CHALLENGES IN PLANNING FOR ELECTRICITY INFRASTRUCTURE IN INFORMAL SETTLEMENTS:

CASE OF KOSOVO VILLAGE, MATHARE VALLEY –NAIROBI

BY

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DECLARATION

This is my Original Work and has not been Presented for Examination in any University.

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This Research Project has been Submitted with my Approval as the University Supervisor.

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DEDICATION

To you that gave your support for success.

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ABSTRACT

Development efforts in Kenya and other third world countries has for quite some time overlooked the slums areas. This has been majorly attributed to the illegality of the settlements and insecure land tenure systems. This continued trend and ignorance of the fact that informal settlements exist has led to worsening of the situation in the settlements as the population continues to grow. On the other hand, the local authorities continue to be overstretched in terms of providing basic services such as electricity and water.

This research was carried out in Kosovo Village, one of the informal settlements in Kenya within the precincts of the city of Nairobi. The study highlighted the main causes and challenges in planning for electricity infrastructure within the settlements and planning interventions to the current situation.

The research in examining the challenges facing planning for electricity infrastructure in Kosovo was contacted through a well thought data collection and analysis process. Issues of lack of designated space for service provision and deliberate encroachment into wayleaves were observed. Faulty and probably illegal wiring or use of flammable energy alternatives when the power is cut off can cause devastating fires, destroying homes and displacing, killing, or injuring of thousands of people as it has been the case in some parts of Mathare.

In this endeavor, the study established that the main challenge was competition for the limited space by different land uses. The landlords otherwise known as structure owners, due to limited space in the area build houses under the transmission lines to cater for the demand of cheaper housing, and this is done in full knowledge of the restrictions and dangers associated with the power line. Different policies of the government are also at fault of the current situation as they have overlooked the seriousness of the slums and the subsequent service provision.

The research findings and recommendations provide interventions to synthesize competing land uses and improve the situation on the ground, while at the same time looking at policy and regulatory framework. Overlooking the economic status and livelihoods of the people will also lead to failure as suggested in the research recommendations.

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CHAPTER 1: INTRODUCTION

1.1 Background to the Problem

Urbanization is the physical growth of urban areas as a result of rural urban migration. The United Nations projected that half of the world's population would live in urban areas at the end of 2020 Herald (2008). Rapid and unplanned urbanization in developing countries has led to an increase in the mushrooming of informal settlements.

Cities including Nairobi are known to be places where money, services and wealth are centralized. Many rural inhabitants come to the city for reasons of seeking fortunes and social mobility. Businesses, which provide jobs and exchange capital, are more concentrated in urban areas. Whether the source is trade or tourism, it is also through the ports or banking systems that foreign money flows into a country, commonly located in cities

However, the cities are not solutions to all the needs that people come to seek. The increased congestion in towns has made it difficult for the local authorities to provide services as required. This has led to poor living conditions. The slums have become more prone to violence, drugs, and illegal groupings that have made them insecure. They have increased land conflicts and encroachment into reserved lands, environmental deterioration and high costs of living among others.

Despite the benefits of being nearer to potential employment and social services, these community areas are plagued with poor health, risky environments, and crime. Where they exist, slum-upgrading efforts tend to give improvements in water supply and sanitation a higher priority than electricity, as there are alternatives (i.e., theft) or substitutes for electricity even if the service is poor and inadequate for the most desired uses.

Urban settlements in Africa continue to become more chaotic as increasing population put more pressure on capacity of urban cities to provide services to their residents. The cost of urban infrastructure and services notably housing, water, transport, healthcare, and sanitation among others has become unaffordable to majority of urban dwellers due to widespread poverty, and low-

income levels. (Akatch and Kasuku, 2002). Physical infrastructure and services in these settlements are either missing or unplanned (World Bank, 2010).

Development efforts of the past several decades have focused almost exclusively on the energy needs of the rural poor while largely ignoring those of extremely poor households in urban slums. The government of Kenya has even establishes the Rural electrification Authority to help the rural areas overlooking the urban poor. About 40% of the world's poor living in urban areas lack access to modern energy services that could improve living conditions and expand economic opportunities. Rapidly growing slums have overwhelmed most municipalities in developing countries, and many have ceased trying to address the problem of providing legal and safe connections to these areas (USAID, 2004)

Within the urban population, about 34% are considered poor and live below the poverty line. Poverty levels, which have a direct correlation with type and quantity of energy used, play a vital role in the access of energy sources among the urban and peri-urban poor. Although the supply of modern energy resources in urban areas being far much better than in rural areas, access of modern energy among the urban poor is still inadequate. This is largely because the urban poor, in most cases, live in informal settlements/slums around or within the urban areas, which are not usually planned for and have very limited access to modern energy infrastructure (Karekezi,2008). The informal nature of urban poor housing/residence makes planning provision of energy sources to the urban poor difficult.

Most services normally available to legally constituted and occupied areas are not legally available in slums. The growth of slums responds to the failure of planning for the essential services to the people such as water and electricity. This has led to the slum dwellers to acquire them illegally to satisfy their needs. Many people built their houses under the transmission lines aware of the danger it has to their life, but because of lack of other cheap places they opt to do so. Faulty (and probably illegal) wiring or use of flammable energy alternatives when the power is cut off can cause devastating fires, destroying homes and displacing, killing, or injuring tens of thousands of people.

Electricity suppliers have low revenue expectations relative to the high costs of service provision in slum areas. Revenues are typically low and often sporadic, even without theft, because poor households cannot afford to purchase large amounts of energy even at subsidized prices. Electricity companies also face very challenging physical conditions and tenure issues in slums that are unlike those encountered in formal, legal settlements. Given that many slums consist of squatters who do not have land tenure, the electricity company faces difficult legal issues in providing service, including the lack of a means to obtain right-of-way for distribution system equipment (Orvika and Haako, (2009). There is need to legislate laws that will protect the spatial part of electricity provision especially in informal settlements. The vast majority is covered by way leaves.

A way leave is a space of land acquired for laying pipeline, drain, sewer, electricity and communication cables or wire on pylons. According to the Wayleaves Act Cap 292 Laws of Kenya, the Government may create a way leave into, through, over or under any lands whatsoever but may not in doing so interfere with any existing building. Wayleaves can be defined as the right of way granted by the owner of property or land for the purposes of laying a water mains, power lines, sewer, oil pipelines, telephone cables and roads (Syagga, 1994). The right-of-way for a transmission corridor includes the land set aside for the transmission line and associated facilities, and land set aside for a safety margin between the line and nearby structures and vegetation. Having the safety margin helps avoid the risk of fire and other accidents. The right-of-way width needed for transmission lines ranges from 30 meters to 65 meters.

The nature of many projects, which require Wayleaves indicate that they are more suitable if they follow the alignment of existing road or railway network for ease of accessibility and maintenance as long as the topography is suitable. Sometimes, due to poor topography and long distances involved, way leaves may be created away from existing road alignment cutting across various public and private properties. This research project will focus on those created for the purposes of carrying electric supply lines

1.2 Problem Statement

While housing requires a single suitable sizeable land, other development programmes such as electricity, water, sewerage and telecommunication are linear and traverse long distances involving both public and private lands affecting many homes and a big population. This, in essence, calls for creation and planning for way leaves

On 28th February 2011 fire razed down shanties in Nairobi's Mukuru slum which saw 15,000 people lose property and remain without shelter(The Standard Newpaper,2011 Newspaper note). Suspicion was directed at "landlords" who had taken over electricity line way leaves to build shanties, and the criminal gangs that steal power from Kenya Power and Lighting company (KPLC) power lines to supply slum residents. Even more alarming is that some of the shanties are right under high voltage power lines that supply substations. These lines are part of the main grid and carry voltage beyond the normal load.

As per the Wayleaves Act cap 292 of the laws of Kenya way leaves to power lines, railway lines and oil pipelines should remain free of structures or developments that could interfere with them. The limits of the way leaves are also clearly defined by law, but the problem is in enforcement of the rules especially in areas where housing is unregulated such as slums. It will require significant goodwill for the Government to bite the bullet and restore the right status quo to prevent future tragedies (Standard, 2011). In informal human settlements, most of the structures are constructed under the power lines. All the above problems relate to laxity in the legal aspect coupled with inadequate planning for the infrastructure

Power companies go ahead and look for the shortest distances to reach these homesteads due to lack of a well provided Wayleaves trace. In other cases where such settlements are not served with adequate access roads, electricity lines traverse private properties in order to access the homesteads. In Kenya, this is attributed to the poor infrastructure network caused by lack of a well articulated sectoral development plan on infrastructure network.

Further the lack of services has led to the people using crude means to satisfy their needs. Criminal gangs tap both water and electricity illegally to supply to the people. This shows that there is

demand for the services but they are not affordable by the people. The dangers are overlooked in the process only to come out in when there are hazards. The government has resorted to reactive planning by resettling people who have already been affected and lives lost. There is need to prevent this situations through proper land use planning and law enforcement.

This has been a major problem in Kosovo village for years now. The houses are made of poor quality materials because of affordability. Iron sheets, tins, and polythene papers are the main materials used. Most of these materials are highly inflammable in cases of fire. Most of these structures are connected to each other making it difficult to save lives and property in cases of accidents. They are vulnerable to fire breakouts and other calamities such as floods. Availability of electricity to the people has its advantages to improving the livelihoods of the slum dwellers. Legal availability of electricity will deal with the dangerous connection that people have. By creating community awareness about the dangers of electricity, the people will avoid the Wayleaves making the area safe. Planned Wayleaves if well protected by law enforces to prevent people settling there at first place will be of great advantage to the people.

From the above problems, there's need for deliberate intervention measures in planning for electricity infrastructure in the informal settlements. This will go a long way in enhancing safety as well as spurring economic development.

Based on the problems stated the purpose of this study was to examine planning challenges for electricity infrastructure in Kosovo village in Mathare Valley slums as well as propose intervention measures to counter the above problems.

1.4 Research Questions

1. What is the current situation for planning for electricity supply in Kosovo?
2. What is the existing institutional framework and stakeholder formation in respect to planning for electricity supply in Kosovo village?
3. What are the previous planning measures towards electricity supply in Kosovo?
4. What are the constraints for planning for electricity supply in Kosovo?
5. What are the impacts of inadequate electricity infrastructure in Kosovo village?

6. What is the role of planning in ameliorating the situation in Kosovo?

1.5 Specific Research Objectives

1. To investigate the current status of electricity infrastructure in Kosovo village
2. To investigate the institutional framework in regards to planning of electricity supply in Kosovo
3. To examine the previous planning interventions towards planning for electricity supply in the area
4. To investigate the constraints in planning for electricity supply in Kosovo
5. To assess the impacts of lack of planning of electricity supply in the area
6. To propose planning interventions in solving the current situation in Kosovo

1.6 Research Assumption

The study assumed that competing land uses and high population density are the main challenges in planning for electricity infrastructure in Kosovo village Mathare valley.

1.7 Justification of the Study

Emergence of informal settlements is not a new phenomenon; it has been there for centuries. Many people have migrated into towns in search for jobs and better living standards. The population growth in urban areas is on the rise and that 60% of Nairobi population lives in slums (World Bank 2008). Service provision is poor making the areas insecure and unsafe for human habitation. These settlements are mainly located on government land, Wayleaves, and along riparian reserves. They pose both environmental and health concerns.

Several Studies done in informal settlements have either cast a blind eye on this fact or have looked at it in generality. Existing policies have laid emphasis on affordable housing as the major component of slums eradication; in addition players in this sector, which are the local authorities, central government, and service providers, continue to work in isolation. Service providers such as Kenya Power have found the areas insecure and not worth for investing as the returns are not attractive.

Generally, empirical evidence about the benefits of electricity in informal areas is lacking or has not been documented. This lack of information has led to the poor attention given to this sector by policy makers, service providers and other stakeholders in planning for electricity supply in

informal settlement. On the other hand, the current slum upgrading programmes focus mainly on water supply and sanitation with little focus on electricity component. The existing legislative framework notably the Wayleaves Act is biased towards planned settlements with formal and secure tenure.

This research study is important because it gives insights on the challenges encountered in planning of electricity infrastructure in informal settlements. The best practices will also be highlighted and can be adopted by the service providers to mitigate inherent dangers and hazards. The importance of public participation/stakeholder participation is key in planning for infrastructure services in informal settlements. The study is in Kosovo village, Mathare valley Nairobi.

The study fulfills the requirements of the course. It was done within the required timeframe establishing the challenges, and recommending the possible solutions to the issues found.

1.8 Organization of the Study

The study was located in Kosovo, a village in Mathare slums in Nairobi. This study was organized in seven chapters namely; Introduction, Literature review, Research methodology, Study area, Study findings and implications, problem analysis and policy recommendations, and finally synthesis, recommendation and conclusion.

Introduction*:* This chapter gives the background information on the problem statement. Further, it gives the purpose of the study with specific research questions and objectives guiding the research process. Lastly it expands on the study justification.

Literature review*:* This involves review of available body of knowledge on the topic of study. The major sources of these include journals, previous reports, policy documents and books on the research topic. This enables the understanding of what has already been documented on the topic of study and make it possible to identify the gap which has to be bridged by this study.

Research methodology*:* This chapter explains the entire process of the research and how it was carried out. This is in terms of the design of the study that entails data collection including sampling of the targeted population, data recording, analysis and synthesis of the collected data so as to inform formulation of policy recommendations and making of the conclusion.

Background of the study area*:* This chapter gives a clear understanding of the study area. This includes background information in terms of location, spatial spread, geological and climatic conditions of the area. It also gives the general orientation of the study area within the national and regional context. This chapter further provides the reader with relevant population and demographic information of Kosovo to help understand the demand of services.

Study findings and implications*:* This covers the outcomes of the study otherwise called findings. This answers the stated research questions and determines the extent to which the research objectives have been achieved.

Problem issues and policy recommendation: This chapter explains the deficiency of policies and how they can be improved to accommodate the planning of informal settlements in the case of the study area.

Synthesis, conclusion and recommendations*:* This chapter comprises the analysis of the data collected in the view of looking for the answers to the fore-stated question.

1.9 Limitations of the Study

The study limitations included the time provided to take the study but it was dealt with by well organized timetable on how the work was carried out. The other limitation was limited secondary sources of information but they were supplemented by getting the information directly from the field.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Currently the slum population has crossed the billion mark showing that every one person in three lives in slums (UN-HABITAT 2010). This is not only changing the urban form and structure, but also is exacerbating poverty, housing problems, inequality and social exclusion in most cities specially in developing nations. This section will highlight the weaknesses and achievements of past and current informal settlement policies and programs since the 1950s and arguments to meet the slogan 'Cities Without Slums'.

2.2 Indicators and Thresholds for Defining Slums

UN-HABITAT(2003) defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following: durable housing of a permanent nature that protects against extreme climate conditions, sufficient living space which means not more than three people sharing the same room, easy access to safe water in sufficient amounts at an affordable price, access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people, and security of tenure that prevents forced evictions.

Table 1: Indicators of Slum

Character	Indicator	Definition
Access to water	Inadequate drinking water supply	A settlement has an inadequate drinking water supply of less than 50% of households have an improved water supply household connection;
Access to sanitation	Inadequate sanitation	A settlement has inadequate sanitation if less than 50% of households have improved sanitation.
Structural quality of housing	Location	Proportion of households residing on or near a hazardous site, under garbage mountains, high-industrial pollution areas and unprotected high –risk zones(e.g. railroads, airports, energy transmission lines)
	Permanency of structure	Proportion of households living in temporary and/or dilapidated structures.
Overcrowding	Congested housing	Proportion of households with more than two persons per room. The alternative is to set a minimum standard for floor area per person (e.g. 5 square meters).
Security of tenure	Forced evictions and ambushes	Proportion of households with formal title deeds to both land and residence. And in addition to enforceable agreements or any document as a proof of tenure arrangement.

- **Source: UN Chronicle Online Edition: Slums and Housing in Africa 2003**

2.3 Slum Formation and Development Stages

The current existence and continued formation of slums in the developing countries such as Kenya is seen as a major challenge towards achieving the Millenium Development Goals (MDG's). According to Siuliza (2004), understanding the evolution of slums is the ultimate step that will help in formulation of appropriate approaches towards alleviating slums in the developing countries. As earlier stated, slums start from open spaces to densely populated areas.

2.3.1 Population Growth and Rapid Urbanization

Many people believe that slums are inevitable as long as there is rapid population growth and urbanization. However the existence of slums are neither an inevitable consequence of population growth or an inevitable result of rapid urbanization (Ooi Phua,2007,Taubenbok et al,2009). Urbanization is not a problem itself, the problem is rooted in inappropriate policies that are biased towards political elites, lack of capacities in local authorities to supply improved services coupled with rapid urbanization and population growth contribute to growth of slums.

2.3.2 Governance and Growth of Slums

As earlier highlighted, urbanization is not a problem; the real issues are rooted in outdated institutional structures, governance policies, inappropriate legal systems, incompetent national and local governance and shortsighted urban development policies (Share the world's resources, 2008). Governments in developing countries have left matters related to slum improvement to international agencies)

2.3.3 The Economic, Social and Environmental Perspective

A better understanding of slum formation call for appreciation of social, economic, and environmental attributes and their interaction. Hence it is not simply an urban planning problem. Slums actuate considerable public and investment outside the formal economy and investment cycle(Negera,2012). Slum settlements often occupy open public land hence incapacitating government efforts to manage, monitor and plan land use. Illegal connections to infrastructure on the other hand and non payment of taxes diminish the revenue base of the government to provide basic services. The lack of security of tenure makes the settlements vulnerable to evictions and demolitions to pave way for infrastructural development. The slums also contribute to environmental degradation and environmental hazards due to development in natural resources and protected areas. Access to basic services and social facilities are the worst consequences of living in slums compared to security of tenure. Hence planning intervention will looked at in the context of deprivation, vulnerability and fragile livelihoods.

2.3.4 Slum Development Stages

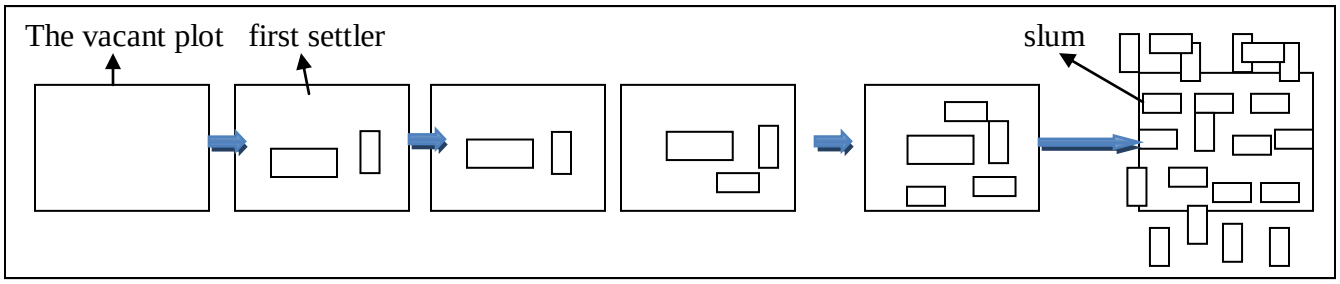
Different authors have described and classified development stages differently. Eyre (1972) classified slums into four stages based on their characteristics (initial occupancy, transitional, stage of attainable secure tenure, stage of absorption). Miller (1965) on the hand classified them on familial stability and job security (the unstable, the coppers, the strained and stable poor). Tuner (1966) classified them in terms of development stages and security of tenure (the transient, provisional incomplete and incipient, complete). Abebe (2011) classifies them as infancy, consolidation and saturation stage. In the infancy stage, potential slum dwellers identify vacant land and start to build structures. These places may be dangerous for settlement but their proximity to working areas will attract people affected by social insecurity. They rather stay in this places that lack basic services and are dangerous than stay far away from their work places. In the "spontaneous" invasion, it should be noted that the first inhabitants of the land acquire a kind of 'power" over it and it is them that newcomers have to ask permission to occupy a piece of land to build their house (Taschner, 2001).

The second stage, consolidation, more buildings are put up as more people come in. they either are unable to pay rent where they were living or are new to the towns. They are welcomed and told to identify places to build. The last stage, saturation, congestion is the order of the day as the conditions worsen coupled with vertical densification. Open spaces are filled up and roads become narrow.

The formation of slums may also be spontaneous or planned. Spontaneous settlements are seen as unstructured and disorganized, but it has also been argued that with time they become organized following the natural features such as topography or drainage systems. They form natural organic urban forms prone to natural disasters. On the other hand, planned invasions are forms of invasion carefully prepared in advance, planned almost with a proposed subdivision of streets showing a similar urban landscape in shape, of a formal subdivision albeit of a smaller

size (Taschner, 2001). They form associations that protect the interests of the people. This is illustrated in the following diagram.

Figure 1 Stages of Slum Development



Source: Sliuza 2008

2.4 Slums in Sub-Saharan Africa

As per the UN Population Division in 1970, only 37% of the world's population lived in urban areas. The current UN projection indicates that this will rise to 60% by 2030 of which 80% will be in developing countries. The urban population growth is estimated to be at 4.58% the highest in the development regions (UN Habitat, 2003).

During colonial days, travel of African natives to urban areas was strictly controlled by the English settlers. The urban population at that time therefore had its housing needs met. However, after independence, the population in the urban centers began to grow because the colonial restrictions on Africans travelling to the city were no more. As a result, the provision of housing was soon overtaken by the rapid urban population growth leading to emergence of squatter settlements and slums for the poor. These informal settlements were mainly on land the poor deemed as unutilized like land set aside for future expansion of services and private land.

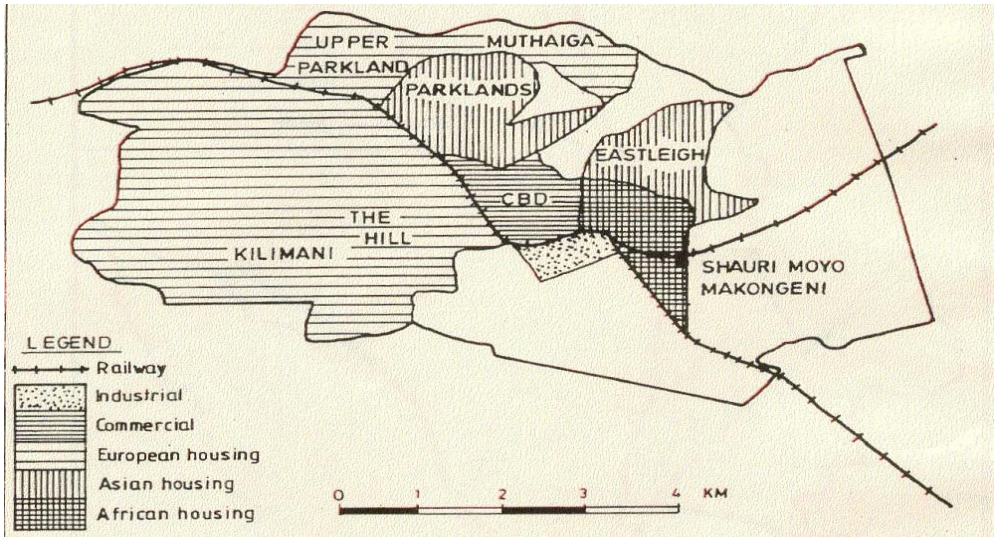
Slums have grown rapidly and continue to due to a myriad of factors. High rates of urbanization coupled with lack of a commensurate provision of housing, especially for the poor has resulted in an increased number of slum dwellers. The stringent building and

planning regulations also don't favor production of low-cost formal housing forcing the poor, who are the majority into cheap informal settlements. The sub-Saharan African countries continue to record the least positive results in efforts towards improvement of living standards in slums areas (Berger, 2006)

2.5 Slums in Kenya

Many of Kenya's urban centers were established in the last hundred years. These centers were established as seats of the British colonial Government. As a result the most visible feature of these centers was their segregated residential layouts. There were white residential areas, where natives required a pass to visit. There were areas demarcated for the Asian population and other areas for the natives (see map below).

Map 1: Colonial Racial Residential Segregation (1948)



SOURCE: Pamoja trust 2008

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 quarter's retained typically Indian architecture, while the houses for natives where

designed to specifically accommodate a migrant workforce and little else. In spite of the disparity in housing, all the residential sectors were well planned with sufficient services provided. There was harmony between the size of the population, and the number of schools, hospitals roads and other public amenities provided. Largely because of restrictions on native travel to the city, population expansion was tightly controlled

The colonial towns created the mould upon which the future growth of urban centers was set. The segregation of populations formed the basis upon which a skewed system of distribution of land and other resources was built. Today in Nairobi, slums make up over 50% of the population and yet occupy only 5% of the total residential land, giving them just 1% of the total land area Syyaga (1994). The colonial Government also bequeathed, to newly independent Kenya, a set of land laws and urban planning standards that were unable to reverse the inequitable colonial land distribution. These laws, policies and planning standards were completely unsuitable in addressing the rapid urbanization that followed independence. The government was supposed to come up with laws that would address the situation at the local level rather than follow the British blue print that led to unequal distribution of resources land being one of them.

With independence in 1963, the management of urban centers shifted from the colonial administration to a national Government. The segregation of residential areas was tacitly perpetuated by the new administration. However, this time round it was based on class rather than race. Within the CBD and the formerly white residential areas, planning and service standards were maintained. The biggest impact of independence was felt in what were previously the areas designated for natives. Independence led to the lifting of restrictions on entry and travel to any part of the country. The result was accelerated rural-to-urban migration. The families of the native migrant working population previously restricted from moving into the city now came in droves and settled. The city was perceived to have plenty of

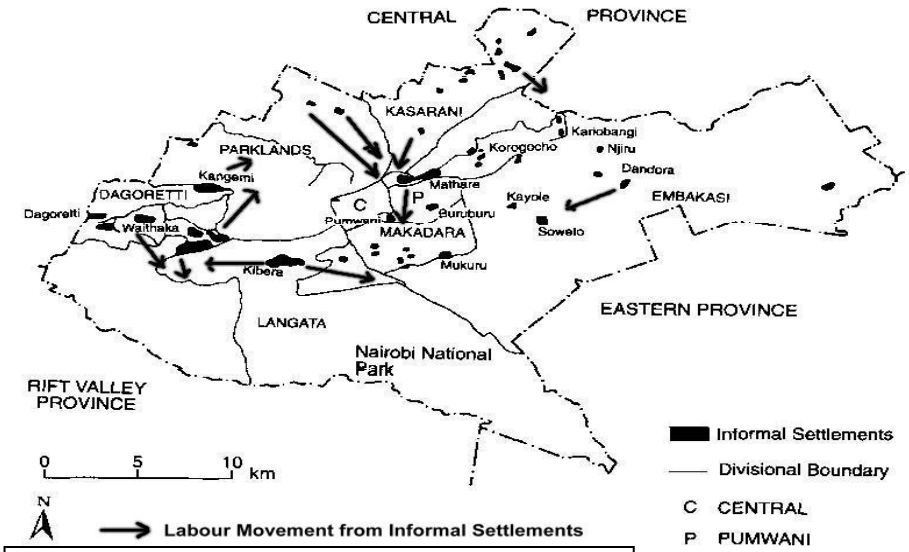
employment opportunities and many sought to make a new life there. The response of government to this was poor, the population increased but the government failed to improve the service provision in relevant sectors such as housing. Inadequate servicing of the sewerage, water, and power systems led to further deterioration of existing residential areas. This then resulted to many people opting to settle in slums as they could not afford houses elsewhere.

The new Government's efforts to settle its landless citizens through land adjudication did not meet the demand for settlement. This led to numerous squatters and the formation of informal settlements. Many slums trace their history to this period. Throughout the seventies populations in urban centers continued to grow rapidly, straining the ability of municipalities to provide sufficient housing and services. Insufficient planning further compounded the situation and as a result the already existing slums expanded and many new ones emerged.

The slums mostly occupied the poorest quality lands as no formal systems were put in place to provide affordable serviced land for the new entrants into cities. In many cases, the only recourse the poor had were riparian reserves, swamps, steep slopes, refilled quarries and garbage dumps. Similarly, settlements spilled over to service reserves like railway safety zones, land under high voltage power lines and on road reserves.

Officially slums were not recognized in Kenya. Maps of urban centers almost universally show slums as unoccupied land. Yet, the political significance of slums, because of high population densities, became a factor of their continued expansion (Nairobi slum inventory 1999). People were packed into these marginal lands for political expediency with little attempt at planning or provision of services. Over the years the challenges of rapid urbanization and growing poverty intensified and perhaps reached its peak during the Moi era and more particularly after the introduction of multi-party politics in Kenya. With the introduction of competitive politics, land was used to purchase political favors and to oil the wheels of a patronage system.

Map 2: Distribution of Slums in Nairobi.



Source: Nairobi slums inventory 1999

2.6 Phases of Slum Eradication

This section discusses the 4 phases of development in slum eradication. The initial phase, during 1950s and 1960s, the dominant approach to informal settlements was one of demolition and replacement by public housing. This strongly interventionist role of the state, in taking responsibility for the delivery permanent housing units was transplanted from developed countries, where it had proved successful in the immediate post-war period. The assumption was that this approach would eventually eliminate the perceived squatter and disorder of informal settlements (Pugh,1995). The governments wanted to replicate what had been done in other places successfully.

The reality was, however, that urbanization, informal settlement growth and overcrowding escalated. During the first phase, when the World Bank entered the housing field, the emphasis was upon the building of houses, or the public housing approach. Harris & Giles (2003) refer to this as 'permanent housing for rent', using the British variation of the approach, as it followed the model developed by the United Kingdom for its own people but which it also

encouraged in its colonies when resources were available. The problem was that resources were rarely available, and when they were, and were spent on housing, the housing was only provided for civil servants and the military (Choguill,1992). Even if houses could have been built, the poor were rarely in a position to pay the true rents on such structures, and few governments at that time were able to extend subsidies to housing for the general public.

A contemporary World Bank study (Grimes,1976) examined the lowest cost house constructed by governments in six cities (Ahmadabad, Bogota, Hong Kong, Madras, Mexico & Nairobi) and concluded that the median incomes of residents was below that threshold where one could hope to afford such a 'cheap' house in all six cities. With the realization that providing housing for the poor was not going to solve the housing problem, international institutions and governments turned a second phase based on experiments involving self-help. It was argued that if the poor actually built their own houses, even with appropriate external assistance, the cost could be reduced sufficiently to allow them to enter the home ownership market. From an institutional point-of-view, this initiative was championed by the World Bank with its sites and services projects, beginning in 1972. The sites and services concept was a simple one: governments should provide tracts of urban land divided into plots and basic support services and then let the poor build their own houses on those plots. Full cost recovery was basis to the approach and essential in that few governments had the funds to subsidize such housing. Sadly the results were predictable. Even with minimal government investments, such projects were still too expensive for at least 20% of most urban populations and, in some cases, a considerably higher proportion (Swan et al., 1983; Kearne and Pariss, 1982). Emphasis on up-grading of existing housing rather than the more comprehensive sites and services, also failed to meet the required cost recovery objectives. The government focused on areas where the services already existed because of the cost implication abandoning the vulnerable areas that needed quick addressing. The third phase began during 1980s when the World Bank realized that this

sites and services approach to housing was unlikely to work on the scale that was required to meet the housing shortages that existed. Thus, along with other international institutions which seemed to have so much influence on housing policy during this period, thinking shifted toward the creation of an 'enabling environment', within which individual nations could develop policies to solve national housing problems.

Attention was directed toward devising ways of providing the economic, financial, legal and institutional environment that was needed to support the housing sector (UNHSP,2005, p. 25). By 1993, this shift had resulted in the formal adoption of a new housing sector policy statement (World Bank, 1993) which emphasized enablement, the sector's contribution to macroeconomic development, and pro-poor policies involving targeted subsidies where required. Whereas earlier policies, such as constructing housing and self help were aimed at directly solving the housing shortages in various countries, the so-called enablement strategy more realistically was directed at removing bottlenecks from the quest for housing solutions. These policies failed to address the spatial planning issues which affected the slum areas, this were particularly the part of service provision. People ended up building in areas that were unsuitable for settlement.

With above discussion, it is clear at that time World Bank has an enormous influence and was "a trendsetter for development thinking" (Baken & van der Linden (1993) quoted in Huchzermeyer (1999). It gave direction to the consulting community, to major western governments (the EU and the United States particularly), and to the United Nations community of development organizations (Huchzermeyer, 1999). Just initiated a fourth phase 'targeted phase'. Attempts are underway for holistic plan (holistic approach) with a usage of GIS (Belo Horizontal, Brazil) and Cities without Slums/Millennium Declaration. Holistic approach with an extensive usage of GIS makes it too expensive and requires a technical staff and resources to implement, unfortunately, as per current scenario, such high profile

technical staff and huge financial resources cannot be born by the developing or underdeveloped nations that are currently combating with slums.

The *"Cities Without Slums"* action plan was developed and launched by the Cities Alliance in 1999 . This initiative has been endorsed at the highest political level internationally as a challenging vision with specific actions and concrete targets to improve the living conditions of the world's most vulnerable and marginalized urban residents. The Millennium Report of Secretary General of the United nations, 2000, states a vision for the world organization in the 21st century - *"We the Peoples: The Role of the United Nations in the Twenty-first Century"* and strongly supports the *"Cities Without Slums"* action plan and the same is reflected in the United Nations Millennium Declaration. The goal is: *"By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers as proposed in the "Cities Without Slums" initiative.*

The City without Slums (CWS) was not comprehensive enough to determine the variables that accounts for slum incidence. The CWS action plan does not articulate what measures should be taken or formulated to curb the emergence of new slum. Similarly, there is no provision or indication as to what actions various urban 'stakeholders' at all levels (local, national and international) should undertake to reduce, if not stop, the mushrooming of new slums.

It should be noted that in all the four faces mentioned above, the problem of slums still persist. Unless these concerns are properly taken on board, the ambitious 'City without Slums' action plan remains a slogan. Policies that are in place do not adequately address the issues in slums. Therefore, there is need to develop a close working relationship between the government, experts, and the slum dwellers. National policies should be able to address the issues of migration from rural areas into towns through equitable distribution of resources.

The brief review as discussed above clearly shows that despite an effort of various implementing slum policies, slums have continued to dominate the urban landscape of most

cities in the developing world. Some of the weaknesses of past slum policies are that conditions pertaining to the incidence of slums were not taken into account. Such conditions include the negative impact of international interventions, the impacts of neoliberal policies (e.g., liberalization and globalization), urban poverty (or income gaps), poor governance, socio-economic and political instabilities, rapid urban growth rate, inadequate planning regulations, poor housing financing (especially for the low-income earners), and limited access to sustainable source of income (Shatkin, 2004). Moreover, all the major approaches towards slum point to lack short-term and 'quick-fix' measures rather than a long-term vision of the prospects of slum incidences (Jacobsen et al., 2002). The literature also indicates that past and existing slum policies and programs have been largely counterproductive because, at the end of the operation, the poor are not the main beneficiaries; instead, middle and high-income earners take over improved dwellings (Jacobsen et al.; 2002; Davis, 2004). It is not, therefore, surprising that "what is happening in most cases is the reverse: piecemeal, undirected or impractical policies that cannot be implemented or which, in practice, benefit only those in power" (UN-Habitat, 2003, p. 5).

The outcome of these policies indicates that housing schemes or urban planning that target a specific population group is not viable. Notwithstanding, designing urban planning for the poor is discriminatory. Finally, such repetitive failures are a clear indication that fractional slum policies and programs, which have aimed to address one or a few aspects of slum thus ignoring other components, could only perpetuate the existence and expansion of slums. To start reversing this way of thinking, future slum policies should engage in a more holistic and comprehensive approach that will not only integrate factors of emergence and growth of slums, but will also co-operate with various national and international urban slum stakeholders. Moreover, one of the most intriguing outcomes of past and current slum policies and strategies relates to their lack of long-term perspective in relation to improvement & housing needs in urban areas. Significantly, urban authorities do not always have the means to appreciate the

social and spatial scope of slums, nor do they have the adequate land management instruments and appropriate appraisal tools (Brennan, 1993; Jenkins, 2001). The areas that need to be addressed are the land issues. The prices of land, location, and services need to be included in policies that will address challenges facing slums in Kenya.

2.7 Government Efforts in Slum Eradication in Kenya

2.7.1 Slum Upgrading

Efforts to improve the slums or eradicate them have been witnessed from international organizations, governments and also local efforts by slum dwellers. Stories about slum upgrading have been successful in some countries for instance Singapore, but in Kenya and other developing countries this has not been the case. The Kenyan government together with the UN Habitat, and World Bank have initiated several projects but most notable are KENSUP and KISIP.

The government of Kenya, in collaboration with other stakeholders, initiated two programmes: the Kenya Slum Upgrading Programme (KENSUP) in 2004 and the Kenya Informal Settlement Improvement Project (KISIP) in June 2011. The programmes are aimed at improving the livelihoods of people living and working in slums and informal settlements. This entails promoting, facilitating, and where necessary, providing security of tenure, housing improvement, income generation and physical and social infrastructure. The actual target is to improve the livelihoods of at least 1.6 million households living in slums by the year 2020. This will be done at an estimated total cost of Ksh 883.76 billion.

1. **KENSUP (Kenya slum upgrading programme)**

This project was started by the government and other stakeholders and it is coordinated by the ministry of housing. It draws expertise from several fields including the ministry of lands. It targets the former provincial headquarters and other secondary towns with a population of 20000 and above. The main principles of KENSUP are decentralization, sustainability, democratization

and empowerment, transparency and accountability, resource mobilization, secure tenure, expansion and up-scaling, partnerships and networking. It also targets institutional strengthening. To achieve its goals, KENSUP has adopted the several strategic interventions. It targets to mobilize the community and make them organized to smoothen the improvement process. It also targets shelter improvement, security of tenure and safety of the people. By so doing it is supposed to prepare master plans which will cater for provision of physical infrastructure (sewerage system, water supply and sanitation, access roads, storm water drainage, electricity and street lighting), and social infrastructure schools, health centres, community centres and recreational facilities.

2. KISIP (Kenya informal settlements improvement programme)

This initiative was started by the Government in collaboration with the World Bank, Swedish International Development Agency (SIDA) and French Agency for Development (AFD). It will focus on improving living conditions in existing informal settlements by investing in infrastructure and strengthening tenure security. It will also support the Government of Kenya in planning for future urban growth in a manner that prevents the emergence of new slums. KISIP will be implemented in 15 municipalities within five years from June 2011 at a cost of 14 billion Kenyan shillings.

This project is divided into four components;

i. **Institutional strengthening**: this targets the relevant ministries and the participating local authorities
ii. **Tenure security improvement**: it involves planning, surveying of the settlements and giving the residents title deeds
iii. **Infrastructure and service delivery**: government will invest in roads, bicycle paths, pedestrian walkways, street and security lights, waste management, water drainage,

sanitation, green spaces, platforms etc. in the informal settlement spaces. KENSUP will work on the housing whereas KISIP will deal mainly with this infrastructure

iv. **planning for urban growth**: This initiative is to take measures that will reduce or prevent slums formation, the government will offer technical support

2.7.2 Challenges in Slum Upgrading

i. Complexities of slum settlements with regard to tenure arrangements Slum settlements have no formal tenure arrangements. Their high densities, haphazard developments, lack of planning, poor housing, lack of infrastructure and the religious, cultural and political inclinations involved are some of the conditions that pose a challenge in proposing the type of tenure that is be best suited to the residents' situation.

ii. Conflicts between tenants and landlords: Conflicts abound between these two groups of residents due to their varied interests. The fact that nearly 85% of slum dwellers are tenants is a unique aspect of Kenyan slum settlements which greatly hampers progress in slum upgrading

iii. Competing interests of various groups e.g. Non-Governmental Organizations (NGOs), Community-Based Organizations (CBOs), Faith-Based Organizations (FBOs), and Central Government, Local Authorities and donor agencies. These stakeholders have their own interests in the slum, most of which conflict therefore they are a major drawback to the programme.

iv. Lack of adequate land; there is limited land space to cater for all residents within the slum settlements and scarcity of land for re-location where necessary. Land ownership is private in most settlements. Lack of planning of informal settlements by the local authorities is a challenge towards upgrading the settlements.

2.7.3 Achievements in Slum Upgrading

Several social and physical infrastructure projects have been initiated in the targeted areas such as Kibera in Nairobi which has 600 units. Other projects include classrooms, health centers, and Early Childhood Development units, rehabilitation of social halls and market stalls and upgrading of roads. It has also improved capacity building by creating settlement executive committees (SEC) which coordinate the activities within the slums.

The government is making strides in addressing the slum menace in Kenya by establishing an all inclusive institutional framework for improvement of informal settlements. Programs such as the Kenya Slum Upgrading Programme and the Kenya Informal Settlements Improvement Programme are aimed at addressing urban planning, infrastructure services, land tenure, shelter and improved livelihoods in our cities and towns countrywide. So far, the government has instituted legal, policy and institutional interventions aimed at promoting access to land, housing, basic services and infrastructure while mitigating the effects of climate change

Figure 2: Access Road in Kibera Nairobi

Source: Field survey, 2012

2.8 Policy and Institutional Framework

2.8.1 Vision 2030

Vision 2030 aims at to provide the country population with adequate and decent housing in a sustainable environment. Housing sector plays a complementary role to the development projects recommended under Vision 2030. Some of the projects and key initiatives are: the government aims at installing of physical and social infrastructure in slums in 20 urban areas to formalize slums, permit construction of permanent houses and attract private investment. The vision also aims at establishing housing technology centers in each constituency to increase access to decent housing by promoting location-specific building materials and low cost housing. Lastly, the vision enhances efforts to design and implement truly low cost housing models/prototypes/preapproved building plans.

Vision 2030 will enhance the overall economic growth which will increase demand on Kenya's energy supply. Currently, Kenya energy costs are higher than those of her competitors. Kenya must, therefore, generate more energy and increase efficiency in energy consumption. The Government is committed to continued institutional reforms in the energy sector, including a strong regulatory framework, encouraging private generators of power, and separating generation from distribution. New sources of energy will be found through exploitation of geothermal power, coal, renewable energy sources, and r econnecting Kenya to energy-surplus countries in the region.

2.8.2 Land Policy

The highlights on Human Settlement issues are as follows:

Resettlement**:** Under the section of land reforms issues the policy considers the need for resettlement and suggests that the purpose of resettlement is to grant the poor and the landless access to land, and to provide them with infrastructure and basic services such as shelter, water and sanitation facilities. Resettlement therefore aims to empower the poor so that they may become self-reliant. Further, the resettlement principle seeks to procure adequate land for the reorganization of both rural and urban settlements in light of expanding populations. The Government shall establish criteria for the determination of who qualifies to benefit from resettlement programmes and ensure that it is carried out in a transparent and accountable manner.

Informal settlement: The essence of 'informal' or 'spontaneous' or 'squatter' settlements is that it is without secure tenure and/or is unplanned. The problems of 'squatters' and 'informal' settlements continue to present a challenge for development in Kenya. A large proportion of Kenya's population has no decent homes, and live as 'squatters' or in slums and other squalid places.

To deal with the 'squatters' and informal settlements, the Government shall: create a regime of secondary land rights as a means of improving security in informal/spontaneous settlements; recognize and protect the rights of informal land occupiers and guarantee their security of tenure; and establish a legal framework and put in place procedures for transferring unutilized land and land belonging to absentee landlords to 'squatters' and landless people.

2.8.3 National Housing Policy

The national housing policy was formulated after several efforts by the government since independence to deal with shortage of decent housing units for the population some of which include formulation of Sessional Paper No.5 on Housing Policy of 1966/67, the National Strategy for Shelter to the Year 2000 and other measures contained in successive National

Development Plans. It was noted that demand far outstripped supply with the average annual urban housing demand is estimated at 150,000 units.

According to the policy an estimated 300,000 housing units will require to be produced annually to cater for housing demand in the rural areas. The shortage in housing is manifested in overcrowding, slums and proliferation of informal settlements especially in peri-urban areas. In the rural areas the shortage manifests itself in the poor quality of the housing fabric and lack of basic services such as clean drinking water. There are quite a number of factor that, according to the policy, cause the deficit in housing units supply and they include: Low level of investment in the sector by both public agencies and the formal private sector, rapid urbanization, inaccessibility to land and housing finance, stringent planning regulations, restrictive building standards, high cost of infrastructure, and poor economic performance and increased poverty

The policy recognizes the government as a key player that will play an effective role as an enabler, partner and catalyst in the housing delivery process with Special efforts expended towards the facilitation of the private sector in their housing finance, production and construction roles, and in enabling low and middle income households to access housing.

The policy also recognizes other stakeholders that will facilitate the provision of housing in the country and they include: the local authorities, parastatals and state corporations, cooperatives, employers, civil society organizations including NGOs and CBOs, research institutions, developers and individual citizens in all levels, will also be equally facilitated to enable them to contribute to the national housing goals outlined in this national housing policy.

The policy proposes the enactment of a comprehensive Housing Act to provide the Government with an appropriate legal framework for the coordination, guidance, regulation, monitoring and evaluation of the sector.

The policy comprises of four elements that are:

i. Policy targets and highlights urban housing, rural housing, slum upgrading and vulnerable groups; and proposes solutions, which include poverty alleviation,
ii. Main housing inputs and addresses ways of managing the housing inputs namely land, infrastructure, building materials, building technology and finances.
iii. Estate management and maintenance necessary to ensure long lifespan for housing stock, disaster management, environmental impact assessment for major housing projects, human resource development and monitoring and evaluation.
iv. legislative and institutional framework and assigns specific roles to various stakeholders

The policy therefore seeks to achieve the following objectives:

i. Enabling the poor to access housing and basic services and infrastructure necessary for a healthy living environment especially in urban areas
ii. Encouraging integrated, participatory approaches to slum upgrading, including income-generating activities that effectively combat poverty
iii. Promoting and funding of research on the development of low cost building materials and construction techniques
iv. Harmonizing existing laws governing urban development and electric power to facilitate more cost effective housing development
v. Facilitating increased investment by the formal and informal private sector, in the production of housing for low and middle-income urban dwellers
vi. Creating a Housing Development Fund to be financed through budgetary allocations and financial support from development partners and other sources

2.8.4 Energy Policy

This policy seeks to solve the challenges in the energy sector in the country. The policy provides solutions to challenges facing the energy sector which include improving the quantity, quality and reliability of energy supply; high initial capital outlay and the long lead times from

feasibility studies to development of energy infrastructure; the policy provides for mobilizing adequate financial resources to undertake massive investment in the power sector, to cab high cost of energy.

This policy focuses on improving power supply and access to the people and it sets an increase from 22% in 2009 to 30% in 2014. Further it provides for enhancing capacity, quality and supply of electricity in urban areas by the year 2015. The policy targets small consumers mainly in informal settlements, the policy targets use of prepaid meters so as to reduce illegal access to power.

2.8.5 Electricity Power Act

It gives the Minister broad powers in formulating sub sector policy and control over tariffs. Such wide ranging powers have not been conducive to the efficient operation of the sub-sector and are incompatible with today's accepted industry and business practices which are based on a clear separation of the ownership, regulation and operation of the sub sector.

2.8.6 The Physical Planning Act (Cap.286, 1996)

An Act of Parliament to provide for the preparation and implementation of physical development plans and for purposes connected therewith.

Section 29; This confers upon local authorities the powers to prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area. This ensures proper planning of the different land uses to ensure their sustainable development.

Section 33; (Building and Development Control Regulations.) this gives mandate to the Director of Physical Planning to refuse to recommend any building or proposed development, or alteration or addition to any existing building if: The proposed development is unsuitable, injurious to amenities or detrimental in respect of appearance or dignity or fails to comply with the physical Planning requirements in regard to sitting, design, height,

elevation, size, structure or appearance.

Section 36; If the local authority is of the opinion that proposals for industrial location, or any other development activities will have injurious impacts on the environment, the applicant will be required to submit together with the application an EIA report.

We however note that the Act does not make planning mandatory and also agencies of planning have no requirements mentioned in how they must be put in place to oversee planning.

2.8.7 The Public Health Act (Cap 242)

Any activity that leads to environmental degradation is likely to pose health hazards to the general public. Section 15(ix) of this Act indicates that any noxious matter or waste water released from any premises constitutes a nuisance. The Act acknowledges that the duty of all local authorities to take lawful measures for maintaining their localities cleans. The slum environment is supposed to improved and maintained by the respective local authorities.

2.8.8 The Urban Areas and Cities Act 2011

The Act provides that urban areas provide services to the residents of the area and charge relevant fees for the service provision under section 21. The urban areas are also mandated to make by-laws and recommendations that will ensure good management of the area of jurisdiction. It also provides for public participation in the decision making under section 22. Further it requires for the cities and urban areas to be part of the integrated plans which touches on environment, and service provision.

2.8.9 Council Bylaws

This is a form of indirect legislation which is made by local authorities with their delegated powers from parliament. However before they can be enforced, they require the approval of the relevant minister. When these by-laws become law a local authority then have the power to prosecute if one contravenes these by-laws

2.9 Institutional and Financial Framework

2.9.1 Physical Planning Department

The key role of the Department of Physical Planning is the production of physical development plans. Physical planning department is duty-bound together with other stakeholders to provide solutions to tackle the issues. New measures have been put into place to enable the department deliver better and efficient services to the public. These include adopting new technologies like Geographical Information Systems, Remote Sensing and Sustainable Development Principles. The implementation of the Physical Planning Act Cap 286 has enabled the Public to participate in the planning process, but with little success.

2.9.2 City County of Nairobi

The city council of Nairobi is mandated by the local government Act to prepare plans for the city. It is also mandated to undertake development works related to sewerage, water and waste collection within the city. It is its mandate to ensure that services in the slums are provided to serve the needs of the people. The city planning department within the city council of Nairobi is mandated to developing plans for areas within its jurisdiction which includes Kosovo. These plans should be comprehensive enough to show Wayleaves and public land in the area. Other services such as water and sewerage should also be planned for.

2.9.3 Kenya Power

There are several bodies mandated in the production, distribution, and supply of electricity in Kenya. These bodies include, KPLC, KENTRACO, REA and KENGEN. KPLC is responsible for retailing power to the consumers showing that in the case of Mathare, it is responsible for the power. There are laws that govern how power is supplied in the area and also standards that are supposed to ensure safety for the users.

a) Power Lines

There are three categories of distribution lines for electricity under this project namely:

i. High voltage lines – 66kV
ii. Medium voltage lines - 33kV and 11kV
iii. Low voltage lines - 415V

Most of the 66KV power lines are constructed on wooden poles although there is the tendency to install underground systems in crowded parts of the City and at the approach and entry into the sub-stations. Most of the overhead power networks at 11KV, 33KV and 66KV are constructed on treated wooden poles. The poles are treated with creosote, which is a petrol-chemical product. The use of wooden poles has been discouraged in certain quarters due to the depletion of the forests. Consequently the use of steel poles, towers and concrete poles is to be encouraged.

b) KenGen

Kenya's total electricity generating capacity stands at about 1,098MW of which 677 is from hydro power, 128 from geothermal sources, 277 from thermal electricity and about 0.35MW from wind power generation (Ministry of Energy and KPLC 2007). KenGen generates approximately 941 MW while IPPs such as Iberafrica and Tsavo Power HFO fire plant, generate about 145MW.

Electricity is usually generated away from place of consumption hence the need for construction of high voltage power lines to transport electricity. Invariably, transportation of electricity is through overhead cables but sometimes underground cables need to be laid (Syagga, 1994).Whenever KPLC undertakes such projects for the transmission and distribution of electricity, it is inevitable these activities will lead to either land acquisition and or denial of, restriction to or loss of access to economic assets and resources. This results in compensation and in some cases resettlement. The table below shows the current distribution and transmission lines spatially

Table 2: Current Transmission and Distribution

Kenya Current Transmission and Distribution System

Type	Voltage	Transmission Lines in KM
High Voltage	220	1323
High Voltage	132	2035
Medium Voltage	66	630
Medium Voltage	40	58
Low Voltage	33	7826
Low Voltage	11	18532
	Total	**30404**

Source: Coastal & Environmental Services, (2007).

2.9.4 The Execution of Wayleaves:

The process of compulsory acquisition of land is now more transparent and will be managed by the Commission. In addition, the process is more just and fair to the owner of land as the award of compensation (determination of amount payable) will be made prior to the Government taking possession of the land. The Commission is expected to promulgate rules to regulate the assessment of just compensation. This is as the result of the land laws of 2012.

Where there is a dispute in the amount awarded, the Commission is required to place the compensation awarded in a special account, which will earn interest at prevailing bank interest

rates, before taking possession of the land. This is a new requirement aimed at making the process of compulsory acquisition more just and fair

Wayleaves procedures at Kenya Power

Stage 1

Explains the different types of land and over which power lines cross and as well as the jurisdiction over which they belong. The design engineer draws the plan of the area over which the Wayleave will be created. The following should also be obtained;-

i. Cadastral plans. This show farm boundaries and position as well as the land reference
ii. Topographical plans which show geographical details, physical features and re

Stage 2

Explains the procedure to be adopted to obtain Wayleaves from various authorities or persons to the crossing of their land

Private Land

Title official search at relevant Ministry of lands' Office is undertaken in order to ascertain the following about the land;-

i. Ownership.
ii. Locality.
iii. Land Tenure whether freehold or leasehold.
iv. Title tenure whether under RTA Cap 281 or RLA Cap 300 of the Laws of Kenya.
v. Any subleases, charges, mortgages, etc.

A Wayleaves agreement is then prepared in triplicate by KPLC and this is to be approved and signed by the land owner. As for the other categories of land, Wayleaves agreements are to be established between KPLC and the respective relevant authorities under whose jurisdiction the land lies.

Table 3: Topographical Plans

Category of land	Jurisdiction
Private/Consolidated Land	Held under freehold title registered under RLA Cap 300 of the Laws of Kenya.
Trust Land	Is unconsolidated and is under control of respective county councils. Examples are Kwale Trust Land Unit and Kipsigis Trust Land Unit.
Forest Land	Under direction of Ministry of Forestry
Government Land	Held by government under the Government Land Act Cap 280 of the Laws of Kenya.
Railway Land	Chief Executive-Kenya Railways, Chief Engineer and District Civil Engineer.
Agricultural Settlement Trust Land	Director of Settlement.

Source: Rabai environmental report 2007

Wayleaves Agreement Forms

They are of three categories as follows;-

i. Non-Standard Wayleaves Forms. These are for land registered under Registered Land Act (Cap 300) of the Laws of Kenya and are to be used for power lines of less than 40kV.

ii. Standard Wayleaves Forms. Used when land is registered under the Registered Titles Act (Cap 281) of the Laws of Kenya and to be used for power lines not exceeding 40kV.

iii. Super Standard Wayleaves Forms. Used where land is registered under Registered Land Act Cap (300), Registered Titles Act (Cap 281) of the Laws of Kenya and the power line is 132kV, 220kV or 275kV.

When Wayleaves have been duly signed and executed, caveats protecting the Wayleaves are prepared and registered against the title at the relevant Ministry of Lands' office

Table 4: The Way leave Traces for Power Lines

Capacity of Power line in (kV)	Wayleaves Trace in Metres (m)
11/33kv Single Circuit	10
66kv Single Circuit	10
132kv Single Circuit	30
220kv Double Circuit on Single Structure	40
66kv Double Circuit on Single Tower	20
132kv Double Circuit on Single Tower	40
220kv Double Circuit on Single Tower	40
66kv Two Circuits Running Parallel	30
220kv Two Circuits Running Parallel	60
132kv Two Circuits Running Parallel	60

Source: Syagga 1994

2.9.5 Other Actors

Numerous organizations work in the informal settlements ranging from relatively large NGOs (both international and national) to small CBOs such as welfare and savings groups, churches and, Cooperatives; private sector actors, large scale business firms and the local Government. CBOs are frequently beneficiaries of support from donor agencies/NGOs because they are seen to be directly representing groups of residents and provide an organizational basis for community participation and management in addressing common interests. Therefore, in any upgrading programme, these varied interest groups must be taken into consideration in all stages of planning and implementation.

Table 5: Actors and Their Responsibility

Actors	Responsibility	Remarks
Tenants	Consumers of electricity	Among the various interests involved, they are the most disadvantaged; the incomes they make are hardly adequate for basic survival, let alone for housing development.
Resident Structure Owners	Ensure connection to the services of their houses	Since most structures are temporary (made of polythene and cardboard), they cannot get permit for electricity connection from the Kenya Power. They also lack ownership documents needed for connection
Non-resident Structure Owners:	Ensure connection to the services of their houses	This interest group is the most difficult to deal with in popular settlements. They are powerful, forceful behind the scenes and are often prominent public figures, those connected to them or very wealthy individuals and firms.
Owners of land	Connection of services to the land	Several NGOs working in the area of advocacy and policy influence on land have illustrated the power of these landowners. They are either powerful interests with the Nairobi City Council, the Central Government or powerful private sector firms.
Government Institutions (provincial administration)	Security provision	Location chiefs and police are not doing their work, but is instead more interested in harassing the poor in order to be bribed

City council of Nairobi	provision and management of services	Due to the poor economic situation, rapid population growth, limited resources, strict control by the Ministry of Local Authorities, and poor management, services have continued to deteriorate in most parts of the city
Civil society	The civil society organizations have piloted a number of projects in service provision, especially housing, education, sanitation and refuse disposal.	This have sprung up to feel the gaps left by the local authority and the central government
Donor Institutions	Mainly provides financial and material resources to most actors within informal settlements	In particular the World Bank and USAID have funded Government housing schemes through the Ministry of Local Authorities and the National Housing Corporation (NHC). By so doing, these institutions should be able to improve the housing standards in area of study so as to reduce the risks of fire breaks and make it easy for the power supplier to provide power in the area.

SOURCE: author 2012

2.10 Alternative Strategies

Poor planning in Kenya has led to unequal distribution of services and infrastructure in the city. There is dire need to have proper planning and implementation system in the country to solve the inequalities that exist. Infrastructure services in many urban centers are in a serious need of attention. The little services that there are, are usually concentrated in high income areas which are sparsely populated. Taking Nairobi as an example; many of the roads are in a poor state of repair, and some have fallen into a state of complete disrepair. The majority of high population low income "informal settlement" residential areas are not served with a formal road network (Mathare, Kibera, Kawangware, Korogocho, to name just a few). Drainage which poses an immediate health hazard to the inhabitants in these areas is even worse. Most of the informal settlement are in areas with poor natural drainage and are prone to flooding. Solid waste collection and disposal is practically non-existent in these areas.

2.11 Case Studies

The case studies act as benchmarks of the research showing similar problems and how they were solved. The case studies discussed here points out how different countries have been able to solve the problems using different methods. They help bring out possible ways that could be used to solve the problem of electricity in low income areas. The first case show how involvement of the community in providing the solution works. If this is applied in the study area, the people will feel part of it and support it fully.

2.11.1 SaoPaulo City

a) Project summary

One billion people in developing world live in poor urban and peri-urban areas; furthermore, this population is experiencing a growth of 5% per year. This project explores the essence of population growth that puts more pressure on service provision which results in poor service

provision in informal settlements. This project shares experiences about economic and social studies on innovative, socially responsible and cost-effective approaches, to expanding access to electricity services in these poor urban neighborhoods. The project further reviews worldwide lessons learned, with a particular highlight of the pilot project in the "favela" (slum) of Paraisopolis in Sao Paulo, Brazil, conducted by AES Eletropaulo (local utility), the U.S. Agency for International Development (USAID), and the International Copper Association (ICA) with local community and industry partners.

The focus of this project was on the safety and reliability of energy supply and use, and especially, the benefits of energy efficiency and renewable energy, as applied to residential and commercial buildings in poor urban areas, commonly called "slums" (favela). Furthermore, it discusses the challenges, sustainability aspects, socio-economic conditions, financial analysis, regulatory and institutional factors, and technical solutions. The total investment in the pilot project reached US$1.8 million. The financial analysis concludes that the payback is a very attractive 1.5 years, making the business case for action.

b) Objective

To convert formerly 'free' electricity consumers into satisfied and paying customers in a manner that is financially viable for the distribution company. This in turn depended on securing community support for the project and improving customers' willingness and ability to pay for their consumption. The specific objectives for the pilot were:

i. To develop and test new approaches for regularization and improvement of electricity services in a target area in São Paulo city; and
ii. To document and disseminate the lessons learned from the roll-out of the AES program in São Paulo for incorporation into a larger regional program.

c) Target Group

The selected pilot area covers two neighborhoods (Antonico and Centro) within Paraisopolis, a "favela" with approximately 20,000 households in the urban area of São Paulo city. This target area includes 4,365 low income households and businesses (of which 60 households had small home businesses and 423 were stand-alone commercial enterprises of varying sizes and types of services/sales). Like most other favela, Paraísopolis is an informal community which lacks many municipal services and is the home to families that migrated from rural areas over the years. Located in a large ravine, Paraísopolis has a physically challenging geography and is surrounded by middle- and upper-income residential areas.

d) Output

A consumer poll, conducted after project completion and several months of billing, showed that a majority of the regularized families in the pilot area were highly satisfied with their better quality service and the assistance received in improving their household energy efficiency. Considering the 400 households surveyed, 62% rated their overall satisfaction with the project as a 9 or 10 on a scale of 1 to 10. Not surprisingly, this percentage increased to 98% for those who received a new refrigerator and were re-wired and to 80% for those who were only re-wired. The majority (88%) of the households considered the quality of the electricity service to be good or very good after project implementation compared to only 17% before the project. 89% of the households would recommend the program to other residents.

The energy efficiency measures taken in the households and distribution network are expected to yield annual energy savings of over 2 million kWh. Until recently, bills to households and businesses were capped at 150 kWh to help households transition to paying for service as well as to educate them about their actual consumption levels and charges once the cap is removed. It is expected that additional savings will accrue (but additional bad debt may also occur) when larger consumers start to experience the true cost of their consumption. After project implementation,

AES Eletropaulo began to collect a significant amount of new revenues from consumers who had not previously paid for their electricity consumption.

e) Key Features of the Case

Before the project implementation in Paraísopolis, the second largest "favela" in São Paulo, Brazil, the quality of electricity service was very poor: *almost all the households and businesses had illegal electricity connections*; they were also exposed to dangerous irregular local grids and wiring conditions and did not pay for service. Households and businesses consumed, what are considered for this population, high amounts of electricity – on average 250 kWh/ month – due to the very poor condition of household appliances and electrical equipment (especially refrigerators and electric water heaters for showers), and the lack of price signal to encourage consumers to use electricity wisely.

f) Sustainable Financing

USAID, AES Eletropaulo, ICA and its local affiliate, Procobre, worked closely to ensure a coordinated approach to project design and implementation. A 'responsibility matrix' was prepared which presented the project components and indicated the organization that was responsible for funding and implementing each task. AES Eletropaulo picked up the bulk of the project costs, including the distribution network upgrades, metering, consumer registration, and with ICA paid for new refrigerators; ICA arranged for the efficient transformers with the support of the manufacturer Itaipu, for the coaxial distribution and service drop cables cost-shared with the wire and cable company Nexans, and the rewiring of households, as well as the preparation of a financial model; USAID covered the community campaign costs, audits of each household and selected commercial customers, post project survey, and efficiency recommendations to targeted commercial customers.

The total cost of the project was around $1.8 million at the average rate of exchange over the project period. A financial analysis concludes that the payback time is 1.5 years, with a range,

depending on optimistic and pessimistic projections of local conditions, from 1.4 years to 2.1years.

g) Supportive Policies and Institutional Environment

In the late 1990s, ANEEL created an 'electricity-industry-wide' fund to be split evenly for Research and Development (R&D) and Energy Efficiency (EE) improvements. Utilities' concessionaire contracts contain provisions to access this fund, which amounts to 1% of the utility's gross revenue for use in their own territory (½% for R&D and ½% for EE). Recently, ANEEL has added the requirement that one-half of the set-aside for EE (i.e., ¼%) be used for low income households. Annual cycles of planning, application, and approval by ANEEL govern each year's allowable activities and expenditures.

Recently, slum electrification initiatives (e.g., reconnection and metering) became eligible for EE activities as they enabled customers to understand and monitor their own energy consumption. In addition, expenditures on energy saving appliances within slum households were also eligible if they achieved at least an 80% cost-benefit ratio.

h) Building Local Capacity and Skills

Fifteen community campaigns were carried out over several months and were supplemented by door-to-door visits by community "agents" hired by AES Eletropaulo, and by utility staff to each household both pre- and post- regularization. As residents previously did not have to pay for electricity (except in some cases to get their illegal connection), these campaigns were important to educate consumers on the importance of paying, understanding their electricity bill, and implementing efficiency measures that could be undertaken to reduce consumption and costs.

AES Eletropaulo undertook the registration of all customers and numbering of the houses. Mini-audits were conducted by Techno light in more than 4.000 houses, and in 70 commercial enterprises, and finally a customer satisfaction survey took place.

i) Achieving Co-Benefits

In the consumer poll, 89% of those surveyed felt that security in the area had improved. Indeed, safety records indicate that emergency incidences responded to, which were related to electricity, fell from 57 from the first 6 months of 2006 to 2 in the same period for 2007. Although external wiring and some re-wiring inside households were replaced under the project, further safety improvements could be made through additional re-wiring. For example, audits of the 70 commercial enterprises found that a third had bad or very bad wiring, which mostly occurred in large commercial customers. Recommendations were made to upgrade the wiring in the worst cases.

j) Affordability and Technical Issues

Under the project, the distribution network was upgraded and households and businesses were metered. The households were not charged a connection fee and any debts owed were forgiven. A key component of the SELR program was the use of new technologies and techniques to reduce theft and improve the energy efficiency and reliability of the distribution network.

k) Local Champions

Through a Global Development Alliance partnership with the International Copper Association (ICA), USAID and ICA teamed with AES Eletropaulo to develop, test, and evaluate customized approaches to regularizing electricity service in a target area of Paraísopolis. The pilot was the first to be launched under the USAID-ICA SELR program, which was initiated in October 2005 on the theme of regularizing and improving electricity service to low income communities.

l) Monitoring and Evaluation

Key Performance Indicators (KPIs) were created to evaluate project results, and kept statistics that would be tracked throughout the project and used to determine which customers would receive additional available benefits as described later in this section.

The KPIs were organized into three categories:

KPI Category 1: Financial Viability for the Company

KPI Category 2: Affordability and Acceptability for the Customer

KPI Category 3: Societal and Community Acceptance

m) Replicability and Scaling-up

The aim of the pilot project was to develop a sustainable service model for AES and other distribution companies that would meet the needs of consumers in low-income urban areas and could be widely replicated. Although AES had undertaken electricity 'regularization' programs in the past with varying degrees of success, they had not examined and conducted analysis on which program elements would be critical to achieving sustainability, which might be optional and which could be eliminated. In addition to developing a new approach, the pilot would serve as a controlled test of the pilot elements most likely to produce a sustainable service model. The partners recognized that the approach must be financially viable for the distribution company which depended on both the willingness and ability of the regularized consumers to pay for their consumption. It was also dependent on the regulatory environment under which the pilot would be carried out. For this reason, Brazil offered particularly fertile ground to conduct the pilot because of the progressive stance of ANEEL in promoting solutions to bringing legal electricity service to the urban poor.

2.11.2 Hanna- Nassif Pilot Project

a) ***Project background***

This was pilot project carried out in Tanzania. It was carried out after a study by Ardhi Institute, the planning and architectural college of the University of Dar es Salaam. It mainly concentrated on service provision in the settlement. The project had failed twice due to poor planning and insufficient funding.

The Hanna Nassif project was formed as a pilot project to test the community contract system in collaboration between ILO, HABITAT, UNV, and the community. Funds for the actual works have mostly come from the Ford Foundation and the European Development Fund. Despite the use of labor-based and appropriate technologies, the costs of major infrastructure works are beyond the means of the community alone. The project objectives are:

i. Pilot project on community-based, employment-intensive storm water drainage infrastructure upgrading of the Hanna Nassif informal settlement; creating in turn capacity within the Dar es Salaam (DSM) City Council to respond to such community-based initiatives.
ii. The capacity for DSM City Council to continue to deal in a responsive enabling manner to community-based urban upgrading proposals be created and expanded.
iii. Support mechanism for community-based initiatives from Kinondoni (DSM City Council Zone) settlements, involving a network of community volunteers.

The proposed initial works for the pilot project were to improve the access tracks, construct storm water drains, and protection to drainage outfalls. Also included was allowance for demonstration ventilated improved pit latrines and possibly pour-flush toilets, and a component for community initiatives to deal with solid waste. In the process the community would be strengthened and able to act as contractors for the works. They would also be involved in the planning and design of the works. In Hanna Nassif the community was responsible for all procurement and letting of petty contracts to artisans. They awere supported by the TST but had to accept a far greater responsibility for financial control and procurement of materials. The CDC was legally formed as a trust and operated their own bank account into which the funds were paid. A construction committee was put in place as a sub-committee of the CDC and they were responsible for the day to day running of the contracts and the receiving of funds for each sub-contract.

ILO is the executing agency with a national execution team; they are assisted in the field of community participation by UN-Habitat is providing general support to Dar es Salaam City Council and particular support to some of the council members of the TST. There were several delays in the signing of the project document and this resulted in a measure of disillusionment with in the community. The community contracting system went through changes for better organization. Despite commitments being given by the community, the parts of the work

designated to be done by self-help were not done by self-help. The idea of including self-help participation or monetary contributions was to maximize the amount of works that could be carried out with the external financial assistance and to enhance the feelings of ownership in the improvements being implemented.

As a pilot project Hanna Nassif highlighted many of the difficulties of dealing directly with communities, relying on support from city council staff (this has been very mixed) and using communities to implement what are technically demanding works. However, work progressed and it is hoped that lessons were learnt in solving some of the problems outlined here. The project also highlighted the need to identifying which types of construction work are suitable for community contracts in the sense of their direct participation, and which may be better left to contractors under the joint supervision of the community and the community technical advisers.

Summary

i. There is a need for a closer consideration of suitable designs and technologies for the providing of infrastructure in unplanned areas. Ideally a group of engineers with varying backgrounds should look at the solutions to providing appropriate designs for the works taking into consideration the restrictions of finance and land availability, varying soil conditions, and maintenance methods. The group of engineers could include; labor-based engineers, municipal engineers, drainage engineers, sanitation and water supply engineers. Town planners should be included in the group to give advice on the relaxation of planning standards for settlement areas.

ii. Following on from the previous is the need to formalize aspects of the upgrading of unplanned settlement areas. There needs to be agreement with planning authorities on alternative planning regulations for certain areas of the town or city designated for the upgrading of unplanned settlement areas. The planning regulations should reflect the situation in the settlements and the scope of improvements that are practical. It should also address problems of land tenure.

iii. If small contractors, or communities acting as contractors, are too be used in upgrading works then simplified contract documents are needed and those developed under pilot projects should be used as a basis for formalizing this type of contract with the relevant municipal authorities.

iv. Resulting from the above, there may be the need to support not only the communities in the upgrading of their environment, but also assistance to the municipal authority to adapt and cooperate in these initiatives, institutionally and technically.

v. To ensure sustainability in community-based organizations, non-government organizations and councils must be involved in the pilot projects and eventually be in a position to continue the works with very little assistance from outside agencies. In many cities in the foreseeable future it will not be possible to carry out upgrading of unplanned settlement areas without some form of external financing for major works. This is a result of the pressures on councils to maintain the infrastructure in the planned areas of the cities and to halt deterioration in the level of services they provide. There is however scope for cost sharing between councils and the beneficiaries for more minor works.

vi. With unemployment and under-employment increasing especially among the urban poor, any method that is used to improve unplanned settlement areas should maximize the use of labor and use the opportunity to create employment. Employment should therefore be a major consideration in the choice of technology used.

2.12 Lessons Learned Across Case Studies

Although the programs varied in their approach to slum electrification, some common themes contributing to the overall success of the program can be distilled. These are discussed below:

i. ***Engaging all stakeholders:*** Successful programs meet the needs of the full range of stakeholders that are involved in slum electrification, these are; governments, electricity companies, communities, service recipients, and intermediaries. For governments, these programs offered an opportunity to meet targets for improving the lives of the urban

poor. Communities saw the promise of improvement in economic and social conditions. The electricity company aimed to reduce non-technical losses and increase revenues. Consumers valued the service enough to pay for connection fees and community and nongovernmental organizations believed that assisting with electricity programs would also benefit their efforts in other areas.

ii. ***Designing for Slum Conditions:*** The challenge of poor physical planning condition which includes narrow alleys, poor housing materials and unsafe wiring, call for planning at the beginning of the project. Electricity programs should also plan for different loads at different stages of the program. With better quality electricity service, appliance use may increase over time.

iii. ***Partnering with Intermediaries:*** All of the programs utilized intermediaries of different types to help the electricity company and other program stakeholders better understand the starting conditions they would encounter within the communities, the barriers to traditional service delivery that had soured the environment for their services in the past, and most importantly to assist them in putting together a program that would work under the extant conditions. The particular form that the intermediary interface took was quite different in the programs studied, including either community agents (COELBA), women's NGOs (AEC), community associations (mandated by MERALCO) or community distribution companies (PN Energy). In several cases, the question arose as to whether the intermediary could be eliminated after acceptance of the program and the electricity company by the community. COELBA briefly tried to penetrate new slum communities without their local partners but stopped after failing to achieve the same results. AEC has recently decided to roll-out its slum electrification program without the use of intermediaries. It is too early yet to determine the success of these efforts.

iv. ***Competing With Illegal Service Providers and Controlling Theft:*** One of the fundamental reasons for theft of power is the relative ease of obtaining illegal access

compared with the barriers to obtaining legal connections for slum dwellers. Each electricity company in the studied cases recognized that it must compete with the entrenched illegal access – in terms of price; ease of payment; and quality, reliability, and accessibility of service. Each company had to devise specific program components and technologies to overcome the entrenchment of theft of electricity.

v. ***Making It Easier to Pay for Electricity:*** All of the electricity companies redesigned their service delivery to fit the needs of the poor communities they were targeting. A common element was community-based customer service centers for easier payment and complaint resolution. Flexibility in payment options and criteria for cut-off may be necessary given the uncertain income streams of slum residents. All programs also subsidized and financed connection fees.

vi. ***Lowering Costs to the Electricity Company:*** All electricity companies considered measures to reduce the costs of connecting and serving slum residents. For example, PN Energy lowered costs by installing highly visible standardized meter boxes, using a ready board for internal connection, providing for prepayment codes, and placing the theft-proof boxes on utility poles serving 6 to 10 houses. MERALCO located all individual meters on a meter wall at the edge of the slum, thereby reducing the cost of extension of distribution lines into the community.

vii. ***Government Policies Supporting Electrification:*** A common thread in all cases was government targets for improving the living standards of the urban poor, as well as determining the regulatory treatment of non-technical losses.

viii. ***Recognizing Women's Roles in Electrification:*** The increase in women-headed or women- maintained households, noticeable in the COELBA, AEC, and PN Energy case studies, means that it is increasingly important to adopt a gender perspective to household electricity supply and demand to ensure that the utility is meeting the requirements of the primary users.

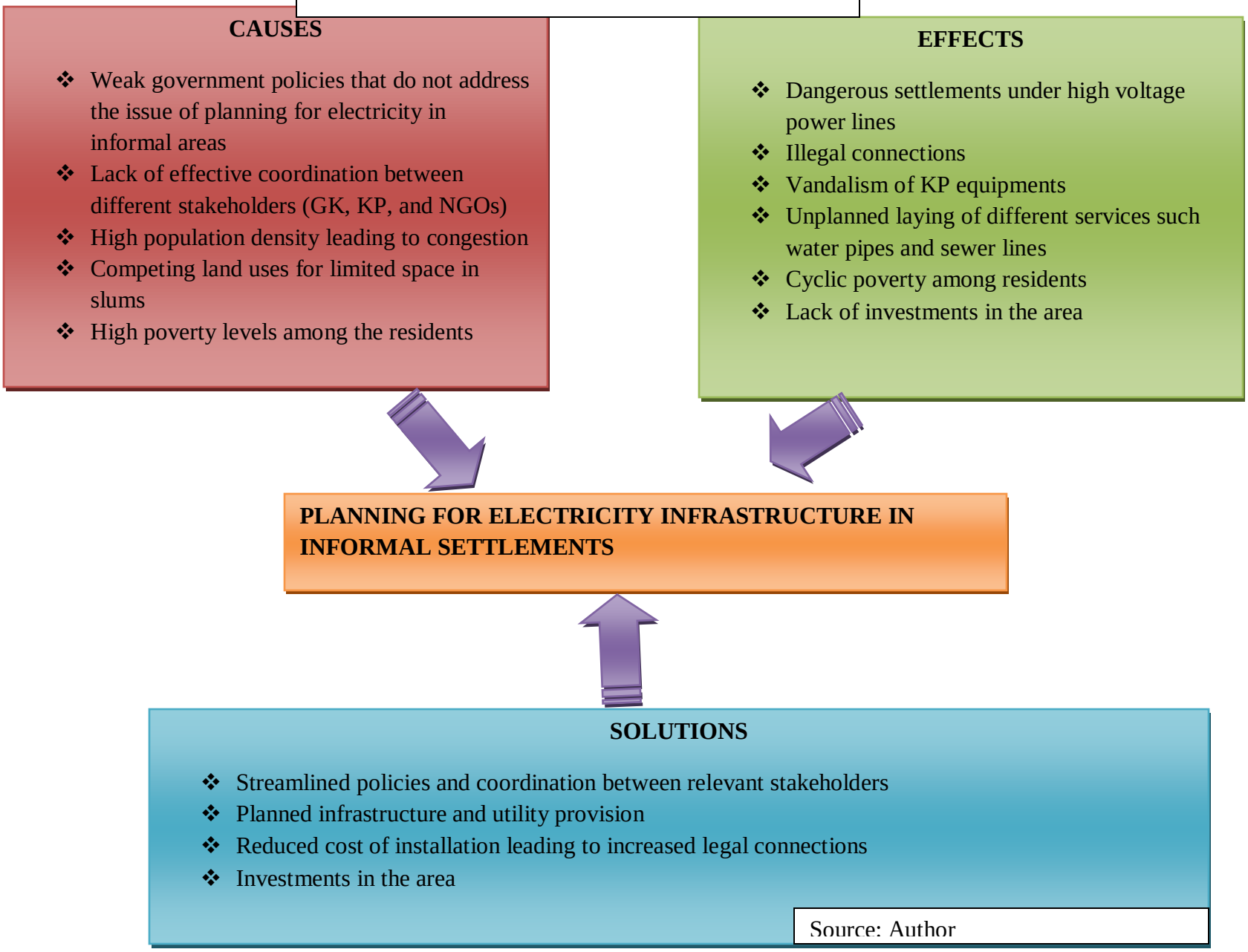
2.13 Emerging Issues from the Literature Review

Provision and maintenance of infrastructure has been a major problem, especially within the low-income urban settlements of Kenya and other developing countries such as Brazil and Tanzania. Most Local Authorities (LA's) in Kenya are unable to meet the heavy demand for infrastructure development and provision of services Nairobi being one of them. The development of infrastructure and provision of services (power, transport and communication, provision of water and sanitation and safe disposal of waste) is necessary program. Issues relating to the distribution of electricity have reduced its accessibility by the urban poor. The study found out that by involving community based distribution companies will improve reliability and quality of the services. Affordability being a major issue, installing of prepaid meters will enable the residents to live within their abilities while also limiting illegal power connections.

Policies on the other hand have also played part in the problems facing the informal settlement. The lengthy process of acquiring Wayleaves, high costs of power connection, and the documents required before connection makes it difficult for the slum residents to seek the correct channels of connection. Lack of energy policies identifying the poor as a special energy needs, poor governance and high poverty levels were also major findings of the study. Due to lack of planning in these slums, leads to completion for space among the services and since there is no land set aside for them, they are constructed over houses posing a major risk to the residents.

The existing legislation are all colonial and not alive to the current dynamics. The laws that govern the provision of services are too stringent and do not give room for different alternatives. It is interesting to note the origins of the Nairobi by-laws. They were just picked from Blackburn (a town in Britain), and used unaltered except for the name which changed from Blackburn to Nairobi.

Figure 3: Conceptual Framework



Source: Author

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The main purpose of this chapter is to give an overview of what the research design was and how it was executed. The chapter details the research process and how various data was collected and analyzed in line with the purpose and research objectives. The chapter gives an explanation of the methods used in data collection, analysis, and goes further to provide justification of the whole process of research.

3.2 Philosophy of the Research

The research adopted an interpretative philosophy. Its success in the field of social sciences and how it helps to bring out issues (Gaffikin 2006) contributed to it being chosen. The philosophy helps the researcher to get close to the participants and understand how the institutions have evolved over time (Shaw 1999). The information collected represents a fare judgment of the people involved and by interpreting it correctly; the research brings out the possible solutions that will be implementable to the community. This method allows for the research questions to be generated out of the reality while the interpretation approach draws meaning from the study basing on the facts that the people reply in an objective way (Shaw, 1999).

3.3 Study Approach

The research adopted a qualitative approach because of the problem and research objectives of the study area set earlier. This kind of approach sees the situation from the point of view of the people affected. In Kosovo, the respondents were asked about what they do, what they think, and what they wish should be done to change the current situation. It enabled the research to study the situation in detail because data collection was not limited to any predetermined categories of respondents.

3.4 Study Area

The choice of Kosovo as the study area was based on the rapid growth of population in Kosovo against the slow pace of service provision if any, and the increasing danger of settling under power transmission line. This phenomenon was well expressed in the area which showed that it can be used as an example to other informal settlements in the country. Kosovo is located adjacent to Mathare River. The area neighbors Mashimoroni, Mabatini, and Mathare b. the total population of Mathare is 102,000 people, but the population of Kosovo is approximately 15,000 people within 3000 (Pamoja Trust 2010).

This population is distributed into two main clusters; Landlords and tenants. The majority of the population is comprises of tenants 92% while structure owners cover 8% (Pamoja Trust 2010).

The study was further broken down into;

i. **Households**: This provided information on household sizes, income levels, and their expenditure on energy. They also gave alternative energy sources and their uses. They further gave information on affordability and accessibility of services.

ii. **Businesses in the area**: This provided details on the types of businesses income levels, access to services in this case energy and affordability. Feedback on intervention measures was also obtained from this segment

iii. **Institutions in the area**: These are the NGOs, CBOs and governmental institutions such as provincial administration, Kenya Power, and local authorities. Information on policies, legal framework, land tenure systems, local participation in relation planning for wayleaves was obtained.

3.5 Sampling

The accessible population of the respondents was categorized into two major groups; tenants and landlord, after which random sampling was applied in the two categories. This method was chosen because it gives each household an equal opportunity to be selected. Because of the time limitations, the method was appropriate to get the right information from the people.

Within the settlement, both quota and systematic random sampling were used to identify the households to be interviewed. And since the settlement was divided into rows by roads running from the main road towards the river, this was used as clusters where the sample size was distributed according to the number of households per row. Households that were interviewed were selected through systematic random sampling from a randomly selected starting point. In the selected households, the head of the household was interviewed, and in his or her absence, any adult present was interviewed.

3.6 Data Categories

i. Secondary

This Involved literature review of documented information from publications, journals, reports and case studies amongst others. This helped to collect demographic information from census report, and other studies done in the area. This included the population, household numbers, and levels of

income. It also involved research and review of documented information from the various institutions and sources. The research consisted of existing literature on studies conducted in Kosovo. Census material from KNBS of 2009 was greatly used to establish the population of the area and other demographic characteristics such as age, gender, and household sizes. The research further utilized materials from passed studies in the area especially by Pamoja Trust and this included; maps, number of structures and physical facilities in the area.

ii. Primary data

This involved direct observation, interviewing the subjects, interviews with key informants and measurements. These were administered to heads of the relevant institutions e.g. The City Council of Nairobi, Muungano Wa Wanavijiji, and Pamoja Trust, and direct measurements were applied to measure distances from the electricity lines to the dwellings and the sizes of roads. Sizes of the houses were also established through this format.

As earlier stated, several instruments were used to collect this data. The primary data included the sources of energy and their use among the residents. The study also established the main players in the power provision and the challenges they face in the settlement. Further, it sought to know the main consumers of electricity (residential or commercial), while also exploring the alternatives that could help improve the situation. Other aspects that were included were:

Physical aspects

i. Location, size and density of the settlements
ii. Quality of Shelter (type, nature, sizes and physical conditions of housing)
iii. Land and housing ownership and occupancy
iv. Physical Infrastructure (access to roads, public transport, water, electricity)
v. Water
vi. Energy sources and usage -
vii. Environmental Concerns including solid wastes management, atmospheric and water pollution

Economic aspects

i. Household income and expenditure on selected items
ii. Characteristics of livelihood activities (business and occupation)
iii. Sources of income and livelihood activities

3.7 Methods of Data Collection

This includes both primary and secondary data collection methods.

Secondary data collection:

This involved mainly literature review of data on documented information from the KPLC, City Council of Nairobi, the Physical planning Handbook and existing legislation.

Primary data collection:

This included direct observation, oral and written interviews, and direct measurement.

i. **Direct observation**.

This is an important method because it had effect even on the other methods of data collection such. It involves use of sight coupled with critical mind to select features of relevance to this study. It will be very easy to observe the electrify distribution network in the study against the planning requirements. Types of the structures were also easily captured through this method.

ii. **Questionnaires**

This method involved use of well structured questions that were given to the area residents to be filled in writing. This is the most appropriate for only the very patient and willing respondents who were literate. This comprised both fixed and open ended questions. Fixed questions referred to those that are formulated to help the researcher get specific data while open ended questions helped the researcher get specific data while open ended questions help the researcher to get opinions of the respondents on the subject matter.

iii. Use of interviews

This involved the use of one on one exchange of information by use of a series of formulated questions to act as a guide to the collection of data systematically. Both oral and written interview schedules were applied to address data needs from the Kenya Power, City Council of Nairobi, NGO's, and Local administration.

iv. **Taking of photographs**.

This captures as situations as they are on the ground. This captures distribution network and encroachments on the way leaves.

v. **Direct measurement** of the encroachments on utility way leaves

vi. **Mapping**: Existing maps aided in location of the Kosovo village in local and regional context. Mapping also made it possible to identify key features relevant to this study in terms of their location within the study area and level of spread. It also helped to establish the size of the study area.

3.8 Data Analysis and Compilation

Both qualitative and quantitative data was collected during the process of data collection. Qualitative data collected about electricity service linkages was analyzed through comparisons with other studies done elsewhere. Other changes were analyzed in terms of the growth, expansion, decline and the establishments.

Quantitative data was analyzed through SPSS showing the economic status of the residents in percentages. Other data analyzed through this was levels of connection, household sizes, levels of education, and levels of consumption among others. Charts, graphs and tables were used to present the data collected from the field for easy understanding. The table below summarizes the whole process of data collection and analysis.

Figure 4: Research Design

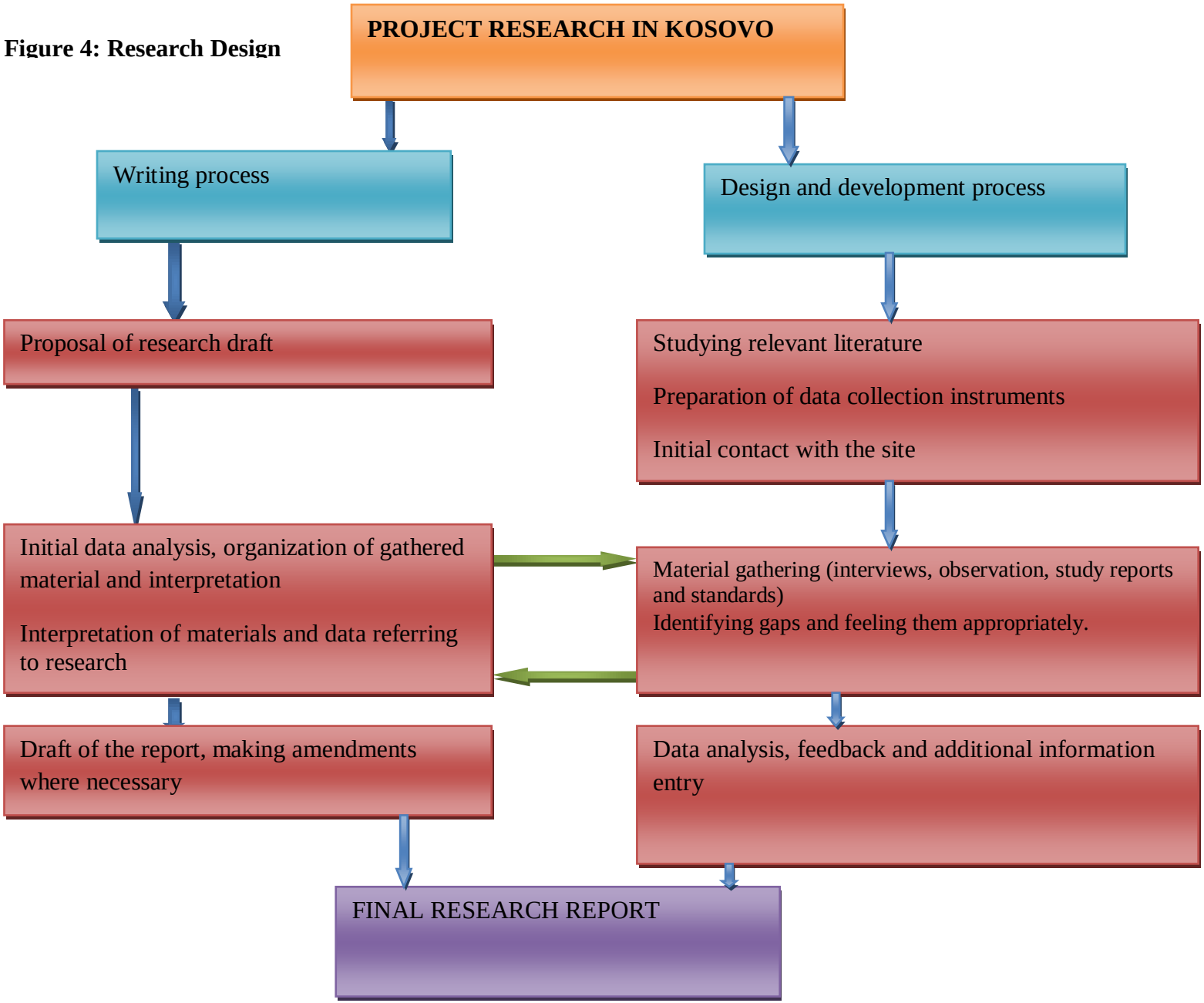


Table 6: **Data Need Matrix**

RESEARCH QUESTIONS	RESEARCH OBJECTIVE	DATA NEEDS	DATA SOURCE	METHODS OF DATA COLLECTION	METHODS OF DATA ANALYSIS	METHODS OF DATA PRESENTATION
What is the current situation for planning for electricity supply in Kosovo?	To investigate the current status of electricity infrastructure in Kosovo village	Identify planning provisions for electricity supply	Field survey, maps, and GIS	Observation, Direct Measurement, photographs Reviewing of government documents	Descriptive	Report
What is the existing institutional framework and stakeholder formation in respect to planning for electricity supply in Kosovo village?	To investigate the institutional framework in regards to planning of electricity supply in Kosovo	Scenario analysis of institutions involved The role of NGOs in the settlement	Field survey, secondary sources, KP	Questionnaires to residents, interview schedules,	Descriptive	Photographs, tables and report
What are the previous planning measures towards electricity supply in Kosovo?	To examine the previous planning interventions towards	Scenario analysis of inadequate electricity	Field survey, secondary sources, KP, NCC,GOK	Interview schedules and review of policy documents. Observation	Descriptive Analytical	Report writing ,Graphs ,charts, photographs

What are the constraints for planning for electricity supply in Kosovo?	To investigate the constraints in planning for electricity supply in Kosovo	Encroachment Land uses Terrain Land ownership	Literature review Expert consultation GIS data	Expert consultation Focus group discussions questionnaire	GIS data analysis	Report
What are the impacts of inadequate electricity infrastructure in Kosovo village?	To assess the impacts of lack of planning of electricity supply in the area	Socio-economic data Conflicting land uses	Field survey, City Council of Nairobi Literature review ,KPLC	Literature review, case profiling	Report writing	Report
What is the role of planning in mediating the current situation	To propose planning interventions in solving the current situation in Kosovo	Possible interventions Responsible institutions	Government documents Previous reports	Focus group discussion Literature review	Expert consultations	Report

Source: Author 2013

CHAPTER 4: BACKGROUND OF THE STUDY AREA

4.0 Overview and History of the Area

This chapter identifies the study area both locally and nationally. It also reviews the population characteristics, physical and environmental characteristics, and socio-economic characteristics. It also touches on the legal and institutional framework of the study area.

4.1 Location and Context of the Study

Mathare Valley is situated five kilometers northeast of Nairobi's city center. As one of the largest slums in East Africa and the oldest in Nairobi, Mathare is divided into different villages; namely; Kosovo, Gitathuru, Mathare 4B, Mathare 3A,3B,3C and Village 2 as illustrated here below.

Map 3: Location of Kosovo

Source: Google maps

This is one of Nairobi's oldest and worst slums in Kenya covering an area of approximately 8km2. It is situated about 5kms northeast of Nairobi's city center. Administratively it is found in the two constituencies of Starehe and Kasarani. Mathare Valley is enclosed by Pangani on the West. On the north, it is enclosed by the police depot, Mathare primary school, and Mathare Mental Hospital. Juja Road borders Mathare on the south, separating it from Eastleigh, an estate dominated by Somali immigrants and entrepreneurs. To the east, it borders Huruma estate. .According to one estimate from the Central Bureau of Statistics, Mathare Valley is home to about 90,000.

Location Context of Mathare valley-Kosovo

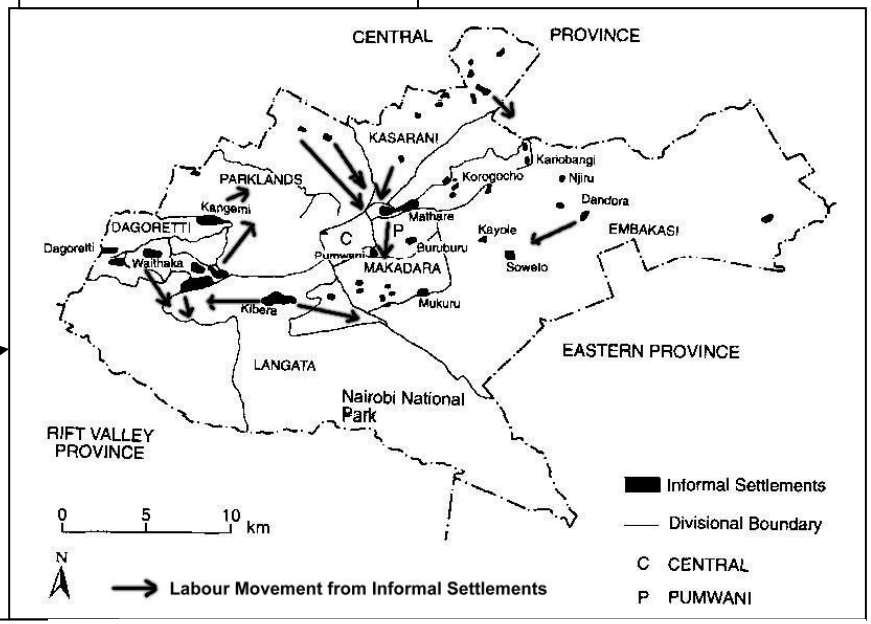
NATIONAL CONTEXT

Kosovo is found in Kenya.

This map is not drawn to scale

Source: Chacha

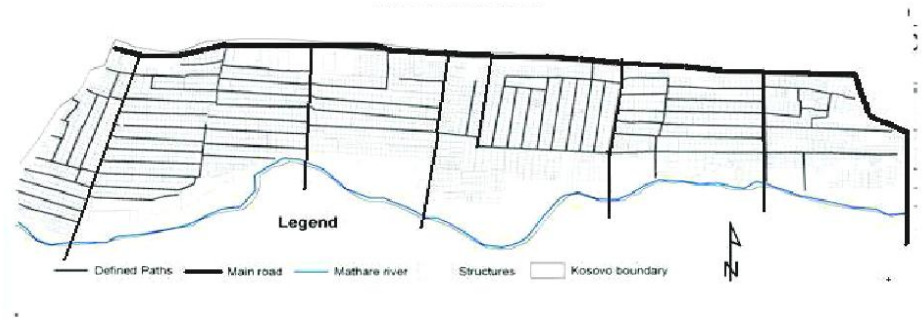
REGIONAL CONTEXT



Map 4: Location Context

LOCAL CONTEXT

Source: slum inventory 1999 map 1: slums in Nairobi



Source: Pamoia Trust 2010

Figure 5: Aerial View of Mathare Valley

Source: field study

4.2 Physical and Natural Characteristics

4.2.1 Geology and Soils

Mathare Valley is structurally a flood plain along the Nairobi River; the soils are a mixture of black cotton and alluviums, with isolated patches of red clays thus making some parts relatively unstable in terms of bearing capacity. Mathare valley generally slopes from west to east but also towards the river channel. About 30% of the informal settlement falls within the thirty-metre riparian reserve. The valley also features pockets that were formerly quarry sites and are now characterized by steep river banks that remain unsettled due to the steep gradients.

4.2.2 Vegetation and Climate

Kosovo is built up almost every place with the exception of grass along the paths and the river banks. Some of the areas along the river have Napier grass.

4.2.3 Climate

Rainfall

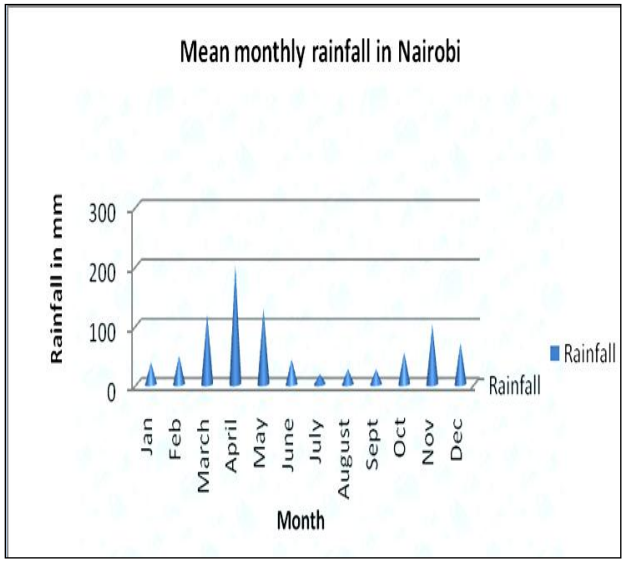
The area has a bimodal rainfall pattern, in which the maxima occurs March – April (long rains). The cloudiest part of the year is just after this first rainy season, until September, the conditions are usually overcast with drizzle. The Minima (short rains) occurs between November-December. The simple rainfall regime is complicated by the uncertainty of rainfall from year to

year (Morgan, 1967). As Nairobi is situated close to the equator, the differences between the seasons are minimal. The average annual rainfall is 875 mm, which may actually vary from a minimum of 500mm to more than 1500mm.

***Temperature**:*

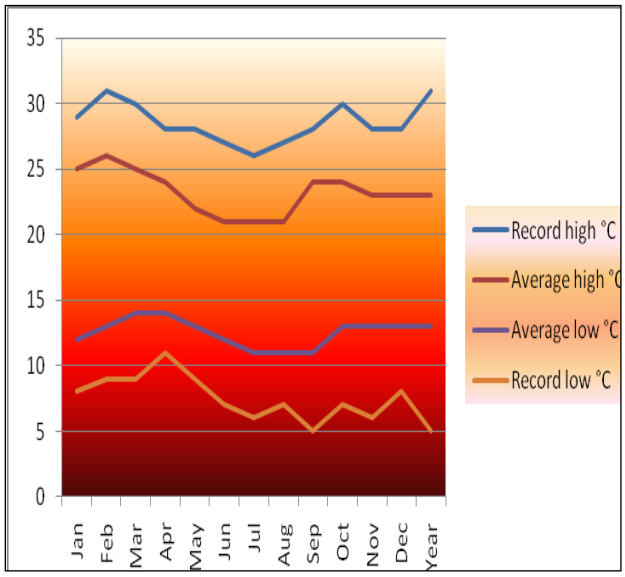
On average, daily temperature varies from 17 in July/August to 28 in March. The maximum daily range of temperature is quite large 10 to 28 in May and February respectively. Minimum daily temperatures range from 11.6 to 15.0C. The hottest months are December to March.

Figure 6: Rainfall



Source: Neo 2011

Figure 7: Temperature



Source: Neo 2011

Sunshine and solar radiation

Nairobi experiences a total of about 2,500 hours of bright sunshine per annum, which is equivalent to an annual mean of approximately 6.8 hours a day. July and August are characterized by cloudiness and during these months the average daily sunshine in Nairobi is four hours. Frequently there are a number of days when the sun fails to penetrate the cloud cover. There is about 30% more sunshine in the afternoon than in the morning and it follows that westerly exposures receive more isolation than easterly ones. Figures show that average daily radiation is highest in February, followed by January.

4.3 Population and Demography

According to the 2009, census report, Kosovo has approximately 3000 households with a population density of 46000 people per square kilometer. The average number of people per household is three people, and the area is dominated by the female gender. According to community informants, 70% of Mathare's residents are native to the settlement. Sixty percent are Christian, 15% maintain traditional beliefs, and 25% are not religious. Mathare's ethnic groups are generally clustered together in certain areas, with Kikuyu and Luo outnumbering smaller tribes, such as the Luhya, Kamba, and Kisi.

4.4 Socio-Political Profile

Mathare valley settlements largely fall under informal, low-cost housing (slum upgrading), and private commercial housing, mainly in form of tenements. Both the informal and formal settlements feature landlordism. The informal settlements are structured into villages whose identity revolves on ethnicity or tenure status. In Kosovo, structure owners are manly located to the west while the eastern part mainly occupied by tenants.

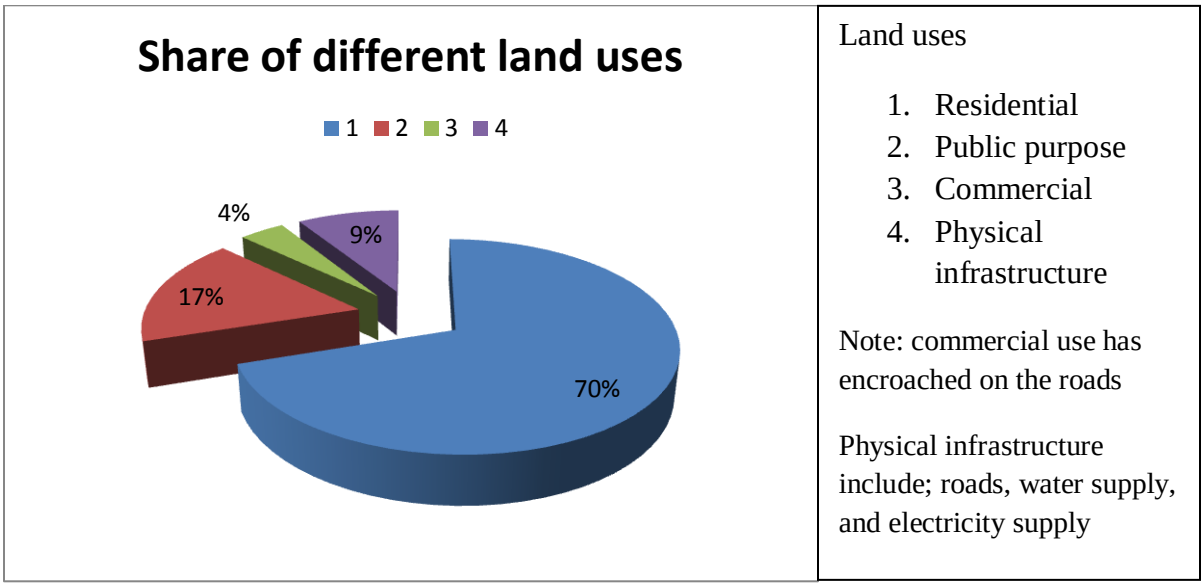
The main ethnic enclaves are those of Kikuyu, Kamba, and Luo communities. Politically, Mathare is influenced by three centres of power, namely, the local administration (chief's office); civic authority/local government (the ward office headed by the Councilor), and parliamentary (the Constituency office headed by the Member of Parliament). Politically, Mathare residents have experienced many challenges, including sporadic violence and proliferation of organized gangs and outlawed sect movements such as *mungiki*. Residents in Mathare live in abject poverty with no functional utilities; no clean water, no sewage system and limited access to electricity. They live in shacks made of mud, bits and cardboard and rusty corrugated iron. While Mathare valley is often associated with a community rife with crime, prostitution, illegal alcohol and drugs, it is also a community of people struggling to improve their lives, educate their children, and lives with dignity.

4.5 Land Use

The land under which the study area is belongs to the government of Kenya, the police department. Several attempts to resettle the people have been futile. Housing or residential land use in this case dominates the other land uses. In a settlement that is characterized by haphazardly laid structures, residential land use takes the majority of these structures. More

than 70% of the structures within the settlement are used for residential purpose. Other land uses include commercial and public purpose which takes up approximately 17% and 9% respectively of land use within the settlement. Apart from serving the educational purposes, the schools are also being used for community gatherings, sporting activities, and playing grounds for children. Only about 4% of the total land in Kosovo has been left for circulation and movement both vehicular and non-motorized movements.

Figure 8: Land Uses



4.6 Economic Activities

The economy of Mathare Valley is largely informal; the main areas that the community engages in include *micro-commercial enterprises* – petty traders in kiosks and hawkers in food products, used clothing, furniture, beauty products, liquor joints, and salons and Berber shops; *agricultural activities* - ranging from crop farming (maize, beans, coco yams, bananas, tomato, and sugar cane) to animal/livestock keeping (chicken, ducks, goats, sheep, and pigs); *recycling* – remnants of burnt charcoal, pieces of wood, waste paper, polythene bags, and scrap metal that are mostly sold to dealers; and *micro-industry* – includes open air motor garages, furniture marts, metal works, and traditional liquor brewing *(chang'aa)* at the riverfront where the river water is used as a coolant in the distillation process.

Although Mathare is located very near Nairobi's commercial district and well within the economic hub of East Africa, community informants estimate that just 1 in 10 individuals are

employed. Most men and women work in the informal sector, earning low wages with little job security. Men ages 20-35 years typically work as casual day laborers in construction, small-scale manufacturing, food/vegetable kiosks, security, or as auto mechanics. The majority of women ages 25-40 work as domestic help in neighboring communities like Eastleigh and Muthaiga, or in small-scale businesses selling food, sundries, or second-hand clothes. Women and young girls also engage in transactional sex (earning 100kshs, the equivalent of $1.50 USD per client) and brew chang'aa (an illegal alcoholic drink) for survival. Anecdotal evidence from health, development, and education practitioners suggests that Mathare's economic insecurity is the primary factor impacting education enrolment and retention. One school leader estimated that fewer than 30% of the school's guardians/parents are able to sustain themselves in addition to paying for school costs.

Jamii Bora Trust, Kenay's largest microfinance organization, works with many residents in Mathare via their office on Juja Road. Jamii Bora's branch in Mathare was its second; as of 2008, 72 branches operate in Kenya, serving 200,000 members. (The organization predicts that their membership will grow to 400,000 by year-end.) According to outreach coordinator Susan Saiyorri, most borrowers in Mathare use the principal loan amounts to start vegetable businesses. The minimum loan amount is 2,000 KSHS (~$30 USD), with most first-time loans averaging 8,000 KSHS (~$125 USD). Additionally, Jamii Bora offers health insurance, business school (3-week entrepreneurship training courses), and sobriety groups to support their members' economic and social well-being.

4.7 Key Infrastructure

i. ***Roads***; The network and hierarchy of roads in Mathare Valley are crude and vaguely-defined typical of the prevalent informal settlements. These are mainly structured by housing layouts and in most cases also serve open space functions. The roads tend to be very narrow and generally unpaved. They also serve the purpose of draining away storm water when it rains; it has resulted to massive erosions.

ii. ***Water Supply***; In Nairobi only about 24% of all informal settlements households have access to piped water, in form of public water taps (APHRC 2002). Contamination of piped water due to infiltration of foul waters through the broken pipes is common. Sanitation challenges in the informal settlements hinge on human waste disposal, provision of bathrooms, and solid waste, and wastewater management. Provision of

sanitation is faced with lack of land for cesspools/septic tanks, lack of a local sewer line, and unsuitable soils for construction of pit latrines or soak-away pits. A trunk sewer along the Nairobi River traverses the villages of Mathare with some sewer manholes falling inside dwelling structures which poses serious management challenges, but it is also high risk regarding human health in case of overspills of raw sewage.

iii. ***Electricity***: Only about 32% of households are legally connected with metered electricity; however through informal extensions, up to 80% of the household at least feature electric lighting. For other energy functions like cooking, the community relies on alternative sources such as charcoal (53%), paraffin (43%), and others (4%) such as gas, wood, and saw dust (Karisa Charles, 2009). There are no reserved areas for electricity supply as shown in the figure below;

Figure 9: Power Lines

Source: field survey

4.8 Healthcare Needs and Providers

The child mortality rate in the Nairobi slums has been placed at over two times the rate for Nairobi in general: 151 deaths per 1,000 births compared to 61/1,000 for children less than five

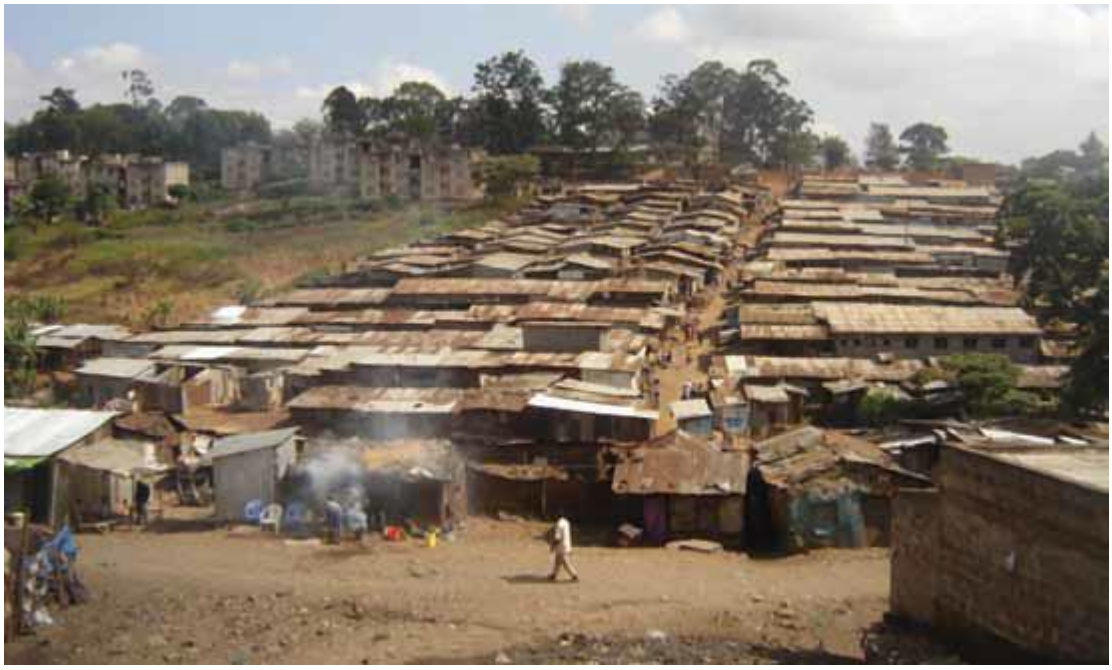
years of age (JHPIEGO, 2007). 26% of children die as a result of diarrhea each year in the urban slums (JHPIEGO, 2007). One study conducted from January 2003 to December 2004 found that acute respiratory infections accounted for 26% of deaths among children under five in Korogocho, a neighboring slum of Mathare Valley (Kyobutungi et al., 2006).

Slum children have less access to healthcare, including immunization, and subsequently face higher mortality rates than even their rural counterparts. For instance, infant, child, and under 5 mortality rates are higher in the slum communities of Nairobi compared to rural Kenya. Full immunization coverage is also 25 percent lower in the slums compared to rural Kenya while the incidence of common childhood illnesses are two to three times higher in the slums relative to rural areas. Adolescent boys and girls in the slums also experience far worse reproductive health outcomes than their counterparts elsewhere in Kenya. They initiate sexual and reproductive activities much earlier and are at increased risks of unwanted pregnancies and sexually transmitted infections, including HIV.

4.9 Housing and Settlement

The predominant house type in Mathare informal settlement is the row/terrace housing, which essentially is the end-to-end joining of rental rooms. The corresponding unit densities stand at about 153 dwellings per acre and the population density at about 460 persons per acre. Such densities not only strain the limited services but are also degrading to the environment, and expose the population to opportunistic environmental and health risks. Today the experience of Mathare informal settlement dwellers has been underlined by risks associated with the lack of services and land that is often inappropriate for settlement due to marshy conditions and post quarrying dereliction. Due to this type of settlement, the power supply also faces a challenge posing more risks to the residents.

Figure 10: Settlement Pattern



Source: Field survey 2012

The housing construction materials in these areas range from corrugated steel to thin wood and trash. Structures are extremely densely packed, and generally more than one family resides in extremely limited space

4.10 Contextual Challenges

Poverty exacerbates an already precarious environment characterized by underdevelopment and lack of basic infrastructure (electricity, water, sanitation). High dropout rates, violent incidents (rape, theft), and a large population of vulnerable children orphaned by HIV/AIDS strain and break existing social networks that would otherwise provide support for community needs. Waste disposal poses a major problem for slum residents, with negative implications for their health. "Solid waste services are…rare in poor urban settings since most slums do not benefit from municipal services. As a result, residents live among mountains of garbage and the associated vermin. Burning of trash causes air pollution, and in some communities, scavenged hospital or medical waste poses a particularly dangerous health hazard" (EHP 2004). However, it should be noted that dumping sites within the community are a source of livelihood for many residents. Additionally, as toilets are often privately owned and/or pay-per-use, many residents resort to defecating in the open or in plastic bags. As a result, human waste can be found in

plastic bags or out in the open on the streets of the urban slums. These areas need well-managed, officially licensed and community-supported toilets.

4.12 Active NGOs and Civil Society

While there are a large number of community-based organizations, no formal network exists to coordinate these efforts. There are many informal networks at the grassroots based on the Kenyan tradition of "Harambee" (Swahili for "let us all come together") offering mutual support to group members. Prominent NGO and civil society groups working on education issues in Mathare include FAWE's Kenya chapter, which supports school fees and needs of 100 girls at Kiboro Primary School and St. Theresa's Secondary School.

4.13 Education

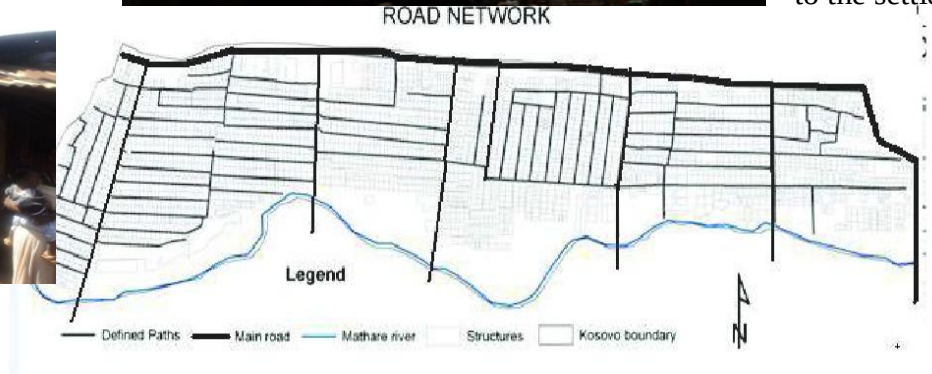
There are three primary schools and one all-female secondary school formally recognized by Kenya's Ministry of Education in Mathare. Mathare official falls within both the Kasarani and Starehe Division. The quality of primary education in Mathare's government-sponsored schools and elsewhere is worrisome, especially with a national teacher shortage and limited textbooks/resources affecting urban settlements—where the number of existing schools is inadequate—most acutely.

Outside the formal government system, there are many so-called non-formal schools, which offer basic, secondary, and vocational training. Largely unregulated, they are often registered under various ministries and vary widely in curriculum delivery, staffing policies, and overall quality. In the Kasarani constituency, non-formal schools are organized into what is known as the Mathare Cluster Non-Formal Schools Association.

4.14 Problem and Opportunity Map for Kosovo, Mathare

Congestion within the settlement with power lines hanging dangerously above structures

There is electricity connection in the settlement and presence of lighting masks to reduce insecurity, despite the illegal connections, There will be no need to construct new connection lines to the settlement



Narrow roads for way leave observance

Presence of a major road can be used by high voltage lines, before the power is stepped down and supplied to the settlement using underground channels

Illegal electricity connection

Presence of other service providers in the settlement such as NWSCO

Source: Author, 2012

CHAPTER 5: STUDY FINDINGS AND ANALYSIS

5.1 Overview

Overall, the research findings show that the study area has varied problems related to planning for electricity supply and accessibility. Demand for the service is high due to increasing population but very few people are connected legally, however some of the research findings are contrary to the general perceptions that people in slum cannot afford electricity. The study established several challenges in the supply of electricity by KPLC. Despite the increasing demand of energy in urban areas and the efforts of the government in terms of increasing electricity supply, most areas in Kosovo remain are inadequately supplied leading to illegal connections and other alternative means of lighting with little regard to safety..

There is high demand for electricity in the area mainly for lighting purpose. The power company is yet to put in strategies for supply and accessibility to meet the demand. This has led to illegal connections. The company has also failed to follow the planning guidelines in power provision. The safety of the people in the area has not been factored in the laying of the overhead lines in the area. Settlements still exist under transmission lines which is a safety risk.

There are major scenarios in terms of energy supply within the settlement. The study established that there are different types of connection to electricity in the area; first there are those residents that are connected to power by Umeme Pamoja project, the second group is those that receive the connection from those that are connected by Umeme Pamoja. The third groups who are the majority in Kosovo are the people who have illegal connections and they extend it to their neighbors.

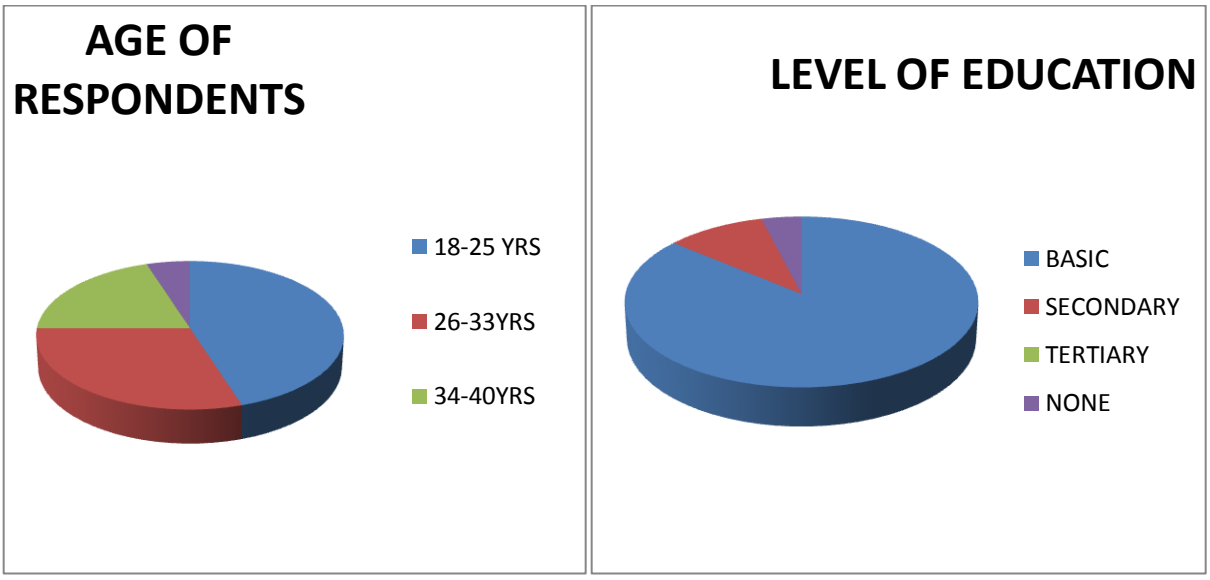
5.2 Characteristics of Kosovo

5.2.1 Socio-Economic Characteristics

The study established that there is high population leading to an increased demand of electricity. The population increase is associated to the rural urban migration and also urban-urban migration. Most of the residents in Kosovo migrated there because of cheap rent while the least did so because of eviction from other informal settlements. The area is also characterized by indigenous

people who have been there since the settlement started. The demographics of the area showed that most the population is young below 40 years. This population consists of school going children and young adults who are mostly casual laborers. They are dependants. The school going children need electricity for reading increasing the demand of electricity in the area. The diagram below shows the distribution of the age of the residents;

Age of Respondent's **Level Of Education**



Source: Field survey 2012

Most of the people in the area are poor and cannot afford to pay for electricity. Most of their income is below 10,000 a month and it is spend on food and other needs such as clothing. The sample population had 86 % of the respondents with primary education.13 % had secondary education, 0% of the respondents had tertiary education as shown in chart below.4 % of the respondents were found to have no education. This explains why most of the residents are involved in informal economic activities such as hawking; washing clothes. Most of the residents blamed the high cost of living and tertiary education as one of the reasons why they did not pursue it. This has resulted to many preferring to illegally connect electricity to save on monthly charges. The high levels of illiteracy make the residents ignorant dangers of such connections

5.2.2 Land and Structure Ownership

The laying of electricity infrastructure requires space and therefore competes with other uses. Owing to the high population density in Kosovo and lack of security of tenure, this has been a challenge to the supply of electricity in the settlement. The original inhabitants in the study area occupied huge chunks of land and built rental structures. Later they started selling the units to individual persons who happens to be current owners of the structures. The land under question is owned by the government for police housing. This means that the residents are there illegally.

5.2.2.1 Land Uses in the Area

The residents have built structures beneath high voltage power lines obvious of dangers of fire and electrocution. Some of the residents have converted the poles to their personal benefit as some use them to hung clothes or join their houses to them. Wires hang dangerously above the structures and the illegal connections have worsened the situation. There are no clear roads where electricity can be supplied through; they are also not straight as they follow the terrain and how structures are build.

Figure 11: Footpath in Kosovo

source: field survey 2013

Due to limited space in the area, the services compete for that space and the providers do not strictly follow the guidelines and standards needed. Water kiosks and sewerage pipes are laid under the power lines as the rest of the place is encroached to by residential houses. The roads in the area are small and mostly are foot paths except for a few which are 6m wide. From this, it is difficult to provide services in the area without interfering with the houses. The owners of the houses are not willing to destroy them. Generally there is high and competing demand for space in the area among different uses. Commercial entities want to utilize the demand from the area while the high population also needs housing putting more pressure on the limited land.

Figure 12: Water Tank under Electricity Lines

Source: Field survey 2012

The water tank in the above plate shows a water tank and electricity pole competing for the limited space in the area. As earlier stated, the roads in the area are narrow and at the same time they are used as power way leaves.

Figure 13: Poles on Narrow Roads

Source: Field survey 2012

Figure 14: Congestion in Kosovo

Source: Field survey 2012

From the above plates, it is clear that there is no designated land for power transmission, the different land uses compete for the limited space. The poles are utilized to support cloth lines and in some instances they are even used to support structures. Extensions of structures also enclose in some cases the supporting wires of the poles.

Figure 15: Pole Support inside a House

Source: Field survey 2012

5.2.2.2 Encroachment on Wayleaves

It is also worth noting that the space purposely left for circulation and movement has been over time being used for commercial activities especially by food vendors who practice it just next to the "carriage way". It is also along the circulation lines that public utilities like water mains, street lighting, sewer line, and drainages are located. The Nairobi Water and Sewerage

Company supplies water to the settlement and this has been one of the most successful projects in the area. However, the company has not provided sewer line and there are private sewer lines made of plastic pipes whose connections are at a fee. The sewer goes down to Mathare river untreated posing health hazards to the community. The streets in Kosovo are lit by Kenya power as initiative to reduce crime in the area. There are masks at specific points in the settlements.

This settlements is not planned, there is virtually no space. Hence the lines are sighted in available tiny access roads with little regard to Wayleaves. Power lines are meant to be sited 2 meters at the edge of road reserve; however, this has been ignored completely. This space is virtually not available. Power poles are next to structures or at times within the structures themselves. Maintenance of these lines is a nightmare when they are faults. There is poor observation of electricity way leaves in Kosovo slum as stipulated in the Physical Planning Handbook. There are cases where the electricity poles are found inside houses or just at the verandahs of the houses.

Poverty plays a huge part in ignoring the risks that come with encroachment into power lines as the people have limited choice of places to build the houses or event house their business.

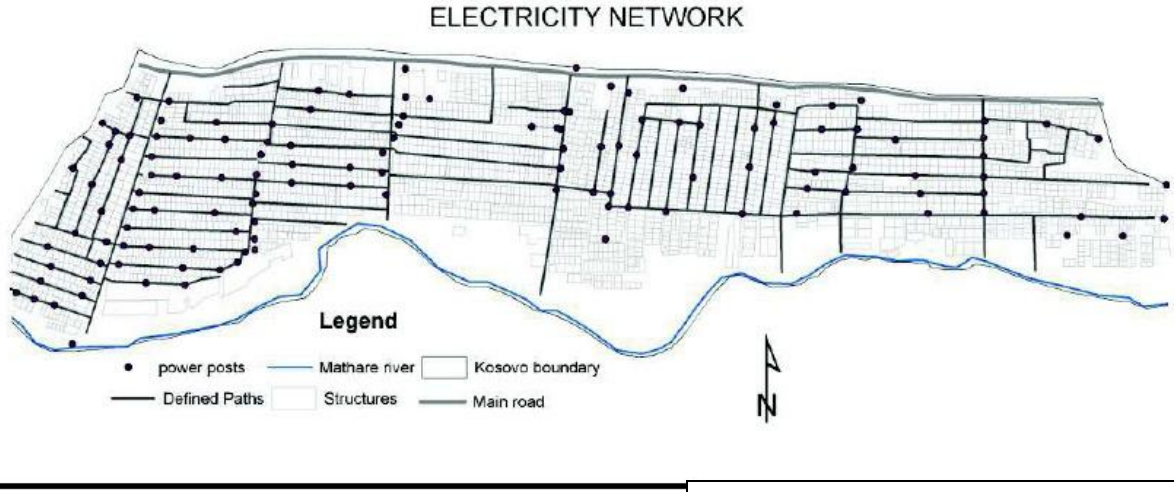
Figure 16: Pole inside a House

Source: Field survey 2012

5.3 Electricity Distribution and Accessibility

According to the survey, most of the people who had legal electricity connection were along the main road network. The bigger portion of the settlers was therefore not connected to the legal connection which can be attributed to poor accessibility to these settlements due to the structure designs and wiring in these structures. Majority of these Residents therefore come up with the decision to connect the power illegally. Despite the availability of power in the area, most of the houses are not connected. The structures have hindered connection and the people have tapped power directly from the post or from the neighbors who are connected legally.

Map 5: Electricity Distribution



The spatial distribution shows poles and lines along the paths in the area, however, houses are built under those lines.

Illegal connections are rampant and they cris-cross each other

Source: Pamoja Trust 2010

The people in the area have settled under the power lines putting their lives in danger. This was attributed to the demand of housing forcing landlords to built houses under the lines. From the map,

it was established that the connection of electricity in the area mainly followed main roads, but the residents tapped it illegally as there are just a few people who have legal connections. The institutions in the area are the main consumers of legal power supply.

5.4 Impacts of Inadequate Planning For Provision of Electricity

The study established that, informal services are mostly attributed to cheap connection rates or at zero-rate and often the convenient billing systems. The main reason why the residents of Kosovo have preferred this illegal connection is the failure of KPLC to address their needs. The standard formal connection rate for a household electricity meter is about Ksh. 35, 000 which is undoubtedly too costly for a low-income household. Apart from the connection fee, the process of application is tedious and requires a proof of property ownership, which households in the informal settlements cannot comply with thus limiting their qualification for servicing. This is further limited through the complex nexus that exist between structure owners and tenants around issues of tenure-ship and property rights. Due to the necessity, the residents risk to have them at the low cost which has encouraged cartels to come in.

Kosovo has an approximate of 3000 households. From this, the legal connections only cover 4.4 percent of the settlement. Approximately 86 percent of the households are illegally connected. Over the years electricity connection between 2005-2007 in Kosovo was controlled by illegal gangs.

In 2007, the Power Company thereafter disconnected illegal connections leading to bloody confrontations. Later the Power Company introduced a project in Kosovo which enabled residents to access electricity at a flat of Ksh.300 per month. However, the capacity provided is only 7 Amps which meant that once a person connected a gadget that is higher than 7 Amps the supply disconnected automatically and could only be reconnected by KPLC at a fee of Ksh 500. This process of reconnection is lengthy. What resulted was emergence of illegal connections within the settlement.

From the field survey it was noted that 77% of the respondents had illegal connection of electricity as compared to 23% who had legal connection. A high percentage accredited to having illegal connection from some of those who are legally connected at a fee of Ksh 300 monthly. The cheap connection fee has encouraged more people to do so, the neglect of Kenya power was also

said to be the other reason. However, the Kenya power company sites insecurity in the area and poor accessibility as the reason there are so many illegal connection.

5.5 Other Energy Sources

Due to high poverty levels, most households use other sources that they believe are cheaper and affordable. Cooking in the area is mainly by charcoal and kerosene stoves, while outdoor cooking in some cases use firewood. Very few homes use gas for cooking accounting for only 1% of the total population. The houses are lit by kerosene lamps, rechargeable lights, and solar in few houses.

Figure 17: Other Energy Sources

Source: Field survey

5.6 Electricity Demand in the Area

The economic activities in the area show that there is demand for power which calls for the provider to consider providing power so as to minimize illegal connections. Some of activities which require power are shops, welding workshops, barber shops, salons, supermarkets, residential houses etc. due to inadequate connections, some of the economic activities in the area have illegal connections leading to the KPLC losing revenue to unaccounted for power consumptions. Business people site the long process to get connected to the power legally as the reason why they are not connected; they even argue that it is expensive and not reliable. The power they use is not accounted for which makes it difficult for KPLC to collect any revenue from the area.

5.7 Summary of Findings

i. Land is mainly used for residential purposes which occupy more than 80% of the total land, the remaining 20% is shared among different services such roads, water supply and electricity infrastructure

ii. The land belongs to the government and no resident has ownership documents

iii. There is no particular order for building houses in the settlement making it difficult to supply services such as electricity and water

iv. Poverty levels are high with many people earning below Ksh 10000, making it difficult for them to pay services

v. There is need for sensitization to create awareness to the slum residents of planning for electricity infrastructure

vi. There is local participation in some of the projects; however, it has not been effective as some of the projects have ignored the contributions of the people

vii. There is lack of efficient coordination among the local government, government and the service provider, with KP charged heavily by CCN on their infrastructure

viii. There are no pro-poor planning initiatives for electricity supply within Kosovo leading to increased demand for illegal connection to bridge the gap

CHAPTER6: MAIN PROBLEM ISSUES AND POLICY RECOMMENDATION

6.0 Overview

The purpose of this research was to explore the challenges facing the planning for electricity infrastructure in Kosovo, Mathare. Challenges in the informal settlements are almost similar and characterized by poor service provision. Energy is a component of development that requires to be availed in the slums in order to achieve slum upgrading or even their ultimate eradication. This research sought to find out what are the main challenges and what are their subsequent causes, and it established through existing literature and field study of Kosovo.

There has been general assumption that communities within the informal settlement have lesser demand for electricity and that they lack the capacity or the resources to meet their demands for electricity. Poor housing within the settlements also send a notion that the communities do not need electricity and they have no equipments that demand electricity supply. It should also be noted that the study spatial issues are at the center of electricity provision because it is a physical component in slum improvement.

This research establishes several issues affecting provision of electricity in slums; they touch on policy and logistical matters.

6.1 Policy Recommendation

i. The energy policy of the country overlooks slum electrification. For any success in this field, it needs to be given the attention same as that which is given to rural electrification, and further given funding that will facilitate its running. If the policies continue to overlook slum electrification, the current situation will worsen as the population growth continues.

ii. The policies have not accepted that there are slums in the country. They are seen as illegal settlements despite their continued existence. Service provision in this settlement is seen as a way of formalization. And due to the frequent eviction threats, long term investments such as electricity infrastructure are discouraged.

iii. The people living in slums are poor, and no policy targets this group of people directly. Policies need to be put in place to provide services to this group as it is the most vulnerable.

6.2 Cost Related Issues

i. Service providers are driven by demand, but the cost implications in most cases limit them. The people in the slums are poor and their power consumption is low. This discourages KPLC to invest as the returns hardly meet the costs of installation and maintenance.
ii. Risks associated to vandalism of the power lines and illegal connections have also discouraged further investment in the area.
iii. There is a need to form partnerships and a good understanding of the community and the KPLC so as to form a basis where both parties benefit. This will reduce vandalism and encourage legal connections.
iv. Some areas in the country that have higher demand and can pay for the services are not connected which makes it difficult to invest in slums where returns are not assured.

6.3 Spatial Related Issues

The main problem within the slums is regarding electricity is limited space for service provision. This coupled with electricity theft has made the provision of the utility difficult. Safety of the people is not considered as they do the illegal connections and further into the structures which are poorly wired. The following were the main challenges identified in regards to physical space;

i. There is lack of secure tenure, which further prevents KP from supplying the residents with electricity. It was noted that before power connection one is supposed to provide land ownership documents
ii. The structures are congested and disorderly limiting clear channels over which the electricity lines can be laid
iii. Building materials for the structures are poor and a fire risk
iv. Lack of means to obtain right of way for electricity supply

6.4 Opportunities Emanating from Slum Electrification.

It has been discussed before how slum electrification encourages growth of income generating activities and opens up development opportunities through investments. With improved slum electrification, more people will venture in businesses such as welding, salons, Barber shops, hotels, among others creating employment opportunities for other slum dwellers who operate for long hours from home and be able to move freely at night as security will be enhanced. At

the end of the day, there will be increased productivity and as more people develop interest in learning new ways of production and income generation, training and learning institutions will develop within the slum to educate them on poverty reduction strategies. It will create new investments by private developers resulting to employment creation and poverty-reduction?

6.5 Summary of Challenges Hindering Slum Electrification

Electric utilities have experienced or expected low or negative returns from expanding service to low income customers, given their relatively low consumption levels and the added problems and costs of electrifying these areas.

The companies strive to increase net revenues to improve their financial viability as well as fulfill universal service policies that are increasingly being imposed by regulators. While on the other hand the commercial and technical losses in many slum communities resort to theft as a means to have access to electricity, they discourage the providers.

6.5.1 Challenges Facing Planning For Electricity Infrastructure

i. The challenge of unplanned nature of settlements

The unplanned nature of informal settlements such as Kosovo has meant there are no infrastructure way leaves which can be used as power line way leaves. Lack of proper support infrastructure such as roads and power way leaves is perhaps the greatest challenge that has faced KP&LC in power distribution within Kosovo and other slums. Different power lines (as per voltage) require different way leaves.

ii. High connection and power usage tariffs

This study recommends lowering of initial upfront power connection charges and usage tariffs for the slum residents to make electricity more accessible and affordable within the slum. A special kind of billing for slum dwellers should be developed both to control the amount of consumption and affordability.

iii. Low quality housing materials

As regards to the low quality housing material used in Kosovo it poses a risk of electricity related disasters, it is proposed that cheaper and durable materials which don't pose risks of

electric accidents be developed for slum developments. These materials should give space for concealed wiring to avoid electricity accidents such as shocks from naked wires.

iv. ***Illegal connections***

Illegal connections in Kosovo are rampant and according to the study there are cartels who connect illegally and sell to the rest other settlement. Community mobilization and formation of partnerships between the slum dwellers and the utility company are identified as the best way to reduce cases of illegal power connection. KP&LC should also ensure that all people who can afford to pay for electricity are connected legally even if they have to pay the initial connection fee by installments.

v. ***Overdependence on traditional forms of energy***

It has been identified that the overdependence on traditional forms of energy such as charcoal and kerosene is triggered by inaccessibility of cheaper alternatives and lack of knowledge on the advantages created by electricity. To this challenge the study proposes that sensitization forums be carried out within the slum on the importance of electricity to poverty reduction and the need to discourage illegal power connections.

vi. ***Lack of policies on slum electrification***

To this challenge, the study recommends the development of legislation supporting slum electrification. Electricity distribution in Kenya is faced with poorly developed legislation with KP&LC holding supreme rights to power related issues. There is need to develop legislation that will encourage more people to invest in slum electrification. This can for example include licensing individual firms of persons to distribute electricity within the slum even if this involves buying rights from KP&LC. This will no doubt reduce the cases of illegal connections as these people will be incorporated into the mainstream distribution network, and pay returns to KP&LC at a commission. Issues of power related disasters within the slums need also be put into legislation in such a manner to hold all involved parties reliable for their actions in regard to power distribution and us

6.5.2 Probable Planning Solutions

i. The government should be encouraged to extend land tenures thereby legalizing occupancy and providing an incentive to pay bills regularly

ii. Supply electricity from the perimeter where the main road is wide and can allow electricity supply. Since the houses are close, 20 households can be served from a single pole located on the periphery. However, this can only work if the cables are well insulated

iii. Underground laying of electricity infrastructure could be another option to be implemented if precautions are taken. It is flexible and is not affected by terrain. Tunnels with proper protection should be provided in Kosovo.

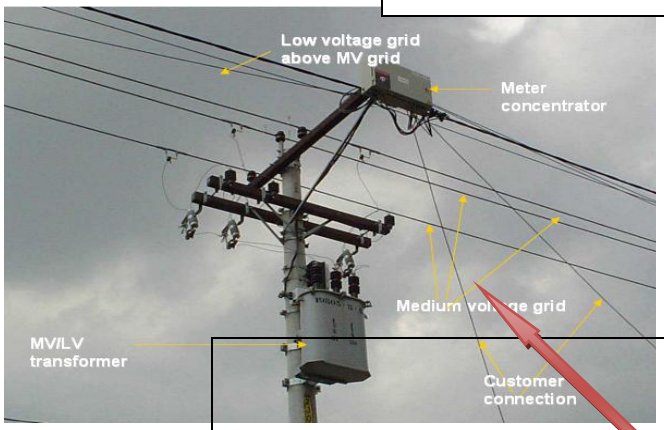
iv. Customer to customer theft can be reduced if the cables are insulated and the distance from the pole to the house reduced.

v. Authorities should identify land and plan for its settlement even if money is not available for urban services

vi. The governments should accept the reality of urban growth, and start to plan for it and determine where the new residents will live

vii. To improve urban inclusiveness, urban policies ought to aim at creating safer cities. This could be achieved through, better housing policies for the urban low – income population

Figure 18: Proposed Solutions



Reading boxes at house level used to re-feel pre paid tokens

- From the perimeter, the supply lines should be underground serving individual households. This limits customer-customer theft and enhances the safety.
- Master meters are located at the perimeter
- There should be community engagement during planning to attain customer satisfaction

Benefits

- Low installation costs as there will be no need for poles within the settlement
- Reduced dangers of electric shocks and fires
- Easy to locate the installation through GIS hence easy management

CHAPTER 7: SUMMARY AND CONCLUSION

7.0 Overview

This project was able to point out the strong and growing demand of electricity in Kosovo; however it noted that the people cannot afford it at the current cost which has led to illegal connections. Dangers that come with poor planning and supply of electricity in the area were more exposed as many people settle below high voltage lines. This was associated with the high demand of land and competing uses for the same piece of land.

The physical conditions and the built environment of the slums make it extremely difficult for service providers to provide, maintain and ensure safety of the utility. A solution to this problem requires that all the utilities (water, sewer, electricity, and roads) are planned for and implemented accordingly. This should bring together the different ministries and sectors involved to channel their funds towards development. Further, it be should be understood that public institutions should aim at expanding the level of services and improving the safety of their use rather than profit making.

Slum upgrading in its simple form means providing a package of basic services such as infrastructure services to improve the well being of the slum dwellers. A fundamental theory of slum upgrading is the legalization and the regularization of the properties of insecure or unclear tenure. The argument behind slum upgrading is that by providing basic infrastructure services such as properly demarcated road networks which will in turn be used as power line Wayleaves, slum electrification will be easy and more people will be served at low expenses. The major advantage of this model is that it will improve the whole of the slum area, from the quality of housing materials used to availability of basic infrastructure services. The challenge of this model is that the upgrading process must involve relocation and/or disruption of the way of life of the slum dwellers which may proof difficult, especially in an environment where distrust exists between upgrading organs and the slum dwellers.

From the set objectives, this research was able to establish the following:

7.1 Current Status of Electricity Supply in Kosovo

i. Some houses are built under power supply lines
ii. Power lines do not follow any clear channels
iii. Most of the connections are illegal 70%

7.2 Institutional Framework in Planning for Electricity

i. There is lack of effective framework in planning for electricity infrastructure between KP and CCN
ii. There is little involvement of local communities and NGOs
iii. Mistrust between the government and the residents due to eviction fears

7.3 Previous Interventions

i. Slum upgrading by the government targeting water and sanitation
ii. Few houses are legally connected to electricity

7.4 Constraints of Electricity Supply

i. Competing land uses for the limited space
ii. Policy failure to address slums as special areas of need
iii. Electricity theft in informal settlement
iv. Vandalism of wires and transformers
v. Affordability of power by the residents is low due to high poverty levels

7.5 Causes of Inadequate Electricity Infrastructure

i. High initial costs of installment
ii. Lack of secure land tenure among the residents of Kosovo
iii. Poor housing structures (mainly made of polythene, cardboards, and mud walls)

7.6 Impacts of Inadequate Planning for Electricity

i. Illegal connections among the residents
ii. High cases of insecurity during the night
iii. Dangerous location of structures within the slum
iv. Continued poverty cycle because of lack of more investments in the area

7.7 Planning Interventions

i. Regulatory framework should be put in place to ensure safety, quality and environmental standards are followed in laying electricity infrastructure
ii. Policies should recognize the existence of slums and allow service provision within the settlement
iii. Working together with the community will allow the community to set aside land for utilities which will improve their safety
iv. A cost effective plan of service provision in slums areas should be developed comprehensively

7.8 Conclusion

It is no doubt that electricity is a vital component of economic growth, social development, and that it opens up opportunities for investment. The Kosovo scenario is no different and improved development of power provision will go a long way in shaping the future of the slum into not just a concentration of poverty but to a concentration of opportunity. However fundamental requirement toward the electrification of Mathare –Kosovo among other slums and squatter settlements lies first in their recognition, legalization and the regularization of tenure through slum upgrading processes. This would not only facilitate provision of basic infrastructure services such as road networks but power line way leaves for easier slum electrification.

From the study it was evident that access to reliable electricity supply triggers an increased investment opportunity particularly in small scale income generating activities within the slum areas, increasing not only their productivity but also in engaging the residents both economically and socially. This not only reduces idleness hence a reduction in crime incidences but also increases safe businesses operating hours.

Higher initial power connection tariffs and electricity charges were however observed to be a key challenge to the low income slum dwellers accessing electricity hence making electricity inaccessible. Special consideration in formulation of affordable tariffs and electricity billing

systems would go a long way in enhancing the electricity access and livelihood improvement. Enactment of legislation supporting slum electrification would not only improve access to electricity in these settlements but also enhance increased returns to both the electricity users and the utility provider.

Since poverty levels are high in slums, there is need for further studies and investigations on legal electricity supply in informal settlements and the economic livelihoods.

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UNIVERSITY OF

NAIROBI

DEPARTMENT OF URBAN AND REGIONAL

PLANNING BUR 615: M.A PLANNING RESEARCH

THESIS

CHALLENGES IN PLANNING FOR ELECTRICITY INFRASTRUCTURE IN INFORMAL SETTLEMENTS:

AREA: A CASE STUDY OF KOSOVO, MATHARE VALLEY

Declaration: This information is confidential and is meant for academic purposes only.

Name of Interviewer_____Questionnaire No: _____ **Date of Interv**

HOUSEHOLD QUESTIONNAIRE

A. Respondent information

1. Name_____
2. Sex [1] Male [2] Female
3. Age_____
4. Marital Status

   [1] Married [2] Single [3] Widowed/ widower [4] Divorced

[5] Others (specify) ----------

5. Educational background.

   [1] Pre-Primary [2] Primary [3] Secondary [4] Tertiary

   [5] University [6] No Education [7] others (specify)

6. Religion [1] Christian [2] Muslim [3] Other (specify)

7. What is your main source of income?

8. What is your monthly expenditure on the following items?

	Expenditure	Amount
1	Food	
2	Rent	
3	Clothing	
4	Transport	
4	Energy	
5	Others	

9. What are the reasons of migrating to this settlement?

   a) Cheap rent

b) Eviction from another informal settlement c)

S e a r c h for economic opportunities

d) Close to work e)

Other specify

10. What is your main source of energy?

11. Which energy sources do you use and how much do you spend on them

Source	Amount per month
Charcoal	
Kerosene	
Firewood	
Electrcity	
Sawdust	
LPG	
Candle	

12. Which of the above energy sources do you prefer?

13. Are you connected with electricity-------?

14. If yes, is it legal Yes ☐ No ☐

15. If not, what are the reasons?

---

16. What are some of the problems as a result of lack of electricity infrastructure?

---

19. Comment on distribution and accessibility of electricity in Mathare.

20. Suggest some of the solutions that will improve electricity distribution and

Accessibility in Kosovo village-Mathare Valley

Population and demographic characteristics

20. Household, Information

H/H Member	Sex	Age	Education level	Occupation	Work place
Father					
Mother					
Children 1					
2					
3					
4					

Migration trends

21. (i) Were you born in Mathare? [1] Yes [2] No

(ii) If No, then where were you born? _____

(iii) What were your reasons for coming to Mathare?

[1] Job opportunity / employment

[2] Education

[3] Acquire land

[4] Acquire housing

[5] Marriage

[6] Others (specify) _____

2. Housing

22. (i) Do you own the land you have settled on?

[1] Yes [2] No

(ii) If yes, what is the size and current value?

Size	Value

23. Is there anything you think is important for this survey?

THANK YOU

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Name of Interviewer_____Questionnaire No: _____

Date of Interview: _____Cluster/Village: _____

LANDLORDS/PRIVATE DEVELOPERS/BUSINESSMEN QUESTIONNAIRE

A. Respondent information

1. Name_____
2. Sex [1] Male [2] Female
3. Age_____
4. Marital Status

   [1] Married [2] Single [3] Widowed/ widower [4] Divorced

[5] Others (specify) ----------

5. Educational background.

   [1] Pre-Primary [2] Primary [3] Secondary [4] Tertiary

   [5] University [6] No Education [7] Others (specify)

6. Religion [1] Christian 2] Muslim [3] Other (specify)

B. Development Related Questions

8. Does the Power Company seek for Wayleaves from you when laying their power lines?

   [1] Yes [2] No

   (ii) If yes, how do they go about it?

9. what are some of the causes of inadequate electricity infrastructure in Kosovo Village?

10.(a) Which do you think are some of problems as a result of inadequate provision of electricity here in Mathare Valley?

(b) What are recommendations which you think can be addressed to provide electricity

C. Business Related Questions

11. What type of business/informal activity are you involved in?

12. Number of employees
13. What is your monthly income from your business?

14. What type of technologies do you use in your business?

15. Do they require energy to run?

Yes……**No**……

16. Please your main sources of energy and the device run by the energy

17. Are you accessed to electricity?

Yes…….No……

18. What is your average bill per month…….

19. What are the benefits of using electricity compared to other source……..

20. Please rate the cost of electricity in Mathare Valley

Very high……..

Affordable…….

Low……

21. What are the challenges facing access to electricity within Mathare Valley

…….....

.....

.....

.....

22. What are recommendations which you think can be addressed to provide electricity in Mathare……
…….....**.....**
.....
.....
.....

THANK YOU!

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Declaration: This information is confidential and is meant for academic purposes only

Name of Interviewer:_____Questionnaire No: _____
Date of Interview: _____Cluster/Village: _____

INTERVIEW SCHEDULE

Kenya Power and Lighting Company

1. What are the design standards as regards to electricity connection in Mathare slums?
2. Before providing electricity here did you consider accessibility of electricity and distribution of the electricity?
3. Which are the ways employed in providing for Wayleaves?
4. What are some of the ways of safeguarding Wayleaves?
3. Are there any policies for provision of electricity in informal settlements?
5. What are some of the legal requirements for provision of electricity?
6. What is the level of engagement with the residents as regards to acquisition of Wayleaves and electricity supply?
5. Do you get assistance from local authorities, central government, NGOs etc?
6. What challenges do you face in providing your services to the residents?
7. What do you think should be done to assist you in providing your services in Mathare?

THANK YOU!

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Name of Interviewer_____Questionnaire No: _____

Date of Interview: _____Name of NGO/CBO: _____

NGOs/CBOs

(i) Respondent information

1. Name of the respondent
2. Age
3. Sex [1] Male [2] Female
4. Nationality [1] Kenyan [2] Non Kenyan (specify)
5. Educational background?

   [1] No education

   [2] Primary

[3] Secondary

[4] Tertiary

[5] Others (specify)

6. What position do you hold in the authority?
7. What are some of your interests in the slum?

8. Do you think there is any challenge faced by electricity provision in Mathare valley?

   [1] Yes [2] No

9. If yes, what are some of these challenges?

10. Is there any program to ensure slum electrification and which organization is responsible for this?

THANK YOU!

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Declaration: This information is confidential and is meant for academic purposes only

Name of Interviewer:_____Questionnaire No: _____

Date of Interview: _____Cluster/Village: _____

INTERVIEW SCHEDULE

Department of Physical Planning

1. What are the planning regulations as regards to provision of Wayleaves?
2. What are ways of planning for infrastructure in informal settlements?
3. What is the level of engagement with the Power Company when planning for a settlement?
4. What the challenges you face when planning for infrastructure especially in informal settlements and any recent examples?
5. What are some of the solutions towards improved electricity infrastructure in informal settlements?

THANK YOU!