994 (Kenya 1994) and a second one in 2009 (Kenya 2009). The Action Plans highlight priority themes and activities for the country towards achieving sustainable development. Since environment is linked to development, well-being of people and their social status, the Plans address environmental issues from various sectors in an integrated manner with the aim of planning to achieve sustainable development.

The Plans also propose a strategy to achieve the MDGs, Kenya's Vision 2030 and the Medium Term Plan of 2008-2012. A number of proposed interventions, legal and institutional framework have come forth from the Plans which need to be incorporated into sectoral development plans and programmes. The implementation of these Action Plans is being monitored through the annual state of the environment reporting.

They also aim to provide a broad framework for the coordination of environmental activities by all actors, i.e. private sector and government, to guide the course of development activities. The Plans acknowledge that human settlements have a lot of environmental pollution caused by the huge amount of waste generated, especially in the urban areas, and as a consequence the human health of the population is threatened.

Environmental Management and Co-ordination Act of 1999

The Environmental Management and Co-ordination Act of 1999 (Kenya 1999) provides for the establishment of an appropriate legal and institutional framework for the management of the environment and any matters relating to it. It recognizes that the environment constitutes the foundation of national, economic, social, cultural and spiritual advancement. Hence it coordinates the various institutions tasked to regulate various sectors. These are referred to as lead agencies, which in Section 2 are defined as any government ministry, department, parastatal and state corporations or local authority in which any law vests functions of control or management of any element of the environment or natural resource.

The Act states that “every person in Kenya is entitled to a clean and healthy environment” and if the person deems that any development near him/her is injurious s/he can apply to the High Court to prevent, stop or discontinue any act or omission deleterious to the environment. The Act also requires that any development be subjected to an environmental impact assessment and in relation to a river (like in the case of Kibera), there needs to be written approval to erect or construct structures near the river bed. The Act goes further to apply the principle of sustainable development, as well as the principle of public participation in development of policies, plans and processes for the management of the environment.

It prohibits the discharge of any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or dumping into the aquatic environment. These safeguards the integrity of water so that it remains unpolluted, free from free flowing human and animal waste, which should be treated before being discharged into the aquatic ecosystems. For the local authorities, operating sewerage systems need to have an effluent discharge license, which can be can be revoked at any time if it contravenes the prescribed operations (Section 72-76). The Act also prohibits noise and only gives license to organizations/individuals for three months to minimize the noise production levels.

The Water Act of 2002

The Water Act 2002 provides the legal framework for the implementation of the water sector reforms based on the following guiding principles (Kenya 2002; Owuor & Foeken 2009):

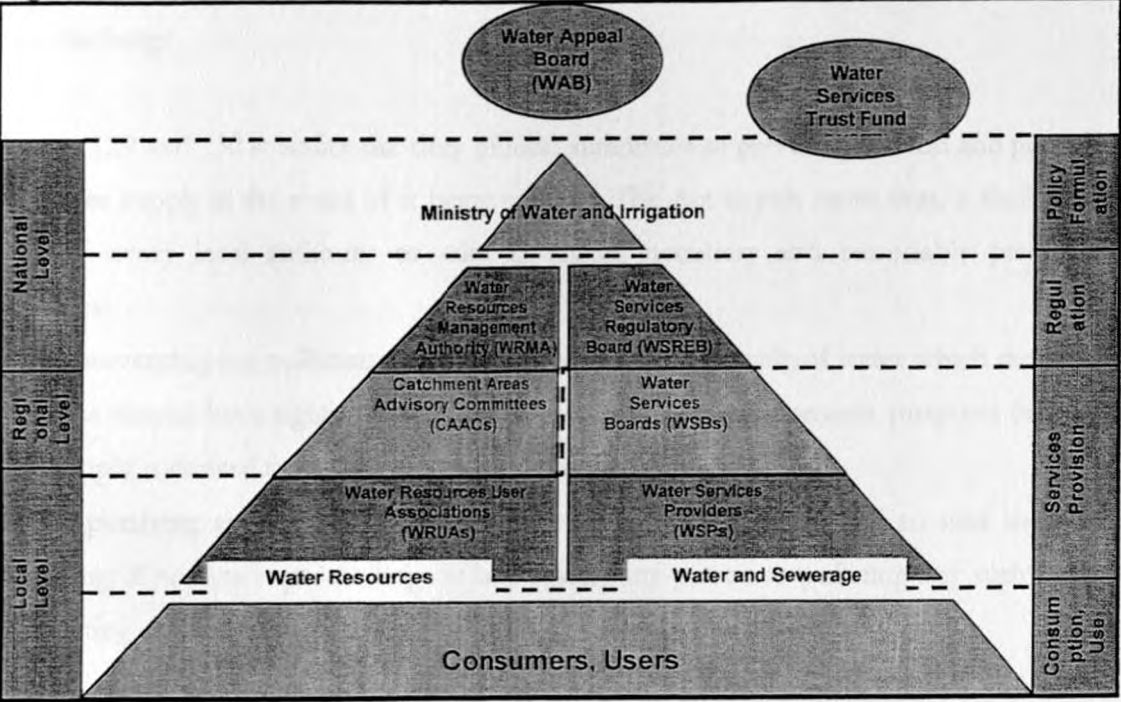
- The separation of water resources management from water supply and sewerage services.
- The institutional separation of policy formulation, regulation and service provision functions.
- Decentralisation, participation, autonomy, accountability, efficiency, affordability and sustainability. For example, *decentralisation* of services to the regional and local levels, i.e. to the Water Services Boards, Water Service Providers, Catchment Areas Advisory Committees, and Water Resources Users Associations; *participation* of all the stakeholders; financial and operational *autonomy* of the Water Service Providers; and financial and ecological *sustainability* in the management of water resources.
- Institutionalising support to the financing of water services for under served areas, i.e. the Water Services Trust Fund.
- Establishing mechanism for handling disputes in the water sector, i.e. the Water Appeal Board.

The Act aims at addressing the weaknesses that face(d) the water sector by separating policy functions from regulation and services delivery. It further separates service delivery functions into asset holding (ownership) and investment and direct water and sewerage services provision. Figure 1.1 presents the 'famous triangle' summarising the institutional set-up of water sector reforms under the Water Act 2002.

It is expected that the clear roles and responsibilities defined to sector actors will result in improved water sector performance. At the policy formulation level the sector reforms are expected to improve coordination in the water sector, enhance clear policy accountability, and give more attention to water resources management. At the regulation level the sector reforms are expected to set in place a clear regulatory framework, enhance monitoring and evaluation, and improve performance of water undertakers. Lastly, the expected outcomes at

the service provision level include improved management of water resources (quantity and quality), ability to attract and retain skilled manpower, improved and efficient service delivery, increased coverage, ability to attract investments, and improved infrastructure (Owuor & Foeken 2009).

Figure 1.1: The institutional set-up of Water Act 2002



Source: Owuor & Foeken (2009)

The Public Health Act

The Public Health Act (Cap 242) (Kenya 1986) has provisions for safeguarding the well-being and health status of the population. It has various sub-sections dealing with habitable dwellings, public water supplies, food, sleeping quarters, and materials for construction, among others. The Act aims to safeguard the quality of life of the people and bring it up to fit-for-life status. It creates provision for securing and maintaining health. Section 116 of the Act specifies the duty of local authorities to maintain cleanliness and prevent nuisance. It stresses on prevention of water pollution by any waste and provision of human waste disposal facilities which should be kept clean.

Section 118 warns the public not to discharge raw sewage into a public water source and spells out acts that are nuisances and are punishable by law. Section 118 1 (e) deems to be a nuisance any noxious matters or waste water, flowing or discharged from any premises, wherever situated, into any public street or into the gutter or side of any street, or into any mullah or water course, irrigation channel or bed thereof not approved for the reception of such discharge.

Section 129 and 130 specifies the duty of local authorities to prevent pollution and purifying any water supply in the event of it being polluted. The Act in part states that, it shall be the duty of every local authority to take all lawful, necessary and reasonably practicable measures:

- (a) for preventing any pollution dangerous to health of any supply of water which the public within its district has a right to use and does use for drinking or domestic purposes (whether such supply is derived from sources within or beyond its district); and
- (b) for purifying any such supply which has become so polluted; and to take measures (including, if necessary, proceedings at law) against any person so polluting any such supply or polluting any stream so as to be a nuisance or danger to health.

Part XII, Section 136, states that all collections of water, sewage, rubbish, refuse and other fluids which permit or facilitate the breeding or multiplication of pests shall be deemed nuisances under this Act. This part seeks to guard against the breeding of mosquito – a cause of malaria. In view of this, it prohibits actions that will lead to making water polluted. For example, bathing, washing of clothes or other articles or of animals in, or in any place draining into, any water supply or erecting dwellings and sanitary conveniences that drain to public water supply which is used for drinking or domestic purposes.

Local Government Act (Cap 265 of 1998)

This Act has vested powers to local government authorities to provide housing, sewerage operations and garbage dumps, execute sewerage and drainage works on land, and oversee

sustainable urban growth. The Act provides the regulating framework in which the municipal councils, town councils and urban councils carry out their operations. Of interest to the present study are Sections 144, 169, 170, 176, 177 and 178. Sections 144 and 177 provide general guidelines on land acquisition and erection of housing units, while sections 160, 169, 170, 173, 176 and 178 deals with water and sewerage. Section 144 vests powers on the local authority of a particular area to lease, let or acquire compulsorily any land for its functions and purposes which are deemed to be public purposes. It has the authority to grant any person jurisdiction over a piece of land so long as the authority approves the functions that the land will be subjected to.

Section 160 helps local authorities to ensure effective utilization of sewage systems. It states in part that municipal authorities have powers to establish and maintain sanitary services for the removal and destruction of, otherwise deal with kinds of refuse and effluent and where such services is established, compel its use by persons to whom the services is available. However, to protect against illegal connections, Section 173 states that any person who without prior consent in writing from the council erects a building or excavates or opens-up; or destroys a sewer, drain or pipes shall be guilty of an offence. Any demolitions and repairs thereof shall be carried out at the expenses of the offender.

For purposes of providing proper housing, Section 177 states that a municipal council, town council or an urban council may, subject to any written law relating thereto:

- (a) Lay out building plots or otherwise subdivide any land acquired or appropriated by it, whether within or without its area, for the purpose of housing schemes for the inhabitants of its area;
 - (b) Erect and maintain dwelling-houses with their appurtenant outbuildings on such plots or subdivisions of land; and
 - (c) Convert buildings into dwelling-houses and alter, enlarge, repair and improve the same
- (Kenya 1998).

Section 169 sets out regulations on carrying out drainage or sewerage works in the local authority area and outside its boundaries. The local authority should lay the pipes in a manner which will ensure the effective disposing of sewerage and drainage in an area and see to its maintenance. In addition, the local authority is given power to access private property for purposes of inspection and repair of sewers, drains, pipes, ventilating shafts or other conveniences for the disposal of sewage or drainage (Section 170).

Further on, Section 176 gives each municipal council, town council, or an urban council power to regulate sewerage and drainage connections between private properties and the main sewer lines of the council concerned, while Section 178 and 180 gives the councils mandate to supply, establish, acquire and maintain works for the supply of sufficient water within its area as long as the authority considers the supply to be necessary, practicable and reasonable.

Physical Planning Act (Cap 286 of 1996)

This Act was enacted to provide for the preparation and implementation of physical development plans. It vests powers on local authorities to ensure orderly development, regulate zoning, control and prohibit the subdivision of land into small and un-economic sizes. Thus any development done in an area has to be approved first by the local authority in charge. The development could be any material change in the use or density of any buildings or land subdivision or erection of buildings or carrying out maintenance works that exceed 10% of a building's floor area or carrying out works on a road reserve.

Section 16 (1) has provision for the Director of Planning to make physical development plans with reference to any government land, trust land or private land within the area of local authority for the purpose of improving the land and providing for the proper physical development of such land. It also ensures securing suitable provision for transportation, public purposes, utilities and services, commercial, industrial, residential and recreational areas, including parks, open spaces and reserves, as well as making of suitable provision for the use of land for building or other purposes.

Section 16 (2) of the Act states that for the purposes of sub-section (1), a regional physical development plan may provide for planning, re-planning, or re-constructing the whole or part of the area comprised in the plan, and for controlling the order, nature and direction of development in such area. Section 29 continues to vest powers on the local authorities to:

- (a) Prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area.
- (b) Control or prohibit the subdivision of land or existing plots into smaller areas.
- (c) Consider and approve all development applications and grant all development permissions.
- (d) Ensure the proper execution and implementation of approved physical development plans.
- (e) Formulate by-laws to regulate zoning in respect of use and density of development.
- (f) Reserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical development plan.

Section 30 states that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial, industrial use or occupation of any building without a development permission granted by the respective local authority. If the local authority is of the opinion that the proposed development activity will have injurious impact on the environment, the developer shall be required to submit together with the application, an environmental impact assessment report.

1.7.4 Examples of past slum upgrading efforts in Nairobi

This section reviews two notable slum upgrading programmes in Nairobi's informal settlements. These are Mathare 4A upgrading programme and Korogocho slum upgrading programme.

Mathare 4A upgrading programme

Mathare is another larger slum area in Nairobi, with all the common characteristics of a slum (Kenya 1992; Ngari & Kamanu 2002). Mathare 4A upgrading programme was initiated in 1992 following an agreement between the Government of Kenya, the German Government and the Catholic Archdiocese of Nairobi. The programme, covering 3 hectares of the larger Mathare informal settlement, was geared towards upgrading the living environment of the slum dwellers by improving their housing conditions, sanitation situation, accessibility and security of tenure. These were to be achieved through construction of low cost houses, improvement of community facilities and support to income generating activities.

Following the success of the initial stage, a separate agreement was entered, in 1997, to cover the remaining 17 hectares of the settlement – under the implementation of the Archdiocese of Nairobi. During the initial piloting stage, 1,500 new rooms made of stabilized soil blocks were constructed – replacing the temporary ones – and 1,700 households (approximately 11,000 people) had access to portable water, sanitation facilities, roads, footpaths, street lighting and garbage collection points (Ngari & Kamanu 2002).

The second phase, envisioned to cover 4,300 households, started in March 1997 and was to end in December 2001, but due to various challenges, it has not been completed yet. Some of the challenges include:

- a) Dissatisfaction of the structure owners. They were not allocated land which they thought that they should get out of equity.
- b) Tenants did not want to pay rent at all on the improved houses. They doubted the genuineness of the financier.
- c) Political interference and negative media coverage causing project delays and bloody conflicts between residents and Nairobi City Council.
- d) Overcrowding of people and structures interfered with implementation schedule.

In addition, there were various conflicting interests, not taken into account during the planning stages. These led to dissatisfied “stakeholders” inciting the residents, leading to

perpetual infighting, suspicion and mistrust – hence difficult to reach consensus on any matter. However, the programme succeeded in:

- a) Improved sanitation, security and environmental quality
- b) Better standards of living
- c) Better housing, using appropriate technology
- d) Improved infrastructure
- e) Capacity building among residents

Korogocho slum upgrading programme

Slum upgrading in Korogocho in Nairobi has had a history of failure, although it is now being revived through a more participatory process. The previous attempts were thwarted by political and individual interests. The structure owners insisted that they deserved to get allotment letters to develop proper houses. On the other hand, the tenants demanded that they are ones who deserve the allotment letters, irrespective of whether they are structure owners or not. Any attempt to upgrade Korogocho has been made slower by these two opposing voices and interests. At one time, the structure owners have been in court seeking an injunction to stop the government from commencing any slum upgrading programmes in Korogocho until they are heard (Personal Communication, July 2010).

The structure owners formed an association – Korogocho Owners Association (KOA) – to have a stronger union with a bigger bargaining power. They staged a series of demonstrations which stopped any upgrading initiative. They wanted to force the government to follow their wishes which was to continue “owning” Korogocho, yet the tenants were not comfortable with this. This led to the formation of a group called “settlement”, which comprised of tenants in the area, who were fighting for their rights and claiming ownership of the settlement, so creating a further deadlock. Some villages in the settlement also claimed that they did not need any infrastructure since what they had was adequate, they only needed allotment letters.

However, in the recent past, there has been a newer attempt by the government to do upgrade the slum. This is through a debt swap between the Government of Kenya and the Government of Italy. The programme – Korogocho Upgrading Programme – seeks to improve the lives of slum dwellers in line with the MDGs through improving their living and working conditions. This newer attempt has so far succeeded because of coordinated support from the community to provide security of tenure through the Community Land Trust (CLT) method and the initial improvements of the physical, economic and social living conditions of the Korogocho communities.

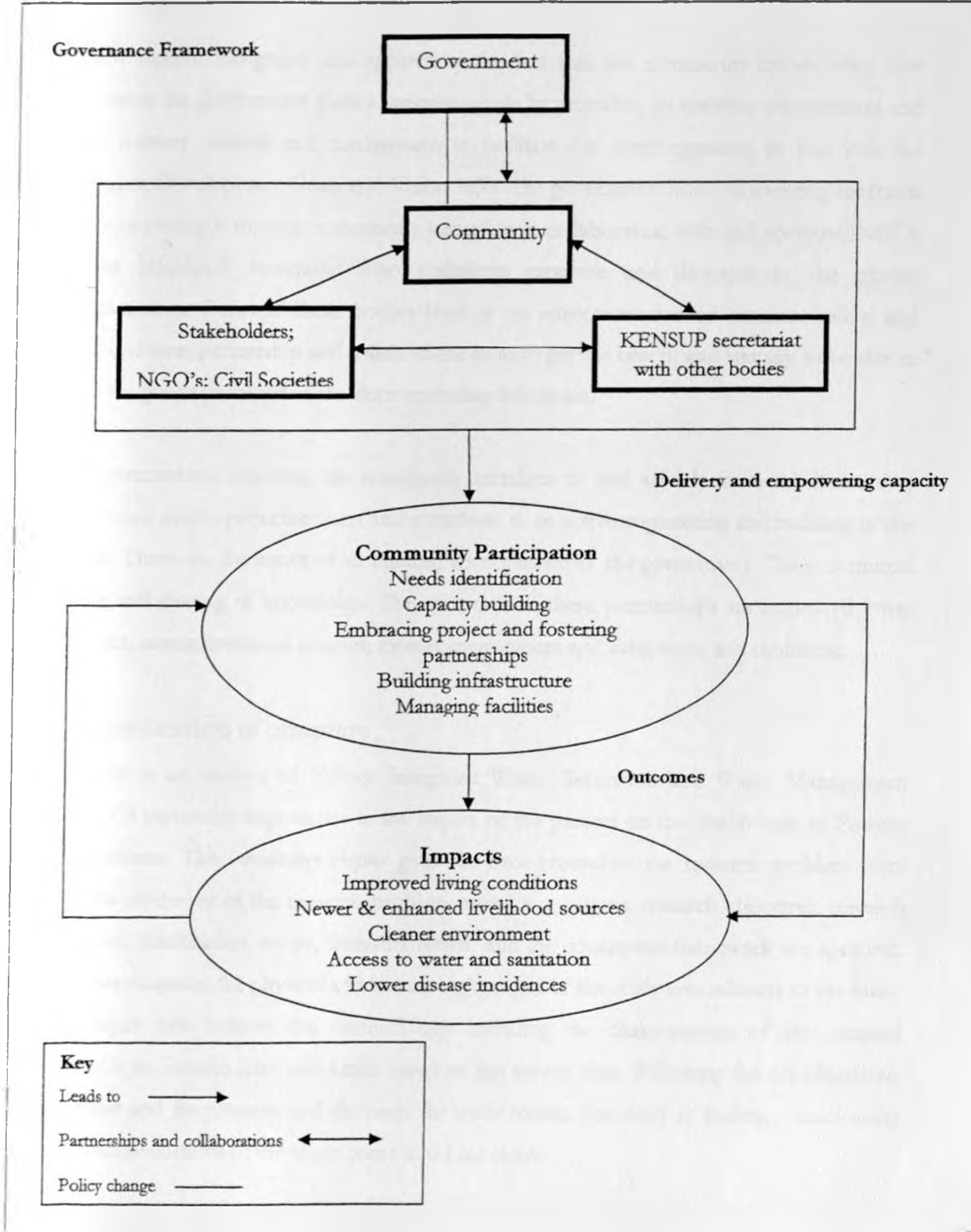
A variety of actors have been involved in this newer initiative: the community itself, community-based organizations, faith-based organizations, the UN-Habitat, the Government of Kenya (Ministry of Finance, Ministry of Local Government, Ministry of Housing, Ministry of Lands, Ministry of Nairobi Metropolitan, Office of the President and Provincial Administration) and the Nairobi City Council.

1.8 The conceptual framework

The unprecedented rapid urban growth brings with it challenges which are common but also unique in individual countries and cities. The rapid urban growth in Africa has led to increased demand for housing; inadequate provision of infrastructure and services; urban poverty and unemployment; as well as environmental degradation. As such, various coping mechanisms have been adopted. Some of these include living in the only affordable areas – the slum – and therefore the proliferation of these informal settlements. It is because of the persistent and inevitability of slums that most governments in Africa are now embracing the slum upgrading programmes. Figure 1.2 presents the conceptual framework of this study.

To empower the lives of 100 million slum dwellers in 2015, as MDG 7 goal 11 advocates, Kenya has decided to empower the community to take responsibility of the slum upgrading in the locality that they live in. This is through a policy change where public private partnership is being emphasized.

Figure 1.2: The conceptual framework



Source: Author (2010)

The government recognizes and appreciates the fact that the community knows what they want, hence the government plays a supporting role by providing an enabling environment and service delivery vehicles and mechanisms to facilitate the slum upgrading in line with the Millennium Development Goals and Vision 2030. The government is key in sourcing for funds and administering it through community leadership in collaboration with civil societies, NGOs and the KENSUP secretariat who contribute expertise and direction in the project implementation. Between these bodies there is an interconnection of communication and correspondence, partnership and collaboration so as to get the best fit and strategy to be able to deliver the goods promised in the slum upgrading document.

These partnerships empower the community members to feel actively involved; hence they identify their needs, prioritize them and contribute to an active engineering and building of the facilities. These are the result of an enabled environment by the government. There is mutual learning and sharing of knowledge. The outcomes of these partnerships are improved living conditions, newer livelihood sources, cleaner environment and safer water and sanitation.

1.9 Organization of chapters

This study is an analysis of Kibera Integrated Water, Sanitation and Waste Management Project. Of particular importance is the impact of the project on the livelihoods of Soweto East residents. The *introductory chapter* gives the back-ground to the research problem from which the statement of the research problem, research questions, research objectives, research hypotheses, justification, scope, literature review, and the conceptual framework are spelt out. *Chapter two* discusses the physical and human background of the study area relevant to the study, while *chapter three* outlines the methodology, including the characteristics of the sampled households in Soweto East and Lindi based on the survey data. Following the set objectives, *chapters four and five* presents and discusses the study results. Summary of findings, conclusions and recommendations of the study come in the *last chapter*.

CHAPTER TWO

THE STUDY AREA

This chapter presents background information of the study area – Kibera – in terms of its geographical characteristics, historical background, and demographic and socio-economic characteristics. The chapter will then present background information on Soweto East village where the Kibera Integrated Water, Sanitation and Waste Management Project is being implemented. It will also give an overview of Lindi village – an area in Kibera with similar characteristics but without water, sanitation and waste management intervention, which was used in this study for comparative purposes.

2.1 Kibera

2.1.1 Geographical characteristics

Kibera is the largest informal settlement in Kenya and in Africa as a whole. It is located to the south-east of Nairobi, 7 kilometres from the city centre. The settlement covers an area of about 262.5 hectares (Orwa 2009) in Langata division (administratively) and Langata constituency (politically). It is bordered by the Royal Golf course, Ngumo and Magiwa estates to north, Mutuini River to the south, Ayany and Fort Jesus estates to the west and Nairobi Dam estate to the east (Jurgen 2002; Orwa 2009). The Kenya-Uganda railway passes through the settlement, splitting it into two – the old and new Kibera. Kibera lies at an altitude of 1680 meters above sea level with an average annual rainfall of 855 mm. Flash floods are common in the area due to its sloping terrain, causing intense erosion, especially along the river banks. Most of the original vegetation has disappeared due to the densification of the area (Jurgen 2002).

2.1.2 Historical background

The origin of the settlement can be traced back to the colonial era, where slums essentially developed because of a range of factors such as the displacement of Africans to make room for European settlers; the colonial government policy of racial segregation; clearance of

substandard housing; and contemporary factors such as economic, legal and cultural factors associated with rural to urban migration.

In the pre-colonial era, Kibera was a grazing land for the Maasai, but was taken by the colonial government before World War II as a military reserve. From 1913 to 1928, Kibera was a military reserve administered by Kings African Rifles (KAR). The reserve was later given to the Nubians who served as soldiers and police functionaries for the British (Jurgen 2002; Orwa 2009). The area acquired the name Kibera from a Nubian word 'Kibra' meaning forested, since the area was wooded (Muthoni 1999; Orwa 2009). In 1933, the Carter Land Commission recommended a gradual eviction and compensation of the residents so that the settlement could be done away with. However, this was not successful but set the precedence for uncertainty of land use in Kibera, tension and insecurity among the residents. The land is therefore government owned but the Nubians lay claim on it based on equity rather than ownership.

Although the Nubians were the first settlers in Kibera, the settlement started to receive immigrants from other parts of the country. For example, the Mau Mau activists from central province joined the area in the 1940s, while the Luo and Luhya came in 1950s, after the demolition of Mathare Valley slums by the colonial authorities. With this influx into Kibera, the Nubians took advantage of the immigrants and extended their houses or built new houses for rental purposes. This was the beginning of landlordism in the informal settlement. The population concentrated around Makina village and up to 1960s Kibera was characterized as a Nubian controlled area with an emerging small scale rental sector (Jurgen 2002; Orwa 2009).

After independence there were fewer restrictions on migration into the city and the result was twofold: more people built self squatter units as they could not afford to pay rent and more rental units were built by the Nubians in the area. The National Housing Corporation of Kenya also used part of the land in Kibera to develop low cost formal rental housing estates. By 1972, the population had grown to 17,000 people from 600 in 1928 (Jurgen

2002). This consisted of the Nubian landlords, tenants and squatters who had started to settle in the fringes of the settlement.

The land rights were not clear and had to be classified first before any further development could take place. The Ministry of Lands and Settlement had to interpret the agreement entered by the Nubians and colonial government because there was tension between the independent Kenya government and the Nubians. It was decided that the Nubians keep the rights to their housing but not to the land. In short, the Nubians lost the little rights they had over land in Kibera. Since then the government has formally owned the land (Jurgen 2002; Orwa 2009).

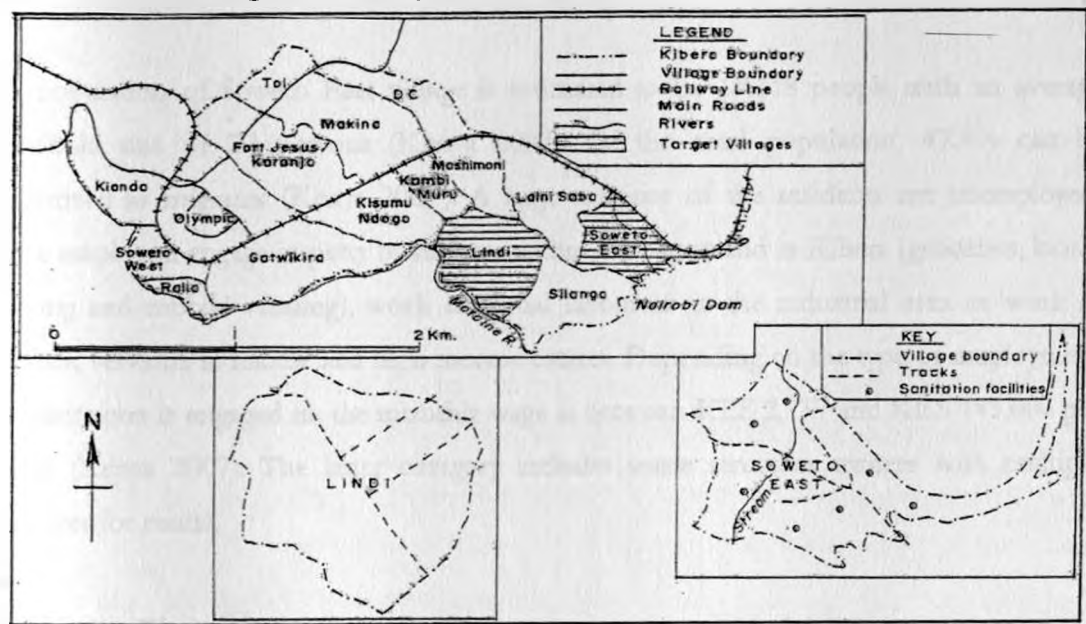
2.1.3 Demographic and socio-economic characteristics

The population of Kibera is estimated to be between 800,000 and 1,000,000 people with a population density of 4,000 people per hectare (Kasili et al 2009), making it one of the most densely populated informal settlement in Kenya. The high density is due largely to high occupancy rates of about 4-5 people living in a single 10 by 10 foot room. Kibera has close to 20 ethnic communities living in 12 villages (see map 2.1). These villages are Kianda, Raila, Mashimoni, Makina, Lindi, Laini Saba, Soweto East, Soweto West, Gatwikera, Kisumu Ndogo, Silanga/Undungu and Kambi Muri.

Like other informal settlements in Nairobi, Kibera lacks basic water and sanitation services. Over three quarters of the residents (79%) buy water and the cost is reportedly high with an average daily expenditure of KES 13.40, with the poorest people being exploited by the water vendors (GOK/UN-HABITAT 2004). Pit latrines are common in the area, more often than not, in poor conditions, inadequate and overused. It is estimated that up to 75 people use one pit latrine. The better maintained pit latrines are used at a fee of KES 2 to 5 per visit or KES 10 to 20 per month, per person (Mitullah 1999; Jurgen 2002). As such, the main coping mechanism is the famous “flying toilets” (GOK/UN-HABITAT 2004).

Kibera residents have diverse livelihood sources: petty businesses, hawking, retailing, manufacturing, construction, transport, rental property and personal services, barber shops, hair salons and laundry shops (Jurgen 2002). These businesses, combined with other sources of livelihoods, are key to the households' survival in the settlement. Since Kibera is unplanned, there is no formal road network except for foot paths and narrow alleys that provide access to the dwellings with the main mode of transport being non-motorized.

Map 2.1: Kibera villages and study area



Source: Author (2010)

2.2 Soweto East village

As mentioned above, Soweto East is one of the villages in Kibera and that it is where the Kibera Integrated Water, Sanitation and Waste Management Project is being implemented. The village borders the Kenya-Uganda railway line to the north, Mbagathi Way to the east, Kibera Highrise estate and Nairobi dam to the south east, and Lindi to the west (see map 2.1). Soweto East village covers an area of about 21 hectares of which 7 hectares are “demarcated” for railway reserve – yet people have still built their structures and live there.

It is estimated that there are a total of 2,434 structures in Soweto East of which 650 are in the railway reserve (Kenya 2007; Mulcahy 2004). The structures include all habitable dwellings, water tanks, stand points, bathrooms, kiosks and all other built structures. Over two-thirds (69%) of the structures are for residential purposes, 20% are for commercial purposes, while the rest (11%) are for other miscellaneous uses such as health facilities, schools and churches (Kenya 2007). There are 7,748 households in Soweto East village. Contrary to what many researchers think, 72% of the structure owners live in the village. Most of the tenants pay an average of KES 726 per month a single room (Kenya 2007).

The population of Soweto East village is estimated to be 19,318 people with an average household size of 2.3 persons (Kenya 2007). Of the total population, 47.4% can be categorized as migrants (Kenya 2007). A large majority of the residents are unemployed. Those employed engage in petty businesses within the estate and in Kibera (groceries, kiosk, hawking and mobile vending), work as casual labourers in the industrial area or work as domestic servants in middle and high income estates. Depending on the type of employment or activity one is engaged in, the monthly wage is between KES 2,737 and KES 145,000 per month (Kenya 2007). The latter category includes some structure owners with multiple structures for rental.

2.3 Lindi village

Lindi has an estimated population of 15,000 people, Muslims and Christians. They earn their livelihoods through casual-daily-wage jobs in the neighbouring industrial area and petty trade (tailoring, carpentry, open air stalls and food vending) in the neighbourhood of Lindi and the larger Kibera. In general, socio-economic characteristics of Lindi are the same as the larger Kibera (Sikolia et al 1999). Based on the fieldwork results, further characteristics of Soweto East and Lindi is discussed in the next chapter.

CHAPTER THREE

METHODOLOGY

This chapter describes the methods used in data collection and analysis. According to Mugenda & Mugenda (1999), the steps involved in conducting a research study should be clearly outlined to help other researchers in understanding one's study. To achieve this, the chapter describes the study set-up, sources and methods of data collection, sampling procedure, and data processing and analysis techniques.

3.1 The study set-up

This study is part of a larger survey on *"Governing African cities: The case of Dar es Salaam (Tanzania) and Nairobi (Kenya)"*. It is a comparative analysis of the dynamics of urban management and governance in the two cities in terms of three pre-identified themes: informality, identity and governance. The programme involves researchers and postgraduate students from various institutions in France, University of Nairobi in Kenya, Ardhi University and Dar es Salaam University, both in Tanzania. This research is part of the informality theme group on *"A comparative study of the role of community participation in the upgrading of informal settlements in Dar es Salaam and Nairobi"*. It follows therefore that the choice of the study area and the scope of this study are within the larger project's aims and objectives.

3.2 Sources and methods of data collection

The study used both primary and secondary data to achieve its three specific objectives. The collection of primary data involved the use of the following procedures:

1. Direct field observation by the researcher and recorded by the use of a field note book and camera.
2. Personal interviews of randomly selected households using a standardized pre-coded questionnaire.

3. Informal interviews with relevant personalities and organizations (specifically, Settlement Executive Committee (SEC) members, the Kibera Integrated Water, Sanitation and Waste Management Programme (K-WATSAN) field officers, community leaders, a clinical officer in Soweto East village, the UN-HABITAT, Maji na Ufanisi, Pamoja Trust, Kenya Slum Upgrading Programme (KENSUP) secretariat, City Council of Nairobi, Department of Physical Planning of the Ministry of Lands, Civil Societies, Financial Institutions, Community Based Organizations (CBOs) and Faith Based Organizations (FBOs) in the study area).
4. Focus group discussions with the management of ablution blocks (four women and ten men) and SEC members (two women and seven men).
5. Attending KENSUP secretariat meetings.

On the other hand, the collection of secondary data involved reviewing and utilization of existing literature, government publications and maps relevant to the study problem. It is important to note that KENSUP secretariat, UN-HABITAT and Maji na Ufanisi have libraries rich with information on the project. Both the primary and secondary data were collected between July and November 2009.

3.3 Sampling procedures

As mentioned before, this study was carried out in two villages of Kibera: (1) Soweto East village where the Kibera Integrated Water, Sanitation and Waste Management Project is being implemented and (2) Lindi village which was largely used for comparative purposes. A workable random sample of 70 households in each village was selected for interviews. Even with a mathematical formula, there are no universal laws about the sample size (Mugenda & Mugenda 1999). However, guiding principles do exist. The sample sizes in the two villages were informed by a guided tour of the two villages as well as the available financial resources and time.

Random sampling of households in Soweto East village was done around the operational UN-HABITAT ablution or sanitation blocks: 10 households around the 7 sanitation blocks.

This was meant to capture, as much as possible, the “project households” in order to achieve the overall objective of this study of analyzing the Kibera Integrated Water, Sanitation and Waste Management Project. In Lindi, simple random sampling was done from a list of households obtained from the village elders.

The same questionnaire was administered in the both villages to capture various aspects such as household demographic characteristics (2009); household head migration history; access to water situation (2009); coping with water scarcity; access to water and household’s health situation; access to water and livelihoods; perceptions on access to water; access to sanitation situation; and house conditions and other amenities. However, Soweto East respondents had an additional set of questions focusing on the impact of K-WATSAN on their livelihoods. In both cases, the respondent was the household head, spouse or an adult member of the household. At the end, the study managed to interview 117 households – 56 in Soweto East and 61 in Lindi.

3.4 Data processing and analysis

3.4.1 Data processing

The return questionnaires from the field were checked in and subjected to a close scrutiny for inconsistencies and errors before coding and data entry in the presence of research assistants. A code book was designed and generated to translate the entries in the questionnaires to a spread sheet. The spreadsheet data were then converted to electronic form using Statistical Package for the Social Sciences (SPSS) interface data editor since SPSS was the main analysis platform. The resulting dataset was further subjected to cleaning based on the preliminary frequency distributions.

To derive quantitative information from dataset variables, which were mainly measured at nominal and ordinal levels, data mining was performed to extract quantitative information using Likert scale technique (see, e.g. Gordon 2003). An example of one of the questions is outlined below:

Table 3.1: Data mining

Raw Response	Old Value	Coded Response	New Value
Access to toilet	1	Water and Sanitation	3
Access to credit services	2	Monetary gain	1
Clean environment	3	Water and Sanitation	3
Reduction of diseases	4	Health benefits	2
Ease of access	5	Water and Sanitation	3
Less distance to facility	6	Water and Sanitation	3
Access to water	7	Water and Sanitation	3
Privacy in facilities	8	Water and Sanitation	3
Employment promotion	9	Monetary gain	1

Source: Fieldwork 2009

In the example above (Table 3.1), the raw responses were the qualitative results obtained from the questionnaires (nominal scale of measurement). To have a meaningful output, the most desired result in line with the K-WATSAN objective was given the value of “3” and the least desired result was assigned the value of “1”. The results were then assigned labels corresponding to categories in line with the. The new values were the quantitative values obtained, which could then be entered in an inferential statistical analysis procedure or be used in generating descriptive statistics.

3.4.2 Data analysis

At the preliminary stages statistical data was subjected to exploratory data analysis using statistical tools of descriptive measures including measures of central tendencies and dispersion to assist in accurate description of statistical data. The results of these analyses were presented in tabular form or in graph form.

To imply association or difference between the variables, some of the variables in the dataset were subjected to cross tabulations as contingency measures. Frequency distributions were performed to provide a better platform not only to describe the quantitative data but also to understand the dataset. The phi and Cramer’s V statistics were used as estimations of chi-square statistics and were used as measures of association and/or differences.

To test the study hypotheses, the mean scores of four variables were generated from the Likert scaling procedures (see section 3.4.1) and then used to measure the position on the Likert scale. The highest placing on the scale was considered most favourable while the lowest placing was considered least favourable. The results were used to make statements in relation to the study hypotheses.

Content analysis was used to interpret the qualitative data, relational analysis method utilized the community participation model (e.g. Daniel 1969, Botterill & Fisher 2002), and rapid appraisal technique to measure the level of community participation in the project. The parameters or indicators used in the community participation model include:

- a) Knowledge base: Whether the relevant community had better knowledge of the problem and a workable solution to it once the programme started being implemented.
- b) Numbers involved: It is assumed that involving the community would mobilize many more human resources than could be marshaled by the government acting alone. This was used as an indicator of whether the programme was government or community owned.
- c) Capacity building: Any participatory programme would build the capacity of the participants to tackle any future problems on their own.
- d) Sustainability: The programme was analyzed to see if the affected population would be able to continue with the programme once the implementing agencies leave the site.

The rapid appraisal technique involved mapping, ranking, diagramming and discussions – by the community. In mapping, the researcher was able to get information as to whether the community knew where the project was being implemented, their views about it, the opportunities and constraints that their new and old situation presented. The ranked information was largely on the levels of participation, what knowledge the community had acquired and issues related to the running of the UN-HABITAT facilities. In diagramming, charts were used to establish relationships between the various processes, stages and participation in project implementation, including leadership structure.

In addition, the Environmental Sanitation Index for Slums – ESI/S (Abiko 1995) was also used to derive indicators that could be used to identify and evaluate the sanitation situation in Kibera in a uniform manner. The index's specific objective is to periodically verify the general conditions of environmental sanitation in any upgraded slum. The sanitation condition is considered positive when the index is $85 < \text{ESI/S} \leq 100$; moderate when the index is $70 \leq \text{ESI/S} \leq 85$; and unsatisfactory when the index is $\text{ESI/S} < 70$.

The index uses six sets of indicators, namely, the water supply indicator (IAB); the sewage indicator (IES); the solid refuse indicator (IRS); the vector control indicator (ICV); the hydro resources risk indicator (IRH) and the socio-economic indicator (ISE). This study identified five indicators that were subjected to analysis: water supply, sewage, solid refuse (solid waste), vector control (health) and socio-economic (livelihoods).

3.5 Study limitations

The study experienced a couple of limitations due to the nature of the study and time constraints. The study was not able to capture the perceptions of the respondents from Lindi on water safety, availability and reliability, since most of the respondents could not identify with the sources listed by the researcher. No information was captured on shallow wells, boreholes and surface water thus leaving only piped water as the source of water. The gender perspective on water and sanitation was not given prominence in this study although an important element in community participation and projects sustainability. Lastly, even though the study was on water and sanitation, water quality was not considered.

3.6 Characteristics of the sampled households in Soweto East

3.6.1 Household demographic characteristics

The household demographic characteristics reveal that over three quarters (78.6%) of the population in Soweto East were below 30 years of age but with slightly more males than females (57% versus 43%). The youthful population is an indicator of a highly dependent population. Just a year earlier Kagiri (2008) found similar results in her study: there were more males than females in the settlement and that a large proportion of the population

(74%) was aged between 18 and 30 years. About half of the total population has never married, many of them being children and those in school. One third of the population was married, with the majority in monogamous unions (Table 3.2). The rest were divorced, widowed, separated or staying together. In terms of education, about half of the population (48%) had at least primary level of schooling, 31% had secondary school education and 10% were educated above secondary school.

Table 3.2: Marital status in Soweto East

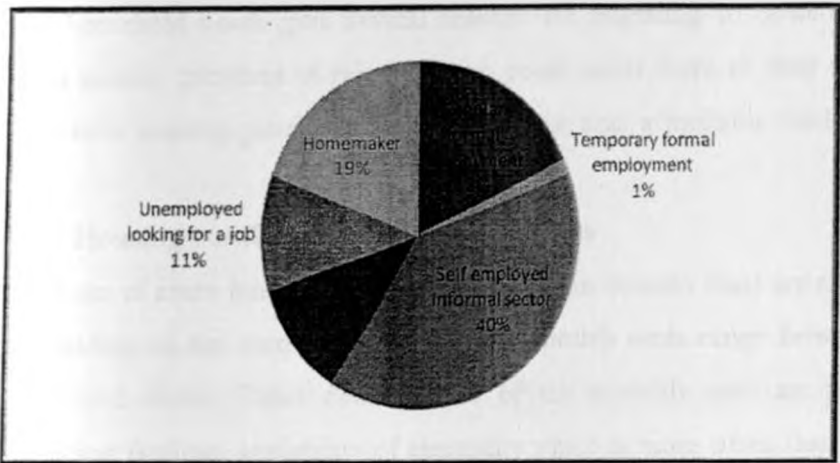
	%
Never married	49.0
Married	32.4
Divorced/separated	6.9
Widowed	2.1
Staying together	9.7
Total	100

Source: Fieldwork 2009

The mean household size was 3. However, when only the nuclear family is taken into consideration, many of the households (75%) had at most 2 children, while 3% had a large family of more than 7 children. The number of children per household is 4 times less than Gichuki's (2005) findings in Mukuru kwa Njenga of an average of 8 children in a household. In terms of household headship, there were more male headed households (61%) than female headed (39%).

When children below school going age and those in school (27% of the total population) are excluded, the Soweto East residents are engaged in a number of occupational activities. As would be expected, about half were engaged in self employment in the informal sector or were employed as casual labourers (Figure 3.1). 19% was in regular employment, while 30% were either home makers or unemployed. The informal sector activities and casual employment ranged from washing clothes, shoe shining and repair, fishing, garbage collection, selling vegetables, selling water, hair dressing to selling illicit brews, among others.

Figure 3.1: Occupational status in Soweto East

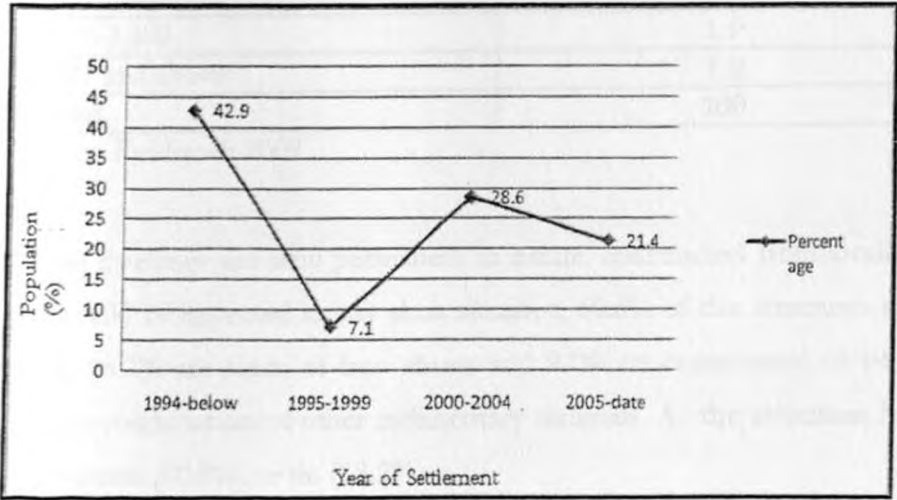


Source: Fieldwork 2009

3.6.2 Household head migration history

The migration history of the household heads shows that a large proportion of them (42.9%) started living in Kibera before 1995. The proportion dropped in the period between 1995 and 1999 before picking up again after the year 2000 (Figure 3.2).

Figure 3.2: Migration history of household heads in Soweto East



Source: Fieldwork 2009

Three quarters of the household heads migrated to Kibera directly from their rural homes. The household heads gave several reasons for migrating to Soweto East village. Some of these include: presence of relatives who could assist them in their search for employment; affordable housing; proximity to the city centre; and affordable food.

3.6.3 Housing conditions and other amenities

Nine out of every ten (90.9%) living dwellings in Soweto East are single roomed structures. Depending on the number of rooms, the monthly rents range between KES 500 and KES 3,000 and above. Other determinants of the monthly rent are proximity to water and sanitation facilities; availability of electricity which is more often than not illegally connected; and nearness to the road. More than half of the renters, all of them probably living in the one roomed structures pay a monthly rent of between KES 500 and KES 1,000 (Table 3.3). Another one third pays between KES 1,000 and KES 2,000 per month. Very few renters in Soweto East can afford to pay more than KES 2,000 per month.

Table 3.3: Monthly rent in Soweto East

(KES)	%
500-1,000	63.0
1,001-2,000	33.3
2,001-3,000	1.9
3,001 and above	1.9
Total	100

Source: Fieldwork 2009

These dwellings are semi permanent in nature, constructed from locally available materials. As would be expected in any slum situation, 60.6% of the structures are constructed from mud, 24.2% are made of iron sheets and 9.1% are constructed of wood. The rest (9.1%) have a combination of other rudimentary materials. All the structures had either corrugated iron sheets (81.8%) or tin (18.2%).

The main source of cooking fuel is paraffin, being used by more than two thirds of the households (Table 3.4). Paraffin is easily available from the nearby petrol stations and the

various kiosks in the settlements. It is also used for lighting in one third (33.3%) of the households, mostly used on tin lanterns locally known as *keruboi*. Even then, electricity is the main source of lighting in the village, used by 66.7% of the households. As noted above, some of the electricity is more often than not illegally tapped from the mains. Other sources of cooking fuel were charcoal (used by about one quarter of the households) and gas which was not very common.

Table 3.4: Type of cooking fuel in Soweto East

	%
Gas	3.0
Paraffin	69.7
Charcoal	27.3
Total	100

Source: Fieldwork 2009

3.6.4 Income and expenditure

As noted in Figure 3.1 above, Soweto East residents engage in a number of economic and income-generating activities ranging from self employment in the informal sector, regular formal employment, casual labour to temporary formal employment. Majority of the households (86%) earn a monthly income of not more than KES 10,000, with 14% earning more than KES 10,000 (Table 3.5).

Table 3.5: Monthly income in Soweto East

(KES)	%
≤5,000	32
5,001-10,000	54
10,001-20,000	14
Total	100

Source: Fieldwork 2009

About half (47.4%) of the sampled households spend less than KES 200 on their monthly water needs, 39.5% spend KES 201-500, while 2.6% spend more than KES 1,000. The

expenditure on food also varies: 61.5% of the households spend KES 1,001-5,000 while 28.2% spend between KES 5,000-10,000 – an indication of high expenditures on food.

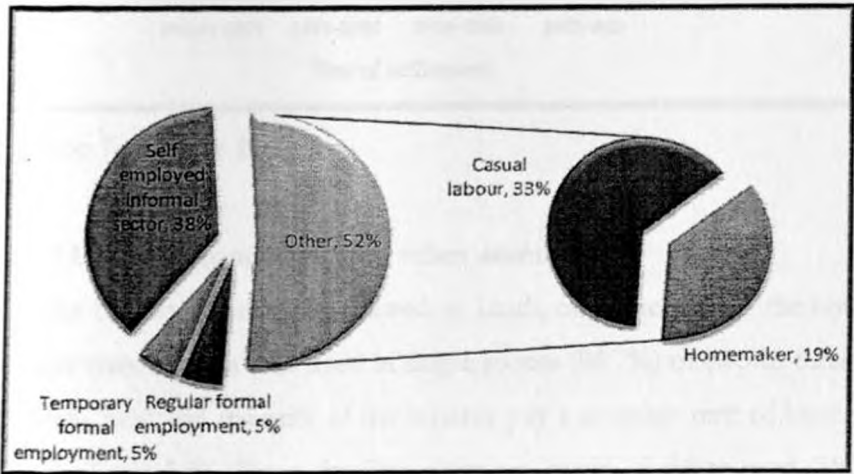
3.7 Characteristics of the sampled households in Lindi

3.7.1 Household demographic characteristics

The population of the sampled households consisted of almost an equal proportion of males and females (51.6% males versus 48.4 females). The majority of households were of nuclear type, consisting of household head, spouse and children. In other words, 91.2% of the Lindi population is composed of nuclear family members. The average household size was 4, slightly higher than Soweto East.

In terms of education levels, more than half (55%) had at least primary level of education, 20% had attained secondary education while only 1% had post secondary education (compared to Soweto East's 10%). Unlike in Soweto East, Lindi had a higher proportion of its population (62%) who are students. The rest of the population consisted of those in formal employment (10%); homemakers (19%), casual labourers (33%) and like in Soweto East those in self employment (38%) (Figure 3.3).

Figure 3.3: Occupational status in Lindi

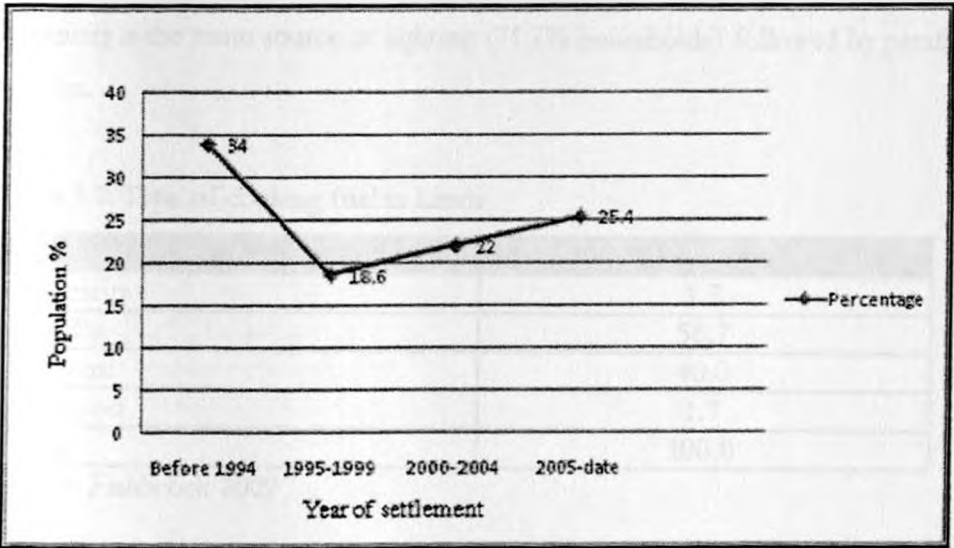


Source: Fieldwork 2009

3.7.2 Household head migration history

1.6% of the household heads in Lindi were born in Nairobi. The rest came to Nairobi in different years. They came to the city in search of employment but settled in Lindi because of affordable housing and proximity to the city centre and the industrial area, where they seek employment. 34% of the household heads settled in Lindi prior to 1994 (Figure 3.4) and have lived in the same houses ever since, mostly due to reasons of convenience and cordial relations with the 'landlord'. Lindi has experienced a stable household head migration trend in the years ensuing with a gradual growth of 66% between 1995 to the time of the survey. The in-migration has been gradual within the 10 year period of 1995 to 2005.

Figure 3.8: Migration history of household heads in Lindi



Source: Fieldwork 2009

3.7.3 Housing conditions and other amenities

Of the 61 respondents interviewed in Lindi, only one owned the house they live in. All the others were tenants who lived in single rooms (96.7%) or two to three rooms (3.4%). Like in Soweto East, the majority of the tenants pay a monthly rent of between KES 500 and KES 2,000 (Table 3.6). These dwelling units are made of either mud (58.3%), mud mixed with cement (40%) or iron sheet and tins (1.7%). Corrugated iron sheet dot the roofs of most houses (98.3), while only 1.7% have tin as the roofing material.

Table 3.6: Monthly rent in Lindi

(KES)	%
500-1000	48.3
1001-2000	43.3
2001-3000	5.0
3001 and above	3.3
Total	100

Source: Fieldwork 2009

The sampled households used a variety of cooking fuels, which were affordable and within their reach. Majority of the households used paraffin and charcoal as the main source of cooking fuel as opposed to electricity and firewood (Table 3.7). On the other hand, electricity is the main source of lighting (71.7% households) followed by paraffin (28.3%) for the rest.

Table 3.7: Type of cooking fuel in Lindi

	%
Electricity	1.7
Paraffin	56.7
Charcoal	40.0
Firewood	1.7
Total	100.0

Source: Fieldwork 2009

3.7.4 Income and expenditure

Nearly half the households (46.7%) earn between KES 5,001 and 10,000 per month while 3.3% earn more than KES 20,000 (Table 3.8). The bulk of the monthly income is likely to be spent on food. For example, half of the households (56.7%) spend between KES 1,001 and KES 5,000 on their monthly food requirements, while 35% use between KES 5,000 and KES 10,000. Expenditure on water reveals that water may still be relatively expensive in the village as compared to Soweto East. One third of the households (35%) spend KES 501-

1,000 per month on water, 33.3% spend KES 201-500, 11.7% spend less than KES 200, while 20% spend more than KES 1,000.

Table 3.8: Monthly income in Lindi

(KES)	%
≤5,000	25.0
5,001-10,000	46.7
10,001-20,000	25.0
≥ 20,000	3.3
Total	100.0

Source: Fieldwork 2009

CHAPTER FOUR

ACCESS TO WATER AND SANITATION SITUATION IN SOWETO EAST AND LINDI

This chapter presents the access to water and sanitation situation in the study sites at the time of survey. The chapter lays the foundation for a better understanding of the impact of Kibera Integrated Water, Sanitation and Waste Management (K-WATSAN) project on the livelihoods of Soweto East residents. As indicated in the earlier chapters, Lindi – a settlement in Kibera with similar characteristics but without intervention – was used for comparative purposes.

4.1 Soweto East

4.1.1 Access to water situation

The major source of water in Soweto East is piped water from the seven UN-Habitat water kiosks which are located in strategic places in the settlement. Almost all the households (91.1%) had access to this source of water. Other sources of water in the settlement were standpipes (28.6%), piped water from the neighbour and/or landlord (3.6%) and roof catchment (1.8%). The cost of water (largely from the water kiosks) ranged from KES 1-4 for a 20-litre container. However, 71.4% of the households use less than KES 15 per day in buying water (Table 4.1).

Table 4.1: Cost of water per day in Soweto East

	N	%
KES 1-4	5	8.9
KES 5-14	35	62.5
KES 15-19	4	7.1
KES 20+	12	21.4
Total	56	100

Source: Fieldwork 2009

The distance to the water kiosks ranged from a radius of about 5 to 100 metres. The person responsible for fetching water was mainly the female spouse. However, in some cases part or all of the household members were involved, including the male spouse, worker and sometimes visitors (Table 4.2). Water is mostly collected (from the water kiosks) when there is a need, although other households prefer mornings and/or evenings. Most of the households take less than 30 minutes to fetch water (Table 4.3). The time taken to fetch water rarely affects the school going children and those who are working. Only 4 households complained of getting late to work. These are the households who took more than 30 minutes to fetch water.

Table 4.2: Person responsible for fetching water in Soweto East

	N	%
Spouse (female)	26	46.4
Spouse (male)	11	19.6
Children (female)	3	5.4
Worker	4	7.1
Children (male and female)	2	3.6
Female spouse and visitor	4	7.1
Female spouse and male children	3	5.4
Parents and female children	3	5.4
Total	56	100

Source: Fieldwork 2009

Table 4.3: Time and duration spent on fetching water in Soweto East

Time/duration	Duration spent on fetching water (by number of households)			Total
	Less than 30 minutes	30 minutes to 1 hour	More than 1 hour	
Mornings	15			15
Evenings	4			4
When need arises	21	3	1	25
Morning and evenings	12			12
Total	52	3	1	56

Source: Fieldwork 2009

Although the results show that water kiosks was the main source of water in Soweto East, the respondents were asked about their perceptions on selected water sources – regardless of whether they use them or not. The perceptions were on cleanliness, safety for drinking, availability and reliability of the water source. The respondents’ perceptions on the selected water sources showed varied results (Table 4.4).

Table 4.4: Perception on selected sources of water in Soweto East

	Cleanliness (% clean)	Safety for drinking (% safe)	Availability (% always)	Reliability (% reliable)
Piped water	75	55.4	71.4	78.6
Borehole	42.9	25	83.9	78.6
Shallow well	42.9	19.6	64.3	62.5
Private water vendors	14.3	1.8	7.1	94.6
Rain water	64.3	32.1	7.1	8.9
Surface water	32.1	16.1	66.1	66.1

Source: Fieldwork 2009 (n=56)

Except for piped water which was fairly perceived as safe for drinking (55.4%) the other sources of water were generally perceived as not safe by a larger percentage of the respondents. Given the fairly good perception on piped water, only 37.5% of the households treat their water and 48.2% thought that their current water source (largely from the water kiosks) is safe for drinking. There were two modes of treating water: boiling and use of chemicals (Table 4.5).

Table 4.5 Mode of treating water in Soweto East

	N	(%)
Boiling	13	60
Chemical treatment	8	40
Total	21*	100

Source: Fieldwork 2009 (*n=21 households which treated water)

Households who treat their water incur some costs associated with buying of charcoal and kerosene for boiling water or the cost of buying the water chemical. The use of a chemical called “water guard”, bought at KES 20 from the shops was common in most households using this mode of treatment. According to the respondents, a bottle of “water guard” lasted for a month. Treatment of water can be associated with the residents’ awareness of the risks of drinking unclean and unsafe water. All the respondents were aware that drinking unsafe water exposed one to water borne diseases and/or death.

The regularity of water in Soweto East can be considered as “good”. 82% of the respondents said that they get water most of the time. Only one stated that it is irregular (Table 4.6). Even then, the residents are faced with some challenges with their current water supply. These are:

- a) Some pipes pass through flowing sewage or broken sewer pipes and therefore may contaminate the water.
- b) Some households find the current price of water (KES 1-4 for a 20-litre jerrycan) expensive.
- c) Illegal water vendors disconnecting pipes, resulting to a lack of water for some days in the week.

Some respondents noted that these challenges have considerably reduced compared to some months before the time of this survey.

Table 4.6: Regularity of water in Soweto East

	N	%
Always (regularly)	9	16.1
Most of the time	46	82.1
Now and then (irregularly)	1	1.8
Total	56	100

Source: Fieldwork 2009

Related to the safety of water described above, more than half (64.3%) of the respondents stated that they were willing to pay more to get clean and safe water. This is despite some of the respondents who complained that the cost of water is relatively high. When asked what they thought should be done to improve their access to clean and safe water supply, they had a variety of recommendations:

- a) Erection of steel pipes instead of plastic water pipes which get easily broken and can get contaminated.
- b) Treating of water from the mains by use of chemicals.
- c) Covering of water tanks with lids and cleaning the tanks on a regular basis.
- d) The water vendors could be taught how to handle water hygienically.
- e) Installation of drainages in the settlement.
- f) More donor assistance.

4.1.2 Coping with periods of water scarcity

About half (53.6%) of the respondents claimed that they had experienced periods of longer than normal water scarcity in the early months of 2009 (before the survey). According to some of the respondents this was due to illegal connections by private water vendors and destruction of water pipes. The 46.4% of the respondents who claimed to have *not* experienced any periods of water scarcity were largely from Zone A and B of the settlement.

Those who had experienced periods of water scarcity used various alternative sources of water such as:

- a) Buying water from outside the settlement, for example, from the nearby Kenyatta Hospital, Kenya Medical Research Institute, Kibera High-rise estate, Nairobi West estate, Madina Mosque and the Kenya Army camp.
- b) Buying water from private water vendors.
- c) Buying water from the settlement's Zone A and B which, apparently had water.
- d) Buying water from other villages in Kibera.
- e) Using water from their storage tanks.

The same respondents were asked what problems they encountered as a result of the water shortage. They articulated the following problems:

- a) Getting late to work and school since they had to fetch water.
- b) Hygiene standards went down because some people could not take a bath nor wash their clothes for many days.
- c) Looking for water and buying water became expensive. Some had to hire porters to get the water from long distances, water prices went high.
- d) More time was spent looking for water at the expense of other (economic) activities.

4.1.3 Access to water and household’s health situation

The water borne diseases prevalent in Soweto East as reported by the respondents is presented in Table 4.7. The prevalence of the common water borne diseases of typhoid, diarrhea and cholera is high at 70.5% of all the reported diseases. However, some of the respondents noted that since they started receiving clean water from the UN-Habitat sanitation blocks the general instances of disease outbreaks has significantly decreased.

Table 4.7: Water borne disease prevalent in Soweto East

	N	%
Malaria	15	19.2
Typhoid	13	16.7
Diarrhea	32	41.0
Cholera	10	12.8
Amoeba and bilharzia	2	2.6
Other related diseases	6	7.7
Total	78*	100

Source: Fieldwork 2009 (*n=by disease)

4.1.4 Access to water and household’s livelihood

Soweto East residents have various sources of livelihoods. These are: operating barber and salon businesses, operating food businesses, doing cleaning and laundry, employment as security guards, construction workers and other casual businesses. According to 58.9% of the respondents, some of these livelihood sources require water. These were mostly the

small scale businesses dealing with making or cooking food. Others were salon businesses, construction workers and washing clothes, among others. The unavailability of water affects these sources of livelihoods in three broad ways:

- a) Lack of income for those who depend on these activities, i.e. cleaning, laundry, selling clothes, selling food and construction workers.
- b) Reduced sales in some businesses like in hotels.
- c) Spending more time and money looking for water.

Indeed, 90.6% of the households spend more time looking for water when it is unavailable while 87% spend more money on buying water when it is unavailable. The *Cramers' V* was used to analyze the relationship between time spent on looking for water and money spent in buying water when it is unavailable. The result (*Cramers' V* = 0.818) when there is no water, people tend to spend more money looking for it.

4.1.5 Access to sanitation situation

Only 33.9% of the households in Soweto East had access to *on-plot* sanitation facility (i.e. a toilet). However, all the households had access to a sanitation facility, whether *on-plot* or *off-plot*. The types of sanitation facilities that exist in Soweto East include traditional pit latrines and modern ablution blocks (the UN-Habitat sanitation blocks). Almost all the households (94.6%) had access to the modern ablution blocks while only 1.8% used pit latrines. 3.6% of the households used a combination of both.

Table 4.8: Type of sanitation facility in Soweto East

	N	%
Modern ablution block	53	94.6
Traditional pit latrine	1	1.8
Traditional pit latrine and modern ablution block	2	3.6
Total	56	100

Source: Fieldwork 2009

These sanitation facilities are all shared by the residents. Most of the sanitation facilities are part of the K-WATSAN project put up by the UN-Habitat. The cost of using these facilities was on average KES 3 per single use. As will be discussed further in the next chapter, these facilities are maintained by the residents themselves. However, they had a mixed reaction about their maintenance and cleanliness:

- a) Clean, well maintained, no smell, well built and safe to use even at night since it has electricity.
- b) Dirty and not well maintained.
- c) Sometimes they are dirty due to people not using them well and attendants who fail to clean them.
- d) Dirty environment around the facility though inside is clean.
- e) Facility has plenty of water.

4.2 Lindi

4.2.1 Access to water situation

Lindi's main sources of water are piped water from the neighbours and roof catchment. Other sources of water used by very few households are piped water from landlords and private water vendors. All the residents buy water with prices ranging from KES 1 to about KES 20 per 20-litre container (jerrycan). In fact, 85% of the households use more than KES 20 per day to purchase water (Table 4.9).

Table 4.9: Cost of water per day in Lindi

	N	%
KES 1-4	1	2.1
KES 5-14	3	6.4
KES 15-19	3	6.4
KES 20+	40	85.1
Total	47*	100

Source: Fieldwork 2009 (*14 households never responded)

The female spouse is more often than not responsible for fetching water (Table 4.10). Even then, all other household members participate in this activity. Just like in Soweto East, the

preferred time for fetching water was either in the mornings (45.9%) or when need arises (41%), with a few other households (13%) preferring the evenings. Two thirds of the households (67.2%) take less than 30 minutes to fetch water, while 32.8% take more than 30 minutes. Those who prefer fetching water in the morning sometimes experience lateness going to work or to school.

Table 4.10: Person responsible for fetching water in Lindi

	N	%
Spouse (female)	39	65.0
Spouse (male)	11	18.3
Children (male)	3	5.0
Children (female)	3	5.0
Children (male and female)	2	3.3
Female spouse and male children	1	1.7
Female spouse and female children	1	1.7
Total	60*	100

Source: Fieldwork 2009 (*1 household never responded)

Three quarters of the respondents (75.4%) perceive that their current water sources are not safe for drinking. As such, about half of the households (45.8%) treat their water before use, mainly for drinking. The main mode of treating water was boiling, while some households also used chemical treatment, filtering and solar disinfection (Table 4.11). Like in Soweto East, all the respondents are aware that unsafe (drinking) water increases one's exposure to water borne diseases and other related health risks.

Table 4.11: Mode of treating water in Lindi

	N	%
Boiling	22	81.5
Chemical treatment	3	11.1
Boiling, filtering and solar disinfection	2	7.4
Total	27*	100

Source: Fieldwork 2009 (*n=27 households which treated water)

When asked how regular their current source of water is, all the respondents, except one, mentioned that they get water now and then (i.e. irregularly) (Table 4.12). The respondents noted that the major problems with their current sources of water are:

- a) Unavailability of water
- b) Dirty, contaminated and unsafe water
- c) High prices of water
- d) Spending more time looking for water
- e) Rationing of water

Table 4.12: Regularity of water in Lindi

	N	%
Most of the time	1	1.6
Now and then (irregularly)	60	98.4
Total	61	100

Source: Fieldwork 2009

The respondents suggested the following measures to improve their access to clean, safe and reliable water supply:

- a) Regular cleaning of water tanks and supply taps
- b) Repair of pipes, regular monitoring and maintenance
- c) Treatment of water
- d) Clean storage of water

Given the above, 76.7% of the respondents were willing to pay more to get clean and safe water supply.

4.2.2 Coping with periods of water scarcity

About three quarters of the households (74.6%) had experienced periods of water longer than normal water scarcity in the early months of 2009 before the survey. During these periods, the alternative sources of water for the affected households were fetching water from other villages in Kibera, fetching water from other nearby estates or institutions, and

paying people to look for water. Table 4.13 presents a summary of the water problems in Lindi and how the affected households coped with them.

Table 4.13: Water problems and associated coping mechanisms in Lindi

Problem	Coping mechanism
Not doing household chores	Used fewer dishes and avoid making the house dirty
Walking for long distances and high water prices	Stored water and used it sparingly
Piling of dirty clothes	Washed clothes from the water source and used them more than once
Lack of personal hygiene	Shower at work place
Unavailability of water	Went to other villages in Kibera and out of the settlement to fetch water.

Source: Fieldwork 2009

4.2.3 Access to water and household’s health situation

Table 4.14 enumerates the water borne (and other diseases) diseases prevalent in the Lindi as reported by the respondents. It is evident that the prevalence of the common water borne diseases (typhoid, diarrhea and cholera) is much higher, i.e. 76.8% of all the reported diseases.

Table 4.14: Water borne diseases prevalent in Lindi

	N	%
Malaria	1	1.5
Typhoid	15	23.1
Diarrhea	16	24.5
Cholera	19	29.2
Amoeba and bilharzias	6	9.2
Other related diseases	8	12.3
Total	65 *	100

Source: Fieldwork 2009 (*n=by disease)

4.2.4 Access to water and household's livelihood

The household's livelihood sources in Lindi include engagement in petty businesses, casual employment and dependence on the spouse's or household head's source of income. Most of these livelihood activities do not require water. Only 21.7% depended on water. A possible explanation could be the scarcity of water in the area. For the activities that required water, the water was used for the following purposes:

- a) Washing fresh produce, e.g. fish and vegetables before selling
- b) Washing glasses in bar and for toilets
- c) Washing hair and equipment in the salons and barber shops

Just like in Soweto East, the unavailability of water affects these sources of livelihoods in three broad ways: loss of income, reduced sales, and spending more time and money looking for water. All the households admitted spending more time and money to source for water when it is unavailable.

4.2.5 Access to sanitation situation

Like in Soweto East, all households in Lindi have access to a sanitation facility. However, the type of sanitation facility was the traditional pit latrine – more often than not shared by many other households and provided by the landlords at no cost of usage. None of the households had access to a modern ablution block which is common in Soweto East. Some respondents noted that “flying toilets” is still common in the village and that the traditional pit latrines are not in good shape, i.e. they are filthy and sometimes overflowing.

Photo 4.1: A traditional pit latrine in Lindi



Source: Fieldwork 2009

CHAPTER FIVE

THE IMPACT OF KIBERA INTEGRATED WATER, SANITATION AND WASTE MANAGEMENT PROJECT

This chapter discusses the impact of Kibera Integrated Water, Sanitation and Waste Management Project (K-WATSAN) on the livelihoods of the households involved. However, for a clearer understanding, the chapter starts by presenting the Kenya Slum Upgrading Programme (KENSUP) and the K-WATSAN project, including community participation and challenges. The impact assessment is thereafter presented by discussing the project's impact on the household's access to water situation, health situation, economic activities and sanitation situation.

5.1 The Kenya Slum Upgrading Programme

The Millennium Development Goal 7, Target 11, aims at significantly improving the lives of at least 100 million slum dwellers by the year 2020. Kenya Slum Upgrading Programme (KENSUP) is a step towards this global effort as well as the one to realize "cities without slums" dream. It is a Government of Kenya initiative in collaboration with the UN-HABITAT. It is a nation wide venture with interventions promoting a multidisciplinary and integrated approach to slum upgrading, which will be achieved by consolidating past experiences together with lessons learnt so as to influence the national policy frameworks.

The programme is intended to cover all municipalities with an objective of improving the overall livelihoods of people living and working in slums through targeted interventions to address shelter, infrastructure, services, land tenure and employment issues, as well as the impact of HIV/AIDS in slum settlements. According to the KENSUP Implementation Strategy (2005), KENSUP aims at creating conditions that can sustain long term nation wide slum upgrading in Kenya through harnessing political will, strengthening nascent forms of organization of slum dwellers, and promoting an inclusive process based on consensus and partnership.

KENSUP's specific objectives are to: develop a nationwide slum upgrading and management framework; operationalize the principles of good urban governance; provide a broad range of social and physical infrastructure services; provide security of tenure and improved housing; enhance opportunities for income generation and employment creation; attract private sector finance and encourage investments in slum upgrading; promote a culture for environmental conservation and management; enhance the capacity for research, planning, implementation, monitoring, evaluation and replication of shelter and human settlements programmes; and to address and mitigate the prevalence and impacts of HIV/AIDS.

To facilitate the realization of its aim and objectives, KENSUP has been divided into three phases, namely:

1. Phase 1 to be implemented in the first ten years of the programme to cater for 75% of the urban residents in Kenya. The towns to be covered are Nairobi and its dormitory towns (Ruiru, Thika, Ongata Rongai and Mavoko), Mombasa, Kisumu, Nakuru and Eldoret.
2. Phase 2 to include all other municipalities in the country.
3. Phase 3 to include all other towns that have town councils.

The strategic components of KENSUP include: community mobilization, organization and participation; preparation of city/town development strategic and land use master plans; shelter improvement; provision of security of tenure; provision of physical and social infrastructure/amenities; environmental and solid waste management; employment and income generating activities; capacity building; micro financing and credit systems; HIV/AIDS concerns; conflict prevention and management; and support to vulnerable and disadvantaged groups.

KENSUP is guided by an institutional framework for its functions and operations. The framework has three main pillars: coordination, implementation and participation. However, given past slum upgrading experiences, the framework puts more emphasis on stakeholders'

participation. As such, KENSUP's mandate falls under four broad stakeholder institutions which play different but complimentary roles. They are (1) the government; (2) local authorities; (3) United Nations Human Settlement Programme (UN-HABITAT); and (4) development partners.

The coordination of the programme is under the government ministry in charge of housing at the national level – currently the Ministry of Housing. The ministry steers KENSUP and holds the government budgetary allocation vote for the programme. The ministry is helped to fulfill its mandate by other key relevant ministries such as the Office of the President (Provincial Administration); Ministry of Lands; Ministry of Local Government; Ministry of Roads and Public Works; Ministry of Finance and Planning; Ministry of Trade and Industry; Ministry of Health; Ministry of Water and Irrigation; and Ministry of Information and Communication.

Representatives of all these ministries, together with those from local authorities, UN-HABITAT and development partners form the *Inter-Agency Steering Committee (IASC)*. The IASC is mandated to give policy direction and approve policy decisions. The committee reports to the President of Kenya who is the patron of KENSUP. Another committee – the *Inter-Agency Coordinating Committee (IACC)* provides a link between the various ministries and KENSUP operations. The committee brings together people with technical and policy skills to coordinate KENSUP's activities.

The *KENSUP secretariat* is the focal point of all operations. It coordinates the day-to-day running of the programme. The secretariat engages relevant actors and partners in its operations, i.e. NGOs, faith and community based organizations, civil societies and the government. The secretariat has a *Project Implementation Unit (PIU)* which coordinates the work of the *Settlement Project Implementation Units (SPIUs)*. The community is represented in the upgrading programme through the *Settlement Executive Committee (SEC)*, whose main role is to facilitate and organize community networks, ensuring that their views are taken into account during implementation. They ensure that the needs of the community are brought

to the foreground. They are the ones in charge of advocacy and link the particular community where they are established, to the programme's implementation unit.

Lastly, the *Multi-Stakeholder Support Group (MSSG)* is an avenue of sharing experiences with different stakeholders working in slum areas or in slum upgrading. They also play a key role in identifying funding opportunities and provision of technical expertise and support.

5.2 Kibera Integrated Water, Sanitation and Waste Management Project

5.2.1 Background information

Kibera has witnessed many interventions and abundant flow of resources on matters relating to water and sanitation over the last couple of years. Many actors have been present in the settlement trying to do something about the water and sanitation situation. However, there has been minimal success or unsustainable interventions. According to an actor's survey commissioned by the Kenya Slum Upgrading Programme (KENSUP) in 2003, over 545 civil society organizations composed of Non Governmental Organizations (NGOs), community-based groups and religious organizations were found to be operating in Kibera, yet the settlement is still in a sorry state (Acacia 2004).

Several reasons for lack of significant impacts in this sector have been cited. Some of them include:

- Lack of good governance structures for integrated interventions.
- Lack of community participation in the interventions.
- Lack of monitoring and evaluation of especially the donor-driven projects.
- Absence of an organized central coordination mechanism at national and settlement level.

The K-WATSAN project was born as a much needed solution to the above challenges. As mentioned earlier, it is a component project of KENSUP and is being implemented in Soweto East village of Kibera. The project started with a socio-economic and needs assessment mapping for the settlement (Soweto East village). Surprisingly, the mapping

revealed that the Soweto East residents had other priorities far important than housing. In fact, housing was last in their priority list. As such, K-WATSAN was initiated not only as a starting point to provide water and sanitation (which was high in priority) but also to build trust among the slum dwellers before upgrading the dwellings and provide a backbone infrastructure to peg the upgrading on (Personal communication, Maji na Ufanisi representative – July 2009). An integrated and holistic water, sanitation and waste management project was expected to yield meaningful impact in the village before the dwellings were upgraded.

5.2.2 Aim and objective of K-WATSAN project

K-WATSAN project aims at contributing towards improving the livelihoods of the urban poor in Soweto East village by supporting small-scale community based initiatives in water, sanitation and waste management. K-WATSAN project objective is in tandem with KENSUP's objectives. That is, to improve the livelihoods of people living and working in slum areas in Kenya, through the provision of basic infrastructure and services, security of tenure, housing improvement and income generation activities. It is expected that the project will be replicated in other villages in Kibera and thereafter in other slums in Kenya.

5.2.3 K-WATSAN project implementation

K-WATSAN project is an initiative of the UN-HABITAT's Water for African Cities Program. The project is being implemented by the UN-HABITAT and Maji na Ufanisi, the latter being a local NGO with a specific focus on water and sanitation initiatives in the country. A partnership agreement was signed in February 2007 for the period February 2007 to October 2007 with subsequent renewals thereafter. UN-HABITAT is the lead partner while Maji na Ufanisi offers both technical and non technical advice and skills as the key implementing partner. Maji na Ufanisi are the people working on the ground to harness the potential of the local community. They empower the community to work together to produce the desired results. They play the daily role of ensuring that field activities are going on as planned on behalf of the UN-HABITAT (UN-HABITAT 2009).

5.2.4 K-WATSAN project activities

The K-WATSAN project has a number of activities that are being carried out to achieve the desired goals of KENSUP. These activities aim to (1) support the Soweto East community to improve their access to water, sanitation and drainage; (2) set up and strengthen governance frameworks to regulate distribution and accessibility to water and sanitation; (3) promote the formation of small scale waste management enterprises and access to credit facilities; (4) enhance access to modern energy for the residents of Soweto East; (5) enhance information and technology skills among the population; and (6) enhance capacity building. These activities are elaborated further below.

Supporting the Soweto East community to improve their access to water, sanitation and drainage

Access to water and sanitation situation in Soweto East village is being improved through the construction of sanitation blocks at strategic points in the settlement, where they can be accessed by as many residents as possible. The project had planned to support the construction of eight sanitation blocks – two in each of the project's planning zones (the project has four planning zones, namely, A, B, C and D). At the time of this survey, seven sanitation blocks had been constructed and were fully functional.

These sanitation blocks comprise all-in-one complexes with modern ablution blocks, shower cubicles, babies' area, water booths and a laundry area. To make sure that water is available most of the time, these facilities have been fitted with 10,000 litres water storage tank (Photo 5.1). To access these facilities with ease, the project has also designed a 2.5 kilometer low volume traffic road and 1.8 kilometer storm water drains to improve drainage in the area. At the time of this survey, only 750 metres of the designed road had been tarmacked. The road is expected to cut across Kibera (from Mbagathi way to Kibera drive). This is expected to improve the accessibility of Kibera with other city suburbs. In addition, the project has commenced the construction of two foot bridges and another 1.25 kilometres of low volume road aimed at further improving accessibility and mobility in the settlement.

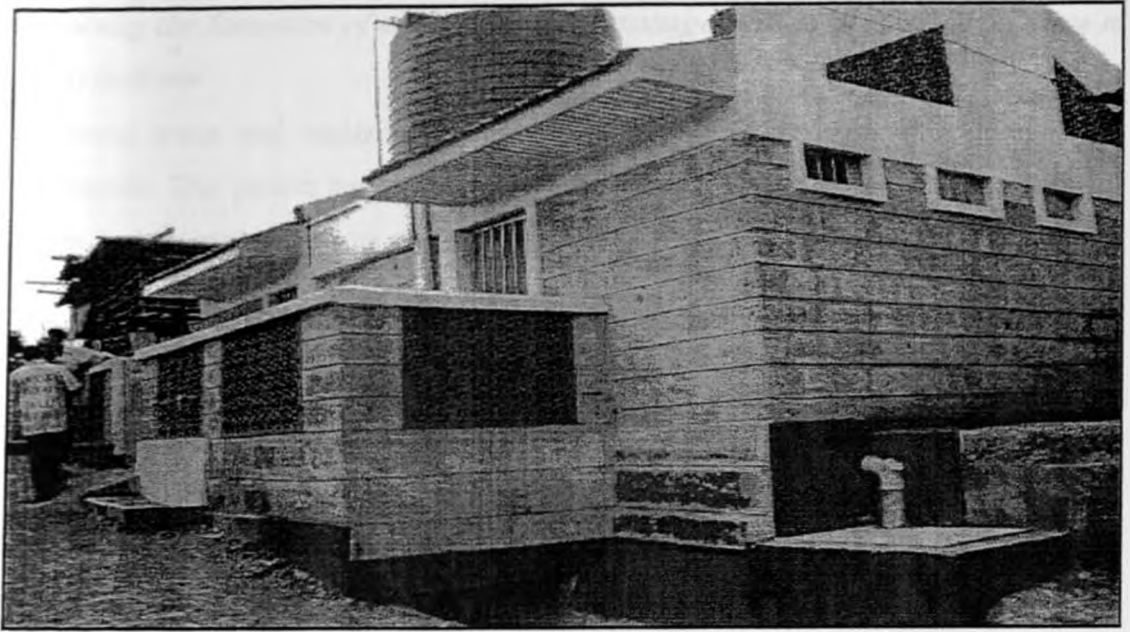


Photo 5.1: A sanitation block in Soweto East

Setting up and strengthening governance frameworks to regulate distribution and accessibility to water and sanitation

Based on past (failed) experiences, the project is setting up and strengthening governance frameworks to regulate distribution and accessibility to water and sanitation. Poor governance can lead to the mismanagement of water and sanitation facilities, as well as their inequitable distribution and inaccessibility. Good governance structures have been set up through the formation of Water and Sanitation Committees at the community level. The committee is made up of technical staff, non-technical staff and community representatives. The committee is helped by the Settlement Executive Committee (SEC). The Water and Sanitation Committee has a structure which allows for selected individuals from the community to monitor the use of sanitation facilities, do repairs and collect revenue from the facilities.

Promoting the formation of small scale waste management enterprises and access to credit facilities

Integrating water and sanitation with waste management is important in any slum intervention. The project has put in place a community based solid waste management system, largely spearheaded by youth groups in the village. The main components of this intervention are: (1) construction of solid waste (garbage) transfer points; (2) construction of a recycling centre; and (3) procurement and installation of appropriate waste collection, handling and recycling equipment. This activity had not started at the time of the survey, except for the solid waste receptacles next to the sanitation blocks. Some youth groups have been provided with bicycles which they use to collect waste – not for disposal, but for sorting and selling of recyclables. Photo 5.2 shows the waste management situation in Soweto East.

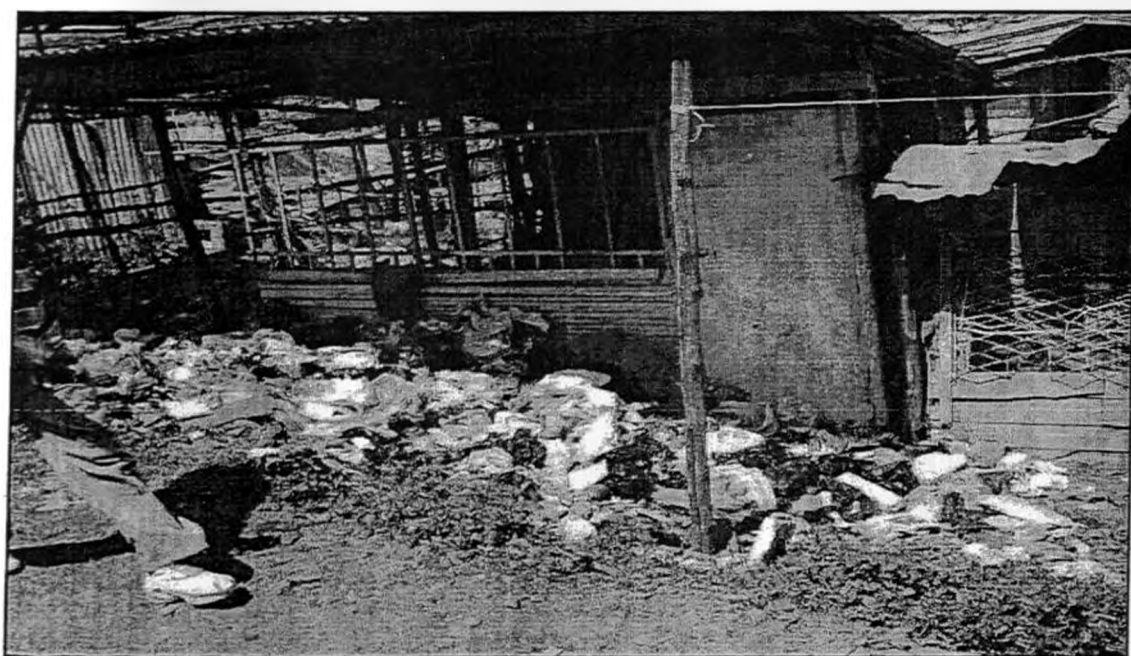


Photo 5.2: Waste management situation in Soweto East

Members who manage and utilize the sanitation blocks have access to credit from the money they earn from these facilities. 25% of the money earned from these facilities is shared between the members while the rest (75%) is saved in the cooperative societies they have

formed. It is expected that the saved money will help in financing the purchase of KENSUP upgraded houses (Personal communication with SEC Treasurer).

Enhance the resident's access to modern energy

Most of the residents in Soweto East use paraffin, fuel wood and charcoal for their daily needs, yet electricity grid lines pass through the settlement. Some of the residents go as far “stealing” electricity from the grid lines and even “selling” the same to others – an illegal and very dangerous venture that has led to loss of many lives. The K-WATSAN project aims at providing the Soweto East residents with alternative modern energy sources, street lights and individual household electricity connections.

Enhance information and technology skills among the population

Information and technology skills are intended to link the settlement to the global village and technological advancement. This will be achieved through the establishment of a community information and communication technology resource centre. At the time of this survey, the centre was being temporarily run from the UN-HABITAT site office in Kibera. With eight computers, the centre has ensured continuous access to computers and internet facilities to the residents. In addition, Soweto East is one of the slums which participated in UN-HABITAT JAM where residents learnt and used internet facilities (Maji na Ufanisi 2006).

Capacity building

Capacity building on the main aspects of the project is intended to empower the community to run and manage the project in a sustainable way. Capacity building is being done through mobilization, sensitization and awareness creation; empowering the youth in various ways; formation of management groups; information sharing; and conducting community and management committee trainings. The project intends to construct a project management centre or focal point for this purpose. The youth are being empowered through the Youth Empowerment Programme (YEP). YEP ensures that the youth have access to entrepreneurship opportunities by equipping them with skills that can enable them start small scale businesses – intended to later grow into large enterprises. YEP is committed to

improving the livelihoods of Soweto East youth through provision of practical entrepreneurship training in construction (making of low-cost construction blocks), carpentry, masonry, electrical wiring and plumbing, among others. In addition, they are trained in managerial and organizational skills, business development and information communication technology.

5.2.5 Community participation in the project

Community participation is important in the sustainability of community-based projects. Some of the previous slums upgrading initiatives may have not realized their objectives because of lack of community involvement and participation in all stages. Both the project implementers and the community share the blame. Some implementation agencies lack community mobilization skills or just ignore the community they are supposed to work with. The community, on the other hand, may take time to “accept” the project. They may want to know how the project will “help” them or how they will “gain” from it. In addition, the community members are normally busy with their daily livelihood endeavours rather than “participate” in projects that they do not “see” making an “immediate impact” in their lives. In some instances, the community lack trust and confidence in the implementers, largely due to past experiences.

In short, community participation in any project needs skills and strategic planning. In cognizance to this idea, the K-WATSAN project has adopted a strategy of transparency and accountability by allowing the community to understand the project, spearhead and monitor its activities in all stages. The community identifies their needs, concerns and challenges and offer appropriate solutions. The K-WATSAN project encourages community participation through the following structures and ways.

The Settlement Executive Committee

As mentioned above, the Settlement Executive Committee (SEC) is the arm of K-WATSAN project that represents the Soweto East residents at all levels of project implementation. The SEC, formed in 2003, comprise of 18 democratically elected community members from

various interest groups or stakeholders. These are the structure owners (of whom less than 1% are living in Kibera – Acacia & Maji na Ufanisi 2004), tenants, community-based organizations, NGOs, faith-based organizations, the youth, widows and orphans, the disabled, the area chief, the area Councillor, and the area District Officer. The latter three are ex-officio members with no vote.

Such a composition makes sure that all the stakeholders are represented and their views taken into consideration at all levels of project planning and implementation. The SEC stresses the interest of the community and ownership of the project. Their legitimacy and mandate comes from the same community who democratically elected them and whom they represent. The SEC ensures that communication channels remain open and transparent. They see to it that the community is totally informed and involved in project planning and implementation.

The water and sanitation technical committee

The water and sanitation committee is composed of 32 people who have been drawn from different zones of Soweto East. The committee is being helped by Maji na Ufanisi to build and strengthen the community participation structures through needs identification; provision of labour; planning; provision of space; managing the facilities; and capacity building.

1) Needs identification

As the main beneficiaries of the project, Soweto East residents were involved in needs identification. The residents identified and prioritized their needs during the KENSUP baseline survey. The community identified water and sanitation as the most pressing challenge in the village, hence the beginning of K-WATSAN project. According to the UN-HABITAT 2009 progress report: “social mobilization, although a grueling process has been instrumental in the smooth running of operations in Soweto East. A lot of time was spent in mobilizing and informing residents about their roles in the project, before actual

implementation begun. This is not a one-off activity as had been envisaged, but a continuous process throughout the project cycle” (UN-HABITAT 2009: 3).

About half of the respondents (44.8%) heard about the project through meetings, local cooperatives, seminars organized by the implementing partners, speakers and community opinion leaders and an equal number from passersby (Table 5.1).

Table 5.1: Mode of awareness of the project

	%
Meetings, cooperatives, seminars, speakers and opinion leaders	44.8
Family members	10.3
Passersby and residents	44.8
Total	100.0

Source: Fieldwork (2009) (n=29 for those who knew about the project)

The community has continuously been consulted on several issues through meetings with the SEC members (Table 5.2). Running and facility management was important in the consultation process as two-thirds of the respondents (62%) revealed (Table 5.3). The community is now running and managing the existing sanitation blocks through cooperatives or organized community groups. This has brought a sense of ownership to these facilities.

Table 5.2: If consulted about the project

Consulted:	N	%
Before the project started	21	37.5
During the project	22	39.3
At the time of survey	23	41.1

Source: Fieldwork (2009)

Table 5.3: Consultation issues

Issues consulted about	Percentage (%)
Running and facility management	61.9
Community mobilization	19.0
Hygiene Issues	14.3
Location of facilities	4.8
Total	100.0

Source: Fieldwork (2009)

2) Provision of labour

The residents of Soweto East have been used by Maji na Ufanisi to provide (paid) labour in building the sanitation blocks and the access roads. The SEC has been instrumental to make sure that the abundant labour in the village is utilized by the project implementers. Due to their availability during most of the day and “honesty”, women have so far contributed 75% of the labour (Personal communication, SEC Treasurer). The women have provided labour in making the low-cost bricks, in record keeping and transportation of materials from one point to the other. The latter had to be done “by hand” due to the inaccessibility of the settlement. Although the process has been slow and tedious, it has cultivated a sense of ownership.

The Soweto Youth Group (SYG) has also been instrumental in providing labour to the project activities. In fact, they have been subcontracted by Maji na Ufanisi to fabricate moulds for casting the low-cost building blocks and are also involved in the block making (Photo 5.3).



Photo 5.3: Blocks made by the Soweto Youth Group

The labour is rotated on a weekly basis at the construction sites to ensure that the majority of the residents get an opportunity to work in the community projects. Although it may cause some delays, the impact is positive as it increases trust and ownership. For example, during the 2007/2008 post-election violence, these facilities were not destroyed (as would have been expected) because the residents were protective of them. In one incident, some residents went as far as bringing down their structures which were adjacent to one of the facilities to prevent it from catching fire. The construction sites have also been providing a means of sustenance for the residents because they provide job opportunities for as many people as possible. Besides learning various skills, they also earn some money.

3) Planning

The planning team consists of the community, Maji na Ufanisi, UN-HABITAT and the government. The planning team consults widely with different stakeholders. They identify the areas to construct project facilities by both mutual cooperation and contractual agreements. The planning team then deals with the design, planning and scheduling of the projects. Having partners working together has reduced design-construction conflicts. For example, the planning for the relocation of houses and electricity poles to pave way for an access road was done by this team – in consultation with the relevant arms of the government and the community.

4) Provision of space

One of the challenges that most slum upgrading programmes face is lack of space. There is hardly any space to construct related facilities or access roads. Soweto East is densely populated with structures almost everywhere. It was clear right from the onset that for any upgrading, physical infrastructure or development, space had to be created from the existing structures (see Photo 5.4). At the initial stages of community mobilization and awareness, a lot of resistance was experienced, especially from the structure owners who did not want their structures destroyed to pave way for an access road and sanitation facilities. This is the major reason that the last sanitation block and the resource centre are yet to be constructed.

After intense community mobilization and awareness, SEC has been very instrumental in negotiating for space where the existing sanitation facilities have been located, including the access road. The SEC has so far succeeded in this task using the principle of “negotiating for space with as minimum displacement as possible”. For example, the residents whose structures were removed to pave way for the construction of the spine road (including drainage and walkway) were relocated to other areas within the settlement. In addition, the business structures that were demolished were rebuilt along the walkway to enable the owners maintain the business advantage they had before the construction.



Photo 5.4: Paving way for the spine road

The K-WATSAN project counted on the residents' goodwill for them to relocate to other areas, since this meant uprooting not only a structure but a whole micro-culture which is more tasking and unnerving as one of the residents put it. It involves making new friends and building social networks which take time to build and forge. As a gesture to the goodwill a solidarity wall has been put up that says: 'this was my land that I donated so I own the facility'.

5) Managing the facilities

The community's enthusiasm to manage the sanitation facilities was enhanced by their argument that "whatever is given free-of-charge is usually misused or misappropriated". That is the more reason that the community participated in the construction of the sanitation facilities and currently in their management. The Soweto East residents have formed a facilities management team charged with the day-to-day management of the sanitation facilities, ensuring they are clean and adequately provided with water. For sustainability of the facilities and the environment, the social enterprise approach is being used. This is an enterprise that is owned by those who work in it and/or reside in a given locality, governed by registered social as well as commercial aims and objectives and run co-operatively (UN-HABITAT 2009). The facility management teams are duly elected members of a given cooperative society in the area covered by the facility. The profit from the sanitation facility is banked by the cooperative.

6) Capacity building

One of the key aims of the K-WATSAN project is to empower the community and leave them with a capacity to sustain themselves. This has been done effectively in the areas of problem identification and prioritization; community resources identification and utilization; and gender and youth issues. For example the Soweto Youth Group has sent ladies for courses in "hair and beauty" while the boys have been trained in brick and block making. The trained residents are expected to pass the knowledge and skills to other residents. The previously idle youth are now able to engage in income-generating activities and therefore reducing crime in the area.

5.2.6 Challenges of the project

Whereas the project is so far running well, it is not void of challenges that it has to grapple with. Some of these challenges that the respondents reported they faced in the ablution blocks include:

- 1) Some of the respondents considered the charges for use of the sanitation facilities "too high" and "prohibitive" for their income levels. It was this group of persons that had to

cope through other disposal means such as the infamous flying toilets.

- 2) The sanitation facilities have not yet been connected with electricity and as such cannot be accessed at night.
- 3) Irregular water supply to the sanitation blocks, sometimes leading to unsanitary conditions.
- 4) Solid waste has not been adequately addressed and therefore is still a problem in the village. In fact, the domestic waste disposal methods in Soweto East are throwing in the river, trenches, drains or anywhere (56.9% of the households); use of garbage bags (27.6%); and composting (15.5%).
- 5) Some respondents mentioned the possibility of corruption in the management of the sanitation facilities.

5.3 The impact of the project on the livelihood of the households involved

So far, the project has transformed the lives of several Soweto East residents. The project gives an opportunity for the residents to earn a living through communal management of the water and the sanitation facilities. The sanitation facilities are communally owned and their management is on a rotational basis – for as many residents to benefit from them as possible. Furthermore, improved access to water and sanitation is not only closely linked to the health status of a population, but also to livelihoods. A healthy population necessarily translates to a population which has capacity to look for livelihood means.

Bergeron and Esrey (1993) observed that with less disease, the population can absorb more food, thus improving nutritional status and consequently health. Access to water can result in time savings for primary care givers and also in the preparation of more or better food for children. In addition, improvements in sanitation due to access to water results in better health (see for example Bateman and Smith 1991; Esrey et al 1991). Another potential benefit of improved access to water is that some income generating activities and livelihood sources need water.

Any area that is close to a main road is potentially lucrative in terms of business potential. The construction of the spine road has made Soweto East village accessible to the city centre and industrial area, making it easier and quicker for the residents to reach their places of work. The spine road has also allowed for motorized transport within some areas of the settlement. Transportation of goods to the area is now much easier and cheaper, especially to the small scale traders who depended on hand carts and human porters over long and winding paths to reach their destinations.

So far, the following impacts of K-WATSAN are emerging:

1. Improved access to water situation in terms of sources of water, cost of water (affordability), safety of water, reliability, distance traveled to water source, and time spent on fetching water (see also Photos 5.5 and 5.6).
2. Improved access to sanitation situation brought about by the sanitation blocks.
3. Improved accessibility through access roads.
4. Improved environmental conditions through waste management initiatives and community trainings on health and hygiene. Already, as seen above, 27.6% of the Soweto East households are using garbage bags and another 15.5% are composting their domestic waste.
5. Improved sources of income and livelihoods through running of the sanitation blocks, employment in the ablution blocks, provision of labour in K-WATSAN activities, access roads and a better business environment.
6. Capacity building, empowerment and training through the various trainings and Youth Empowerment Programme.
7. Greater awareness, participation and partnerships in slum improvement.



Photo 5.5: Water access point in Soweto East (at the ablution block)



Photo 5.6: Water storage tank for the ablution blocks

5.3.1 Reported benefits of the project

The respondents were asked to list some of benefits they are getting from the K-WATSAN water and sanitation blocks. Table 5.4 presents a summary of the reported benefits of the K-WATSAN water and sanitation facilities (ablution blocks). Access to toilet facilities and a clean environment, which were previously lacking in the area, have been improved. There are now less incidences of the infamous flying toilets, largely due to ease of access and less

distance to the toilets. The unpolluted rooftops (where the flying toilets landed) can now be used for rain water harvesting as an alternative source of water. The clean environment was attributed to the presence of more toilets and bathrooms for the population coupled with the reduced distances to the facilities.

Table 5.4: Reported benefits of the K-WATSAN water and sanitation facilities

	N	%
Access to toilet	23	31.1
Clean environment (water, area, toilet, no faeces)	20	27
Access to water	13	17.6
Ease of access	6	8.1
Employment creation and promotion	5	6.8
Reduction of diseases	3	4.1
Less distance	2	2.7
Access to credit services	1	1.4
Privacy	1	1.4
Total	74*	100

Source: Fieldwork (2009) (*n=by benefits)

The Focus Group Discussions (FGDs) revealed that the K-WATSAN water and sanitation facilities were more affordable. Furthermore, those who could not immediately afford to pay at the time of need were allowed to use the facilities with the understanding that they will pay later. Other mentioned benefits were privacy and security accorded especially to women and girls who in the past had to wait for night fall to fulfill their sanitation needs.

More than one-third of the respondents (42.9%) reported that they had benefited from K-WATSAN project in terms of employment, either directly or indirectly, in construction and building, running the ablution blocks, and maintenance of the blocks. As indicated before, when the construction phase was going on for the different infrastructure (i.e. ablution blocks and access roads), many of the community members were called upon to provide paid labour. Most of them were hired as casual labourers on a “cash for work” basis.

The study results further reinforces that more than half of the households are now spending less on buying water than before; spending less time fetching water than before; water borne diseases have reduced in the village; and that they were satisfied with the services rendered by the ablution blocks (Table 5.5).

Table 5.5: Other benefits of the K-WATSAN water and sanitation facilities

	N	%
Spending less on buying water than before	26	53.2
Spending less time on fetching water than before	40	81.6
Has the water borne diseases reduced in the area?	39	79.6
Satisfied with the ablution facilities	52	98.1

Source: Fieldwork (2009)

When asked how the access to water and sanitation situation was before the ablution blocks, most of the respondents mentioned that the village was dirty (with wastes) and that it was difficult to get water due to the long distances they had to cover.

5.3.2 Impact analysis: A comparison of Soweto East and Lindi

While some emerging impacts have been explained above, some variables in the questionnaire were used to compare Soweto East and Lindi. As mentioned before, the comparison between Soweto East and Lindi provides a better understanding of the impact of K-WATSAN on the livelihoods of Soweto East residents.

Table 5.6 reveals that Soweto East has a regular source of water than in Lindi. For example, 82% of the households in Soweto East have a regular source of water from the K-WATSAN water points compared to only 1.6% in Lindi. Furthermore, water is relatively cheaper in Soweto East than in Lindi. For example, 85% of the households in Lindi use more than KES 20 on a daily basis to buy water while the percentage is much lower in Soweto East with the K-WATSAN project. In addition, Soweto East residents spend less time fetching water. For example, only 7.1% of the Soweto East households spend more than 30 minutes fetching water. This is because the K-WATSAN water points are nearby.

Table 5.6: Comparison of Soweto East and Lindi: Selected characteristics

	Soweto East (%) (N=56)	Lindi (%) (N=61)
Source of water (regular – most of the time)	82	1.6
Cost of water per day (>KES 20)	21.4	85
Time taken to fetch water (>30 minutes)	7.1	32.8
Perception on the current water source's safety for drinking (not safe)	51.8	75.4
Experienced periods of longer than normal water scarcity	53.6	74.6
Prevalence of typhoid, diarrhea and cholera	70.5	76.8
Type of sanitation facility (modern ablution block)	98.2	0

Source: Fieldwork (2009)

One of the respondents in Soweto East noted that:

...the children, especially the girl child, are spending less time fetching water and thus getting to school on time. Previously, they had to queue for 10-20 minutes at the water vendor's kiosk who could not account for his water source. In addition, they spent another 10 minutes walking back to the house, and this had to be done early in the morning otherwise they miss water. Nowadays the round trip is only 10 minutes and water can be fetched at any time.

Given the K-WATSAN project, the perceptions on the current water sources' safety for drinking is also different in the two villages. Soweto East residents have far much more confidence in their source of water in terms of its safety for drinking than in Lindi. Even then, there was no much difference in the prevalence of water borne diseases in the two villages. Owing to the intervention, fewer households (53.6%) in Soweto East had experienced periods of water scarcity than in Lindi (74.6%), prior to the survey. Lastly, the Soweto East had access to modern ablution blocks, while Lindi had largely the traditional pit latrines (see Box 5.1 for a description of the various types of sanitation facilities).

Box 5.1: Types of sanitation facilities

- a) **Traditional pit latrine:** A simple pit covered with logs, not usually roofed, sometimes they have no walls and requires no specialist skills for constructing. If not used well it is unpleasant, smells and attracts flies. They are normally sprayed with ash to clean them. They do not require periodic emptying once a pit is full it is sealed and a new pit dug. In Soweto East they are emptied manually with an exhaustor. Some pit designs are meant to be completely dry, while some use small quantities of water.
- b) **SanPlat latrines:** Like the traditional latrine but with a SanPlat, i.e., a small concrete platform (usually 60cm by 60cm or smaller), laid on top of logs or other supporting material traditionally used to cover the pit. It is slightly elevated for ease of use in the dark. Its aim is to provide a sanitary (san) platform (plat) which can be easily cleaned to limit the presence of disease vectors around the pit. Once the pit is full, the sanplat can be moved for use elsewhere. It can be located close to house with fitted lid to prevent smell and flies (Brandberg, 1997).
- c) **Conventional improved pit latrines:** Similar to the traditional latrine, but built with more solid materials, i.e. bricks, with walls and a roof. Putting hot ashes in the latrine can reduce smell and flies.
- d) **VIP latrines (Ventilated Improved Pit):** The normal pit but with a screened vent pipe fitted on the wind direction so that the wind blows over the vent pipe. The chimney draws air currents into the structure and through squat hole. Odours rise through the chimney and disperse. The structure of the toilet means that any flies attracted to the pit through the squat hole will try to escape by heading towards the strongest light source, which comes from the chimney. The flies exit is blocked by a wire mesh so the flies eventually die and fall back into the pit. The spiral structure prevents too much light entering the toilet while allowing a free flow of air (Brandberg, 1997).
- e) **Pour-flush latrines (modern ablution blocks):** Water seal fitted to drop hole, this ensures that there are no flies and lingering smell. Water is poured into the water seal to flush the toilet.

5.4 Hypothesis testing

This study formulated two hypotheses, namely:

1. K-WATSAN operations are of no consequence to Soweto East residents.
2. K-WATSAN has had no impact in the livelihoods of the Soweto East residents.

To test the hypotheses the Likert scaling technique was used (See section 3.4.1). The variables which could satisfy the conditions for the hypotheses were identified and selected; the variables were then subjected to recoding and computation of their means to derive a measure of value which could be ranked. Those means which reflected lower values when ranked on the Likert scale were considered as less desirable than those that were highly ranked thus failing to satisfy the hypothesis condition.

To test the first hypothesis which was to analyze the consequence of the K-WATSAN operations on the Soweto East residents, responses from the following variables were subjected to the tests:

1. Levels of knowledge of the project; there was a need to establish what extent of the residents knew about the intervention that was taking place in their village.
2. The mode of awareness. It was most desirable that they received knowledge from the community mobilization meetings.
3. The benefits accruing from the use of the facilities.
4. Their level of satisfaction of the project benefits.

For the second hypothesis, the impact of K-WATSAN on the livelihoods was measured by analyzing two major variables, namely, (1) time spent on accessing the facilities after the commencement of the intervention, and (2) the cost of accessing the sanitation facilities.

The study findings were in line with the above mentioned hypothesis formulated to guide the study and can conclude that K-WATSAN operations are of consequence to Soweto East residents, and that K-WATSAN has had an impact in the livelihoods of the Soweto East residents.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the findings emanating from the study, the conclusions and finally the recommendations which future researchers and policy makers could look into. The summary of research findings section has been presented under the three main objectives of the study which sought to answer the following research questions:

1. What is the nature and extent of Kibera Integrated Water, Sanitation and Waste Management Project?
2. What is the nature and extent of community participation in the project?
3. What is the impact of the project on the livelihoods of Soweto East residents?

6.1 Summary of findings

The key findings resulting from the data obtained from secondary sources and verified in the field are summarized below:

Nature and extent of K-WATSAN project

K-WATSAN is a community based water and sanitation intervention in Soweto East which has partnerships, sustainability, inclusion and participation as its guiding principles. It has initiated accountable governance frameworks to support small scale community based initiatives in water, sanitation and waste management.

Nature and extent of community participation in K-WATSAN project

The community in Soweto East is participating actively in the K-WATSAN project in the following major aspects: (1) capacity building, empowerment and training through the various trainings and Youth Empowerment Programme; (2) greater awareness, participation and partnerships in slum improvement.

Impact of the KWATSAN on the livelihoods of Soweto East residents

The K-WATSAN project has a positive impact on the households in Soweto East in terms of (1) improved access to water and sanitation situation; (2) improved accessibility and environmental conditions; and (3) improved sources of income and livelihoods security.

6.2 Conclusion

This study has established and concludes that K-WATSAN has had an impact on the livelihoods of the Soweto East residents. The data reveals that the residents have better access to water and sanitation as opposed to the period before the intervention. Access to sanitation in an area is important because it affects the health of that population. Water quantity improvement and ease of access to sanitation increases the capacity of a people to acquire food and income as less time is used in obtaining the former. In Soweto East people have more time in which they are utilizing for securing their livelihoods which has emerged as an impact. Studies suggest for example, that when women have more time for other activities as opposed to looking for access to water and sanitation, they spend much of that time in food-related activities. The K-WATSAN project exemplifies implementation of the government's policy on informal settlements of gradual improvement in terms of physical infrastructure, public utilities, services and affordable housing without occasioning forced displacement of the resident population in the informal settlements.

6.3 Recommendations

The study has come up with recommendations that are useful for the government, policy makers and the community at large. The recommendations could be used in future projects as they are being planned and worked on, they are:

6.3.1 Recommendations to policy makers

1. To identify the income poor and the water and sanitation poor since they are different and target interventions that suit the particular group so as not to have a blanket solution for all interventions.

2. Re-examine government policy and budget allocations so as to target the poor communities.
3. Give priority to extend access of water and sanitation to those who do not have services and improve the current delivery of the same.
4. To design policies that enable more resources be put into research and development to ensure that low cost technologies for service delivery are implemented.
5. They should target interventions that fill gaps in service delivery, have long term reforms in planning and management , build institutional and capacity building and
6. Target participatory approaches which enhance ownership, poverty alleviation and good governance for sustainability
7. In putting up an intervention involve the community, put transparent governance mechanisms and put up pro-poor financial mechanism so that they gain both financially and environmentally.
8. Look for strategies and policies that will enable community members take an active role in ensuring that they receive environmental education to better and safeguard their physical environment.
9. Ensure that any government intervention is self financing and the community is in charge so that there's more ownership and responsibility and less fiscal burden on the public.
10. In focusing on interventions there should be private public partnerships as this ensures accountability and a profit making aim which guarantees efficient service provision.
11. Set up a monitoring and evaluation unit to check on the progress of how efficiently the interventions are being implemented.
12. Focus on establishment of microcredit arrangements that avoid unsustainable subsidized services yet facilitate improvements in water and sanitation infrastructure demanded by the slum dwellers.

6.3.2 Recommendations to future researchers

1. Further studies to be carried out to examine the waste component which was not captured in this study.

2. The researchers could study and understand people's preferences and service levels for which the slum dwellers are willing to pay and what financing and delivery mechanisms will ensure that all community members will be able to afford and have access to the services.
3. Further studies should be carried out to analyze gender preferences and dynamics in this particular intervention in the design of water supply access points and other crosscutting issues like education and H.I.V/AIDs.
4. Research should be conducted to come up with eco friendly sanitation facilities.

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APPENDIX

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**The Kenya Slum Upgrading Programme (KENSUP):
An Analysis of Kibera Integrated Water, Sanitation
and Waste Management Project**

*The information you obtain through this questionnaire is strictly confidential
and will be used only for academic purposes*

Date of interview	
Name of interviewer	
Name of the respondent	
Area of interview	

FORM 1: HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS (2009)

Name	Relati on to Hh head	Sex	Age	Marital status	Educ ation level	Occu pation al status	Type of occupation

<u>Relation to household head</u> 1 = household head 2 = spouse 3 = son/daughter 4 = brother/sister 5 = father/mother 6 = other relative 7 = non relative 8 = employee 9 = not stated/don't know	<u>Marital status</u> 1 = never married 2 = married monogamously 3 = married polygamously 4 = divorced 5 = widowed 6 = separated 7 = staying together 8 = not stated/don't know <u>Education level</u> 1 = none 2 = primary 3 = secondary 4 = above secondary 5 = not stated/don't know	<u>Occupational status</u> 1 = regular (formal) employment 2 = temporary (formal) employment 3 = self employed/informal sector 4 = casual labour 5 = unemployed (looking for a job) 6 = none (student/child) 7 = home maker 9 = other (specify)
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<u>Sex</u> 1 = male 2 = female		
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<u>Age (in completed years)</u>		
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FORM 2: HOUSEHOLD HEAD MIGRATION HISTORY

Q1. In which year did you come to this town/city?

Q2. Since when did you start living in this estate?

Q3. Have you ever stayed in other estates of this city/town? [1] Yes [2] No

Q4. If yes, which ones?

FORM 3: ACCESS TO WATER SITUATION (2009)

Q1. Access to water situation rapid assessment

	Sources of water	Main source	Uses of water	Location of water source	Do you buy the water?	Cost per unit	Do you treat the water?	Mode of treatment
Piped water (individual)								
Piped water (landlord's)								
Piped water (neighbour's)								
Piped water (public standpipe)								
Piped water (water kiosk) [1] council [2] NGO [3] CDF [4] UN-Habitat								
Borehole (individual)								
Borehole (landlord's)								
Borehole (neighbour's)								
Shallow well (individual) [1] protected [2] unprotected								
Shallow well (landlord's) [1] protected [2] unprotected								
Shallow well (neighbour's) [1] protected [2] unprotected								
Private water vendors								
Roof catchment/rain water								
Surface water [1] river [2] lake [3] spring [4] pond								
<u>Uses of water</u> [1] Drinking [2] Cooking [3] Washing [4] Farming [9] Other (specify)	<u>Location of water source</u> [1] On plot [2] Off plot	<u>Do you buy/treat the water?</u> [1] Yes [2] No	<u>Cost per unit</u> (please specify unit)	<u>Mode of water treatment</u> [1] Boiling [2] Use of chemicals [3] Filtering [4] Solar disinfection [9] Other (specify)				

Q2. If location of water source is off-plot:

(a) Who is normally responsible for fetching water in the household?

- [1] Spouse (female) [2] Spouse (male) [3] Children (male) [4] Children (female)
[5] Worker [9] Other (specify)

(b) At what time do(es) s/he/they normally fetch water?

[1] In the mornings [2] In the evenings [3] Any time there is need

(c). Approximately how much time do(es) s/he/they spend on fetching water in a day?

[1] Less than 30mins [2] 30mins to 1 hour [3] More than 1 hour

(d). How does this affect the school going children or those working?

Q3. If paying for water:

(a) Approximately how much does it cost the household?

[1] Per day _____ **OR** [2] Per month _____ **OR** [3] Included in the rent

Q4) If treating water:

(a) Is there any cost associated to this treatment? [1] Yes [2] No

(b) If yes, in what way(s) and approximately how much per given period or per given unit?

Q5. Current water situation

(a) How regularly do you get water?

[1] Always (regularly) [2] Most of the time [3] Now and then (irregularly)

(b) Do you think that the water you use is safe for drinking?

[1] Yes [2] No [3] Don't know

(c) What are the other major problems with your current water supply?

FORM 4: COPING WITH WATER SCARCITY

Q1. Have you experienced some periods of longer than normal water scarcity this year?

[1] Yes [2] No

Q2. If yes, what were your alternative sources of water?

Q3. What problems did you encounter as a result of the water shortage and how did you cope?

FORM 5: ACCESS TO WATER AND HOUSEHOLD'S HEALTH SITUATION

Q1. What are some of the water and sanitation related diseases common in this area?

Q2. Has any member of this household suffered from any one of these diseases in last one month? [1] Yes [2] No

Q3. If yes, which diseases and which members of the household?

FORM 6: ACCESS TO WATER AND LIVELIHOODS

Q1. What are the household's sources of livelihood (i.e. income and food-generating activities)?

Q21. Do any of these livelihood sources directly and/or indirectly require access to and/or use of water? [1] Yes [2] No

Q3. If yes, what is the activity?

Q4. How does the availability and unavailability of water affect this activity?

Q5. How does the availability or unavailability of water affect the other household's income-generating activities?

Q6. Do you spend more on buying water when it is unavailable? [1] Yes [2] No

Q7. Do you spend more time looking for water when it is unavailable? [1] Yes [2] No

Q8. What is the household's present income situation per month?

- [1] Upto Kshs 5,000/= [2] Kshs 5,001-10,000/=
[3] Kshs 10,001-20,000/= [4] more than Kshs 20,000/=

Q9. Roughly how much did this household spend on food last month?

Q10. Roughly how much did this household spend on water last month?

Q11. If a tenant, how much did this household spend on rent last month?

FORM 7: PERCEPTIONS ON ACCESS TO WATER

Q1. What is your perception about the following sources of water?

	Cleanliness for use [1] <i>clean</i> [2] <i>not clean</i>	Safety for drinking [1] <i>safe</i> [2] <i>not safe</i>	Availability [1] <i>always</i> [2] <i>not always</i>	Reliability [1] <i>reliable</i> [2] <i>not reliable</i>
Piped water				
Borehole water				
Shallow well				
Private water vendors				
Rain water				
Surface water				

Q2. What do you think are the risks of unclear and unsafe water?

Q3. What do you think are the benefits of clean and safe water?

Q4. Are you willing to pay for more to get clean, safe and reliable water? [1] Yes [2] No

Q5. What do you think should be done to improve your access to clean and safe water supply?

FORM 8: ACCESS TO SANITATION SITUATION

Q1. Does this household/plot have a sanitation facility (i.e. toilet)? [1] Yes [2] No

Q2. If yes/no, what type of sanitation facility do you have access to?

- [1] None [2] Traditional pit latrine [3] VIP latrine
[4] Modern ablution block [9] Other (specify)

Q3. Is the sanitation facility you have access to shared? [1] Yes [2] No

Q4. Who put up the sanitation facility?

- [1] Self [2] Landlord [3] The council [3] NGO [4] Don't know
[9] Other (specify)

Q5. If a project, council or NGO based facility, who runs and maintains it?

- [1] Self [2] Landlord [3] The council [3] The NGO
[4] The community [5] Don't know [9] Other (specify)

Q6. Where is the sanitation facility located?

- [1] On plot [2] Not far from here [3] Far from here

Q7. Do you pay to use the sanitation facility? [1] Yes [2] No

Q8. If yes, how much per single visit?

Q9. If a project, council or NGO based facility, how can you describe the sanitation facility in terms of its cleanliness, facilities inside and maintenance?

Q10. How has this project benefited you in terms of sanitation situation at the household level and this area in general?

Q11. How do you dispose your domestic (solid) waste?

Q12. How has this project benefited you in terms of solid waste management at the household level and this area in general?

FORM 9: HOUSE CONDITIONS AND OTHER AMENITIES

Q1. Since when did you start living in this house?

Q2. How many rooms does the house have?

Q3. What is your tenure status?

- [1] Owner occupier [2] Rented [9] Other (specify)

Q4. If rented, how much do you pay per month?

Q5. What is the household's main source of cooking fuel?

- [1] Electricity [2] Gas [3] Paraffin [4] Charcoal [5] Firewood

Q6. What is the household's main type of lighting?

[1] Electricity [2] Paraffin [9] Other (specify)

Q7. Observe roofing material of the house:

[1] Corrugated iron sheet [2] Tin [3] Grass [9] Other (specify)

Q8. Observe wall material of the house:

[1] Permanent [2] Semi permanent [3] Mud [4] Iron sheet/tin
[5] Wood [9] Other (specify)

FORM 10: FOR SOWETO EAST K-WATSAN HOUSEHOLDS

Q1. Do you know about the Kenya Slum Upgrading Programme taking place in Soweto East Village? [1] Yes [2] No

Q2. If yes, how did you know it and what do you know about the programme/project?

Q3. What are some of the benefits you are getting from the K-WATSAN ablution blocks?

Q4. What are some of the challenges/problems you are facing in using the ablution blocks?

Q5. What was the access to water and sanitation situation before the ablution blocks?

Q6. Has the water project reduced the occurrence of water-borne diseases in this area?
[1] Yes [2] No

Q7. If yes, what was the situation before and what is the situation nowadays?

Q8. Do you spend less on buying water than you used before the project? [1] Yes [2] No

Q9. Do you spend less time on fetching water than you used before the project?
[1] Yes [2] No

Q10. In general, are you satisfied with the services rendered in the ablution blocks?
[1] Yes [2] No

Q11. In what ways are you/you not satisfied?

Q12. How did you or are you participating in this project?

Q13. Were you consulted before the project started? [1] Yes [2] No

Q14. Were you consulted during the project? [1] Yes [2] No

Q15. Are you being consulted now? [1] Yes [2] No

Q16. If yes, what was the consultation about and who did it?

Q17. Have you ever benefited from this project in terms of employment (directly or indirectly)? [1] Yes [2] No

Q18. If yes, explain in what way(s) and how much did you earn?