

**STUDY OF LAND USE AND MANAGEMENT PRACTICES IN THE  
PERI URBAN AREAS OF KENYA  
CASE OF MUTUINI LOCATION, NAIROBI COUNTY**

BY

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## DECLARATION

I, HANNAH WANJIRU KAMAU, declare that this project is my original work and has not been presented for a degree award in any other university.

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## **DEDICATION**

I dedicate this work to my entire family members and all the volunteers of change in Mutuini location.

## ACKNOWLEDGMENT

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## ABSTRACT

Despite the fact that, trends that stem from theory and practical experiences; that the influence of a city usually goes far beyond its boundaries into its peri-urban and rural zones, the peculiar characteristics in Mutuini, especially regarding land use management indicated non-conformity towards this inclination. In this research, the peculiar land use management in Mutuini location has been investigated. To offer valuable reasons for debate on urbanization and its consequences based on the experiences the from study area, this research sought to identify and investigate the peculiar land use management that characterize the study area. Specifically, the research examined the existing land use management in Mutuini; assessed the challenges associated with the land use management; and has recommended policy and programmatic interventions for effective land use management planning for Mutuini and areas of similar characteristics.

The methodology used in undertaking the study involved collection of both primary and secondary data through desk review of books, journals, articles, governments documents and information on the internet, as well as field questionnaires, oral interviews, direct field observations, photography, mapping and sketching, and key informant interviews. Both qualitative and quantitative data was collected. The data was analyzed using SPSS software to generate charts, graphs and tables.

Findings show that land use management in Mutuini is based on the area's history of modification of land resources through dynamics in agriculture, commerce and industry, as well as residence. The biophysical factors were also found to be important in addition to the management of the area's physical infrastructure; gender roles; religion; the population's age distribution, educational attainment; and personal values. The societal factors influencing land use management include the cultural attachment to land and personal views towards land subdivision; energy resource management; mobility and travel; road infrastructure; infrastructure design principles; development of commerce; residential areas functioning as economic areas; migration trends; land tenure, development and use changes.

Effects of current land use management in Mutuini include poor physical development; inefficient social and economic enterprises; mobility challenges; insecurity; soil erosion; and poor agricultural production. Impacts from these effects include poverty, rampant levels of unemployment and migration of affluent members of the community to other residential areas, thus denying the area of the much needed enlightened and resources human resources.

It is recommended that concepts such as multifunctionality in planning processes of peri-urban areas be promoted to enhance agriculture and green spaces in Mutuini and other peri-urban areas. Furthermore, local level initiatives for agricultural production need to be encouraged. Establishing networks of local bodies involved in agriculture and commerce in peri-urban areas that gather all municipalities targeted with inter-urban spreading, so as to protect and successfully exploit agricultural, forested and natural peri-urban areas is also recommended. There is also need to encourage bottom-up initiatives to further the development strategies and legal frameworks that contribute to agriculture and green spaces in peri-urban areas.

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## ACRONYMS

B.A.	Bachelor of Arts
CBD	Central Business District
CBOs	Community Based Organizations
CDF	Constituency Development Fund
ETM	Enhanced Thematic Mapper
FDGs	Focus Group Discussions
FPE	Free Primary Education
GDP	Gross Domestic Product
GLA	Government Lands Act
GK	Government of Kenya
GoK	Government of Kenya
HH	Household Head
Hons.	Honors
ITPA	Indian Transfer of Property Act
KDHS	Kenya Demographic Household Survey
KIs	Key Informant Interviews
KNBS	Kenya National Bureau of Standards
KNHA	Kenya National Highways Authority
KUR	Kenya-Uganda Railway
LAP	Land Administration Project
LPG	Liquid Petroleum Gas
LTM	Landsat Thematic Mapper
NCC	Nairobi City Council
NMC	Nairobi Municipal Committee
NMA	Nairobi Metropolitan Area



NMR	Nairobi Metropolitan Region
NWSC	Nairobi Water and Sewerage Company
OECD	Organization of Economic Co-operation and Development
PAG	Planning Advisory Group
PTR	Pupil-Teacher Ratio
TM	Thematic Mapper
TND	Traditional Neighborhood District
TOL	Temporary Occupational Licenses
RLA	Registered Land Act
RTA	Registration of Titles Act
UN	United Nations
UNEP	United Nations Environmental Programme
UNESCO	United Nations Economic, Scientific and Cultural Organization
USA	United States of America
USGS	United States Geological Survey

# CHAPTER ONE: INTRODUCTION

## 1.1 Background to the Research Problem

Land is a limited resource, which is subject to numerous conflicts and competitions (Ulrike and Hartmut, 2011). The social and cultural organization of every society, as reflected in its systems of property ownership, chieftaincy, and lineage are inextricably linked to land (Fobih, 2004). This underscores the importance of land to society. The use of land, therefore, has to be planned, managed and controlled pragmatically.

Land has been defined as any portion of the earth over which rights of ownership, stewardship, or use may be exercised, including the earth's surface, water covered lands, water and mineral resources, as well as features and resources attached to the earth, whether they be natural or artificial (Barlowe, 1986). It has been held to include the soil, everything below it to the centre of gravity and everything above to the sky, and anything that is permanently fixed to it (Syagga, 1994). The United Nations Environmental Programme (UNEP) has defined land as a physical entity in terms of its topography and spatial nature, with a broadly integrative view that includes natural resources, namely the soils, minerals, water and biota that the land comprises (UNEP, 2013). In Kenya, unlike in customary law where land refers to the soil only, the constitution defines land to include, (Government of Kenya (GoK), 2010):

- a) The surface of the earth and the subsurface rock,
- b) Any body of water on or under the surface,
- c) Marine waters in the territorial sea and exclusive economic zone,
- d) Natural resources completely contained on or under the surface, and
- e) The air space above the surface.

Land is hence a finite resource, but the natural resources that it supports can vary over time and

in tandem with prevailing land use planning and management practices. The ever expanding human requirements, including economic activities keep piling pressures on land, thus fostering competition and conflicts that often result in suboptimal use of both the land and its resources. To meet the human requirements of land sustainably, there is need to resolve these conflicts on one hand, and move towards more effective and efficient use of land and its natural resources on the other. Integrated land use management constitutes the singular technique towards achieving this eminently and in a practical way.

By examining all uses of land in an integrated manner, it is possible to minimize conflicts, make the most efficient trade-offs and link socio-economic development with environmental protection and enhancement, thus helping to achieve the objectives of sustainable development, (United Nations, 1992). The essence of an integrated approach, therefore, finds expression in the coordination of the sectoral management activities concerned with the various aspects of land use and land resources. It draws from candid research, dissemination and demonstration (RD&D). An understanding of the peculiar land use and land management practices in Mutuini location, which has hitherto been inconvenienced by lack of appropriate data and information, is fundamental to this stance.

Land use has been defined as the human modification of the natural environment or wilderness into built environment such as settlements, agriculture and pasture, (Vancutsem, 2008). Land use management on the other hand is the process of managing the use and development of land, in which spatial, sector-oriented and temporary aspects of urban policy are coordinated, (Ulrike and Hartmut, 2011). It covers the debate about the norms and visions driving policy-making, strategic and operative planning, spatial integration and decision-making, (Vancutsem, 2008). Sustainable land use and management improve the coordination of policy as well as public and public-private investments, and involves inhabitants and local stakeholders in setting common visions, (Ulrike & Hartmut, 2011). Land use planning is one of the tools of sustainable land use

and management, (Tavares, 2001). Informed land use planning requires an understanding of the prevailing land use and management practices.

Land use and management practices describe characteristics of landscape occupation, use and organization, (Lesslie, 2004). They vary based on whether the subject area is rural, peri-urban or urban, and are influenced by demands for settlement areas arising from migration, immigration and demographic changes (age structure, education, household size, living standards, etc.). Additionally, infrastructure has to be provided for the flows of people between rural, peri-urban and urban areas, (Totzer, 2008). Indeed, urbanization, which is a politically important issue, is also a deep-seated driving factor in land use and management traditions.

Urbanization refers to the process of increase of modernization systems, which modify the socio-economic activities and revolutionize the land use practice according to time, (Ejaro and Abdullahi, 2013). It is a universal concept that signifies changes in man's interest, activities and values, and appears to relate to the increasing functional specialization in human societies. Its characteristics and processes of manifestation differ from place to place, based on economics, the environment, socio-cultural and political inclinations peculiar to the particular location. The extent to which urbanization affects land use change and the ways in which these interact, has both direct and indirect impacts on land use transformation, (Yichum, et al, 2007).

Keating, et al. (2003) assert that rapid unplanned urbanization observed in many parts of Africa is changing the context of interaction for human population and natural systems. Indeed, human populations are growing fast, especially in developing countries, and the desire for land is increasing daily, (World Bank, 1992). This has led to the escalation of conflicting demands and pressures on land, (Thornton, 2010). To resolve these, it is crucial to understand the drivers and processes behind urbanization. For a deeper comprehension, therefore, it is never sufficient to focus on the core city of an urban area. Consideration of the functional urban region and the

interdependencies between its rural-urban sub-regions as the agglomeration of urban and rural areas into new patterns of built and non-built environments is vital. This calls for an understanding of the transition zone between rural and urban areas. This is the zone where the influence of the city continues beyond the stipulated administrative boundaries and the rural area is gradually introduced.

The transition zone is not a discrete area, but rather a diffuse territory identified by combinations of features and phenomena, generated largely by activities within the urban zone proper. Corubolo (1999) has described this area as an 'uneasy phenomenon' because it has a mixture of phenomena that are difficult to separate. Daniels (1999) this as a rural-urban fringe zone with a hybrid of both the influences of rural areas and the urban areas. He argues that the phenomenon is best thought as a step in the development hierarchy between the rural and urban areas. He continues to state that the city develops in a circular manner from the centre towards the edges, and that what is presently a fringe eventually becomes incorporated into the city as suburban.

The phrase rural-urban fringe and peri-urban have been used in many studies to refer to one similar phenomenon, which is this transition zone between urban and rural areas, (Masika, 2003). The two phrases mean separate phenomena, but share some similarities, (Adell, 2002). Adell observes that rural-urban fringe is a term used to describe development along the periphery of the city by the affluent citizens of the city. This is the situation where capital, labour, commodities and information flow from the city centre to the post suburban area. It is mostly associated with the movement of the high-income people, who leave the city centre to escape the noise and the congestion of the city. This is common in developed industrialized countries.

On the other hand, the peri-urban phenomenon is more common in developing countries and is

also associated with the settlement of dense low-income households along the city's periphery, (Adell, 2002). These could be rural immigrants that have just come to the city to seek better opportunities, easy access to markets for their agricultural produce from the rural areas, or cheap labour. Unlike the rural-urban fringe, peri-urban growth is characterized by the location of people to the periphery prior to the flow of commodities and capital. Therefore, in most peri-urban areas, there is lack of capital and infrastructure to improve the living conditions of the people. The peri-urban interface is hence more often the location of the poor, (Mattingly, 1999). Both these concepts describe the development of the transition zone between the rural areas and urban areas. This could perhaps be the reason why most literature tends to use the words interchangeably, yet they are clearly dissimilar.

According to Adell (1999), peri-urban areas manifest development that is associated with lack of capital and infrastructure investment. Peri-urban has been described by the Organization for Economic Co-operation and Development (OECD) as the grey area, which is neither entirely urban nor rural in the traditional sense, (OECD, 2007). It is neither fully urbanized nor completely rural, but is often seen as a middle band of land with atypical characteristics, (Buxton, 2007). It serves as the zone where rural-urban interaction is at its peak, (Johnson, 1974). At this zone, rural activities and models of life are in rapid retreat, compelled by extensive urban land use intrusion. The peri-urban zone is in fact becoming the most common type of living and working situation in many parts of the world, (McGee, 2009).

Presently, the peri-urban zone is becoming the most common type of living and working situation in the world, (McGee, 2009). In many parts of the world, the region is characterised by affluence and conspicuous consumption. In others, however, it is where poverty and social displacements are more common, a front line between the problems of the city and the countryside, (Ravetz, Fertner, & Nielsen, 2013). While some peri-urban regions derive their characteristics from the influence of their surrounding cities, (Webster, 2004), others are

influenced by the unguided individual actions intrinsic to the rural areas that border the peri-urban regions. Such individual actions are often recipes for resource exploitation, social waste, and shifting of costs to other members of society. This realism raises many questions that require informed answers regarding land use in peri-urban areas.

In search for answers, it has been established that land use should be based on the functional dimension of land for different human purposes or economic activities, (Maxwel, 2011). Typical categories for land use are dwellings, industrial use, transport, recreational use or nature protection areas, (World Bank, 2005). Land resource management in peri-urban regions should therefore endeavour to understand whether the regions are influenced by the surrounding cities or rural areas, besides other factors. It is when this is done that land use and management will promote orderly development of the available land resources, minimize problems and conflicts associated with private land use, foster optimum development of the land resource base and maximizes public satisfaction and safety in the use of land resources.

## **1.2 The Problem Statement**

While it is generally accepted that the influence of cities usually goes far beyond their boundaries into peri-urban and rural zones, (Webster, 2004), the peculiar characteristics in Mutuini location, especially in relation to land use management indicate nonconformity to this inclination. Typically, transition zones between urban and rural set-ups are characterized by sprawl that is influenced by rapid change due to increase in urban pressures. Indigenous villages hitherto located in rural areas a good distance from the city are expected to experience migration, growth, changes in population composition, land-use and economic base. As a generalization, the closer the city comes, the more pronounced the transition from rural to urban characteristics is expected, eventually having the settlements become part of the built-up urban environment.

This tendency appears not to be true for Mutuini Location mainly due to the boundary extensions that were done in the 1960s. Mutuini then was a rural settlement, but was incorporated in the jurisdiction of Nairobi city following the land adjudication processes of the 1960s. Despite these boundary changes, Mutuini has, for over 50 years, manifested peri-urban settlement characteristics, even when urbanization has leapfrogged it. The area is known for migration of its affluent residents to other peri-urban areas like Ngong, Kikuyu, etc. This situation provides a gap, which should be researched to shade light on the peculiarities of the area and offer examples to be used in areas with similar characteristics.

Further, the peculiarity of the characteristics in Mutuini can offer valuable lessons for the debates that abound on urbanization and its consequences, including on land use and management. Unfortunately, these debates remain limited by the use of coarse scale data aggregated at national and county levels, (Hasse & Lathrop, 2003), which leads to poor capturing of the fine-grained patterns of land use and management issues, (Theobald, 2001). These gaps affect informed planning of Mutuini.

### **1.3 Purpose of the Study**

This study sought to identify and investigate the peculiar land use management that is characteristic of Mutuini; a rural-urban fringe location in the City of Nairobi, and propose informed appropriate steps for effective land use planning and management necessary for sustainable development of the area. As a case study, apart from providing information that would contribute to informed and realistic planning in cities and their frontiers, the wealth of knowledge generated from Mutuini location's characteristics fills the knowledge gap that relates land use and land use and management narratives in unique peri-urban areas.



## **1.4 Scope of the Study**

This study focused on Mutuini Location located in Dagoretti Division of Nairobi County in Kenya. Although other land use and management practices exist and are generally associated with peri-urban areas, this study concerned itself with the practices identified in Mutuini location. Further, due to time considerations, only a fair sample of respondents was involved in the study. Adequate effort was made to ensure fair representation of respondents based on age and gender was done. Additionally, being a study that focused on land, which is an emotive subject in Kenya, respondents occasionally became emotional due to the challenges they experienced regarding land. While some sentiments emerging from such respondents were captured by the data collection team, what was used in the analysis was only what was found relevant to the study objectives.

## **1.5 Research Objectives**

### *1.5.1 Overall Objective*

This study sought to identify and investigate the land use management in the peri-urban area of Mutuini location.

### *1.5.2 Specific Objectives*

The specific objectives of the study are to:

- (a) Examine the existing land use management in Mutuini location,
- (b) Assess the challenges associated with the land use management identified in 1.5.2 (a) above, and
- (c) Recommend policy and programmatic interventions for effective land use management planning for Mutuini location and areas of similar characteristics.

## **1.6 Research Questions**

The following research questions guided the study:

- 1.6.1 What land use and management practices exist in Mutuini location?
- 1.6.2 What challenges are associated with the land use and management practices identified in Mutuini location?
- 1.6.3 What policy interventions are appropriate for effective land use planning and management in Mutuini location?

## **1.7 Justification and Significance of the Study**

This study helps to bring out the factors that exacerbate or hinder sustainable land use and management in Nairobi's peri-urban areas. The known trend is for rural areas close to an urban area to transit from rural to urban characteristics and experience immigration, growth, changes in population composition, land tenure, land use and economic base. This appears not to be the case for Mutuini location, despite its situation within the rural-urban fringe of Nairobi. This trend needed to be investigated as it presents a unique avenue for understanding the underlying issues. This will not only enrich land use and management debates, but also fill the gap of knowledge attributable to the peculiar characteristics of study area.

Studying Mutuini location and its urban footprint was expected to also provide useful learnings to be integrated in planning paradigms that seek fine data from grassroots scenarios as opposed to those that use coarse scale data aggregated at national and county levels, (Hasse & Lathrop, 2003), which leads to poor capturing of the fine-grained patterns of land use and management issues, (Theobald, 2001).

Mutuini was selected using purposive sampling due to its geographical location, poverty index, ethnic diversity and a fairly distinct rural-urban dichotomy. The people of Mutuini are settled in relatively stable villages whose boundaries are informal, but known by the village chiefs and

chairmen. Ethnically, the population is predominately Kikuyu. The area is extremely heterogeneous economically with a few relatively affluent land owners, a large body of labourers, artisans, and service workers who supplement cash employment with subsistence farming activities. A growing population of landless, mostly unemployed squatters who frequently lack any substantial resources or family ties are found in the area.

### **1.8 Limitations of the Study**

This study was majorly qualitative in nature. Similar to other qualitative studies, the study had limitations relating to validity and reliability. This is because qualitative research occurs in the natural setting, which makes it extremely difficult to replicate, (Wiersma, 2000). The study also focused on Mutuini location. As a case study, therefore, one cannot make causal inferences from it because alternative explanations cannot be ruled out. The generality of the findings may also be unclear, which are the other limitations of the study.

Other limitations experienced while carrying out the study included the limited time that was available to enable bigger sample sizes that enhance data validity and reliability. Further, the study relied on the 2009 Kenya Demographic Household Survey (KDHS) data in arriving at the population sample that participated in the study. This survey was done about five years ago hence its data does not represent the current population in Kenya and of Mutuini.

### **1.9 Delimitations of the Study**

The first delimitation of this study related to the study problem. Indeed, there were other related problems that could have been chosen but which were screened off from view based on the researcher's general appreciation of the peculiarities of land use and management in Mutuini. The history of land adjudication in the area, absentee landlords, etc., were areas that called for keen attention. Undeniably, effects of rapid urbanization, such as sprawl, are concerns that

studies relating to peri-urban areas easily find themselves drawn into. In Mutuini, however, this was not found to be directly relevant, hence was purposely excluded.

### **1.10 Assumptions of the Study**

The study was premised on the assumption that effective land use planning and management in Mutuini requires policy interventions.

### **1.11 Structure of the Study Report**

This report is structured into six chapters. Chapter 1 on *Introduction* presents a general overview of concepts supporting the study topic, problem statement, study purpose, study assumptions, research questions, and research objectives, justification of the study, scope and organization of the study as well as the definition of terms, variables and key concepts. Chapter 2 on *Literature Review* comprise a review of theories and concepts around the topic of study and also an examination of findings past of related studies. Also of concern under this section are the relevant policy, institutional and legal frameworks as well as planning standards in Kenya.

Chapter 3 gives a *Background of the Study Area* including physical location of the study area both in the regional and local contexts and physical characteristics. It also included the history of planning and development of the area, population characteristics and transport system of the area. Chapter 4 presents the *methodology* and the research design while Chapter 5 presents the *Study Findings* by articulating the results of the study, which are organized in accordance with the study objectives. Under Chapter 5, *Planning Implications* are presented based on the issues emerging from the findings and corroborated with existing literature in order to translate them into meanings that are helpful for effecting planning of Mutuini, as well as contribute to land use planning and management discourses. Finally, Chapter 6 gives the *Conclusions and Recommendations*.

## 1.11 Definition of Terms and Variables

A number of terms and variables are used in this thesis as defined below.

- **Land adjudication** - A process whereby existing rights in a particular parcel of land are finally and authoritatively ascertained (Dale and McLaughlin, 1988).
- **Peri-urban interface** - A transitional zone between city and countryside, often described, 'not as a discrete area, but rather as a diffuse territory identified by combinations of features and phenomena, generated largely by activities within the urban zone proper' (Ravetz, et al, 2013).
- **Research design** - The way a study is planned and conducted, the procedures and techniques employed to answer the research problem or question (McMillan and Schumacher, 1984).
- **Sample** – A representative part of a population.
- **Specified population** - All the members of the population are recorded in some register, such as the national census list, while the reverse is true for unspecified populations.
- **Sprawl** – Unplanned incremental urban development, characterized by a low density of land uses on the urban fringe, or a low density, scattered urban development without systematic large scale or regional public land-use planning (Bruegman, 2008).

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Overview**

This section of the thesis examines literature that relates to existing land use and management practices in rural-urban transition zones, namely, the peri-urban and the rural-urban fringe, and the challenges associated with them. It also explores some of the policy interventions for effective land use planning and management associated with the land use and management practices. Through the review, an attempt has been made to link the existing land use and management practices to the situation in Mutuini location. Various concepts have also been clarified and a conceptual framework for the study presented.

### **2.1 The Peri-Urban**

The origin of the term peri urban is still unknown but its importance rose over half a century ago as a result of the limitations in the dichotomy between rural and urban. These settlements have been given such terms as “rurban”, “suburban”, “urban fringe”, “urban periphery”, “peri rural”, and “peri urban” areas. Among these terms, “peri urban” is commonly found in the literature and policy discussions. Peri urban may include land inside, or at the fringes of urban areas and lands further away from the city. This may, in turn, include both urban and rural land that is formally or informally occupied. Peri urban has been defined by Kasanga et al., [1996] “as a locus of abrupt tenurial transformation”

Peri urban areas are of capital importance in modern societies because it is there that most of the transformations resulting from the dynamics of society are concentrated. Between towns which find it difficult to adjust and which often have declining populations and rural areas proper which continue to lose populations at a diminished rate – the peri-urban areas are the centre of almost all new developments and of a great deal of the transformations in economic

activities. Economic expansion in all its forms gives rise in these areas to lively competition for land, which is also in demand to meet the housing requirements since the population continues to increase in these areas, (Organisation for Economic Cooperation and Development, 1979: 1).

## **2.2 Land in Peri-Urban Areas**

Peri-urban areas are mosaics of temporary, new residents and activities mingled with longstanding land uses, including farms, villages, quarries and forest patches, (Douglas, Undated). Demand for land has always exceeded supply due to the fixed nature of land and its immobility, (Wildasin and Wilson, 1998). To maximize satisfaction on the available land, therefore, there is need to put land into the highest and best use. This requires planning for urban land-use, and is especially so in the peri-urban areas, where different competing land use interests exist. Land and the natural environment are limited resources that are often strained by growing population and poor land use planning in the peri-urban areas, (Storey, 2006). Their proper management is therefore important for their sustainability.

According to Browder et al (1995), peri-urban areas have a diversity of land uses that vary in relation with their urban and rural linkages. The areas depict a transitional nature with a patterned sequence of uses that become progressively more agrarian in orientation as one recedes from the urban centres, (Adell, 2002). Inversely, agricultural land uses, employment and rural linkages give way to urban oriented activities as distance to the city centre diminishes, (Masum, 2009). Peri-urban areas therefore have heterogeneous land uses that include existing farmlands and villages, residential estates, sewerages disposal works, forestry and industries.

In developing countries, peri-urban areas are usually used for agriculture, horticulture, sand excavation, informal squatter settlements, low cost residential housing, leisure sports, forestry, obnoxious industries and public facilities like airports and roads, (UNEP/MAP, 2003). This is due to the suburbanization processes, which encourage urban dwellers to move to the fringe

areas in search of advantages in land rent, or the capitalize opportunities for land acquisition, speculation and informal enterprises such as building of kiosks. Therefore, peri-urban areas support important informal economic activities reflected in the proliferation of petty commodity production such as maize and vegetables and self-help housing through co-operative land ownership.

What makes these areas so interesting is the complexity of political, economic and socio-cultural factors impacting on the changes that occur there, and the resulting outcomes for the health, well-being and economic survival of people in these communities (Douglas, Undated). Integrated management of such a contested space, where the off-side impacts of land uses and activities are as important as those within the changing land unit pose challenges to planning disciplines. It is complex because it involves reconciling the diverse special interests of different sectors and communities to achieve agreed shared goals. The first step in this paradigm is to achieve a shared awareness of the different interests and concerns in peri-urban environments, which starts by understanding the nature of land use changes, (Mehta, et al, 2009).

### ***2.2.1 The Nature of Land Use in Peri-Urban Areas***

Land use in the peri-urban areas is characterized by organized land invasion, unplanned expansion, land speculation, informal subdivisions of farmland near the city and settlement of squatters on public and private land, (Gathoni, 2013), with the poor and the middle class affecting land use differently. Large tracts of undeveloped land attributed to the lack of infrastructure, such as sewer drainage systems, security posts, water, electricity and roads are also attributable to peri-urban areas. Much of this land is usually under private ownership, with the system of land tenure not rendering itself easily to development control measures, (Agevi, 1996).



Most municipal council officials have found themselves unable to exercise any effective control over the use of land in peri-urban areas, (Leech, 2014). In developing countries especially, this is because local authorities lack resources to deploy the required manpower for enforcing development regulations in these areas. They also lack structural and zoning plans which can guide development activities in the peri-urban areas, (Pablo, 2014), which gives private developers the momentum to utilize their land in such a manner as to ensure maximum returns without any regard to set aside land for community public facilities, such as recreational facilities, (Neal, 2010). Speculative development is also rife in areas where land transactions are based on informal land ownership documents.

Conflicting land property ownership issues are typical in the peri-urban fringe, because of pressures from squatters, private developers, or speculators and large tenants different land market conditions feature dual systems (informal or formal) and various property and tenancy arrangements such as rental or customary right systems, (Adell,1999). Due to lack of development control, the peripheral areas of the city or town grow in haphazard and undesirable manner, (Mohan, 1992). This leads to premature development of the peripheral areas where land which has no infrastructure, including water, roads, sewer, is developed through informal subdivision schemes without a physical development plan to guide and co-ordinate land use and development activities. It is therefore necessary to apply zoning not only to the city but also to the city region, (Marcus, 1991). Since peri-urban lands cover mosaics, thus usually straddling city, municipal and rural administrative boundaries, ribbon development of these areas usually extends fingers of juxtaposed rural and urban activities and land uses several Kilometres into the surrounding countryside. Due to this, land and land use become major sources of conflicts in the areas, which call for understanding of these dynamics for effective land use management.

### ***2.2.2 Land Ownership in Peri-Urban Areas***

The patterns of Land ownership are important but poorly understood aspects of urban development. Land tenure refers to the right to hold, use and possess land as defined and protected within a legal framework. There are different systems of land tenure in the peri-urban areas. These systems determine the availability of land for urban use. Agevi (1996) has noted that the prevalent forms of land tenure in any given area have a profound effect on physical urban patterns and the flexibility of adapting to the pressure of rapid urban growth. The land tenure affects not only the land use or land acquisition but also the way the land uses respond to growing urban pressures created among different competing uses. Even more important is that various forms of tenure systems will determine the amount of control that municipals authorities can assert over a given piece of land.

In Kenya land ownership is individualized and exchange takes place within the framework of a formal market and comprehensive land title registration system, (Swilling, 1997). In spite of this there is an informal land market and large squatter settlements illegally established on private and public land on the periphery of urban settlements due to mixed land tenure systems and weak developed control by authorities who lack requisite personnel to enforce land regulations. According to Ratcliffe (1976), systems of land tenure embody legal, contractual or customary arrangements, whereby individuals or organizations gain access to social or economic opportunity through land. Land without the dimension of tenure is a meaningless concept’.

Kivell (1993) opines that the notion of land of ownership has implications of great importance for urban development. The size and configuration of landholdings profoundly effects urban morphology. The layout and scale of urban development owes much to the nature of original land ownership boundaries. The timing of land sales affects the nature of urban development.

Land ownership confers power to individuals in society since land owners may exert considerable influence over urban planning policies especially if they act in concert.

This comes about through their decision on whether, or when, to sell land and participate in different kinds of development. In addition, land owners have influence over the preparation and execution of land use plans. Hence land ownership is an integral part of both national and local economics and it can be seen as a part of the relationship between the production sector and the consumption sector. The former sector views land as a commodity and comprises developers, farmers and latter sector consists of those who occupy land for a specific purpose, e.g., industrialists, home owners and farmers, whose main interest is to maximize the exchange value of land.

Land ownership is important for what it reveals about the nature of society, given that ownership is a social construct. Across the spectrum from market economics such as those of Japan and U.S.A. through the mixed economics of much of Western Europe to the centrally planned economies of former Eastern Block, it is the ownership and trading of land which is a key characteristic of differing societies. In Kenya just like most countries, there exists a strong legal and social right for individuals, companies and other private sector bodies to own land. These rights are jealously guarded, but they are rarely absolute, being constrained by a variety of state legislation. In general, private property rights may be limited by:- the exclusion of certain social groups from ownership, restrictions on the use and development of land according to planning or zoning laws, taxation of land itself, its beneficial use or betterment and expropriation of land by the state.

Within the fringe areas, pressures for land for development are great but the pattern of development is a fragmented one without a clear sense of urban expansion from a central point. Most of the land use decisions are essentially local resulting in haphazard land use changes and

development activities. There is thus little evidence that there exist effective institutions to deal with the large land use planning and management needs of peri-urban areas. In Britain, much reliance has been placed upon the green belt to regulate land within such cases, but even this can be claimed to be an anachronism because it is drawn too close to major cities to have any real effect upon growth in the outer fringes, (Herington, 1991).

A distinctive characteristic of the peri-urban fringe is that land is often under intensive pressure due to different processes of use, conversion and increased commercialization, (Allen, 2006). This is as a result of rural – urban migration, the urban poor moving toward the outskirts where rents and land prices are lower and the rich building new houses in the less congested areas of the urban fringe. This result in the loss of agricultural land due to the physical expansion of the city, speculative land subdivisions and land use changes prompted by development of industries and large scale infrastructures such as roads, airports, sewerage disposal works in the peri-urban areas.

Thus, peri-urban fringe land use changes respond to the relatively ‘Spontaneous; strategies of the poor (both from rural and urban areas) to access land in proximity to diversified livelihood opportunities, to market forces, or to public policies aimed at restraining urban sprawl, dispersing industrial development or locating special physical infrastructure with high potential environmental impacts away from densely populated areas, (Davila, 2003). As a result, the peri-urban fringe areas are often characterized by a patch work’ of different developments, including residential settlements interspersed with vacant land (often held for speculative purposes) and agricultural land shifting from subsistence to commercial uses.

### **2.3 Rural-Urban Fringes and Land Use**

Rural-urban fringes, as earlier alluded to, relate mainly to developed economies, and are characterized by capital and investments flowing into an area from wealthy members of an

urban area or city. The rural-urban fringe can also be described as part of the continuum from rural areas unaffected by urbanization to the core built-up area of the city, (Balint, et al, 2013). In this view, the rural-urban fringe is the innermost of the transitional zones of the rural-urban fringe-urban shadow-rural hinterland continuum, (Bryant, et al, 1982). Some studies divide the rural-urban fringe into the inner and outer fringe. In the inner part of the rural-urban fringe, transformation into urban space is usually more advanced, with most of the land under construction or zoned for urban purposes. In the inner fringe, it is a forgone conclusion that most of the area will eventually be converted to urban-oriented uses.

In the outer part of the fringe, rural land uses prevail mixed with urban-oriented elements, (Balint, et al, 2013). Besides maintaining its agricultural attributes, the rural-urban fringe can be the place for recreational activities and the destination of suburban migration too. The rural-urban fringe is also the ideal location of urban activities that require a lot of space. These activities include, cemeteries, greenfield investments, wastewater treatment plant etc, and are often regarded as a nuisance to the inhabitants of the city. In the rural-urban fringe, some changes are clearly visible, while others, such as the changing expectations by local residents of the future, which affect both land and agricultural investment, are difficult to perceive, (Bryant, et al, 1982).

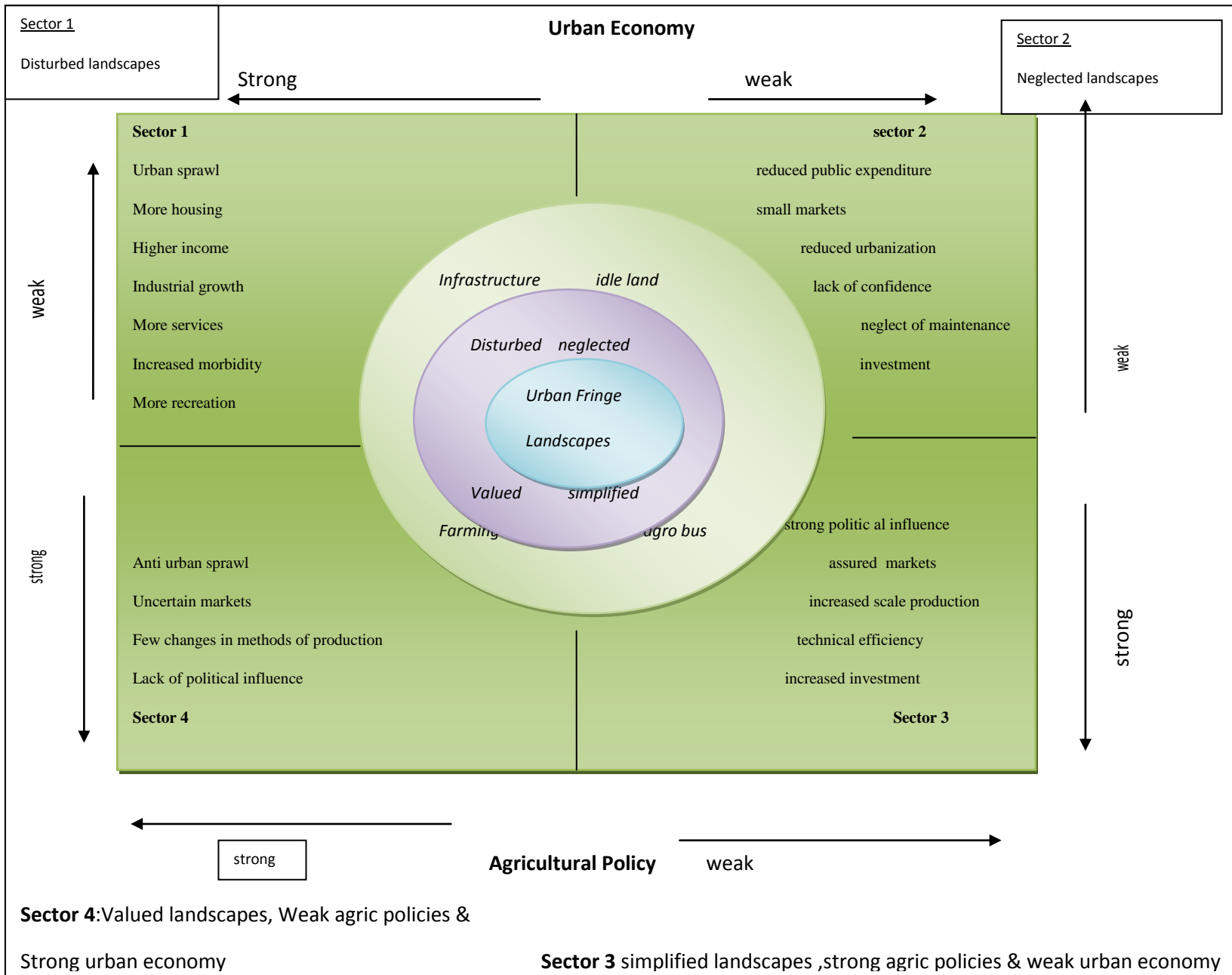
The origin of the concept of rural-urban fringe dates back to the 1930s, when it was first used by Louis in 1936, (Huggart, 2005), and Smith in 1937, (Pryor, 1968). During this period, the concept gained not only scientific, but public and political interest too. In the United Kingdom (UK), for example, quick changes in the fringe aroused public concern, and ultimately led to the acceptance of the Green Belt Act in 1938, (Huggart, 2005). The Green Belt is one of the oldest and most powerful instruments of town planning in the UK. The conceptual concept of Green Belts goes back to the 1890s vision of rural belts around Ebenezer Howard's Garden Cities. They were based on the principle of always preserving a belt of country around cities, till, with

time, a cluster of cities, so grouped around a Central City that each inhabitant of the whole group, though in one sense living in a town of small size, would be, in reality, living in, and enjoying all the advantages of a great most beautiful city; and yet all the fresh delights of the country-field, hedgerow and woodland – not prim parks and gardens merely – would be within a few minutes walk or ride.

This early example illustrates that rural-urban fringe is characterized by rapid land use change and land use conflicts. In fact, it is informed by this that the rural-urban fringe has been described as ‘an area in which a variety of forces and processes operate to influence the structure and dynamics of human activities’, (Bryant, 1995). Depending on local circumstances, local actors and prevailing policies, a large variety of possible land uses and landscapes for rural-urban fringes have been identified. Figure 2.1 illustrates these.

A strong urban economy accompanied by weak countryside planning often results in a disturbed urbanizing landscape, characterized by intensive urban sprawl, (Balint, et al, 2013). A weak urban economy accompanied by a weak agricultural economy results in a disturbed, deteriorating farming landscape with halted urban sprawl and deteriorating agricultural production (Ibid.). This scenario is characterized with neglected landscape and a high share of fallow land. Such areas become the destination for the low-class migrants from the city.

Figure 2.1: Possible land uses and landscapes in the rural-urban fringe, and their characteristics



Source: <http://www.geocases.co.uk/sample/urban-figure2.htm> (Geocases, 2013) Modified.

### ***2.3.1 Challenges of Land Use in Peri-Urban Areas***

Much of the literature analyzing peri urban problems has maintained a dual portrayal of the legal system (customary, traditional, tribal, or informal versus state, modern, official or formal). In some cases the duality is made absolute, and the interconnections are entirely ignored. The dichotomization of peri urban land activities into ‘legal/illegal’, traditional/modern, official/unofficial, regular/irregular could obscure the rather fluid relations and structures that span both the legal/illegal and the customary/statutory, (Home 2004; Fourie 200)].

Peri–urban fringe areas suffer from uncontrolled urban expansion characterized by low- density development and vacant or derelict land which imposes several disadvantages such as higher infrastructure costs, a wasteful use of land resources and environmental pollution (McGregor et al, 2006). According to Frumkin (2001) the development of peri–urban areas is characterized by urban sprawl which has been associated with rapid geographical expansion of urban areas in leap hog, low density pattern segregation of distinct land uses heavy dependence of automobile travel with extensive construction from the construction from the centre to the periphery and relatively weak regional planning. Peri-urban sprawl has been attributed to urban population growth; public investment in infrastructure such as roads, public buildings, water, and sewer.

This is common in developed countries whereas development in developing countries occurs in the periphery without provision of infrastructure. Therefore peri-urban land use and development is characterized by the following processes: land loss to housing, economic transformation away from agriculture, agricultural intensification and commercialization, environmental degradation, rapid land use changes, illegal invasion of private and public land and speculative land subdivisions. All these activities have serious implications on land use planning and management. Mutuini location has peculiar land use systems and has not undergone transformation comparable to other areas of the urban fridge of Nairobi like Ruaka, Mavoko or Ngong.



## **2.4 Land Administration**

Land administration is an umbrella term commonly used by land related professions: surveying and mapping, planning, land law, land valuation and taxation. The existing definitions and uses of the term land administration are vague, contradictory and often partially cover all aspects of land administration. There is also a problem when distinguishing between land administration and land management, especially when these terms – administration and management – are not as distinguished as they are in English. Nichols and McLaughlin (1990) have defined land administration as the operational component of resource management ... concerned with the management and control of the tenure system”.

Land management includes the formulation of land policy, the preparation of land development and land use plans, and the administration of a variety of land related programmes.... Land administration includes the functions involved in regulating the development and use of land, gathering revenue from the land...[and] resolving conflicts concerning ownership and use of the land, (Dale and McLaughlin, 1988: 6).

## **2.5 Land Use Planning**

Indeed, land-use planning is not a new phenomenon and many countries have policies of this kind regulating land-use. Even in societies where free enterprise is a major value and a mode of operation, a certain amount of government guides private along the lines of officially idealized features with less conflict or more health, (Olima W. , 1993). For example, Germany has the most ancient tradition in land use planning, (Mathew, 1999). Apart from the building regulations which were applied to the development of towns since the Middle Ages, the first planning law (the “Building Lines Act”) was enacted in 1868 in Baden. It was followed by similar laws and regulations in other regions. The modern era of land-use planning legislation in Germany was established in 1960s when the “Bundesbaugesetz” (meaning the “Federal Planning Law”) was passed. This Law, with its subsequent amendments in 1969 and 1976

provides the legal framework for land use planning, building and zoning plans. In addition, it regulates the implementation of the plans with regards to building control, land acquisition, and land markets.

In Britain, land-use planning originated in the latter part of the 19<sup>th</sup> century, when the public health legislation and building by-laws were introduced to prevent the worst excesses of rapid and haphazard urbanization that accompanied industrialization. The rationale of this initial government intervention was geared towards “safeguarding the environment”, “promoting good design”, “promoting suitable land-use”, and “using national resources efficiently”. Reports written by Barlow, Scott and Uthwatt commissions provided the foundation of urban land-use planning in Britain from the wartime to the late 1960s.

The report of the Planning Advisory Group (PAG) of 1965 reaffirmed the importance of land-use planning as a regulatory mechanism for both, land-use allocation and the quality of the physical environment. In Japan, land-use planning dates back to the mid 1970s. In the 1960s Japan introduced policies that attempted without much success to get to the grips with the problems of urbanization including traffic congestion, pollution and skyrocketing land prices in the areas of Tokyo, Nagoya and Osaka. Japan currently has two parallel and close systems of land-use planning. One system is aimed at land and regional development, while the other deals with zoning and the regulation of private land-use and transactions in order to ensure an orderly and more equitable development of urban land.

Planning literature in the 1980s revealed concerns that shifted the focus of land-use planning towards the security of the public by establishing restrictions for the individual liberty through land-use planning controls. In the English speaking world, the terms land-use planning, town and country planning, regional planning, town planning, urban planning, and urban design are often used interchangeably, and will depend on the country in question but do not always have

the same meaning. In Europe, the preferred term is increasingly spatial planning or more recently territorial cohesion (for regional and trans-national planning). In Australia, the United Kingdom, and New Zealand, the term town planning is common, although regional planning, statutory planning and land-use planning are also used. In the United States and Canada, the terms current planning, urban planning and regional planning are more commonly used. In Kenya, regional planning is commonly used.

As alluded to earlier, land-use includes the human modification of natural environment or wilderness into built environment such as fields, pastures, and settlements. The major effect of land-use on land cover since the 1750s has been deforestation of temperate regions. More recent significant effects of land-use include urban sprawl, soil erosion, soil degradation, salinization, and desertification. Land-use change together with use of fossil fuels, are the major anthropogenic sources of carbon dioxide, a dominant greenhouse gas. Land-use is based on the functional dimension of land for different human purposes or economic activities. Typical categories for land-use are dwellings, industrial use, transport, recreational use or nature protection areas, (World Bank, 2005). Despite confusing nomenclature, the essential function of land-use planning remains integral whatever term is applied.

## **2.6 Land Use Planning Models**

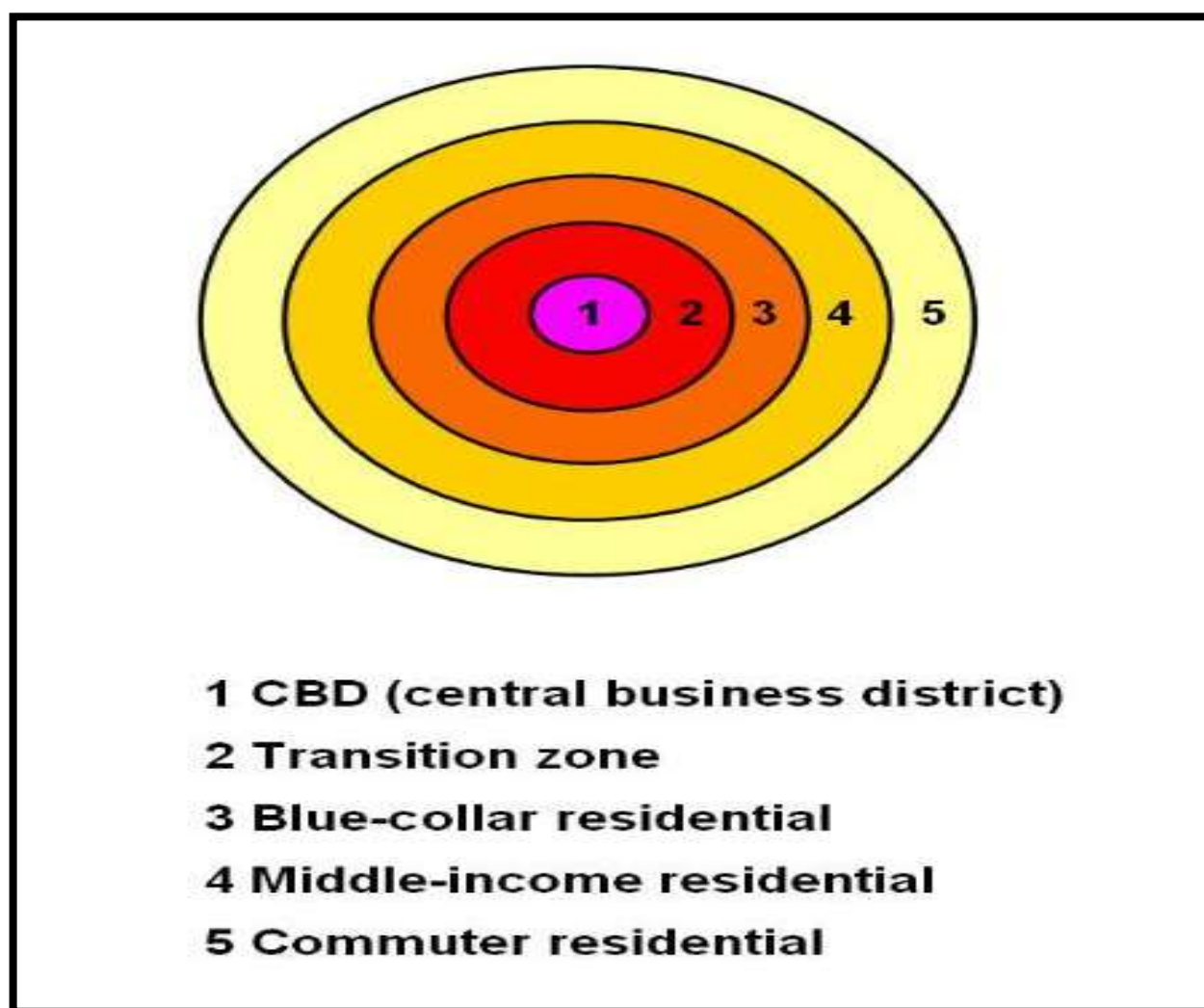
A number of authors have contributed to the evolution of the theory that underpins land-use planning. These include the concentric ring model, the sector theory, multiple nuclei model and the central place theory.

### ***2.6.1 The Concentric Ring Model***

This is also known as the Burgess model is one of the first theoretical models to explain urban social structures, (Klaff and Schnore, 1972). It was propounded by sociologist Ernest Burgess in 1925. Based on human ecology theories done by Burgess and applied on Chicago, it was the

first to give the explanation of distribution of social groups within urban areas. The concentric ring model depicts urban land use in concentric rings: the Central Business District (or CBD) was in the middle of the model, and the city expanded in rings with different land uses, (Maxwell, 2011). It is essentially an urban version of Von Thunen's regional land use model developed a century earlier. It contrasts with Homer Hoyt's sector model and the multiple nuclei model. The zones identified are at the centre, being the CBD; the transition zone of mixed residential and commercial uses; low-class residential homes (inner suburbs), in later decades called [http://en.wikipedia.org/wiki/Inner\\_city](http://en.wikipedia.org/wiki/Inner_city) and better quality middle-class homes (outer suburbs) and commuters zone. Figure 2.2 is Burgess' concentric ring model.

**Figure 2.2:** Burgess' concentric ring model.

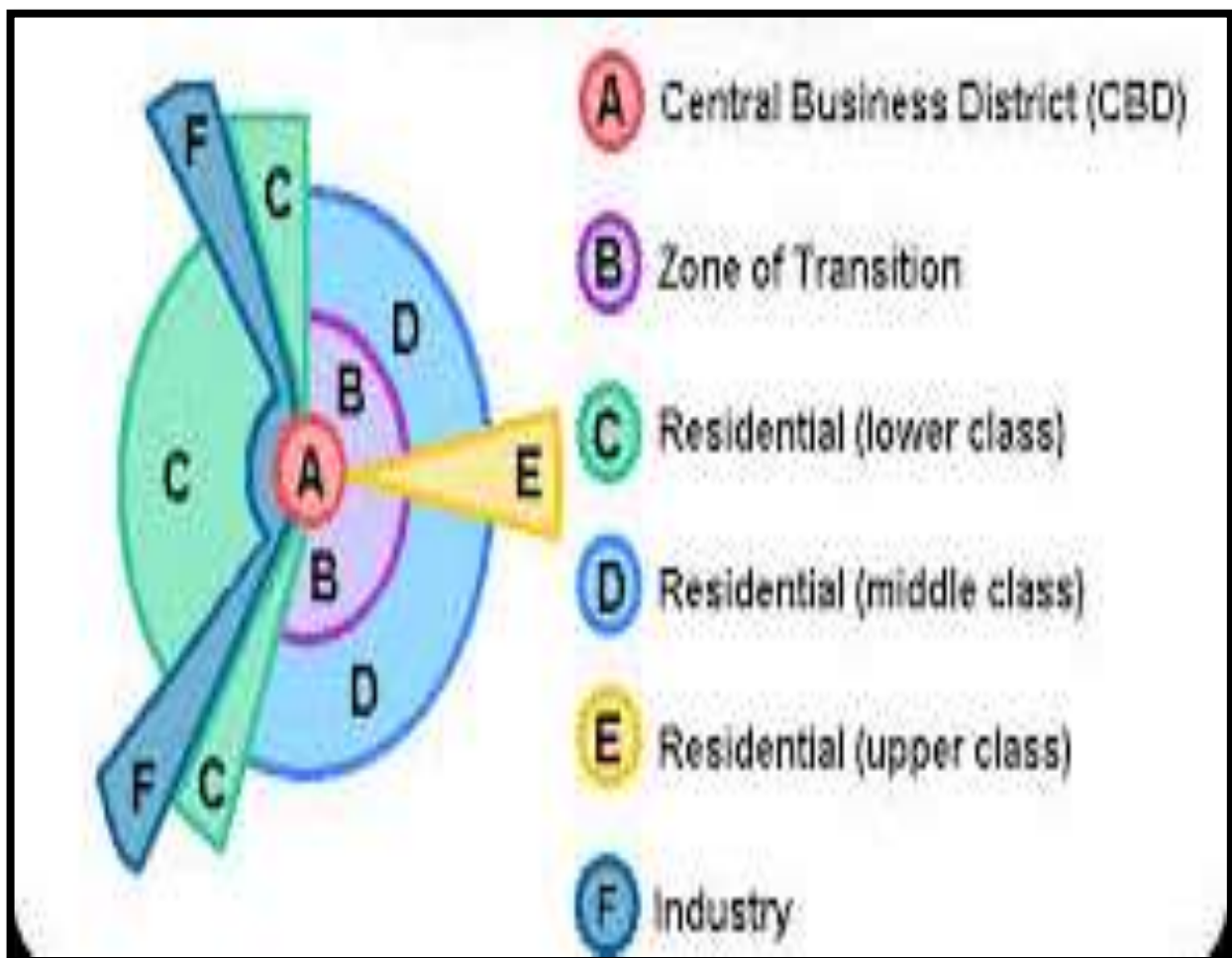


Source: Internal structure of cities, (Cronodon, 1925).

### 2.6.1 The Sector Model

The sector theory holds the view that housing areas in a city develop in sectors along the lines of communication, from the CBD outwards, (Maxwel, 2011). High quality areas run along roads and also reflect the incidence of higher ground. Industrial sectors develop along canals and railways, away from high quality housing. Thus a high status residential area will spread out along the lines of the sector by the addition of new belts of housing beyond the outer arc of the city. Once contrasts in land use have developed in a sector near to the city, these contrasts will be perpetuated as the city grows, (Maxwell, 2011). This theory was advanced by Hoyt (2000) as an alternative to Burgess' concentric model, and was based on residential rent patterns in the USA.

Figure 2.3: Hoyt sector model.

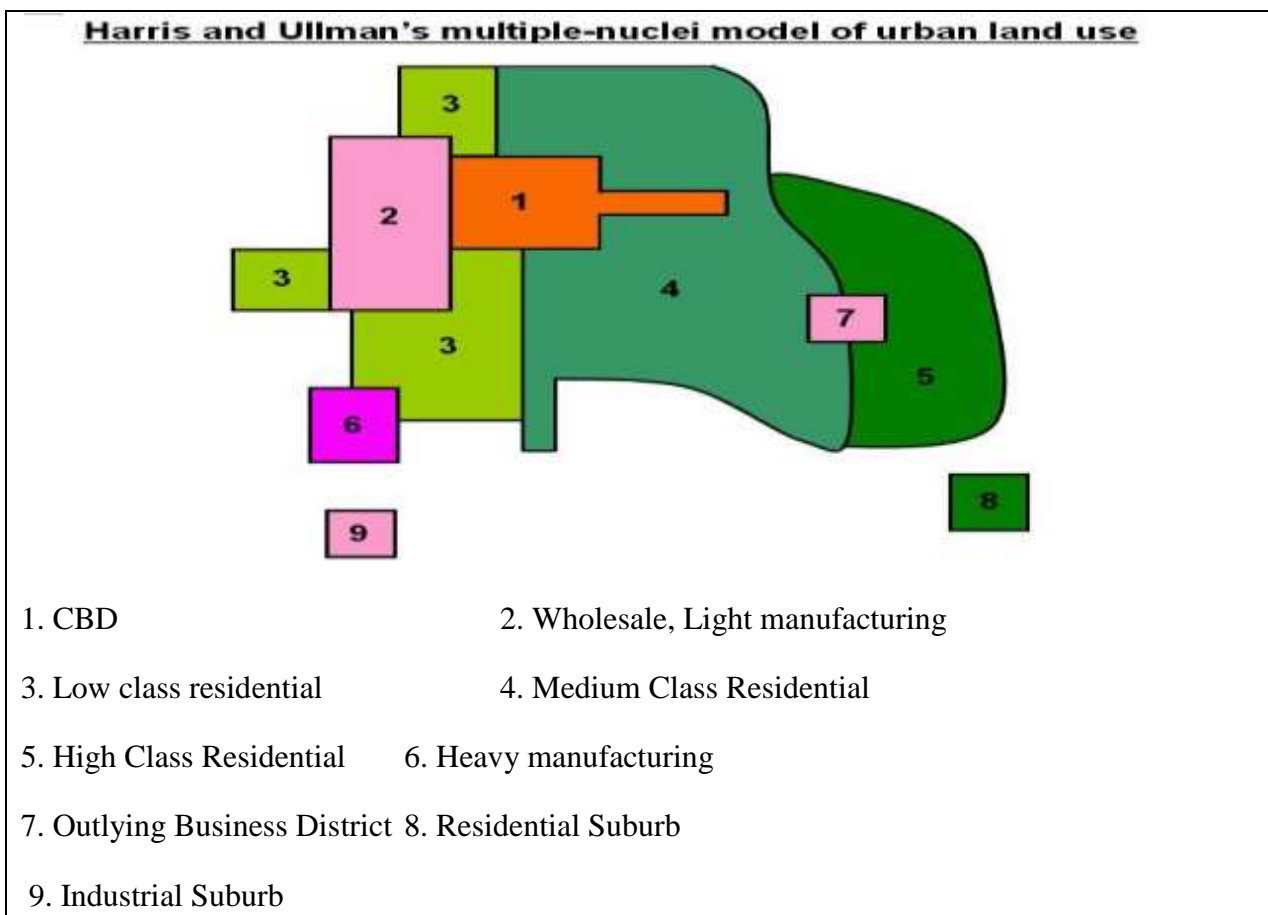


Source: Internal structure of cities, (Cronodon, 1925).

### 2.6.3 The Multiple Nuclei Theory

This theory was first proposed in 1945 by Harris and Ullman. They constructed this model to demonstrate that not all cities fit into the concentric and sector model, (Feitosa, 2010). They claimed that although these patterns may exist, reality is far more complex than those two theories imply. They argued that land use patterns do not grow from a single central point in the city but from multiple points or nuclei. They assumed more than one desired location for access. This is based on the fact that many towns and nearly all large cities grow about many nuclei rather than around a simple CBD. Some of these nuclei are pre-existing settlements; others arise from urbanization and external economies. The number and functions of the nuclei differ from city to city, (Harris and Ullman, 1945).

Figure 2.4: Diagram representation of the multiple nuclei theory.

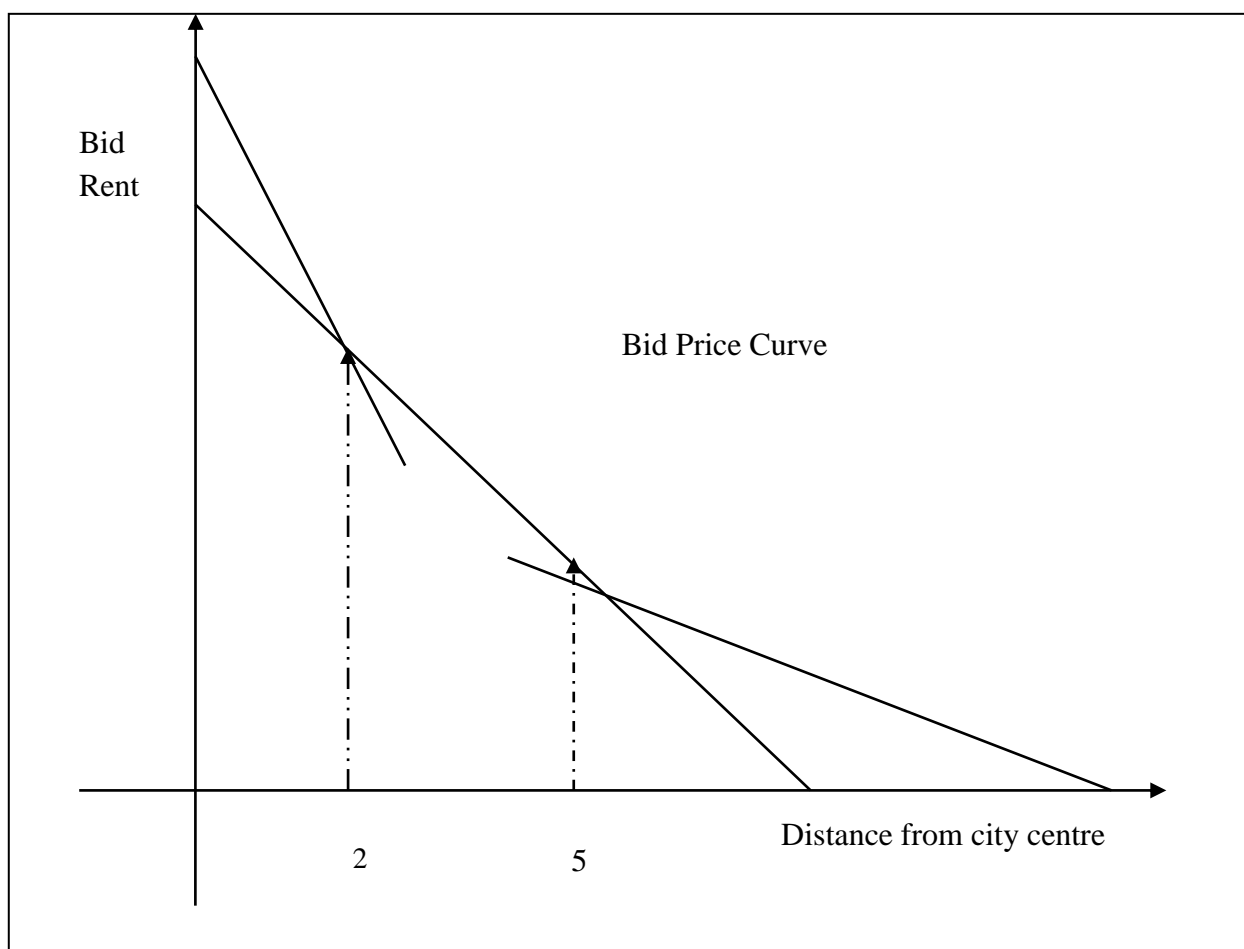


Source: Internal structure of cities, (Cronodon, 1925).

### 2.6.4 The Classical Theory of Land-Use

This was put forward by Alonso's work in the early 1960s. Alonso developed a model of the interaction of land values and uses. In theory, Alonso explains preference on the demand side and land and location on the supply side are mediated through the market and political processes. He assumed that urban firms and households locate so as to account for costs of all inputs on necessities including land costs at the same time trying to minimize on transportation costs. He postulated poor families have stiff budgets, use little and large amounts of other commodities, which explains the building of multi-storeys in the cities. He thus concluded that the poor occupy the most expensive land around the CBD, due to the fact that cheap land in the periphery is not available in smaller units. Figure 2.5 is Alonso's bid price curve.

**Figure 2.5:** Alonso's bid price curve.



*Source:* Urban Land Economics and Public Policy, (Balchin et al, 1995).

The bid price curves are the loci of all land facing urban firms and agricultural enterprises when all firms and households and agricultural enterprises achieved equilibrium both internally with respect to production, in put combinations. In this model, Alonso assumed one working area, that is, everyone comes to the city centre to work. In real life situations this is not to be the case. Land-use is also seen to be under the influence of various factors and variables, but it is however not without an economic explanation.

### ***2.6.5 The transportation-oriented theory of land use***

In 1961, Wingo through this theory provided another systematic and rigorous abatement of urban spatial structure in the framework of equilibrium theory, (Maleche, 2001). Wingo directed his attention to residential development whereby he developed a concept of transportation demand, considering the spatial relationship between home and work. The central theme in his theory is to achieve an equilibrium distribution of households of particular rent – paying abilities to sites with particular structures of rents. Wingo achieved this location equilibrium by substituting transportation costs for space costs.

On the supply side he thus uses transportation costs to establish distribution of household sites at varying position rents – position rent to mean annual saving in transportation costs given the highest cost location in use. On the demand side, if prices of other goods competing for the household incomes were held constant, the rents households are willing to pay is based on the classic utility concept. This means that the greater the unit rent, the fewer the units of space consumed. Wingo's model is therefore used to determine the spatial distribution of densities and rents and the spatial distribution, value and extent of land required for residential use.



### ***2.6.6 Social Values in Land-Use***

Choices of location of land-use are also influenced by social values tastes and symbols, choices that will frequently vary among different social and ethnic groups of a pluralistic society. This idea was put forth by Firey in 1947. He noted that rationalists readily acknowledged the reality of effectiveness of social values in spatial adaptation, but no attempt was made to incorporate the empirical concession in to the theoretical system. Social factors were viewed as limiting, or complicating the natural competitive process, but were not regarded as ultimate causative factors. Firey then set to determine whether socially rotted values exert a causative influence on urban land-use pattern, and whether vocational processes can be wholly separated from a cultural context. His findings indicated that social values have an influence upon land use, which is not all limited to areas with congenial physical and architectural characteristics. Firey also deduced from his study that market-governed determinates of land-use are themselves contingent upon a particular culture – bound values system, and the culture component is central to locational processes.

### ***2.6.7 Garden cities***

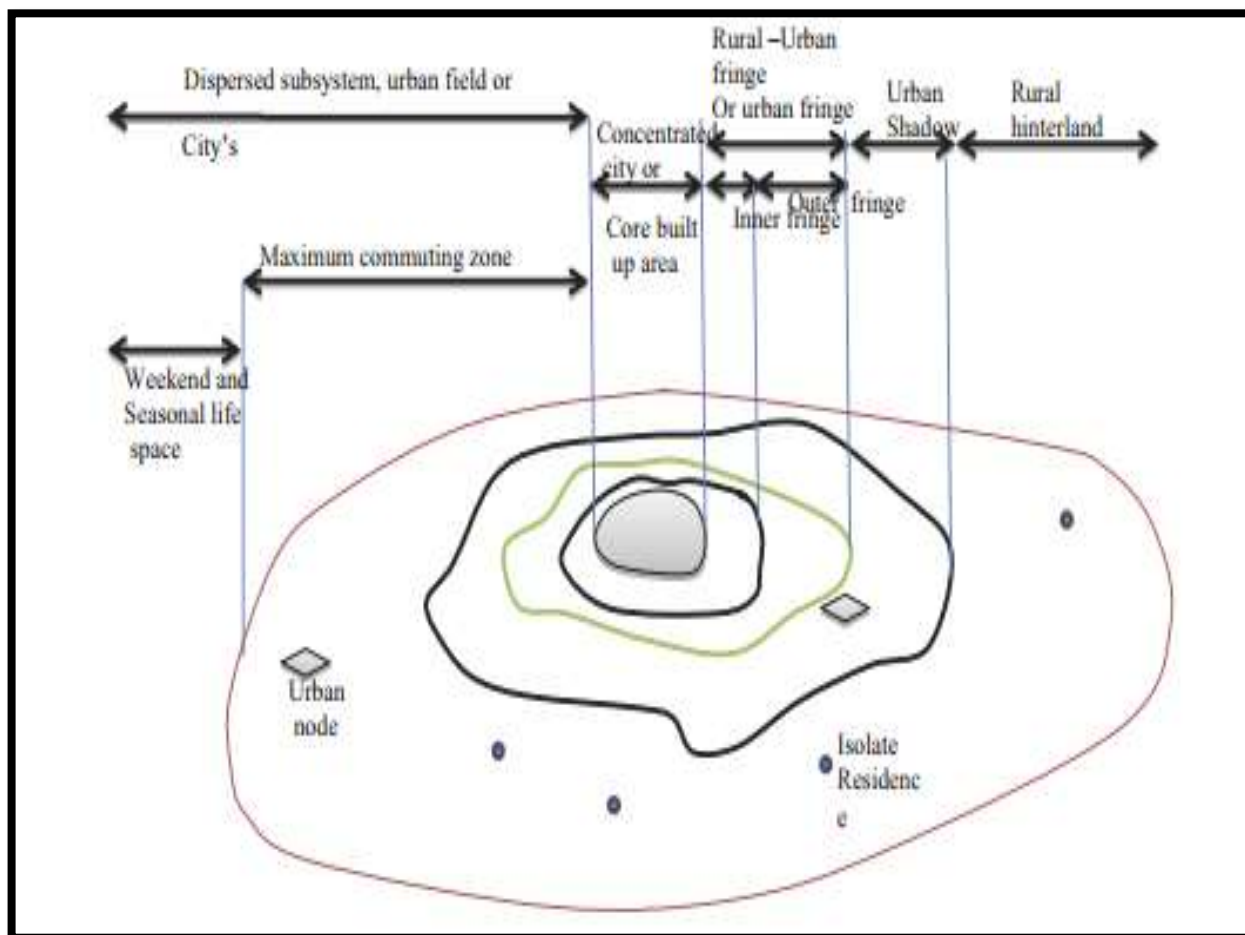
Through his book “the garden cities of tomorrow” Ebenezer Howard in England proposed growth by deliberate planning. Each garden city was to be sufficient unit containing both residences and work places within walking distances from each other and surrounded by a permanent agricultural belt. Each city was to be limited in size ,like the cites of ancient Greece and the middle ages and need for expansion was to be satisfied by the foundation of new garden cities expanded by founding colonies. His book offered a vision of towns free of slums and enjoying the benefits of both town (such as opportunity, amusement and high wages) and country (such as beauty, fresh air and low rents). His ideas were conceived for the context of a capitalist economic system, and sought to balance individual and community needs. Howard’s ideal has found wide acceptance in somewhat modified form of as the satellite city with organic

decentralization of the big city and gradual transfer of its industries and population into such satellite cities each being self contained unit of definitely limited size while arteries may be needed.

A number of criticisms, however have been levelled against the theories articulated above, making the central business district (CBD) to be widely adopted in most countries world-over.

Bryant et al. (1982: 34) have pointed out that a city spreads out into the countryside like an advancing wave on a beach and land in the fringe, be it farmland, grassland or forest, and is converted to urban use. Bryant et al. (1982: 34) best captures this scenario thus: ...there is more than just the advance of the built-up edge. Like a wave braking on a rocky shore, irregular patches of urban and urban-associated land uses develop well beyond the built-up edge with ribbons of development, at least in the early stages of development...It is this ribbon and scattered development that can best be labelled 'urban sprawl' and which generates most land-use. Figure 2.6 depicts how land use changes at the peri-urban fringes.

**Figure 2.6:** Land use changes at the peri-urban fringe.



*Source:* Internal structure of cities, (Cronodon, 1925).

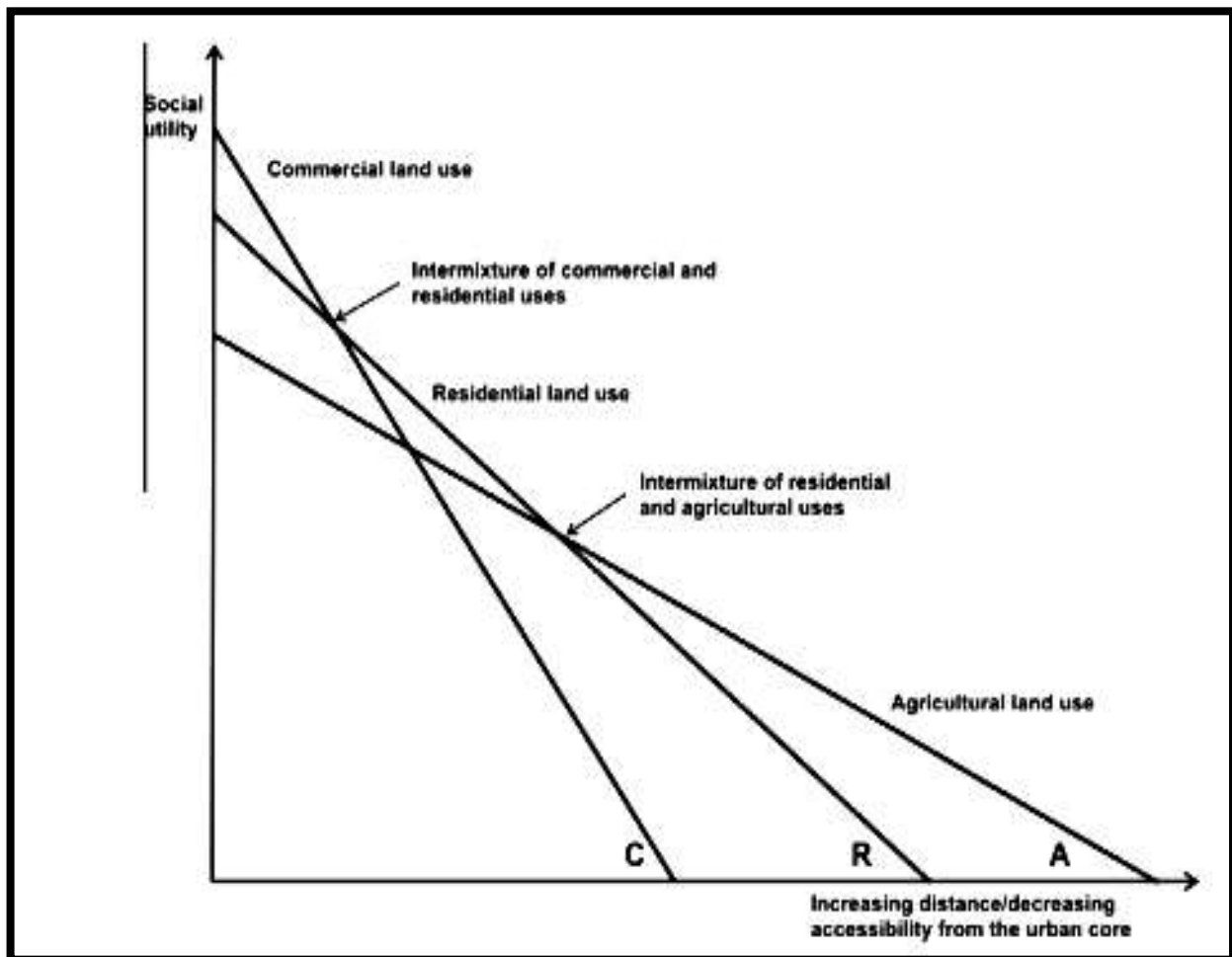
Similarly, Greene and Pick (2006) have made reference to the bow wave analogy in explaining the processes that underlie land use changes at the urban fringe. According to Hart (1991, 36), the bow wave is a standing wave that always remains immediately in front of the bow of a ship moving through water. The urban-rural fringe then is the bow wave of the built-up area of the city that remains immediately in front of the expanding edge. This conceptualization assumes the existence of a contiguous zone of expansion at the urban fringe. However, in certain circumstances nuclei may develop, through leapfrogging, and serve as a basis for residential, industrial or institutional use. Eventually, such nuclei may merge with the main built-up area. This, in essence, is the basis for the multinuclear morphogenesis of urbanization.

Concentrated urban markets generate demands for certain resources such as food, construction materials, energy resources, land and labour from the periphery sub-region, shown in Fig. 2.7

As the urbanization process unfolds, adjacent peripheral spaces become progressively integrated into the city region. Some of the earliest concepts on urban spatial structure and growth have been articulated in terms of urban ecological processes that derive from the biological analogies of invasion, competition, dominance and succession of natural areas occupied by various land-uses (Alonso, 1964; Burgess, 1925). From those perspectives, there is invasion of natural areas by competing groups, competition between the invaders and the invaded, and eventual dominance of the fringe areas by invaders, thus facilitating their succession to and dominance of the area.

The dynamics of the urban ecological processes have been rationalized in economic terms, based on basic net return or locational rent (Bissett, 2004; Speigel, 1971; Lipsey, 1975). The resultant conceptualization has been referred to as the land value or bid-rent model, shown in Fig. 2.7. The main assumption is that, in a free market situation, the highest bidder will obtain the use of a given piece of land. The spatial distribution of urban land uses therefore reflects the resolution of competition among types on any specified piece of land.

**Figure 2.7:** Land value or bid-rent model.



Source: Lipsey (1975).

The use that yields the highest net income return will be conducted and competing enterprises will be relegated to other plots where they yield the highest net return. This explains the continually changing uses of urban spaces as net returns from various space allocations vary within the built up centre and the peripheries. An intermixture of uses and functions however occurs at points of indifference where respective utility schedules intersect since both uses derive the same socio-economic utility. This is consistent with the classical Ricardian and quasi-Thunen analysis of the urban fringe. Leapfrogging of residential uses into the most peripheral areas occasionally occur in response to availability of cheap land, where landowners attempt to realize capital gains in the value of their land, or the desire by the wealthy to be at one/in harmony with nature. In the African scene this pattern may be further complicated by informal

land use players whose actions may not necessarily be governed by market forces. The above conceptualization assumes the existence of a single city centre. However this may not necessarily be the case. As a result, the above scenario may replicate itself from several other centres. Urban planning in most former British colonies in Africa, including Botswana, derives mostly from the Town and Planning Act of 1932. The two main elements in the legislation consisted of planning schemes for future urban development and a system for the control of development. For example, the vision for the Physical Planning Department in Kenya is typically stated as, “To become a lead agency in the promotion of well-planned and sustainable human settlements”

Indeed, land-use planning is not a new phenomenon and many countries have policies of this kind regulating land-use. Even in societies where free enterprise is a major value and a mode of operation, a certain amount of government guides private along the lines of officially idealized features with less conflict or more health, (Olima W. , 1993). For example, Germany has the most ancient tradition in land use planning (Mathew, 1999). Apart from the building regulations which were applied to the development of towns since the Middle Ages, the first planning law (the “Building Lines Act”) was enacted in 1868 in Baden. It was followed by similar laws and regulations in other regions. The modern era of land-use planning legislation in Germany was established in 1960s when the “Bundesbaugesetz” (meaning the “Federal Planning Law”) was passed. This Law, with its subsequent amendments in 1969 and 1976 provides the legal framework for land use planning, building and zoning plans. In addition, it regulates the implementation of the plans with regards to building control, land acquisition, and land markets.

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A number of criticisms, however have been levelled against the theories articulated above, making the traditional neighbourhood district (TND) to be widely adopted in most countries world-over. The February 2010 Neighbourhood Edge Area Civic use Green Space indicates on plans low, medium and high density residential areas. It also indicates the proposed density for each category, including office, commercial and industrial uses (indicating proposed intensity (square footage per acre) of all non-residential uses). It also indicates common open space provisions such as squares, plazas, preserves, greenbelts, golf courses, parks, passive or scenic areas; community recreation or leisure time facilities; and areas for such public or quasi-public institutional uses such as public facilities. A separate sketch plan for pedestrians and vehicular circulation showing the general locations and rights-of-way widths and the general design capacity of the system as well as access points to the major thoroughfare systems is also provided. Thoroughfares and utilities in TND Districts connect to existing thoroughfares and utilities, or dead-end as stubs intended for connection to future thoroughfares, unless otherwise prohibited by topography, environmental constraints or other considerations. All these must be considered in the process of land use planning as shown in table 2.1.

**Table 2.1:** The process of land-use planning.



<b>PHASES OF LAND USE PLANNING</b>	<b>STAGES OF PLANNING</b>
<b>I. OBSERVATION</b>	1. Identification of the problem and determination of need
Physical land characteristics	
Present land use	2. Collection and analysis of data
Human aspects	
<b>II. COMPILATION</b>	3. Development of goal and objectives
Land unit identification	
Physical land potential	
Land use requirements	
Feasibility aspects	4. Classification and diagnosis of the problem and surrounding issues
Ecological considerations	
Social and economic considerations	
Development aims	
Land use plan development	5. Identification of alternative solutions
	6. Analysis of alternatives
	7. Evaluation and recommendation of actions
<b>III. IMPLEMENTATION</b>	8. Development of an implementation program
Land use implementation	
<b>IV. EVALUATION</b>	9. Surveillance, monitoring and evaluation of the outcome
Baseline evaluation	
Evaluation of impacts	
Ecological aspects	
Socio-economic and technical aspects	

Source: Lein, 2003.

## **2.7 Restrictions to Private Land-Use**

Restrictions to private land-use can be achieved through various tools. These include defeasible fees, easements, equitable servitudes, restrictive covenants, nuisance, eminent domain and historic districts.

### ***2.7.1 Defeasible Fees***

In defeasible fee estates, the grantor gives land to the grantee, subject to certain conditions. For example, John might convey a parcel of land to James, provided that it would be used for school purposes, (Boyce, et al. 2003). Failure to observe the conditions causes the property to revert to the grantor. The effect of the defeasible fee is that it restricts the use of the property by the possessor. Estates of this type are no longer favoured in most jurisdictions, because they make the transfer of land cumbersome and do not take into account unforeseen situations. The limited scope of defeasible fees makes them of limited value.

### ***2.7.2 Easements***

Easements are rights to use the property of another for particular purposes. A common type of easement in current use is the affirmative grant to an electric power company to run its line across the property of a private land owner. Easements are also now used for public objectives, such as the preservation of open space and conservation. For example, an easement might preclude someone from building on a parcel of land, which leaves the property open and thereby preserves a park for the public as a whole, (Gorman, 2002).

### ***2.7.3 Equitable Servitudes***

Equitable servitudes are land-use restrictions enforceable in a court of Equity. They are created by the language of the promise in the form of a Covenant (agreement) between two individuals, (Merill, 2002).

### ***2.7.4 Restrictive Covenants***

Restrictive covenants are provisions in a deed limiting the use of the property and prohibiting certain uses, (Merill, 2002). They are similar in effect to equitable servitudes, but restrictive covenants run with the land because the restrictions are contained in the deed. Restrictive covenants are typically used by land developers to establish minimum house sizes, setback

lines, and aesthetic requirements thought to enhance the neighbourhood. The legal differences between equitable servitudes and restrictive covenants are less important today, as courts have merged the terms into one general concept.

### ***2.7.5 Nuisance***

Nuisance is an unreasonable, unwarranted, or illegal use by an individual of his or her own property that in some way injures the rights of others, (Scheberle, 2004). A nuisance action ordinarily arises between two neighbouring landowners or is brought by a government attorney. The person initiating the nuisance action seeks to control or limit the use of the land that is creating the nuisance. Nuisance is based on the principle that no one has the right to use property in a manner such as to injure a neighbour, (Patty, 2011). A public nuisance extends further than a private nuisance, since it adversely affects the health, morals, safety, welfare, comfort, or convenience of the general public. Statutes in many states precisely define what constitutes a public nuisance. Common examples are water and Air Pollution, the storage of explosives under dangerous conditions, houses of prostitution, the emission of bad odours or loud noises, and the obstruction of public ways.

### ***2.7.6 Eminent Domain***

Eminent Domain is the right or power of a unit of government or a designated private individual to take private property for public use, following the payment of a fair amount of money to the owner of the property. The theory behind eminent domain is that the local government can exercise such power to promote the general welfare in areas of public concern, such as health, safety, or morals. Eminent domain may be exercised by numerous local government bodies, including drainage, levee, or flood control agencies; highway or road authorities; and housing authorities. For example, if a city wishes to build a new bridge, and the land it needs is occupied by several houses, it may use its eminent domain power to take the houses, remove the buildings, and build the bridge. The government must make just compensation to the

affected property owners, who are entitled to the fair market value of the property. The power of eminent domain is exercised through condemnation proceedings (Aaron, 2004). These proceedings indicate the existence of rights to take the property by the government or designated private individual (usually Public Utilities) and the amount of compensation to be paid for the property.

## **2.8 The Key Systems Affecting Land Uses**

The key systems affecting land uses have been identified as activity systems, environment systems and land development systems. Activity systems concern ways in which institutions of households, firms and governments organize their affairs daily. Their interaction involves communication whether through the media or face-to-face made possible by transport. Therefore movements and activities are interlinked in that one cannot be examined without considering the other, (Chapin & Kaiser, 1979). Development systems on the other hand focus on processes that convert and reconvert space and adapt it for human use in the pursuit of activities (ibid).

The main agents in land development include land owners who hold the land ripe for development. Developers are involved with land conversions to re-conversion subject to availability of finance, public agency approvals and disposal. Other agents include consumers who purchase or lease the already developed property in order to accommodate their activity systems. Others include financial intermediaries and public agencies. Financial intermediaries are concerned with financing development, assessment of risks and returns from investments in land, while public agencies review and approve land use development proposals in view of public interest.

Environments systems are also important in impacting on land use. They include biotic aspects. The biotic agents are the land and animal communities while the abiotic agents are the water,

air and matter cycles. These function both to contain and to enhance the functioning of the development and activity systems. In a nutshell, urban land-use planning requires insight into the fundamental characteristics of activity, development and environmental systems. The concept of a system is not only concerned with the identification of spatial patterns of these systems as they exist, but also why they take the form they do and how these systems are likely to change in future and impact land use. Indicators to measure these land use impacts are hence important. Table 2.2 presents such indicators for measuring land use impacts.

**Table 2.2:** Indicators for measuring land-use impacts.

ECONOMIC	SOCIAL	ENVIRONMENTAL
<ul style="list-style-type: none"> <li>➤ Property values</li> <li>➤ Cost to provide public services</li> <li>➤ Economic development and productivity</li> </ul>	<ul style="list-style-type: none"> <li>➤ Relative accessibility for different groups of people</li> <li>➤ Integration of Communities</li> <li>➤ Public health</li> <li>➤ Aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>➤ Pollution and emission</li> <li>➤ Flooding</li> <li>➤ Drainage</li> <li>➤ Green-space and Wildlife habitat</li> </ul>

*Source:* Adapted from Kroll et al. (2009).

## **2.9 Contexts for Land Use Dynamics and Peri-Urban Growth Characteristics**

Understanding land use transformation in the urban core and along the rural-urban boundary is essential towards guided urban growth for future habitation, (Shi, et al, 2012). Further, understanding urban growth and landscape characteristics through historical and current land uses provides the necessary information to evaluate environmental impacts of land use change, to delineate urban growth boundaries or local government areas, to develop land use zoning plans, and to determine the future infrastructure requirements, (Kennedy, 2007). A number of environmental, socio-economic, political and historical factors exist, which not only impact land use and land cover, but also interact dynamically, resulting in diverse sequences and trajectories of landscape changes based on the specific contexts in which they arise. We will focus on the Kenyan context, with particular emphasis on the city of Nairobi, and more so, Mutuini location.

### ***2.9.1 The Dynamics of Land Use in Peri-Urban Areas in Kenya***

Peri-urban areas in Kenya are characterized by a number of distinct characteristics. These include, land that is overtaken by unplanned and often informal developments; inadequate basic infrastructure and other services; unclear administrative responsibilities between local governments and the National government; intensified regional and local inequalities; and limited fertile land, which is quickly being subdivided and replaced with uses other than agriculture. The problems experienced by urban and peri-urban areas in Kenya are fundamentally rooted in the country's history of socio-economic and physical development processes intertwined with ineffective urban development policies. Urban areas in Kenya are hence today characterized by rapid population growth, increased poverty and crime rates and high rates of unemployment, among others (Hove, et al, 2013). Since most urbanization is projected to take place in hitherto agriculturally dominated developing countries, understanding

how to better plan for peri-urban areas in Kenya, beginning with Nairobi, is very important. Kenya is located in Eastern Africa, directly on the Equator, and has over 194 urban centres.

### ***2.9.2 The Dynamics of Land Use in Peri-Urban Areas in Nairobi***

Cities and urban areas have expanded into the country since the beginning of time. However, the enormous pace of expansion in less developed areas today has led to a unique set of patterns. Nairobi, which is south-centrally located in Kenya, is one of the largest cities in Africa and one of the fastest growing areas in the world. Spatially, the urban cores of Nairobi are expanding, as is the growth area of the peripheral areas due to a combination of both natural population growth and rural-urban migration. The current growth rate reported by most centres within greater Nairobi is twice as much as the national population growth rate, at an estimated rate of 7.3%.

Of the over 194 urban centres in Kenya, an estimated 45% of the national urban population resides in Nairobi (Olima, 2001). Given the growth and urbanization forces being exerted from the major growth pole of Nairobi, most of its peri-urban zones have been experiencing correlative growth trends. The implications of the rapid, uncontrolled urbanization of Nairobi has led to unguided and improper development of its urban fringe. There has thus been shift in land use on the periphery of Nairobi that is exemplified in its peri-urban areas. Most of the peri-urban areas of Nairobi generally exhibit the detrimental effects of Nairobi's growth model. For instance, they suffer from a general lack of infrastructure services from no water provision to poor transportation network; informal and inadequate housing structures; and poor regulatory avenues for improved services and land use control. Further, Nairobi is affected by forces arising from the fact that over 80% of the Kenyan workforce is employed in agriculture, and over 50% of the people live below the poverty line. Unlike most cases, and similar to the patterns in Africa, the rapid urbanization in Nairobi is occurring without a correlating increase in employment opportunities.

## **2.10 The policy and legal underpinnings for land use planning and management in Kenya**

The legal land regime in Kenya comprises of The Constitution of Kenya, 2010, The Land Act, 2012, The Land Registration Act, 2012, The National Land Commission Act, 2012 and The Physical Planning Act (Revised in 2012). This legal regime replaced the previous regimes, which included The Land Titles Act, The Registration of Titles Act, The Registration of Land Act, The Government Land Act and The Indian Transfer of Property Act.

### ***2.10.1 The Constitution of Kenya, 2010***

The promulgation of the constitution of Kenya 2010, (Kenya, 2010), ushered in a structure of the government with a two tier system, one at the national and the other at the county level. Under the new governance structure, a number of laws have been enacted to guide governance at both levels and their modalities of cooperation. These include the County Governments Act (2012a) (Kenya, 2012b), the Urban Areas and Cities Act (2011), (Kenya, 2011), the Intergovernmental Relations Act (2012), (Kenya, 2012c) and the National Government Coordination Act (2012), (Kenya, 2012d). Following the principles stated in the constitution development planning in Kenya should be based on integrated national values, equity, resource mobilization and concerns of minorities and marginalised groups. The constitution also requires an integrated development planning framework to enhance linkage between policy planning and budgeting. The legislation cited above governs planning at national and county levels.

Article 184 of the Constitution provides for governance and management of urban areas and cities. It particularly provides that they:

- (a) Establish criteria for classifying areas as urban areas and cities,
- (b) Establish the principles of governance and management of urban areas and cities,
- (c) Provide for participation by residents in the governance of urban areas and cities.



### **2.10.2 The Land Registration Act, 2012**

The Land Registration Act, 2012, (Kenya, 2012e), was legislated to amongst other things, revise, consolidate and rationalize the registration of titles to land in Kenya as well as to give effect to the principles of devolved government in Kenya.<sup>1</sup> The statute has effected a number of changes in the arena of land registration in Kenya; where it has not brought in new provisions, it has significantly consolidated the provisions of earlier existing provisions into one law. Key highlights from the statute include:-

- (a) Section 101 of the Act recognizes the jurisdiction of the Environment and Land Court established by the Environment and Land Court, 2011 No. 19 of 2011 on matters emanating from the Act. The Act repeals The Land Titles Act, The Registration of Titles Act, The Registration of Land Act, The Government Land Act, and The Indian Transfer of Property Act.

### **2.10.3 The Land Act, 2012**

The purpose of The Land Act, 2012, (Kenya, 2012f), as presented by its preamble, was to give effect to Article 68 of the Constitution of Kenya, 2010. Specifically, the Act was to revise, consolidate and rationalize land laws in Kenya, and to provide for the sustainable administration and management of land in Kenya. Key highlights of the statute include:

- (a) Section 5 of the Act provides for the land systems in Kenya as freehold, leasehold and customary land holding,
- (b) Section 7 provides for the methods of land acquisition. They include allocation, land adjudication process, compulsory acquisition, prescription, settlement programs, transmissions, transfers, long-term leases exceeding 21 years created out of private land or any other manner prescribed in an Act of Parliament.

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<sup>1</sup> Preamble to the Land registration Act

#### ***2.10.4 The National Land Commission Act, 2012***

The purpose of the National Land Commission Act, 2012, (Kenya, 2012g), is to make further provision as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission; to give effect to the objects and principles of devolved government in land management and administration.

#### ***2.10.5 The Urban Areas and Cities Act, 2011***

The Urban Areas and Cities Act, 2011, (Kenya, 2011), explicitly states that every city and municipality shall operate within the framework of integrated development planning which shall contribute to the protection and promotion of the fundamental rights and freedoms contained in Chapter Four of the Constitution and the progressive realization of the socio-economic rights which include the right to housing; and be the basis for overall delivery of service including provision of water, electricity, health, telecommunications and solid waste management.

#### ***2.10.6 The County Government Act, 2012***

According to the County Government Act, 2012, (Kenya, 2012a) each county shall prepare a county integrated plan which shall be the basis for all budgeting and spending of public funds. The acts clearly states that “A county government shall plan for the county and no public funds shall be appropriated outside a planning framework developed by the county executive committee and approved by the county assembly” The county integrated plan shall focus on economic, physical, social, environmental and spatial planning.

According to the Urban Areas and Cities Act and County Government Act, service delivery and urban and regional Planning rests squarely on County governments. They require Counties to develop integrated plans and setting up such plans as the basis for fund allocation and spending

means that counties have no choice but to develop proper integrated plans. Such plans are likely to curb the development and growth of slums.

#### ***2.10.7 The Environment and Land Act, 2011***

This Act establishes a judicial forum for adjudicating matters relating to land and environment. Section 4 of the Act gives this forum the same status as the High court. Indeed, Kenya has an excellent policy and legislative framework for effective land management. The framework nonetheless remains that, 'a framework'. Unless efforts are not put in place, starting from local levels to effect the robust framework for efficient and sustainable land management, the current state in the country risks remaining the same.

#### ***2.10.8 The Land Control Act, 2012***

The Land Control Act regulates development, use and subdivision of agricultural land, it was designed to ensure that agricultural land is used and developed in such a way that good husbandry is not compromised. Consequently the process required that the regulatory institution known as the Land Control Board must be satisfied that the user of the land or the prospective user is capable of putting the land to productive agricultural use. For instance the Board may ask for what purposes the land is being purchased and whether it is being put to good use, secondly the board must ensure that land is not subdivided into sizes which are not capable of being put into agricultural use.

#### ***2.10.9 The Physical Planning Act (Cap 286)***

The Physical Planning Act (Cap 286), (Kenya, 1996), is a much more comprehensive statute that provides for physical planning and development control. The Physical Planning Act was enacted in 1996 repealing two earlier statutes the Town Planning Act (Planning in Urban areas) and the Land Planning Act (Planning in rural areas). The Physical Planning Act provides for planning in both urban and rural areas. It came into effect in November 1998 as a response

primarily to the outcry relating to the excision in Karura Forest. Nevertheless it is now in effect. Institutionally the Physical Planning Act places the functions of Physical Planning in the Office of the Director of Physical Planning; administratively the director of physical planning is an officer in the ministry of lands.

The Act states that the Director of Physical Planning is the chief government advisor on all matters related to physical planning and in that capacity he shall formulate physical development policies prepare physical development plans, advise the Commissioner of Lands on the alienation of government lands, advise the Commissioner of Lands and Local authorities on the most appropriate use of land and require local authorities to ensure the proper execution of physical development control. The Act establishes committees known as physical planning liaison committees at National, provincial and district levels. The function of these committees is to act as an appeal mechanism from the decisions of the Director of Physical Planning. The membership of these committees is comprised of permanent secretary as the chair, the Director as the secretary. It is top heavy full of government people.

The Act provides for three kinds of physical planning

- (a) Regional Physical Development Plan,
- (b) Local Physical Development Plan,
- (c) A special area physical development plan.

The regional physical development plan is prepared by the director with reference to any land with the area of authority of a county council for purposes of improving the land and providing for the proper physical development of such land. It is also designed to secure provision for transport, public purpose, utilities and services, commercial, industrial, residential and recreational areas and to make provision for the use of land for building and other purposes. A regional physical development plan is prepared for a rural area. The purpose of the plan is to

provide for proper physical development and also to provide for commerce transport etc. A local physical development plan is prepared with respect to land within the area of the city, municipal, urban or Town Council or any trading or market centre. Under Section 23 the Director may declare an area with unique development potential or problems as a special planning area. The declaration of a special planning area enables the preparation of a physical development plan irrespective of whether such an area lies within the area of a local authority.

#### ***2.10.10 The Building Code***

The building code is one of the legislation that has, along with others been instrumental in influencing planning standards, although it is more concerned with housing quality and building materials. It also contributes to planning standards in that it deals with the sitting and space about buildings (Part II of Grade I by-laws); and minimum areas of plots or buildings thereon (Grade II by-laws). They contribute to planning and design, regulation control of a residential environment. The Grade II by-laws were revised in 1995 to facilitate the development of low cost housings and Local Authorities have since adopted them by resolution. For instance, Nakuru Municipality has adopted them for application in seven areas of low income housing by a council resolution.

#### ***2.10.11 The Water Act (Cap 37-2)***

The Water Act (Cap 37-2) provides for the conservation, control, apportionment and use of water resources of Kenya. Various institutions have been found to oversee matters of water utilization such as water retainment.

#### ***2.10.12 The Agriculture Act (Cap 318)***

This Act aims to promote and maintain a stable agricultural environment by providing for the conservation of soil and its fertility. It also calls for the stimulation of good land management and husbandry.

### ***2.10.13 The Land Policy***

After a protracted land policy formulation process between February 2004 and December 2009, Kenya obtained a comprehensive national land policy. Key features of this policy were anchored in the Constitution of Kenya 2010 which was promulgated on 27th August 2010. For the first time in history, the policy and constitutional frameworks provided Kenya with a unique opportunity to undertake comprehensive land reforms to respond to contemporary land issues. The National Land Policy (NLP) has a vision to guide the country towards a sustainable and equitable use of land. The land policy calls for immediate actions to addressing environmental problems that affect land such as degradation, soil erosion and pollution.

The policy stipulates the principle of conservation and management of land based natural resources, the principle of protection and management of fragile and critical ecosystems including wetlands and arid lands. The policy further calls for extensive overhaul to current policies and institutions in an attempt to address chronic land tenure insecurity and inequity. The National Land Policy designates all land in Kenya as public, private (freehold or leasehold tenure), or community/trust land held, managed and used by a specific community. This land policy seeks to address land administration, access, use planning, restitution of historical injustices, environmental degradation, conflicts, proliferation of informal settlements, outdated legal framework, etc. Table 2.3 shows the techniques used in land policies.

**Table 2.3:** Various techniques used in land policies.

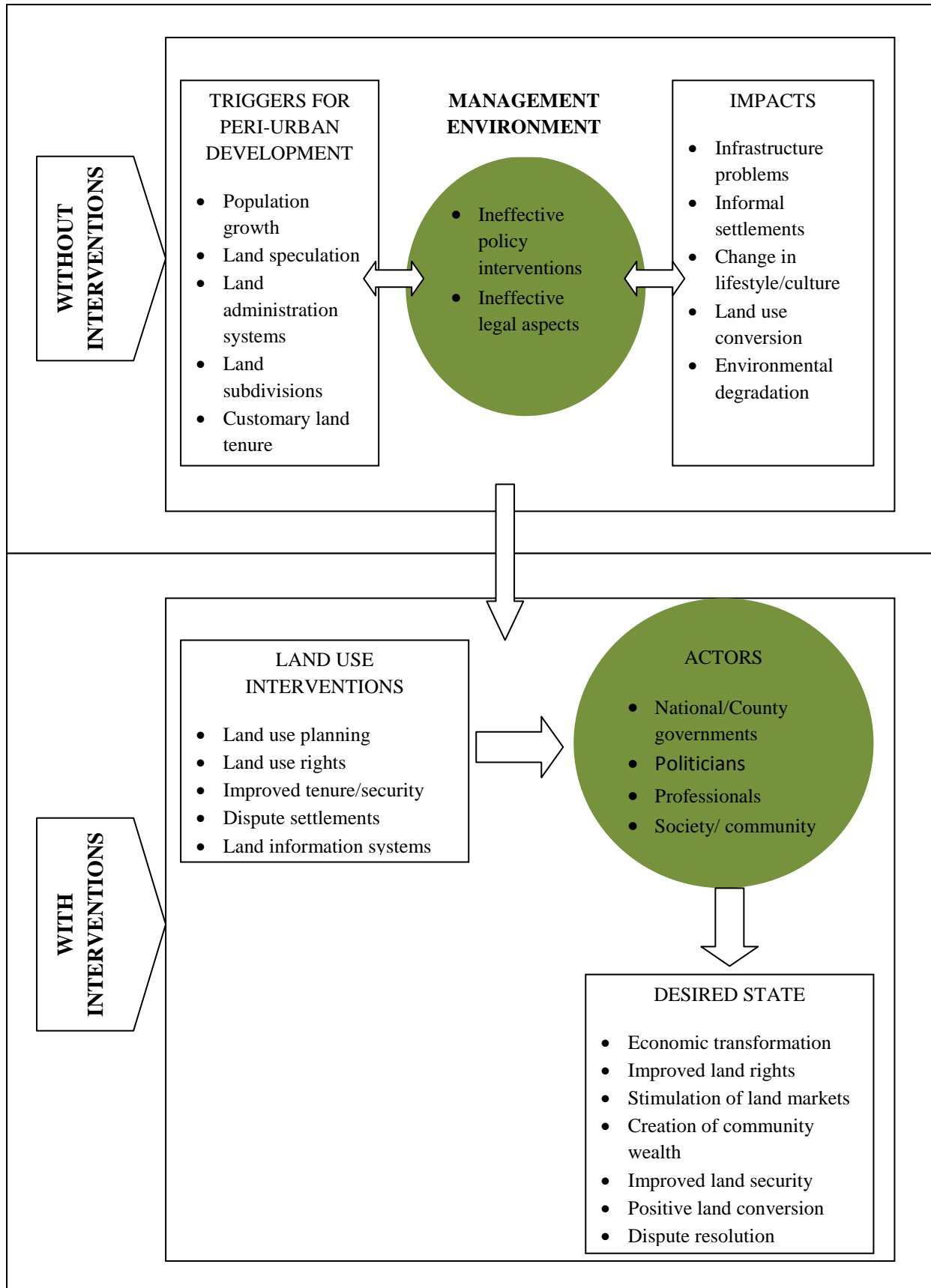
	Tactic / Routine	Objective	Legislation	Current Practice.
1.	Land Banking.	Create reserves of cheap land; Control land values; Control supply of land for housing.	Local Government Act.(REPEALED); Land Acquisition Act.	Piecemeal accumulation for specific project.
2.	Rating	Raise Revenue	Rating Act	Rating based on market value of unimproved site.
3.	Development Levy	Revenue raising Control rate of development.	Physical Planning Act	Development application upon subdivision change of user, etc.
4.	Land use Zoning	Regulated use of land, control urban growth, control travel demand, and regulate supply of housing.	Physical Planning Act Local Government Act.	Preparation of physical development plans delineating zones.
5.	Density zoning	Prevention of overcrowding.	Public Health Act; Building By-laws; Physical Planning Act; The Land Act	Plot ratio, site coverage, height restriction, minimum plot size and number of dwellings.
6.	Building control	Ensuring safety; Reduce fire hazards; Establish space standards; Establish sanitation standards	Building by-laws grade I & II	
7.	Development control	Regulate type and density of development Aesthetic control; Maintain health and safety standards; Protect Environment servicing standards.	Physical Planning Act; Local Gov't Act; Public Health Act; Building by-laws.	Planning permission and approval; Enforcement Planning inspection by various experts.
8.	Sub-division control	Control densities; Enforce space standards; Enforce servicing standards.	Physical Planning Act; Registered Land Act; Street Adoption Act.	Subdivision application. Survey; Registration and planning.
9.	Physical planning	Provide orderly basis for urban development; Improve quality of life. Protect environment.	Physical Planning Act; Local Gov't Act; Building by-laws.	Preparation of various development plans.

Source: Yahya, 1987.

## 2.11 The Conceptual Framework

Figure 2.8 is the conceptual framework for this study. It depicts the land use and management challenges in peri-urban areas.

**Figure 2.8:** Land-use and management challenges in urban areas: the conceptual framework.



Source: Author, 2015.



As can be obtained from figure 2.8, population growth, state bureaucracy, poverty, scattered statutes, unclear land policies, political interference, laxity in the enforcement of the law, and the micro-cultural issues, like attachment to ancestral land, are some of the triggers for peri-urban land use. Urban land management on its part affects and is affected by the land administration regime. Without the intervention of the land administration regime which gets influence from the politics of the day, and which depends on the available information systems; including those from the local and central governments, politicians, professionals and the general society, mainly informed by the micro-cultural inclinations, such as attachments to ancestral land the peri areas will be generally be affected both positively or negatively. The whole of this mix influences the effectiveness of land use planning and management. This means that to effectively plan for land use, the dynamics associated with many agglomerates and linkages that exist require to be carefully considered to achieve the desired state.

This study, therefore, forms the starting point in understanding the role played by land planning and management in influencing land use transformation in peri-urban areas. Land and its control mechanisms have been identified as the overarching land use transformation impediments, but had not been investigated to establish how they play out in Mutuini location. The key actors in the pathway were evaluated and used as informants in the study. This study was hinged on managing the relationships between the land-related determinants of peri-urban land use and land cover as managing such relationships remains at the core of any policy agenda for integrated development for territorial cohesion in the rural-urban fringes and peri-urban areas, (Cadieux, 2006).

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Introduction**

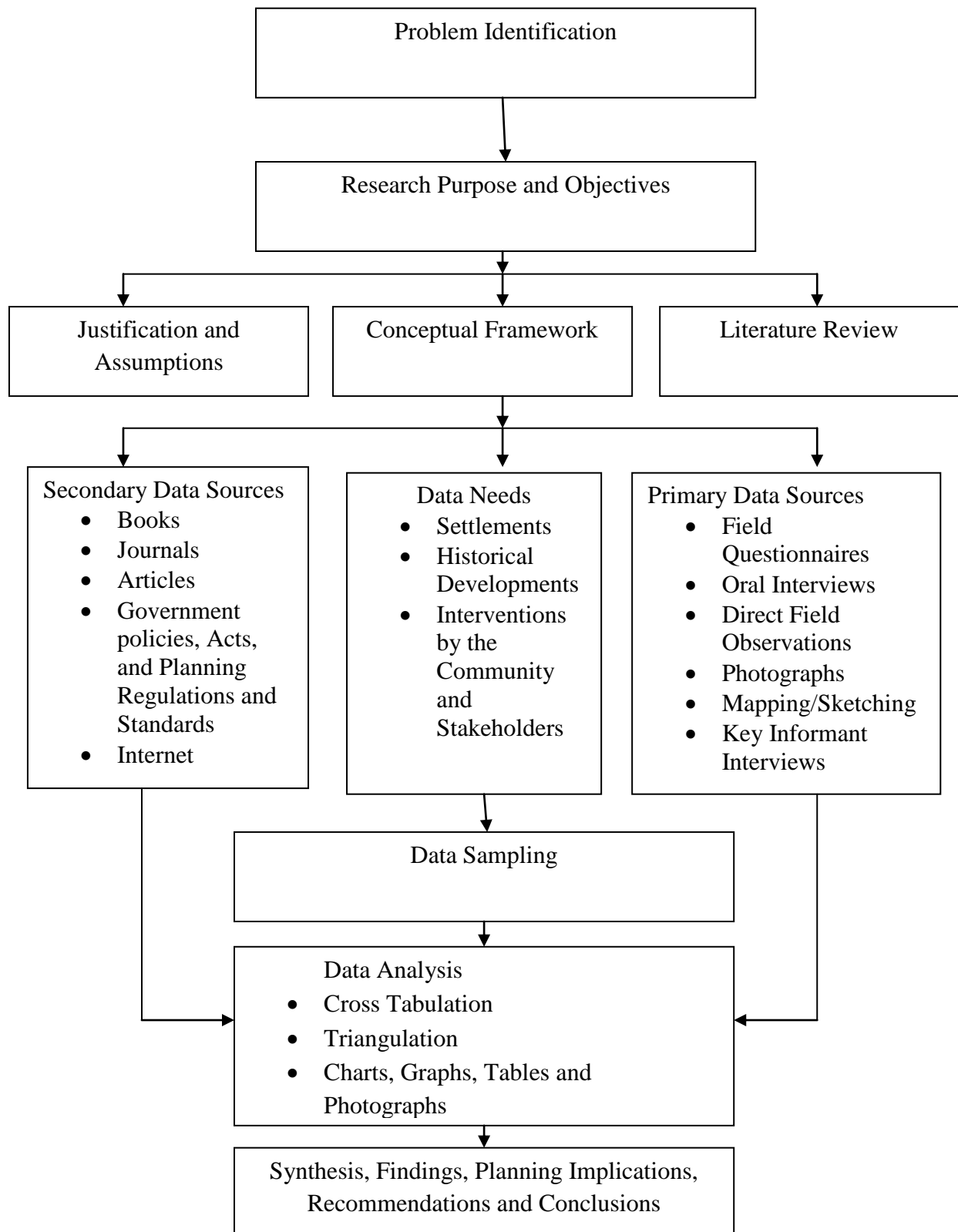
This chapter discusses the research methodology that was used in this study and provides a general framework for the research. The chapter presents details of the research design, target population, sample and sampling procedures, description of research instruments, validity and reliability of instruments, data collection procedures, data analysis techniques and ethical considerations that were adhered to while conducting the study.

### **3.2 Research Design**

This study adopted a descriptive survey design involving stratified and random sample survey carried out with the help of household questionnaires. The purpose of the survey was to obtain information of the sample so as to generalize for the population so that inferences could be made about certain parameters. The information required from the study included establishing the land management practices in the location, their effects, challenges and implications of the effects. The study also sought for possible planning interventions for effective land management in Mutuini location. The design allowed for collection of both quantitative and qualitative data at the same time. Figure 3.1 summarizes the research design framework.

Specifically, the study examined land uses and narratives about land uses in order to understand how people in Mutuini urban-edge landscapes frame their small-scale amenity-productive land uses, especially in terms of (a.) how they learn how to produce and maintain their landscapes, (b.) how they relate amenity and practicality in these landscapes, (c.) how they connect these landscapes to local, regional, and global scale issues, and (d.) how they relate these competing land use motivations. To trace these processes of learning, framing and producing, the residents were asked about their historical and cultural narratives of land use, and about their production of and interaction with their everyday landscapes.

**Figure 3.1:** The research design.



Source: Author, May 2015.

Focus was placed on small scale landscape projects, since these are related to residential spaces

of the city or urban periphery. A diverse set of narratives about land adjudication and the prevailing environment was sought to provide a chance for the exploration of the hypothesis that critical engagement with the landscape offers opportunities to disrupt processes of commodification and abstraction of relationships with environments. An exploration of how and whether residents could express their experience of pressures that discouraged residing in the area was done.

Of particular interest to the study, was to establish how people expressed their familiarity of processes that abstracted their experience of life in the area, and how they posited their everyday experience of the landscape as related to such abstracting processes. Basic questions relating to paradigms and narratives that order land uses in amenity production landscapes were asked at the start of interviews so that stories and indication of processes of engagement and disengagement in the landscape, especially the patterns of land use following the land adjudication process came to the fore. Narratives of land use and landscape ideology or preference that is related to these patterns were encouraged. Keen observations were made during the interviewing because, while people who engage in aspirant or emancipatory landscape projects may be eager to talk about their forms of engagement, disengagement is less easily articulated, and is something often seen in general terms, and perhaps most easily seen in someone else (*their* lifestyle, those people, that political party).

As the study progressed, interaction with interpretive systems that would help in considering absences, reluctances, omissions, and resistance<sup>2</sup> were noted, and tactics of presenting disengagement in terms of *concealment*, and correspondingly thinking of engagement in terms of the opportunities afforded – or made visible, and salient, un-hidden – in relation to the amenity productive landscape enhanced. Throughout the process, it was keenly noted that relationships between everyday activity and larger conceptions of environmental context are

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<sup>2</sup> Moments of “I want to, but...” are often particularly illuminating.

usually manifested in the material landscape, and are also both abstract and symbolic. In this regard, it was kept in mind that people are often not accustomed to or comfortable with thinking about everyday experiences of landscape in the terms curiosities may be about – where the symbolic, abstract, and material are joined through motive, intent, and practice.

Therefore, rather than question informants directly, an approach of discussing residents' residential landscape projects was frequently adopted, hence leading up to more abstract conversation through the material landscape (which was in most cases the immediate residential surrounds) made our central interests more accessible to the informants. Once specific examples of significant things being done were established, exploration of how and why things were happening the way they did could followed, and, in so doing, getting at the affordances or context of land uses, and also at the intentions, motives, etc involved in those activities. These topics were then explored using prompts – often when raised by informants themselves – about global, national, or regional connections.

To avoid incidences of derailing or hanging up on a particular topic due to not knowing the specific situation (politics, economics, history, etc), which is often common when dealing with broadly structured interview research, informants' influences and motivations, connections, and meanings in their stories were explored, rather than focusing too closely on particular details that would tell little. Use of periodic questions was avoided during the study as this was thought to make informants assume shared cultural context (statements about particular historical events, politicians, planners, or developers, for example). The influence of the interviewers on the resulting stories while enlisting richer explanations was controlled.

### **3.3 Target Population**

Mutuini location comprises of two sub locations with a total of 16 villages with an estimated population of 17973 people. The subjects of the study were drawn from all the 16 villages

therefore, the target population for this study constituted of all the adults individuals who are living in Mutuini location, Dagoretti Constituency, Nairobi County.

### 3.4 Sample Size and Sampling Techniques

The study applied both random sampling procedures to obtain the respondents for questionnaires. Random sampling selected four villages from each sub location making a total of eight villages for the study including Njiku, Ngurumo, Kirigu central, and Kigaro all in Kirigu township sub-location, then Wathuti, Manyatta, Saigon and Gacegu all in Mutuini farms sub location. The location then consisted of 8 village clusters consisting of 1223 number of plots .Out of this the survey covered 874 no of plots for the village cluster which represented about 71 % of the total no of plots in the sub locations. The plots for a detailed survey, were equitably selected by taking each nth plot in each village considering the total plots in the village and dividing by the sample size. This was considered necessary to make the sample survey more representative. The sample frame of the study was drawn from all the plots covered in the registry index map of the Mutuini settlement which constitutes 16 villages.

#### 3.4.1 Random sampling

Simple random sampling method was used to select representative villages of Mutuini location for the study. Each village was assigned a random number, after which, using shuffled numbered village specific balls, a ball was picked at random without replacement. The process was continued until 50% of the total number of villages was attained. In this work, however, given that the specific population based in Mutuini location are more than 10,000 people, (Kenya National Bureau of Statistics, (KNBS), 2012), the independent sample units was determined using Fischer’s formula, (Fischer, et al., 1991):

$$n = \frac{Z^2pqD}{d^2} \dots\dots\dots[1]$$

*n* represents the sample size for populations greater than 10,000,

$Z$  represents that standard normal deviate at the required confidence level. This is normally set at 1.96 corresponding to 95% confidence level, which will be used in this study),

$P$  represents the population estimated to have a particular characteristic (where there is no reasonable estimate, a default of 50% or 0.5 will be acceptable),

$$q=1-p,$$

$d$  represents the degree of accuracy required (this is usually set at 0.05), and

$D$  represents the design effect.

Therefore, on substitution, we obtain:

$$n = \frac{1.96^2 \times 0.5 \times (1-0.5) \times 1}{0.05^2} \dots\dots\dots[2]$$

This implies that:

$$n = 384.16 \approx 385 \dots\dots\dots[3]$$

The study area has 8 villages with – total households of both semi-permanent and permanent nature. Size sampling method was used to calculate the desired sample size per village. In working out the sample size in cluster sampling, the villages in the study were the primary sampling units (PSUS) or clusters. The population within the villages were the secondary sampling units.

In general, for a given total sample size  $n$ , (Ingule and Gatumu, 1996):

$N$  is the number of the psus in the population

$T_i$  is the total population in the  $i$ th psu

$t$  is the total population of the sampled villages.

$t_i$  is the estimated total for the  $i$ th psu

Then  $n = N/T_i \sum t_i$

**Table 3.1:** Sample size per village.

Villages	No of household per village	Population in the ith unit	Sample size	percentage	Cumulative percent
Kirigu central	184	916	83	22	22
Njiku	166	820	73	19	41
Kigaro	149	476	43	11	52
Ngurumo	101	448	41	11	63
Manyatta	162	422	38	10	73
Mutuini central	154	386	35	9	82
Gacegu	106	392	36	9	91
Saigon	132	402	36	9	100
TOTAL	1154	4280	385	100	

### 3.4.2 Cluster sampling

This sampling technique was used to identify the household, commercial and business respondents. The types of businesses enterprises that are in Mutuini location were listed and clustered. These were, groceries/butcheries, hotels/eateries, general shops, barber shops/hair dressing, downtowns/rentals, mechanics/drivers/conductors and farming. Using the list that was obtained, enterprises in the area were mapped and marched to one of the 7 business enterprise categories thus giving rise to the formation of 7 business enterprise categories. Random sampling was then used to select 10% of the members from each category for use in the study.

The sample size was calculated based on the formula, (Bartlett, Kotrlik, & Higgins, 2001):

$$A = \frac{B^2 CD}{E^2} \dots\dots\dots [4]$$

Where *A* refers to the required sample size, *B* refers to the confidence level at 95% (standard value of 1.96), *C* refers to the proportion in the target population estimated to have characteristics being estimated (90%), *D* refers to one less the value of *C*, while *E* refers to the margin error, which is set at 5% (standard value of 0.05).

Computation of the formula and calculation of design effect yielded 28 samples, which was



further increased by 5% to account for contingencies such as non-response. Therefore the sample size for key informants representing various business enterprises was 30. This number was distributed proportionally in the pre-selected 7 business enterprise categories based on the number of businesses that was established under each. Consequently, 4 were selected in the groceries/butcheries cluster, 2 in the hotels/eateries cluster, 3 in the general shops cluster, 5 in the barber shops/hair dressing cluster, 7 in the downtowns/rentals cluster, 5 in the mechanics/drivers/conductors cluster and 4 in the farming cluster. In each selected cluster, random samplings started centrally, then moved eastwards then to other directions until all the selected informants were visited. Every 3<sup>rd</sup> household, commercial entity or business enterprise was considered until the last respondent was obtained from each cluster. When the key respondent was not available, the next business entity in the cluster was considered. The head of the household, commercial or business entity or someone aged 18 years and above was considered the entity's respondent.

### ***3.4.3 Purposive sampling***

This sampling technique was used in the identification of key informants (KIs) relevant to the study area. Key informants were officers of the Ministry of Lands, the local area administration, professional bodies relevant to land issues, water management authorities, the Nairobi County officials, etc. A list of all possible key informants was drawn. Content analysis of the services that they are mandated to offer was then done to establish their relevance to the context of the study. Those whose mandates were found to be of benefit to the study were selected and interviewed to establish various issues that made up this study.

### **3.5 Data Collection Methods**

The household questionnaires, key informant guides and observation record sheets were the tools used to collect data in the field. These tools are described in the following sub-sections.

### 3.5.1 Data types

Table 3.2 is the data matrix that guided on the types of data required from the study.

**Table 3.2** The project data matrix.

<b>OBJECTIVES</b>	<b>TYPE OF DATA</b>	<b>TECHNIQUES FOR DATA ANALYSIS AND PRESENTATION</b>	<b>EXPECTED RESULTS</b>
(1) To establish the existing land management practices in Mutuini location, Nairobi County.	1. Primary data from survey, 2. Secondary data from relevant institutions	<ul style="list-style-type: none"> <li>• Photographs</li> <li>• Graphs</li> <li>• Tables</li> </ul>	The types of land management practices in Mutuini location
(2) To establish the effects of the land management practices in Mutuini location on the development of the area.	1. Primary data from the survey, 2. Secondary data, including policy, legislation, by-laws, documents from the ministry of lands, the lands commission, NCC, etc.	<ul style="list-style-type: none"> <li>• Photographs</li> <li>• Graphs</li> <li>• Tables</li> </ul>	Effects of the land management practices in Mutuini on its development
(3) To identify the challenges and implications of the effects of the land management practices on land development in Mutuini location	1. Primary data from the survey, 2. Secondary data, including policy, legislation, by-laws, documents from the ministry of lands, the lands commission, NCC, etc.	<ul style="list-style-type: none"> <li>• Photographs</li> <li>• Graphs</li> </ul>	Challenges and implications of the effects of current land management practices in Mutuini location
(4) To propose planning interventions for effective land management in Mutuini location	1. Primary data from the survey, 2. Secondary data, including policy, legislation, by-laws, documents from the ministry of lands, the lands commission, NCC, etc.	<ul style="list-style-type: none"> <li>• Graphs</li> <li>• Tables</li> <li>• Descriptive statistics</li> </ul>	Informed planning proposals for effective land management in Mutuini location

Source: Author, May 2014.

### 3.5.2 Household questionnaires

The main data collection instrument that was used in this study was the household questionnaire. This was used for the purpose of collecting primary quantitative data. The

questionnaires were used for the following reasons: a) their potential in reaching out to a large number of respondents within a short time, b) ability to give the respondents adequate time to respond to the items, c) they offer a sense of security (confidentiality) to the respondent and d) they are objective since no biases can result from personal characteristics such as in an interview, (Owens, 2002).

Administration of the household questionnaires was done to the selected 162 household respondents. The questionnaire was divided into three parts. Part A was on general information, which was purposed to assist in establishing the respondents' demographic data. Part B was designed to collect data on land management practices and their effects Part C was designed to collect data on the challenges or implications of the land management practices in Mutuini and local proposals for planning interventions. Both qualitative and quantitative data was collected from the study.

### ***3.5.3 Key informant guides***

Key informant interviews were conducted among the community, county-level and national-level resource persons. These included the chief of the area, officers from the Ministry of Lands, Nairobi County planning department, Nairobi Water and Sewerage Company Limited, professional bodies such as surveyors, estates agents, etc. Respondents from the commercial or business sector were also interviewed as key informants. All these were asked the types of land management practices in Mutuini and how they affect them. In the process, both qualitative and quantitative data was collected.

### ***3.5.4 Observation and record sheets***

The record sheet was used for recording any observation on land management practices and their effects. A digital camera was used to photographically record observations. The information gathered was essential in verifying the responses from the respondents.

### ***3.5.5 Remote sensing images***

Landsat data from U.S. Geological Survey (USGS) website was collected. The landsat images captured for this region are Landsat Thematic Mapper (LTM) 1987, Landsat Enhanced Thematic Mapper (ETM) 2000 and Landsat Enhanced Thematic Mapper (ETM) 2005. The data downloaded was covering a very large region. A process known as layer stacking (that is combining the 7 bands that into one) was done on the image to extract Mutuini from the three Landsat images using a vector shape file of Mutuini. This task was accomplished using Erdas Imagine which is remote sensing software. The modelling process entailed performing supervised classification on the three Landsat images to monitor how land use/ land cover has changed over time, specifically how housing has changed in Mutuini. Supervised classification was chosen since there have been prior information of how Mutuini looks particularly in terms of the various land uses that have been there in Mutuini.

## **3.6 Validity and Reliability of Research Instruments**

### ***3.6.1 Validity***

The questionnaire that was used in this study was validated in terms of content and face validity. Content related techniques measured the degree to which the question items reflected the specific areas to be covered by the study. A draft questionnaire was initially developed and presented to the supervisor and at a departmental presentation involving academicians and students for review and critique after which it was tested in the field on a pilot basis before the final version that was used was developed.

### ***3.6.2 Reliability***

Reliability is concerned with consistency, dependability or stability of a test, (Nachmias, 1996). The researcher measured the reliability of the questionnaire to determine its consistency in testing what was intended to be measured. The test re-test technique was used to estimate the

reliability of the instruments. This involved administering the same test twice to the same group of respondents that had been identified for this purpose.

### **3.7 Data Collection Process**

Prior to the commencement of data collection, the researcher obtained all the necessary documents, including an introduction letter from the University. Audience with the sampled local authorities in the region was sought to clarify the purpose of the study. Upon getting clearance, the researcher, with the assistance from research assistants distributed the questionnaires to the sampled individuals who are living in the sampled villages of Mutuini. Assistance from the local authorities was sought. During the distribution of the instruments, the purpose of the research was explained to the respondents.

### **3.8 Data Analysis Procedure**

Both quantitative and qualitative approaches were used for data analysis. Data, collected using structured questionnaires, was analyzed using statistical methods. All the variables were chronologically arranged with respect to the questionnaire outline. Data entry was followed by data editing. This ensured that every data entered for each questionnaire in each variable was correct. Variables relating to the study were formulated and the information on the questionnaires coded and analyzed using IBM SPSS Statistics 20 program. The qualitative data generated from open ended questions was categorized in themes in accordance with research objectives and reported in narrative form along with quantitative presentation. The qualitative data was used to reinforce the quantitative data. The results obtained from the analysis are presented and discussed in chapter Five.

### **3.9 Ethical Considerations**

The researcher and her assistants explained to the respondents about the research and that the study will be for academic purposes only. It was made clear that the participation was voluntary and that the respondents were free to decline or withdraw any time during the research period. Respondents were not coerced into participating in the study. The participants had informed consent to make the choice to participate or not. They were guaranteed that their privacy will be protected by strict standards of anonymity.

## **CHAPTER FOUR: PROFILE OF STUDY AREA**

### **4.0 Introduction**

The location of Mutuini, which was the study area, is described in this section. The spatial dimensions and neighbouring districts to the study are presented so as to provide information about the geographical background of the study area. The demographic characteristics of the area are also explained. The built environment and the spatial location of various settlements are highlighted to give information about settlement patterns. The nature of land use planning systems, land ownership, challenges of land use planning as well as the dynamics of land use in the area have been discussed in this chapter to give insight into land use planning issues from which deductions based on the findings from the study were drawn.

### **4.1 Location and Extend of the Study Area**

Mutuini settlement area is located in Dagoretti Division, Nairobi West district within the Nairobi Metropolitan Region (NMR), Nairobi County. Figure 3.1 is a map of the Nairobi Metropolitan Area (NMA). The area is situated some 18 Kilometres west of the Nairobi City. It lies approximately 1°18'0" south of the equator and 36°42'0" East of the Prime Meridian and it occupies an area of 250 hectares or 3.28 km<sup>2</sup>, (Kenya National Bureau of Standards (KNBS), 2010). Its altitude varies between 1600 and 1850 meters above sea level, (Mutillah, 2003). The western part of Nairobi where the study area is located is high ground that is approximately 1700-1800 m above sea level and has rugged topography. Features that comprise the immediate surroundings of the area are hilly slopes, Dagoretti and Ngong forests, Mutuini River along which we have the Kenya Forest Service Recreational dam.

The extent of the study was Mutuini location covering two sub-locations, of which shares the name Mutuini while the other is Kirigu. Kirigu sub-location comprises of Mutuini Township while Mutuini sub-location comprises of Mutuini farms. Mutuini location borders Thogoto location that is in Kiambu County to the west. To the north it borders Ruthimitu location, which

is also in Dagoretti district. To the east, Mutuini location borders Waithaka location, which is also in Dagoretti district. The southern part of Mutuini is abutting to Karen/Langata division. The southern by pass cuts across the settlements along a stretch of the southern bypass road from the C60: Ngong Road interchange and the interchange at the C63: Dagoretti Road C63. Table 4.1 shows the codes, description, local names and length of the said roads while figure 4.2 is the map of Nairobi County. Dagoretti is in Nairobi West and Mutuini location is one of the locations in it, while figures 4.1 and 4.2 are maps of the Nairobi Metropolitan area.

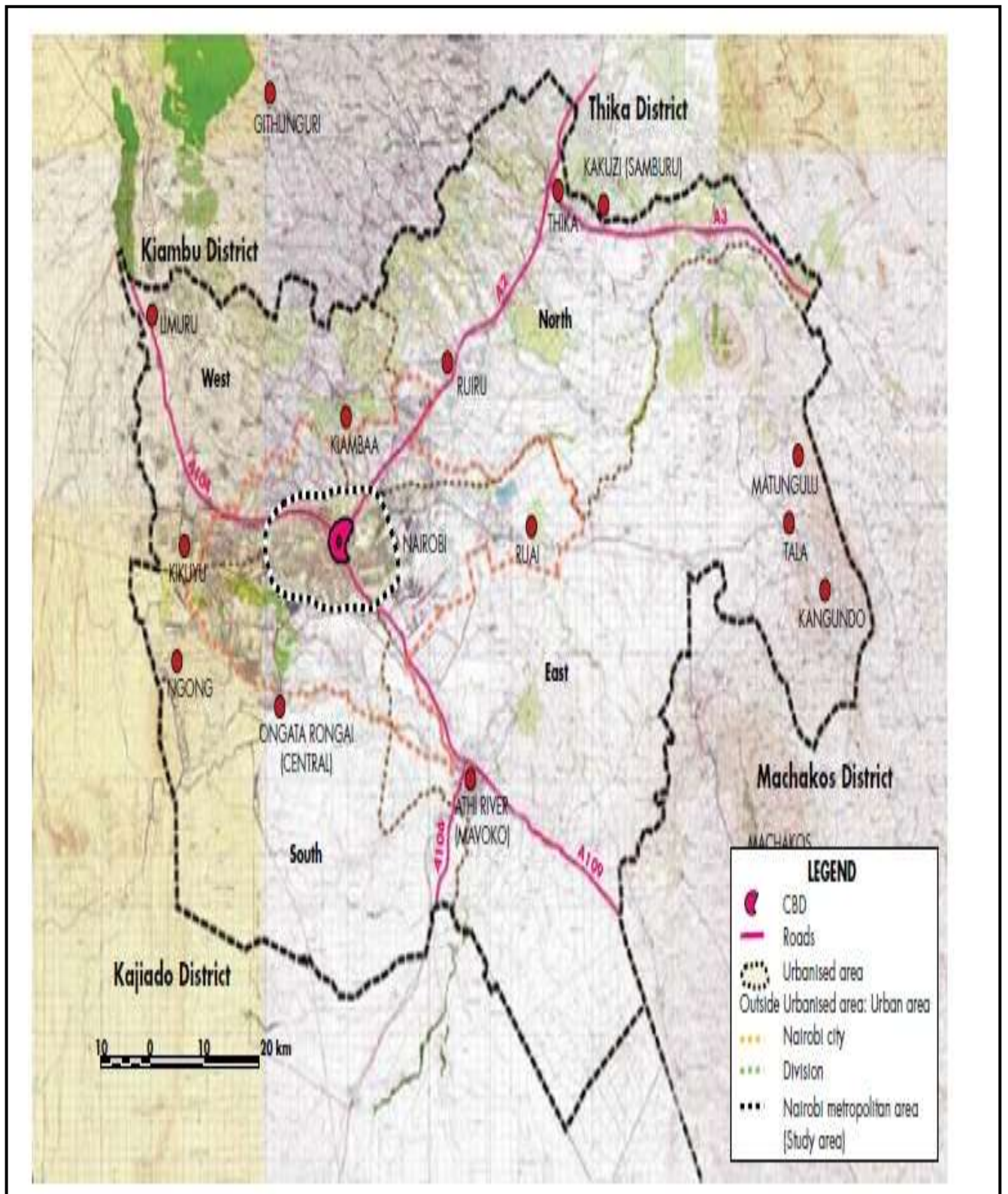
**Table 4.1:** Codes, description, local names and length of roads that have link to Mutuini,

Code	Description	Local Name	Road Length
C60	C61/Ngong Road/DB Kajiado Bulbul	Ngong Road	13.5 Km
C63	C58/Langata/DB Kiambu Dagoretti	Langata Road	15.5 Km

Source: Kenya National Highways Authority (KENHA) Nairobi Region, 2009.

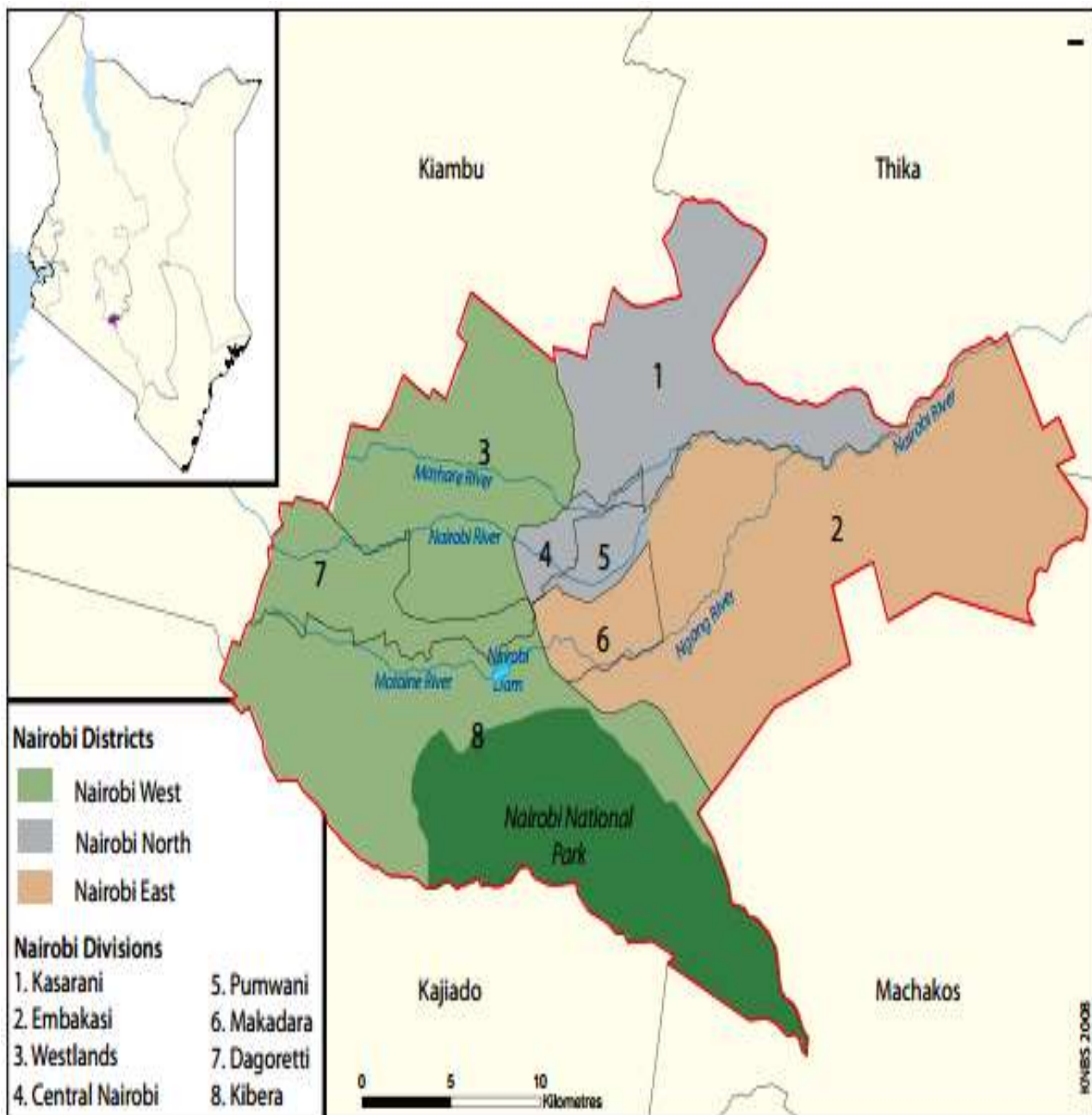


**Figure 4.1:** Map of the Nairobi metropolitan area.



Source: NCC Planning Department, 2015.

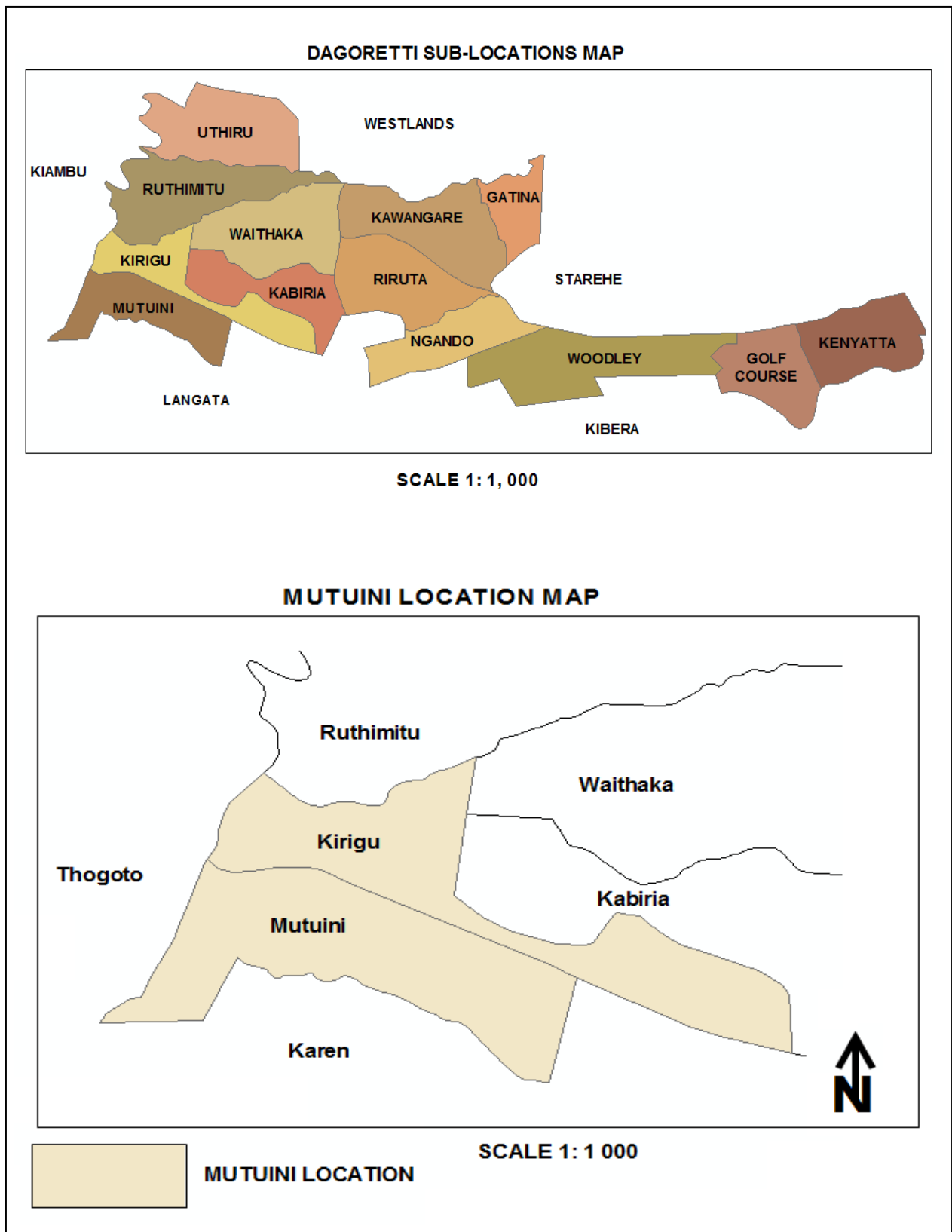
**Figure 4.2:** Map of Nairobi County showing the divisions.



Source: NCC Planning Department, 2015.

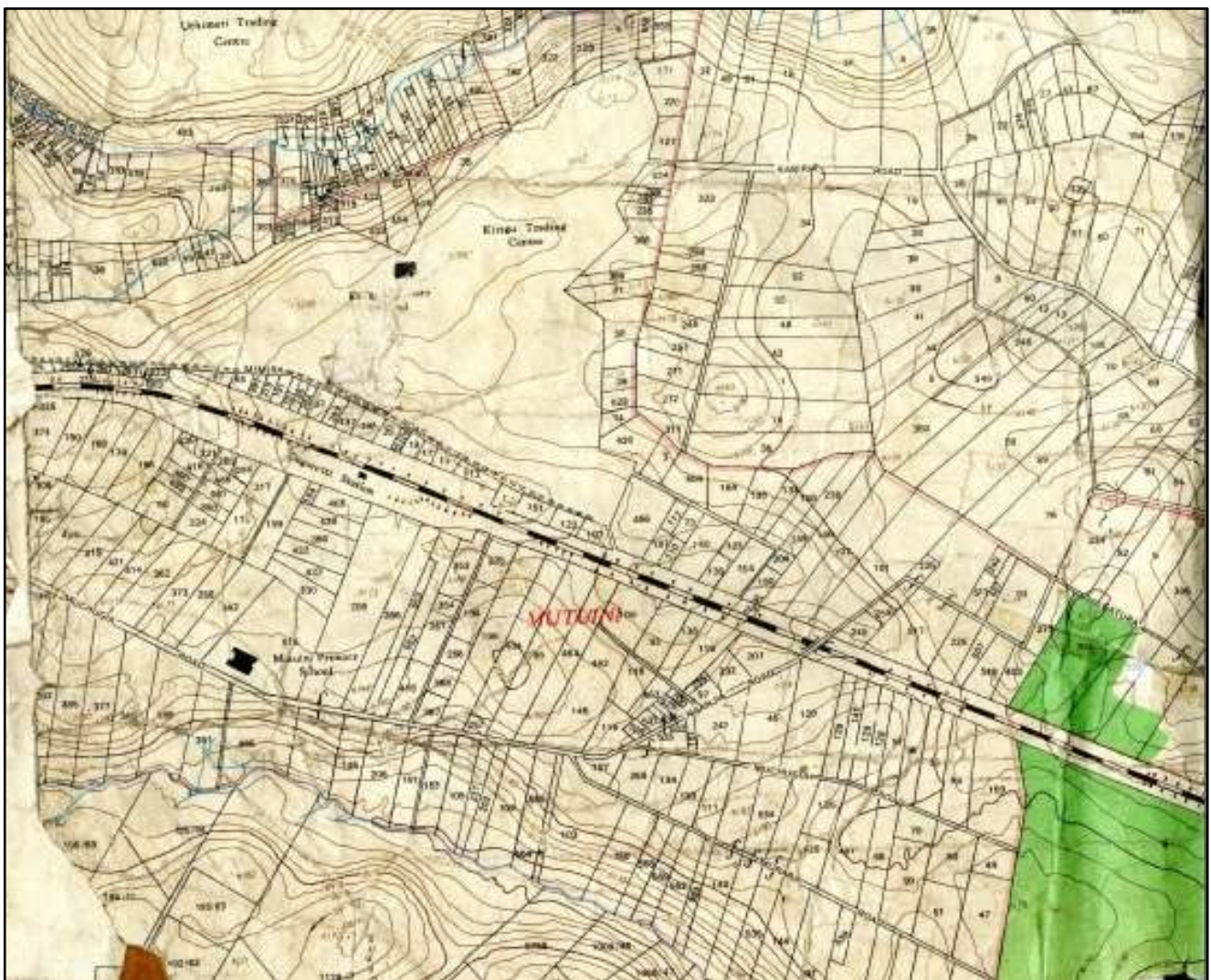
Figures 4.3 and 4.4 show the study area within the context of Nairobi and Kenya as obtained from the Survey of Kenya database, and Mutuini location's topo sheet showing Kirigu shopping centre, Ruthimitu trading centre and part of Thogoto forest respectively. Table 4.2 shows Mutuini location's planning specifications according to the Nairobi City Council.

**Figure 4.3:** The study area within the context of Dagoretti division



Source: Survey of Kenya data base, 2015.

**Figure 4.4:** Mutuini location's topo sheet



Source: Survey of Kenya data base, 2015.

**Table 4.2:** Mutuini location's planning specification by the Nairobi City Council.

Zone	Ground Coverage	Plot Ratio	Recommended Developments	Remarks
15	35	75	Agriculture/residential mixed gap flats, Maisonettes and Bungalows	The noted developments show that the area maintains agricultural character, which is steadily being replaced by high-rise buildings

Source: NCC Planning Department, 2015.

### **4.3 Physical and Natural Resources**

Mutuini is rich in fragile natural features and resources. It is near forests and wetlands, including the Ngong and Dagoretti Forests as well as the Ondiri swamp. Mutuini River forms the boundary between Mutuini and Karen locations. Most of the land has been under agriculture use for many years. The rocks in Mutuini are mainly a succession of lavas and pyroclastics of the Cainozoic age and overly the foundation of folded Precambrian schist's and gneisses of the Mozambique belt, (Oyake, et al, 2003).The crystalline rocks are rarely exposed, but occasionally their fragments are found as agglomerates derived from former Ngong volcanoes. The soils of the area are products of weathering of mainly volcanic rocks. Weathering has produced red soils that reach more than 50 feet in thickness, (Oyake, et al, 2003).

### **4.4 Climate Characteristics**

Mutuini experiences the climatic conditions that are similar to the entire Nairobi; a semi-tropical area characterized by two rainy seasons, namely, a short rainy season from November to December and a long rainy season from March to May. Air temperatures are almost constant throughout the year, at approximately 20 degrees centigrade. The average annual rain fall in the area is approximately 1,750 mm, of which more than 50 % is witnessed during the long rainy season. The mean daily temperature ranges between 12°C and 26°C. It is usually dry and cold between July and August, but hot and dry in January and February, (CBS, 2003). The mean monthly relative humidity varies between 36% and 55%, while the mean daily sunshine hours vary between 3.4 and 9.5 hours. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with drizzle.

### **4.5 Leadership and Governance**

In terms of governance, Mutuini falls under the Nairobi County. The 1977 Local Government Act was the main legal statute that governed the operations of Nairobi. Nairobi County is responsible for providing services such as health, primary education, refuse collection, water

and sanitation and fire protection services, among others to its residents. Over the years, however, its service delivery capacity has deteriorated. Plate 4.1 is a picture of Mutuini Railway Station, whose maintenance has not been done for a long time.

**Plate 4.1:** Mutuini Railway Station.



Source: Author, May 2015.

Inadequate provision of services in the area has been linked to the fact that existing facilities were not planned to cater for the numbers of people now residing in the city. This problem extends to Mutuini location. Population growth rates are high and resource bases low. Problems relating to management; the technical and institutional capacity needed to increase service coverage is lacking, hence impacting negatively on planning and foresight. Mutuini Ward County Assembly is number 17,973. The Ward Comprises Kirigu and Mutuini Sub- locations. Mutuini Ward has been represented by various Councillors. The current Member of County Assembly representing the ward is Martin Karanja.

#### **4.6 Population Growth**

Population is a major driver of developmental change in Mutuini and as such is a determinant of other parameters such as solid-waste-generation rates, land-use patterns and settlement, and water consumption. Population growth is partly explained by net migration into the area. There is also the phenomenon of diurnal migration of people from the location who commute daily into city of Nairobi for purposes of employment, education or trade. Projections are that diurnal migration will continue unless deliberate efforts are made to develop the land employ strategies to reduce the daily influx of people to the city. In order adequately to tackle these problems, however, diurnal migration first needs to be quantified and factored into the city development policies. The overall population density of Mutuini location is 8785.5 people per square Kilometre.

#### **4.7 Education**

The Government of Kenya introduced free primary education (FPE) in 2003. This was embraced well in Mutuini with the enrolment rate superseding the recommended pupil-teacher ratio (PTR) of 40:1, (Kiumi, Kibe, & Nganga, 2013). FPE was intended to broaden access to primary schooling especially among poor households. There are four primary public schools in Mutuini location namely Kirigu primary school, Mutuini primary, Gitiba primary and Dr

Muthiora primary school. Plate 3.2 is a photograph of Kirigu Primary School, which is one of the oldest schools in Mutuini location. There is also a Catholic-based education centre known as Mutuini Educational Centre as well as one special school for the mentally handicapped, known as the Waithaka School for the Mentally Handicapped. On secondary education, Mutuini high school started in 1969 as a mixed secondary school and today, it is a the boys day high school. It is still the only secondary facility in Mutuini location. Poor performances during the national examinations have characterized the schools in Mutuini over the past years.

**Plate 4.2:** Kirigu Primary School; one of the oldest schools in Mutuini location.



Source: Author, May 2015.



## 4.8 Age Structure

The population of Mutuini can be described as youthful as the proportion of children (those aged below 15 years) is 21% of the total population in 2009, (Kenya National Bureau of Standards (KNBS), 2010). A high proportion of children are always associated with dependency problems both at household and societal level as children are mostly consumers of goods and services; though in some rare circumstances they contribute significantly to domestic incomes. The youthful structure of the population causes high dependency ratios and is responsible for high unemployment rates and demands for education, housing, health, transport and other social amenities. The female/male population ratio or the sex ratio as derived from table 4.3 is about 1:1.01.

**Table 4.3:** The population statistics of Mutuini Location.

Sub-location	Male	Female	Total	Households	Area in Sq. Km.	Population Density
Mutuini	2918	2847	5765	1760	3.28	1758.1
Kirigu	6097	6111	12208	3694	1.74	7027.4
Total	8015	8958	17973	5454	5.08	8785.5

Source: Kenya Open Data, 2009.

## 4.9 The Dynamics of Land Use

### 4.9.1 Historical perspectives

Mutuini settlement developments relate much with the development of the city of Nairobi. Nairobi is the current capital city of the Republic of Kenya. It is also the largest city in the East Africa Region. Nairobi takes its name from the Maasai phrase “*Enkare*” which means “a place of cold waters”. Nairobi was originally grazing land and a livestock watering point, with no permanent African settlements. The city of Nairobi owes its early development and growth to

the Kenya-Uganda Railway (KUR) as Nairobi was first established as a transportation centre during the construction of KUR and later grew to become an administrative centre (Obudho and Aduwo, 1992). In 1900, the Nairobi Municipal Committee (NMC) regulations that were published by the Government of Kenya (GoK) defined urban centre as “the area within a radius of one and a half miles from the offices of the sub commissioner of the then Ukamba Province” , (Morgan, 1967). A small number of settlers had begun settling in the urban centre area at the time, particularly around Kabete and around Westlands.

The railway reached Nairobi in June 1899 and by July it had become the headquarters of the Kenya Uganda Railway (Rakodi, 1997). The Chief Engineer acting on the recommendation of the engineer in charge of the site selection team, Guildford Molesworth exercised powers vested in him under the Land Acquisition Act in India (1894) and obtained for use of KUR the whole plain south of Nairobi river swamp to the Ngong River. In addition, a strip of land on both sides of the KUR line, measuring 3.2 Kilometres wide was deemed to be KUR land. The designated land area came under absolute ownership and control of the railroad authorities according to the Act.

Mutuini area was within the limits of the delineated area under the ownership of the railroad authorities. The establishment of Nairobi as Kenya’s headquarters, led to its growth as a commercial and business hub of the British East Africa Protectorate (Mitullah, 2003). Early settlers of Mutuini are believed to have originated from the central province of Kenya, notably, Muranga, Nyeri and Kirinyanga. They occupied extensive chunks of land which extended to the now Karen location and up to Dagoretti Corner. Using the exchange of land and animals, these early residents acquired the land from the indigenous Dorobos. They then naturally increased in population and continued to occupy land further and in different sites.

#### ***4.9.2 Land adjudication and consolidation***

Indeed, land has historically been a major source of contention in Kenya. It was the basis for the struggle for independence and continues to feature prominently in the socio-political narratives of the country. A related issue that has continued to define the politics of the country is the process of land adjudication. Land adjudication has been defined as a process whereby existing rights in a particular parcel of land are finally and authoritatively ascertained (Dale and McLaughlin, 1988). The other key cadastral process, but which is embedded in the land adjudication process is the land transfer and mutation, i.e., the division and consolidation, (Williamson, 1997).

Land adjudication in Kenya dates back to colonial era, when the process was initiated to transform land in Trust Land areas from the customary land tenure to the statutory freehold tenure (Nyadimo E. , 2006). Following independence, the new government appointed a mission on Land Consolidation and Registration to find ways and means of accelerating land consolidation. The mission recommended that the ascertainment of land rights be carried through land adjudication, hence the birth of the process. The process is anchored in the Land Adjudication Act Chapter 284 of the Laws of Kenya.

According to the Land Adjudication Act, the process of land adjudication is initiated once the Minister of Lands has given a declaration that a Trust Land area be adjudicated. The Minister then appoints an Adjudication Officer, who is expected to steer the process. The Adjudication Officer appoints Demarcation Officers, Survey Officers and Recording Officers to help steer the process. The Adjudication Officer subdivides the target land into adjudication units in consultation with the District Commissioner of the area, appoints a panel of officers from which the Adjudication Officer can form an Arbitration Board. The Adjudication Officer, with the help of the committee, the board and other officers help to formulate the adjudication register, which contains the record of rights to the land in the adjudication section.

Anybody having a claim to the land to be adjudicated must be present to show his boundaries to the Demarcation Officers. Any person who, during the demarcation process feels that his rights have not been taken into consideration is required to lodge a complaint to the adjudication committee chaired by the Adjudication Officer. Any complaint on the decision by the Adjudication Officer can further be made to the Land Executive Officer, who will submit the complaint to the arbitration board. Any contention on the completeness or correctness of the adjudication register is referred to the Minister of Land. The Minister of Lands makes the final decision on the appeals, but, with orders from the High Court, the Minister's decisions may be challenged<sup>3</sup>. The processes of land consolidation and adjudication in Kenya were the strategic processes that brought security of tenure to lands that were reserved for and occupied by indigenous Africans.

While land adjudication is noble, it has a number of weaknesses, and has birthed hurdles that contribute to urban sprawl in Kenya. The hurdles include, inadequate resources and capacity, (Njenga, 2005), and coordination challenges, (Nyadimo, 1990), which slow the adjudication process. Further, adjudication of land, whose owner is dead, has historically been fraught with many obstacles. Since the development objectives, strategies and policies to guide Kenya's sustainable development are hinged on the National Poverty Eradication Plan, whose goal is to reduce poverty by half by the year 2015, as well as Vision 2030 that envisions Kenya as a newly industrializing middle income economy by the year 2030, the contribution of land as a factor of production and a driver of a city's or an area's dynamics of change, requires urgent attention. This is particularly essential considering the importance of land in light of the emerging dynamics in the implementation of Kenya's Constitution, 2010, like administrative boundaries in light of devolution in the country. The role that land tenure plays in exacerbating or mitigating urban sprawl cannot be overemphasized.

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<sup>3</sup> Land Adjudication Act Chapter 285 of the Laws of Kenya.

Land use and land use narratives in Kenya mainly stem from the land adjudication process that was begun in Kenya in 1965 following the appointment of the mission of Land Consolidation and Registration, (Nyadimo, 2006). Indeed, this process is a significant dynamic of change relating to growth of urban centres and their peri-urban frontiers in Kenya. This study is premised on the viewpoint that Kenya's land adjudication process, a milestone land use management tool, has had significant effects on the current land use and management practices in Mutuini location.

Before delving into the matter, however, it is pointed out that the viewpoint that conventionally divides between 'urban' and 'rural' will be transcended in this work to a new kind of territory where the 'peri-urban' is the central feature; one which is not fixed, but is in continuous flux and transition. This conception positions the peri-urban as the region where the urban structure transitions into the rural landscape so that it can be a significant territory in ways that must be looked at in the context of the wider transitioning between dense urban cores and rural hinterland. The peri-urban interface acts as a litmus test of change and transition, not just at the local interface of urban and rural, but in the shape of the whole city-region, (Cadieux, 2006).

Generally, and in this work, the process of urban expansion is not viewed only as a negative change, but also one with positive benefits, particularly for the majority of the world's population, who occupy on average, a space of 3.5 m<sup>2</sup> per person, (Hardoy, 2001). The rider, however, is that cities should make realistic plans based on envisaged population growth, (Omwenga, 2008), be it in terms of capacity for governance, investment in infrastructure or management of sensitive areas and factors of production, like land. All these apply to peri-urban areas as well, since these areas are the frontiers of cities' expansion and form the focus of this study. The challenge that exists, however, is that the current urban planning practice and development control in most cities in the developing part of the world tends to be administered by Local Government areas, thus resulting in fragmentation across these wider areas of city

influence. Policies relating to land ownership and use also tend not to be seamless between the cities and their peri-urban interface, (IBRD, 2000). This is particularly true of most cities in Africa, which calls for a more holistic approach to planning and development, (UNECA, 2010).

Land tenure has a bearing on land use and land use narratives at all rural-urban fringes, including in Mutuini location. Unfortunately, inadequate work is directed towards examining the frameworks and trajectories of land use aspirations to establish what they reveal so that it can assist in incorporating the experiences into negotiating planning paradigms for fringe urbanization. Although Mutuini area was planned during demarcation, a number of unplanned settlements still exist there. Area residents who had missed land during the land allocation exercise established villages at Njiku in 1965. At that time, most of these were tenants and squatters on nearby farms. They later moved and occupied the seemingly vacant lands because their rents had increased or the farms they worked on were being developed into residential areas.

Nevertheless, this was affected by the demolitions that took place between 1971 and 1978 by the Nairobi City Council (NCC). As Njiku's population grew, it spilled over to become a fully-fledged Njiku village. The area chief sanctioned the settlements, whose area name indicates that the area had hitherto been set aside for the expansion of the cemetery that the colonial government had established for burying Africans in the 1950s. Another settlement known as Kamwanya village was established on eight plots - six publicly owned and the other two privately owned.

During the emergency period, the colonial government removed land owners of Dagoretti and dumped them into native reserves such as Kamwanya, Njiku and Old Mutuini. After Kenya's independence, however, many residents moved back to their original homes. The

independence government resettled some of those who had been displaced, with some remaining Kamwanya. It was expected that the Government would eventually settle them permanently. This did not happen. Meanwhile the population has grown over time, partly due to incidences of eviction from other settlements. By 1990, the area was completely occupied. Threats to evict the slum dwellers have been very consistent. With the assistance of the area Member of Parliament and Councillor, eviction by the NCC has been thwarted.

Kware village is other settlement that hosts residents most of who are children of the people that missed out on land allocations after land demarcation in the 1960s. Kware started as a three-family settlement in 1969. Over the years, there has been an increase of people due to natural population increase and immigrations from other settlements. Other people joined them due to their incapacity to continue paying rent for the shelters hired in the nearby residential plots. The settlement has always been under threat of evictions, especially starting from the 1970s when there were attempts to demolish the settlement by the NCC. Since then, there have been many attempts to evict them, mainly by the local administration.

In Kandutu village, the initial settlers occupied a bigger space than they do today. With time, however, they have been squeezed by the local administration into the land they currently occupy. Like most other settlements in Dagoretti area, the first residents on the land were those that missed the process of land allocation that occurred after independence. They were settled there on the premise that they would be allocated some land elsewhere by the government. The NCC demolished Kandutu village on many occasions in the 1970s. All demolition exercises were followed by restriction on house repairs and expansion. The residents petitioned the current Member of Parliament in 1993 for protection. They remain fearful of eviction to date since they do not have security of tenure.

In Kirigu village, the residents were initially tenants within Kirigu sub-location. When they could not afford the rents, they appealed to the local administration to settle them. The first settlers on the land were allowed to build by the then District Officer in the late 1960s. In 1971, the area Councillor allowed more people to settle. Residents of Kanguku village, like many other Dagoretti settlements, trace their history to the people who missed the land allocation during the demarcation process that followed Kenya's independence. The settlement has not experienced any eviction threats. The last evictions were witnessed in the 1970s when Margaret Kenyatta was Mayor of Nairobi.

It was expected that the Government would eventually settle them permanently. This however did not happen. Meanwhile the population has grown over time. The land occupied by the villages include freehold land ,uncommitted state land , land planned for public utility, private land, regularized land, NCC land and group owned land. All these categories of land have varying tenure systems; however, the overall land management process in the area is handled by the provincial administration through chiefs. Other stake holders in the land management process in the area include clan elders, self help groups and welfare groups.

#### ***4.9.3 Current land use patterns***

The present land use patterns in Mutuini are predominantly residentially oriented with practices of agricultural farming in between. In most cases the two land uses are seen side by side. To serve this populace, several commercial enterprises have risen, especially in Kirigu village and in the Dagoretti market area. Small residential subdivisions commonly referred to as 'jackrabbit subdivisions' are common in the area. Signs of isolated horticultural activity are evident in the area. On the availability of land in the area, due to high demand for the commodity, it is not common to find vacant land held in anticipation for future capital gains. On the other hand, there is high concentration of residential settlements in form of villages with some villages forming 'slum like' settlements. At the extreme end of the location are jua kali industrial sheds



in the residential area. Figure 4.3 shows Mutuini's competing land uses of farming and residential in the area.

**Plate 4.3:** Competing land uses in Mutuini location.



Source: Author, May 2015.

#### ***4.9.4 Current commuting patterns***

A wind shield survey indicates that a total number of 218 *matatus* ply into the area on a daily basis to the city centre, with each taking an average of 7 trips daily at the peak hours of 6.00 am to 8.30 pm and 4.30 pm to 6.30 pm, (Kenya National Bureau of Standards (KNBS), 2010).

At those times the *matatu* operate at full capacity 14 passengers on bound all to and from city

centre in the morning and in the evening respectively. This works to a total no of 3052 passengers commuting at peak hours daily to and fro Nairobi city centre by *matatu*. There are also a high number of people who uses *boda boda* to and from Dagoretti market where most goods of higher order are available. The commuter train is also used by many commuters heading to kibera and the city centre. Plate 4.4 shows residents of Mutuini boarding the commuter train to the City Centre

**Plate 4.4:** Residents of Mutuini board the commuter train to Nairobi City Centre.



Source: Author, May 2015.

The Southern by-pass is also a key feature that characterizes Mutuini location. Plate 4.5 shows a section of the Southern-Bypass road's construction through Mutuini, while Figure 4.5 shows Nairobi City's urban concession.

**Plate 4.5:** Southern-Bypass construction through Mutuini.

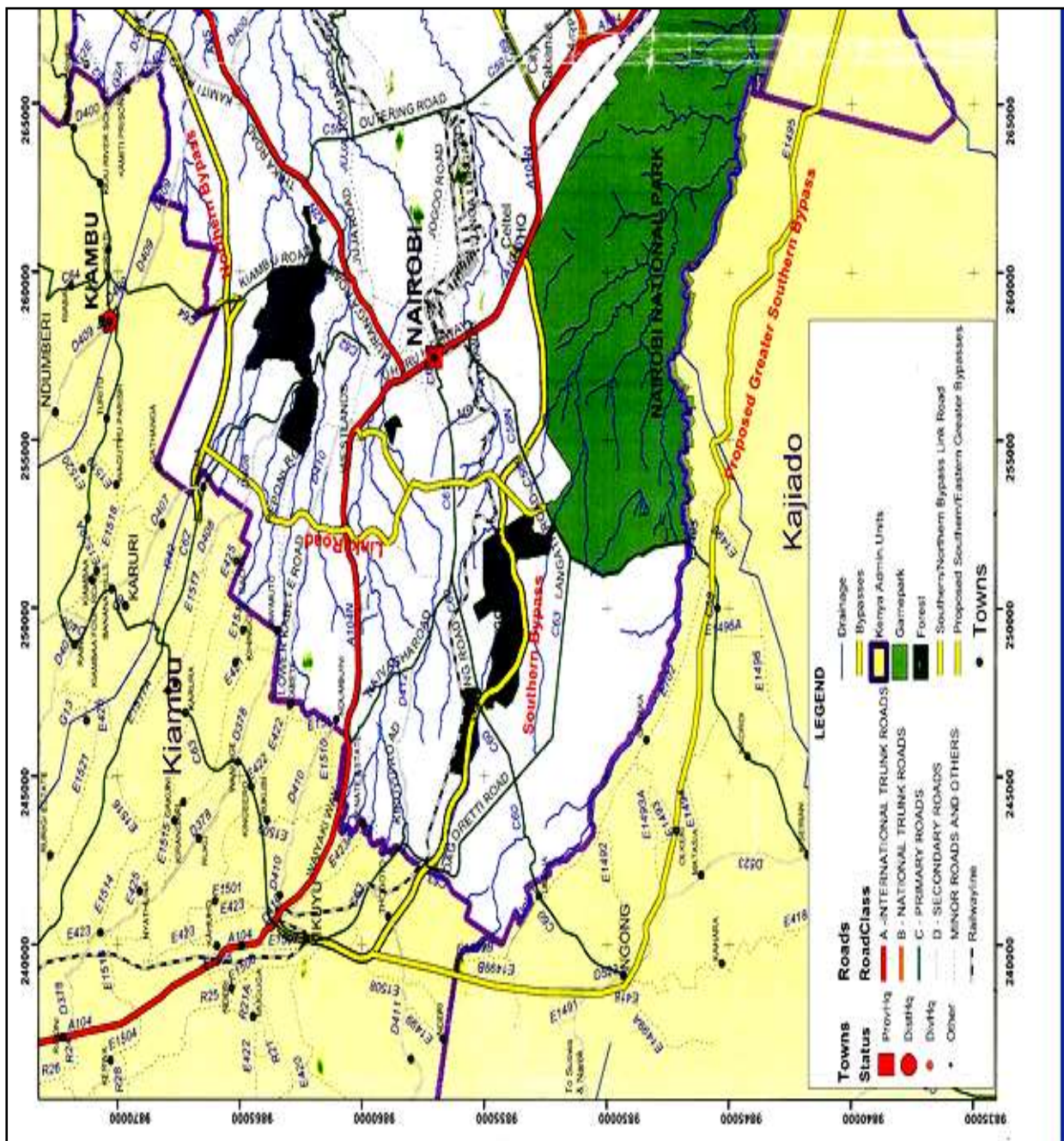


Source: Author, 2015.

The Southern-Bypass connects from Mombasa road near Ole Sereni hotel and runs along the Nairobi National Park fence across Langata Road into Kikuyu township to join the Nairobi-Nakuru highway at Rironi, Limuru. By-passes are meant to divert traffic from the city centre and help reduce heavy congestion. The construction also aims at providing Nairobi with an essential corridor for fast transit traffic, hence facilitating quick diversion movement of the urban traffic and improve Nairobi Metropolitan Area's road network. It also ensures that there are many exits and entries into Nairobi while long distance vehicle do not necessarily come to the city. The Chinese are undertaking the construction of the Southern by-pass, including the

building of interchanges, flyovers, box culverts, and standard pipe culverts for a period of 36 months. The bypass cuts across Mutuini location from the interchange at Dagoretti road C63 through Mutuini to the Ngong road interchange .The road is to the south of the railway line and has been viewed by Mutuini location residents as a gateway to their economic prosperity.

**Figure 4.5:** The southern by-pass through Mutuini location.



Source: NCC Planning Department, 2015.

## **CHAPTER FIVE: FINDINGS AND DISCUSSIONS**

### **5.1 Introduction**

This chapter presents the results and discussion on how land use management in Mutuini has been practiced with the aim of meeting the area's material, social, and cultural needs. Sub-section 5.2 highlights the ways in which residents of Mutuini have been modifying land resources, often with detrimental impacts on the environment and human-beings. Sub-section 5.3 discusses the biophysical conditions that influence land use in the area, while sub-section 5.4 examines the societal factors operating on various spatial and temporal levels, and acting in intricate webs of place- and time-specific relationships to influence land use in Mutuini. Sub-section 5.5 highlights the effects of the current land-use management practices in Mutuini, including effects of the prevailing trends in physical developments, energy source management, state of mobility and travel, state of road infrastructure, state of water and sanitation, the prevailing farming practices as well as the institutional environments. Sub-section 5.6 concludes the chapter with the implications of the effects of the land use management practices pointed out in sub-section 5.5.

### **5.2 Ways in which Residents of Mutuini have been Modifying Land Resources**

#### ***5.2.1 Agriculture***

The economic base in Mutuini for a long time has been dominated by small scale subsistence agricultural activities. Farming in Mutuini can be looked at in terms of 'peri-urban agriculture'. Peri-urban agriculture can be defined as rural production on the perimeter of cities and towns, (Woods, 2009). The development of urban communities requires some of the agricultural land surrounding settlements to change its land use away from farming to housing. Increasing fringe development around Mutuini has resulted in losses of farms that had been responsible for the

production of potatoes, vegetables, etc. Nonetheless, a number of farming practices have been adopted by residents of Mutuini. These are illustrated in plates 5.1 to 5.10.

Farming in Mutuini is still carried out in small scale levels for commercial and for subsistence purposes at approximately 53% and 47% respectively. The farming activities include both livestock rearing and crop growing. The pie charts below shows the type of plants grown and animals reared in the region. Figures 5.1 to 5.3 show the types of agricultural activities in Mutuini, the crops that are mainly grown in the area and the types of livestock kept in the area, respectively, while plate 5.11 shows mixed crop farming in Mutuini.

**Plate 5.1:** Mixed crop farming in Mutuini location.



Source: Author, May 2015.

**Plate 5.2:** Pig Rearing in Mutuini Location.



Source: Author, May 2015.

**Plate 5.3:** Land tilling using hoes in Mutuini location.



Source: Author, May 2015.

**Plate 5.4:** Maize farming in Mutuini location.



Source: Author, May 2015.

**Plate 5.5:** Horticulture activities in Mutuini location.



Source: Author, May 2015.



**Plate 5.6:** Kale farming in terraces in Mutuini location.



Source: Author, May 2014.

**Plate 5.7:** Banana farming in Mutuini location.



Source: Author, May 2015.

**Plate 5.8:** Zero grazing in Mutuini location.



Source: Author, May 2015.

**Plate 5.9:** Poultry keeping in Mutuini location.



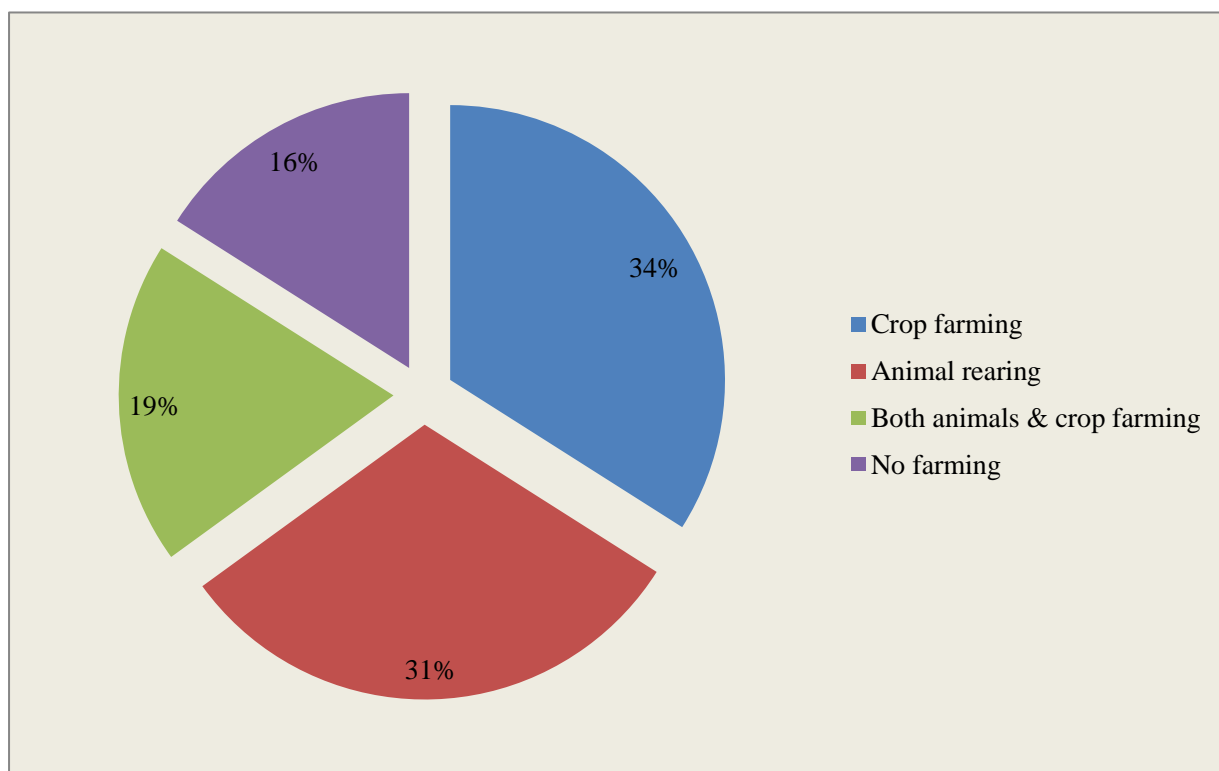
Source: Author, May 2015.

**Plate 5.10:** Napier grass farming in Mutuini location.



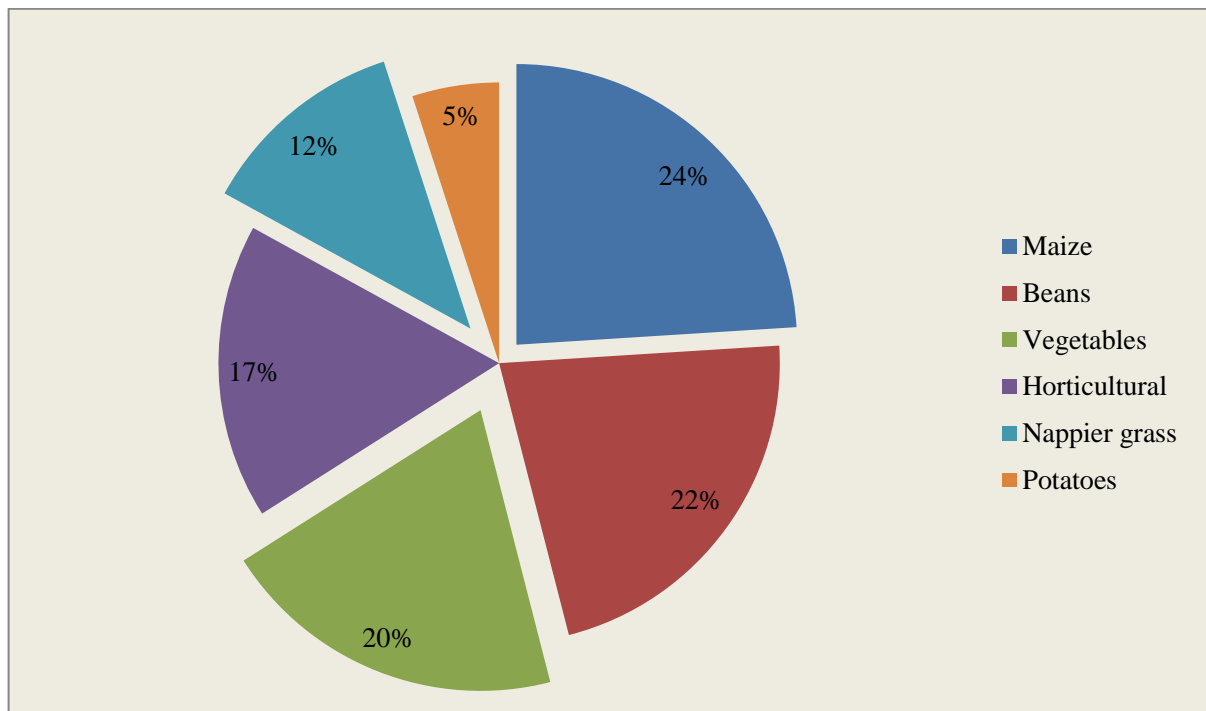
Source: Author, May 2015.

**Figure 5.1:** Agricultural activities in Mutuini location.



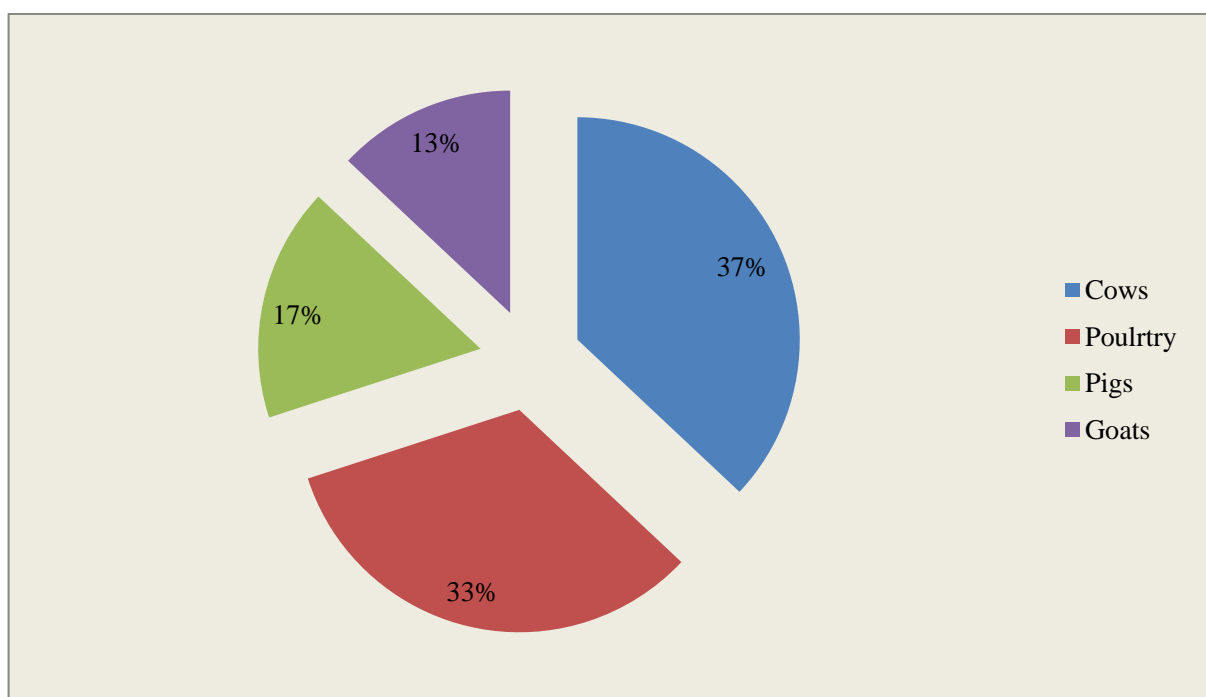
Source: Author, May 2015.

**Figure 5.2:** Crops that are mainly grown in Mutuini location.



Source: Author, May 2015.

**Figure 5.3:** Types of livestock reared in Mutuini location.



Source: Author, May 2015.

Furthermore, Mutuini has been faced with two broadly-based changes in its weather that have affected its agriculture, especially crop farming. The first is the quantity and timing of rainfall. The other is temperature. Both factors affect agriculture, but not necessarily in the same way since though higher carbon dioxide (CO<sub>2</sub>), concentrations are linked to global climate effects, the relative effects on crops depends on other supporting circumstances. For example, while higher CO<sub>2</sub> levels may result in higher yields for crops, *ceteris paribus*, concurrent high heat and low moisture rates may interfere with germination or fruiting in unpredictable ways, thus supporting rapid growth, for example with little or no fruit.

The apparent great variations in temperature and rainfall have in turn affected many variables that influence agricultural productivity, including seed germination rates, the presence or absence of beneficial or harmful insects, the effectiveness of soil treatment, etc. Together, these influences have affected agricultural productivity and the type of agriculture that is extant in the area. Furthermore, changes in rainfall patterns have resulted in higher erosion levels and net decrease in agricultural activity. The reduction in farm sizes due to significant increases in the area's population due to migratory or permanent basis, has limited diversification of farm crops. This has perpetuated pests and fungus infiltration of crops in the area. These changes have however not been factored into the land use management of the area, thus forcing many people that used to earn livelihoods from the farms to delve in poverty and its impacts. Plate 5.11 is a picture of one of the farms in Mutuini – depicting dwindling productivity.

**Plate 5.11:** Section of a farm in Mutuini planted with corn whose productivity is decreasing.



Source: Author, May 2015.

### ***5.2.2 Commerce and Industry***

Access to infrastructure such as electricity, space, roads, etc by commercial and industry facilities in Mutuini is limited. Businesses in Mutuini, including small-scale businesses, like barber shops and salons depend on electricity for their operation. Only a few of these have stand-by small diesel, petrol or paraffin fuelled generators. Roadside businesses involving frying of *mandazi* and chips extensively use biomass. During the reduced runoff scenarios in Kenya, electricity costs increase tremendously. Reduction in the forest cover has resulted in curtailment of logging and restricted burning of charcoal. Effects of these have been slow downs in the area's commerce and industry sector. The attendant consequences of these have

been reduced household incomes that have pushed many into extreme poverty and unemployment. These conditions are associated with poor land use management, (Turner, et al., 1995), which is characteristic of Mutuini. Plate 5.12 is a photograph of a roadside kiosk in Mutuini, depicting the dominant infrastructure state of small-scale businesses in the area as well as use of biomass and its attendant smoke production that pollutes the environment, while Plates 5.13 and 5.14 are pictures of emerging improvements in business units in Mutuini.

**Plate 5.12:** A typical roadside kiosk in Mutuini location.



Source: Author, May 2015.

**Plate 5.13:** Emerging improved business units in Mutuini location.



Source: Author, May 2015.

A number of improvements to the physical infrastructure of Mutuini location were observed during the study. They include renovation of shops, rehabilitation of roads, etc. The proliferation of unplanned settlements, which is rampant in the area, especially due to subdivisions owing to inheritance have increased the influx of people into the area, which has been cited to increase markets for various goods and services. This has been cited as the reason for high incidences of infrastructure improvement, especially within the informal settlements.



The problem with this is that when people get used to this state, they will tend to resist any land-use plans that may be brought forward.

**Plate 5.14:** Kirigu shopping centre facelift.



Source: Author, May 2015.

### ***5.2.3 Residence***

Mutuini was found by this study to be in flux, gradually urbanizing as more of its agriculture gives way to the mushrooming of informal settlements for rent to the increasing immigrant workers in neighbouring businesses or in Nairobi. Since most of the area's population is gravitating towards Nairobi City, we may call this transformation as suburbanization rather than urbanization. This concept depicts what was found in Mutuini – new urban immigrants seeking to reside where house costs are low – in the suburbs. At the same time, Mutuini was found to be

home to a society that is aging – empty nesters that have raised their children and are now approaching retirement age or are in retirement, and have adequate wealth and income from investments to afford an urban lifestyle. A rail system passes through Mutuini and accommodates the high rate of low earning resident immigrants in the area. Plate 5.15 is a photograph of residents of Mutuini struggling to board, an already full commuter train.

**Plate 5.15:** Commuter train from Mutuini.



Source: Author, May 2015.

### **5.3 Biophysical Factors Influencing Land Use Management in Mutuini**

#### ***5.3.1 The local climate and weather***

As canvassed in Chapter 4, Mutuini is a semi-tropical area that experiences two rainy seasons, namely, short rainy seasons from November to December and a long rainy season from March to May every year. The ambient temperatures are usually approximately 20°C, and constant throughout the year. Average rainfall is normally about 1,750 mm, 50% of which is experienced during the long rain seasons. Mean daily temperatures range between 12°C and 26°C. July and August are the dry and cold months, while January and February are wet and hot. The mean monthly relative humidity varies between 36% and 55%, while the mean daily sunshine hours vary between 3.4 and 9.5 hours. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with drizzle. Climatic shifts have however lately been witnessed.

The climatic changes in this context are not the most commonly thought of as emblematic of global change – such as dramatic expansions of deserts. Rather, this study focused on fairly subtle changes in the climate – changes that can easily result from periodic anomalies in weather patterns, regardless of their fundamental cause, but which can also be recognized as symptomatic of major changes in underlying weather patterns in coming years. Again, the intention of this discussion is not to address the best case or worst case scenarios, where opinions are easily formed and defended. Rather, it is intentioned to stay within the limits where the future remains the most intractable. This is because, the best debates, as will be inspired by this discussion, occur when one can reasonably discuss both pro and con in a single conversation. At root, it was found that adaptation to the climatic shifts depended upon the sum of individual economic decisions by members of the area. This is in agreement with observations by Marx (2001). These individual decisions are further influenced by societal factors as has been highlighted in sub-section 5.4.

### ***5.3.2 Topography, bedrock and soil type***

As alluded to in Chapter 4, Mutuini is rich in fragile natural features and resources. It is near forests and wetlands, is endowed with the Ondiri swamp and Mutuini River that forms the boundary between the Mutuini location and the Karen location of Langata division. The rocks in the Mutuini area mainly comprise of a succession of lavas and pyroclastics of the Cainozoic age and overlying the foundation of folded Precambrian schist's and gneisses of the Mozambique belt, (Oyake, Njenga, & Koech, 2003). These rocks are rarely exposed, but occasionally their fragments are found as agglomerates derived from former Ngong volcanoes. The soils of the area are products of weathering of mainly volcanic rocks. Weathering has produced red soils that reach more than 50 feet in thickness, (Oyake, Njenga, & Koech, 2003). These factors have made the community that lives in the area very unwelcoming to any possibilities of selling their land to developers. This is because the area's topography, bedrock and soil types, coupled with its proximity to Nairobi City Centre make the area very lucrative for both residential purposes as well as growing of vegetables for sale to Nairobi residents. This reality uniquely influences land use management in the area.

### ***5.3.3 Water supply and sanitation***

Mutuini area has a perennial water supply problem that has its roots in the original service provider, namely, the Nairobi City Council, which later privatized water supply services to Nairobi Water and Sewerage Company (NWSC) with the objective of improving water supply and management. Most of the area's households suffer from lack of piped water supply. Water vendors charge more than the tariff paid by those who are connected to the NWSC water supply. NWSC was officially launched on 19 August 2004 and operates as a private sector enterprise with an autonomous board of directors. Privatization of the water services appears to have come as an additional burden on the poor residents of Mutuini since most of the bills charged to the residents cannot be verified as the water taps are always dry without water

provision from the NWSC. In response to this challenge, a community based organization has emerged to fill the void in water access to water services by establishing a communal water supply system from a borehole drilled near the Dagoretti railway station. This provides water to some of the residents in Mutuini.

Another area of concern in urban infrastructure is usually the provision of sanitary facilities, especially refuse collection and sewage disposal. As the population increases, so does the amount of waste that is generated and needs to be managed. Despite paying rates to Nairobi City Council and its successor, Nairobi County, solid waste disposal is a perpetual problem in Mutuini. Pit latrines (on-site sanitation) are what are used in almost the entire location of Mutuini location. Sanitation in Mutuini settlements or households is very basic. It mainly consists of earth drains, communal water points (wells) most of which are inadequately maintained. One pit latrine is shared by as many as over 20 people, including members of a homestead and business people that have rented shops near the particular homestead.

The situation is deplorable in the informal settlements of Mutuini. This is occasioned particularly by the illegal status of the settlements since they are not officially recognized by the Government, NWSC has no mandate to provide water and sanitation services to the area. Plate 5.16 shows how dumping starts on a small scale in Mutuini and later becomes a major concern while plate 5.17 shows the construction of drainage systems along the Dagoretti–Karen road at Dagoretti Market.

**Plate 5.16:** Dumping by the roadside in Mutuini.



Source: Author, May 2015.

**Plate 5.17:** Drainage system under construction in Mutuini.



Source: Author, May 2015.

Plate 5.18 is an example of a homestead that has sunk a water borehole to enhance its access to water resources without having to depend on the Nairobi Water and Sewerage Company.

**Plate 5.18:** Borehole water system in a homestead in Mutuini.



Source: Author, May 2015.

Mutuini is well served with both surface and ground water. This is because of its location – near forests and wetlands. The Ondiri swamp and Mutuini River provide constant surface water, while boreholes have been sunk in various homesteads to provide water from under-ground. The sinking of boreholes has especially been occasioned by inconsistencies in supply of tap water by the Nairobi Water and Sewerage Company, which is mandated to provide water services to residents of Nairobi. The borehole system is operated both manually and by use of

electricity. The hybrid manual/electricity system is inspired by the fact that electricity is also not reliable in the area. What is characteristically lacking in the area deliberate approaches to tap rain water for use either in farming or in households.

#### ***5.3.4 Management of physical development***

Plates 5.19 and 5.20 are pictures of Mutuini location highlighting the consequences of unplanned physical development due to the area's apparent neglect by the Nairobi County Government.

**Plate 5.19:** A section of one of the informal settlements in Mutuini location.



Source: Author, May 2015.



**Plate 5.20:** Outlay of residential houses and a close-by cemetery in Mutuini location.



Source: Author, May 2015.

Keeble (1969) explains physical development as the carrying out of building, engineering, mining or other operations in, on, over or under land or the making of any material or substantial change in the use of any building or land. Physical development entails carrying out any operation on or modification to land by mankind in an attempt to create a liveable and comfortable environment. The ultimate objective of physical development is to sustain the improvement in the well-being of individuals as well as bestow benefits on all. Physical development manifests itself in the forms of human activities or land uses in a given area. The dynamic and integrative nature of Mutuini location, which just like other peri-urban areas is evidently characterized by rapid growth and development in physical amenities that generally appear unregulated, has been a major constraint in outlining its physical development or land

use pattern. Although this is reported to be a characteristic of all peri-urban areas, (Johnson, 1974), Mutuini's incidence of unauthorized developments, spatial unit zone and non-contiguous developments and land use changes are catastrophic. The mushrooming of informal settlements is phenomenal. This due to limited influence from the Nairobi County Government (formerly Nairobi City Council) and pronounced land use management by the residents.

It is reported that on several occasions, the City Council of Nairobi has attempted to evict people from the informally established settlements, but such efforts are always met by strong resistance, confrontations and injury to people as well as destruction of property. This state of uncertainty regarding physical infrastructure in the area has resulted in perpetual panic over eviction, and hindered efforts aimed at properly developing the area by the residents.

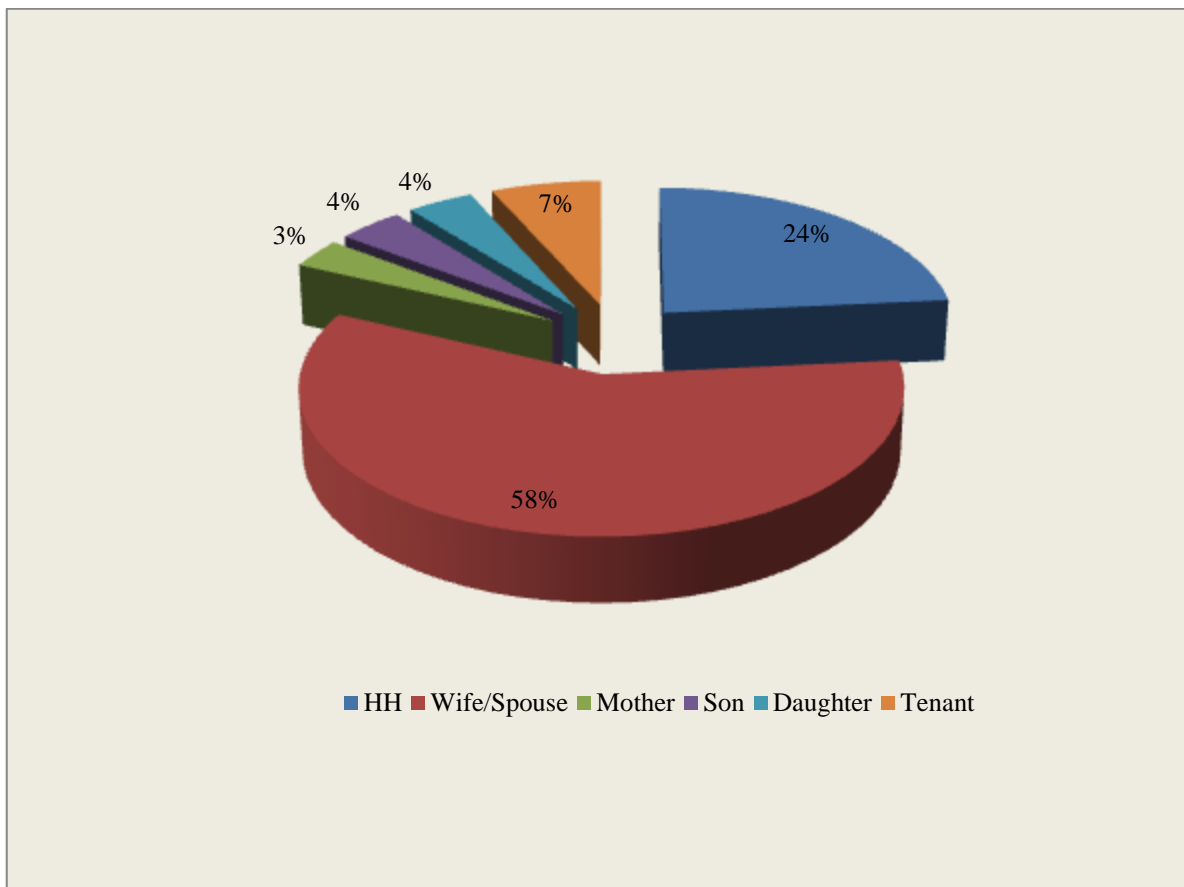
### ***5.3.5 Gender roles***

385 household respondents representing about 2.14% of the reported area's population of 17973; 8015 male and 8958 female, (Kenya National Bureau of Standards (KNBS), 2010), were interviewed during the study. 250 of the respondents were women while 135 were male; representing 65% female and 35% male, respectively. Participation of women was established to have been more than that of men because of the gender roles that are characteristic of the area. In Mutuini, women are often at home during morning hours as most of them undertake household chores and farming-related tasks during that time. On the other hand, men usually go to Dagoretti Slaughter House, where they engage in meat-related businesses, or to their small-scale businesses that characterize the area.

It was established during the study that women often leave their homes during the afternoon, when they attend to activities such as merry-go-rounds, church activities, etc. Most of the men that engage in the meat-slaughter businesses were reported to often stay away from home until evening.

It was based on this context that the study was purposely conducted during morning hours. The consequence of this was a sizeable participation of females as household respondents compared to their male counterparts, as illustrated by figure 5.4. The figure shows that only 24% of the respondents were household heads (HH) – men, while 58%, 3%, 4% and 7% were wives, mothers, sons, daughters and tenants, respectively. This shows that land use in the area is appreciably influenced by women. As the area still has widespread agrarian characteristics, Hans, et al (2006) have reported that female-led agrarian and land use practices are likely to result in basic grain production and less on other progressive land-use practices, like real estate. They also report that women-led agrarian practices also pursue more labour intensive options, despite Rattan and Stewart's (2013) link of labour-saving technologies to specific kinds of land cover conservation. Hans et al (2006) further note that absence of family members, including through migration, have strong influence on the respective family's land management and labour use. These observations appear to be true with regard to the peculiarity in land use management in Mutuini, as has been established by this study.

**Figure 5.4:** Segregation of respondents that participated in the study.

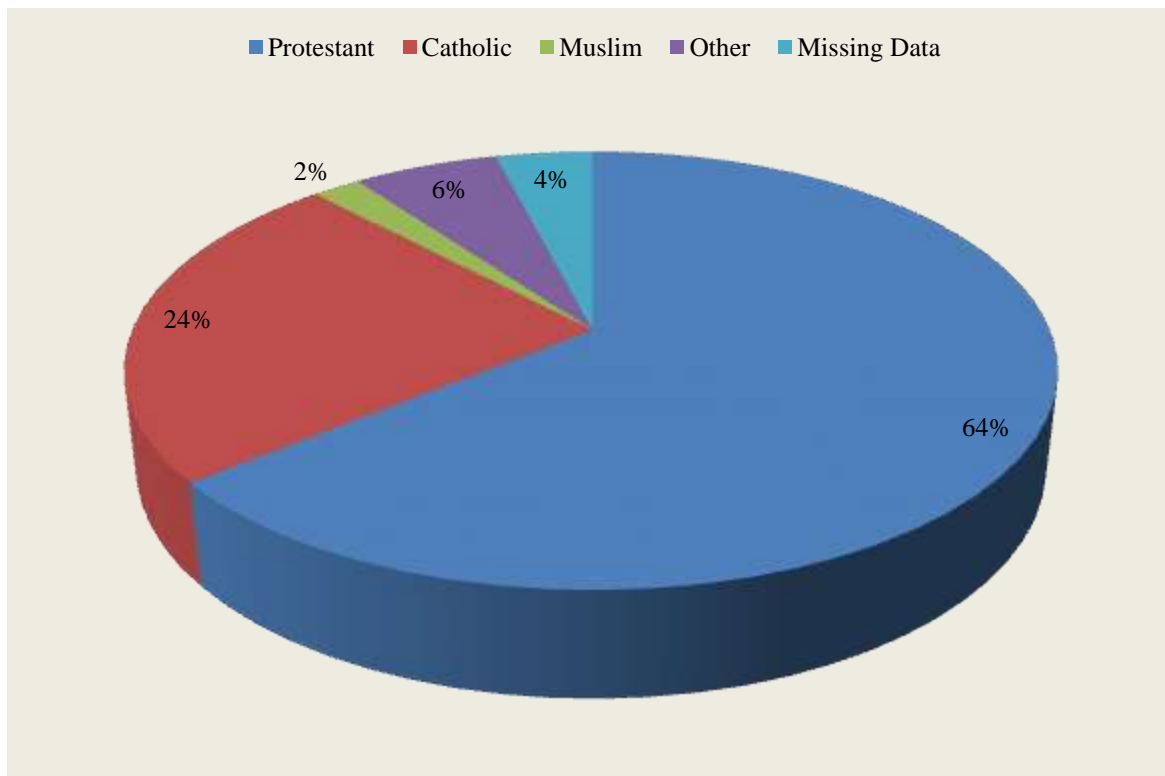


Source: Author, May 2015.

### **5.3.6 Religion**

Undertaking particular land use management practices is a function of attitudes, (Rattan and Stewart, 2013). Religion has been reported to influence people's attitudes, (McDaniel, et al., 2011). Figure 5.5 shows the religion of the respondents that participated in this study, while Plate 5.9 is a picture of the Mutuini PCEA Church. 64% of the respondents were Protestants, 24% Catholic, 4% did not respond to the question, opting not to participate in the study with regard to the question on religion, 2% were Muslim, while 6% were other religions, including indigenous ones, such as the Akurino.

**Figure 5.5:** Respondents' religion.



Source: Author, May 2015.

Mutuini is therefore predominantly Christian. The mode of land use associated with Christianity has been reported as that which is favored by God, (Catherine, 2009). A Christian has the Godly role of maintaining ecological balance and sustainability, and ensuring food to all in the long run, (Ogutu, 1998). This means, for example, he or she would not be satisfied with effluent flowing out of his or her farm to contaminate his or her neighbor's farm. Furthermore, a Christian is responsible for improving his or her land. This can be done by carrying out agrarian activities that would improve the structure and productivity of the soil, such as addition of organic matter, growing deep rooted leguminous plants, and minimization of soil compaction with heavy machinery. As noted by Ogutu (1998), when soil is well aerated, it is easier for water to infiltrate and root penetration to take place. Addition of nutrients also becomes

possible, hence enhancing plant growth and crop cover. Plate 5.21 is a photograph of Mutuini PCEA Church.

**Plate 5.21:** The Mutuini PCEA Church.



Source: Author, May 2015.

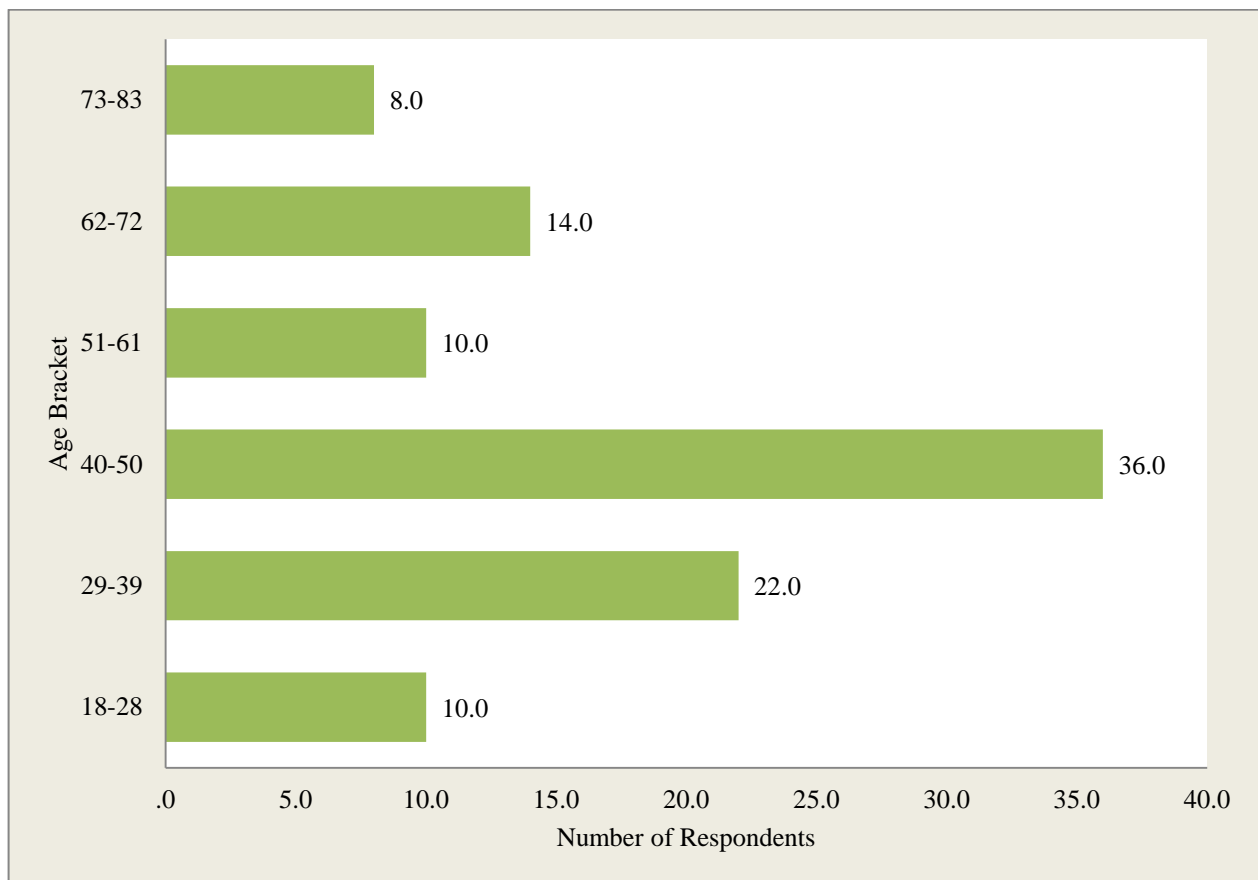
This consequently minimizes the impact of raindrops on the ground, since when raindrops hit bare ground; they do so with great force that eventually makes the pore spaces in the soil to be clogged, making water run-off the soil surface leading to soil erosion and insufficient water for the growing plants. A good crop cover also shades weeds to minimize crop-weed competition for moisture, sunlight, space and nutrients, (Foth, 1984) and hence increases yields. The religious inclination of Mutuini, therefore influences the area's peculiar land use management practices. Furthermore, a link between unplanned developments and protestant-ship appears to be emerging, and can also be witnessed in Mutuini. The reason for this appears to be life pressures that the concerned people grapple with, including lack of education, poverty,

unemployment, seclusion, etc, which makes them seek relief through spiritual encouragement. The challenge, however, is that the churches seldom design appropriate programs aimed at facilitating their adherents to improve their economic conditions.

### 5.3.7 Age

As illustrated by figure 5.6, majority of the respondents (36%) were of ages between 40 and 50.

**Figure 5.6:** Age ranges of respondents.



Source: Author, May 2015.

This highlights the stability of the findings of this study. Studies on attitude stability have indicated greater stability among the attitudes of older respondents, which has been reconciled with a finding that older respondents are open to change – though through exposure to experiences that induce attitude change, (Tyler and Schuller, 1991). The next largest age

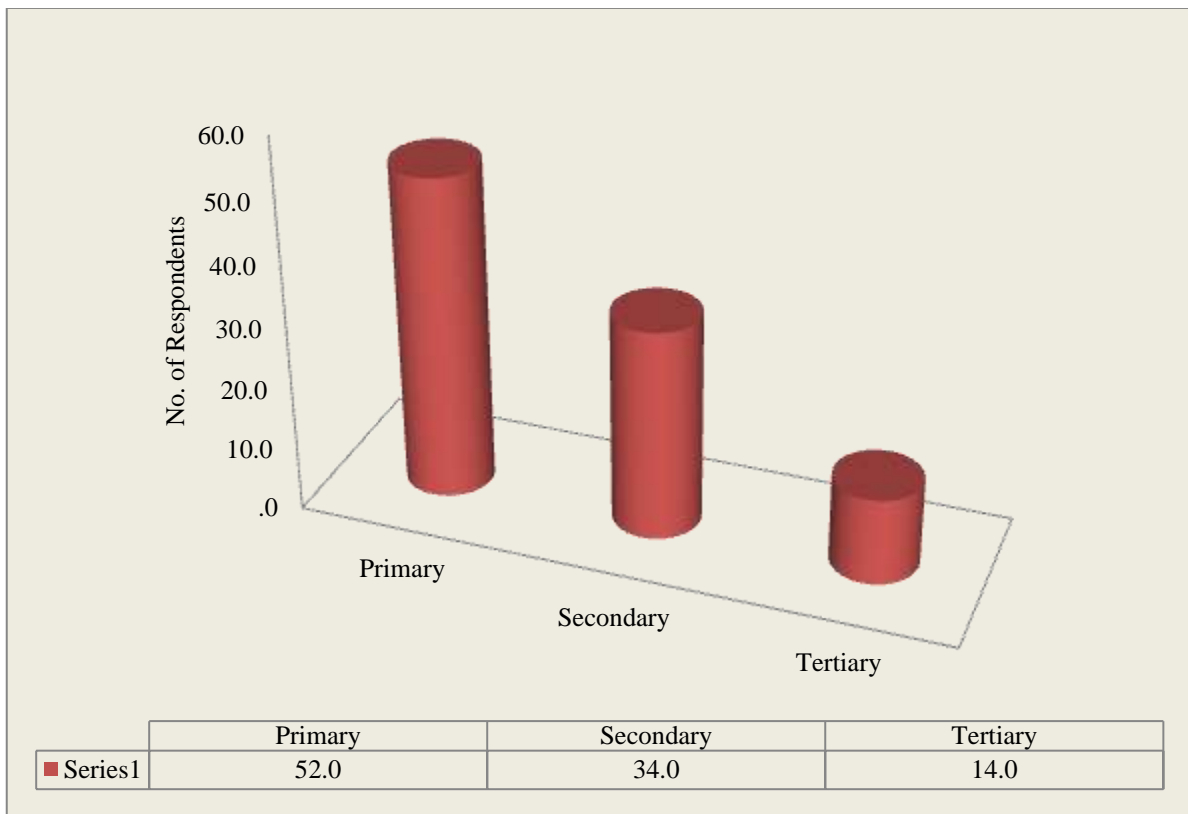
bracket interviewed comprised of those aged between 29 and 39, at 22%. Reconciling this with the finding that majority of the respondents were women, this finding shows the high rate of unemployment among people, especially women of employable ages, in Mutuini location. Unemployment has been reported to lead to poor health and health behaviors, (Nicholas, et al., 2013), which negatively impact on an area's land use management practices. The unemployed people degrade the environment through clearing of vegetation to develop make-shift houses and kiosks, as well as use fuel sources that pollute the environment due to their affordability.

### ***5.3.8 Educational Attainment***

Increase in the level of education of a person reduces the possibility of causing environmental degradation, (Nzunda, et al., 2013). This is because such a person is usually exposed to the knowledge on the wise use of resources, including agricultural practices, and will tend to practice more environmental-friendly land use practices. Figure 5.7 shows the level of education in Mutuini as represented by the respondents that participated in the study. It shows that 52% of the respondents were primary school leavers or drop-outs. This has bearing on the land use management practices in Mutuini. The attendant peculiar land management practices can be associated to the migration of more educated and affluent members of the area to reside in other areas, such as Ngong, Kiserian, etc. This leaves only a handful of residents that have attained tertiary level of education. Indeed, only 14% of the respondents had attended tertiary learning institutions, including universities, colleges and skills training courses. A study by Nzunda et al (2013) established that when only a few educated people reside in a place, land use management practices result in extensive environmental degradation and land tenure challenges.



**Figure 5.7:** Highest education attainment of respondents.



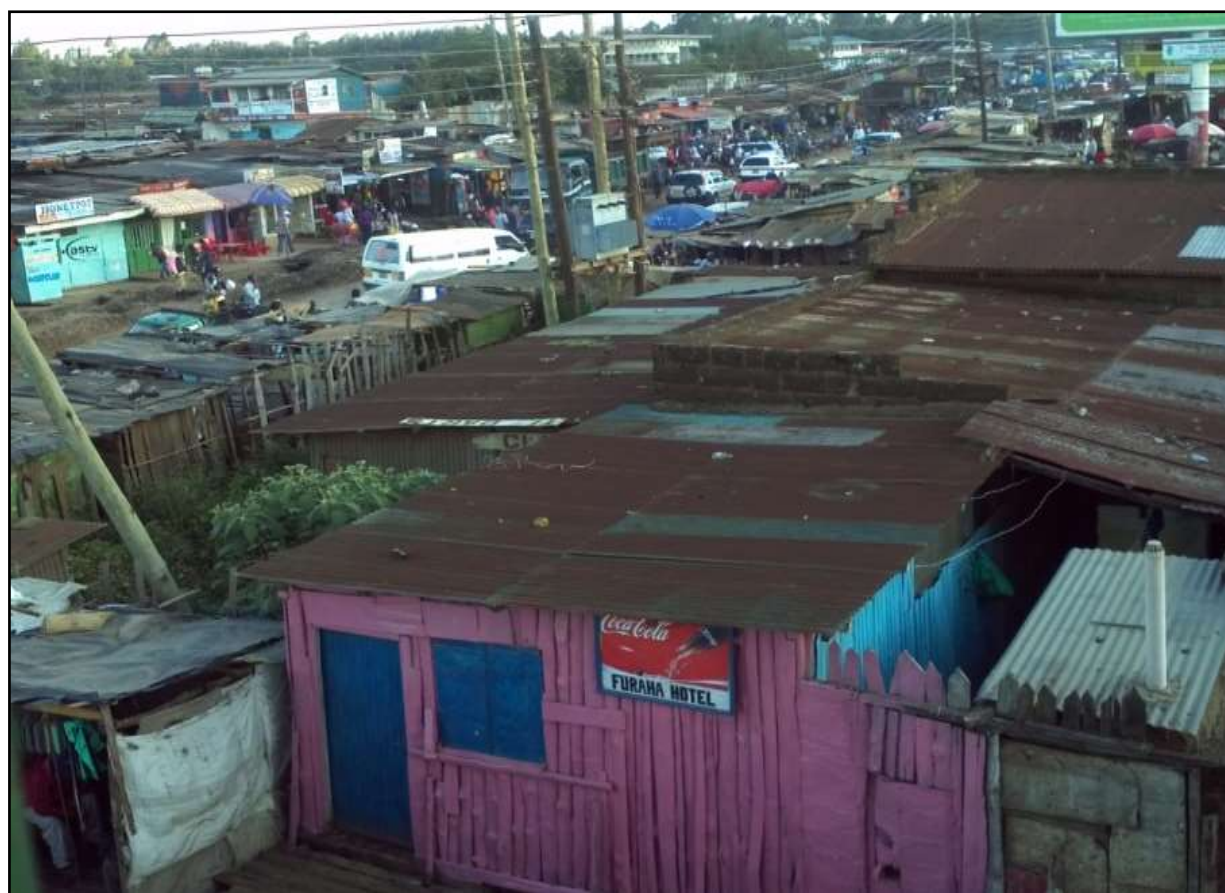
Source: Author, May 2015.

### 5.3.9 Values

Values, especially relating to engendering of approaches by the respondents became one of the topical issues to consider for the analysis as gender has recently been considered an overture to all social and economic development endeavours. Gender is a way of assessing women vis-à-vis men in terms of participation in global development efforts aimed at reducing poverty. Narrowing this global conceptualization to Mutuini location, it was identified that women have done well in providing shelter to accommodate their families. The gender dynamics of the study area are depicted by the finding that 68 percent as against 32 percent of the businesses surveyed was owned by women and men respectively. In fact, it was stressed during the study that at present, women form the backbone of the Mutuini economy. An inquiry into the occupational background of residents of the area gave a true reflection of the

economy of the area as agriculture and small scale enterprises. The contribution of teachers, traders and civil servants was also significant in the area's economy. Plate 5.22 shows a section of Dagoretti Market, where many of Mutuini location residents engage in micro enterprises or get their business supplies.

**Plate 5.22:** Picture of a section of Dagoretti Market, Nairobi, Kenya.



Source: Author, May 2015.

Further to the question relating to values, the study sought to understand how the area residents viewed corruption, especially regarding to the devolved government funds. Residents were concerned about the rate of corruption witnessed in the country, but were upbeat about the utilization of funds by the Dagoretti Constituency Development Fund. They cited the successful construction of a health facility in the area through the CDF, noting that the facility would be

critical in handling health challenges that had hitherto been handled by private health local clinics, and have a positive bearing to Mutuini's development characteristics. Plate 5.23 is a photograph of the Mutuini health facility constructed using CDF funds.

**Plate 5.23:** A newly constructed health facility in Mutuini location.



Source: Author, May 2015.

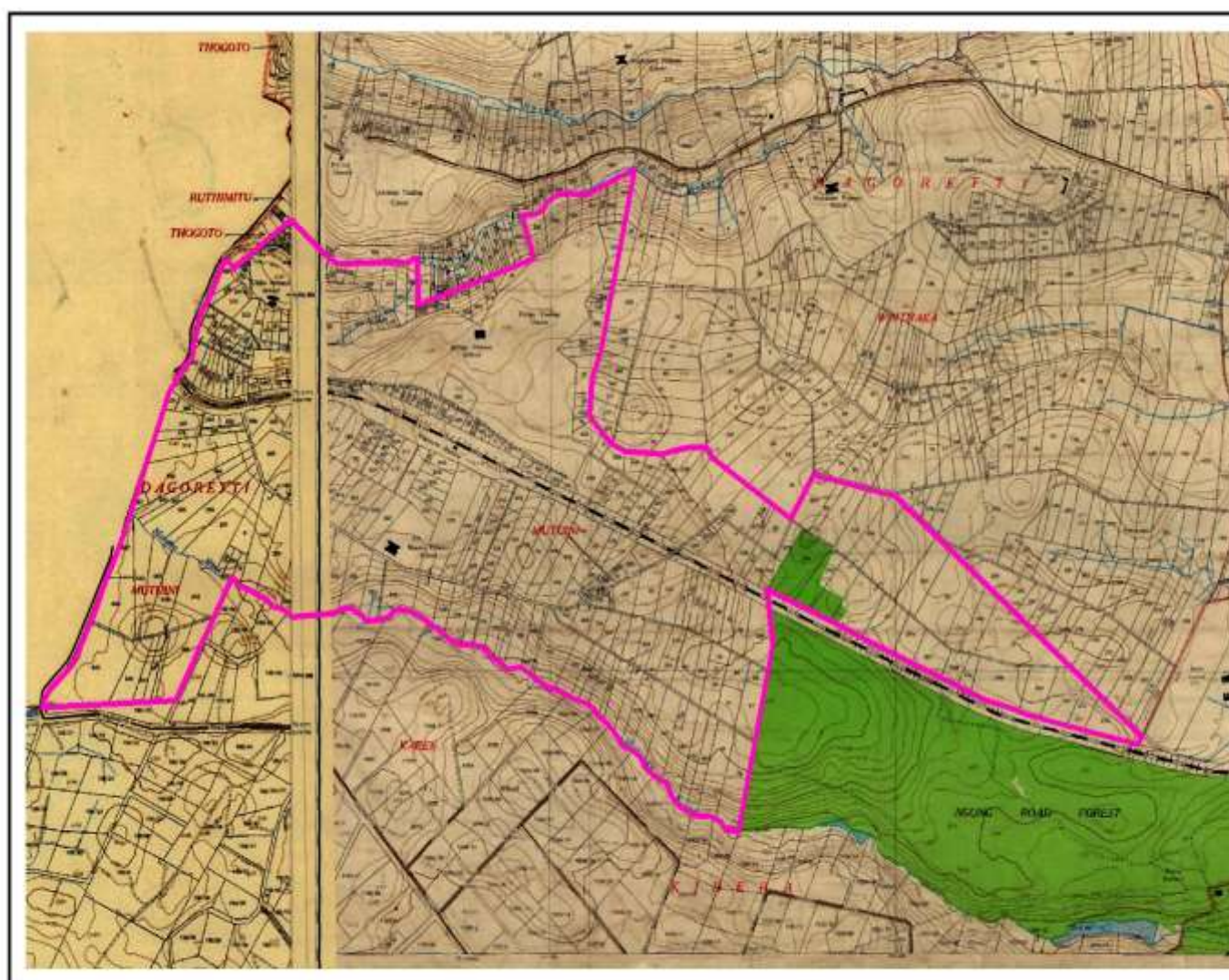
## **5.4 Societal Factors Influencing Land Use Management in Mutuini**

### **5.4.1 Land subdivision**

Land in Mutuini is under freehold ownership the area was zoned as an agricultural area with a restriction of land subdivision up to a minimum of 0.1 ha. Currently it has not been attracting many though its proximity to the city of Nairobi is approximately 11 kilometres. There has not been restriction on its land use. Land subdivision in Mutuini has been slow and has necessitated by three factors; inheritance, facilitating development or sale. Approximately 70 percent of the

total subdivisions done are for the purpose of inheritance, 25 percent for sale and 5 percent for facilitating development. According to the lands board secretary and community perception, sale of land is rampant among the younger people who have inherited land. Plate 5.24 is a map sheet of Mutuini location, with the plots on the left side representing township, while the others represent the farms. Subdivision is being carried out in only one sub-location of Mutuini location, where there are farms because the township plots cannot be subdivided further as they are sized 0.1ha. Figure 5.8 shows the extent of land subdivision in Mutuini location.

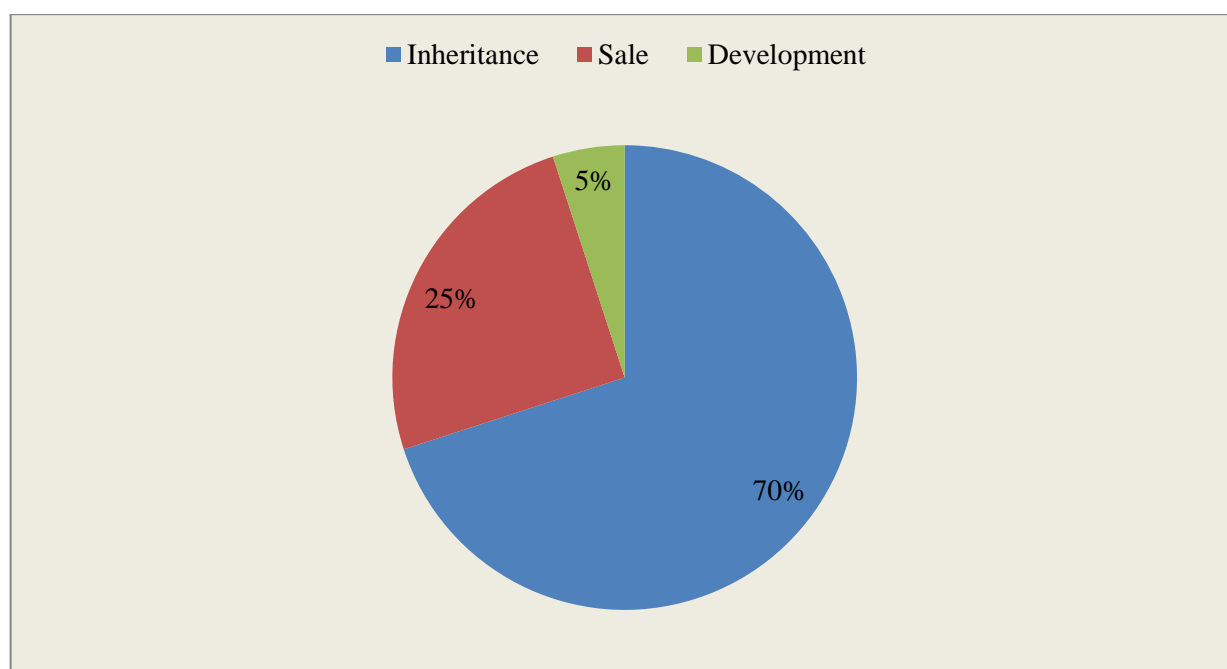
**Plate 5.24:** Boundary of Mutuini location demarcating planning area.



Source: Ministry of Lands, May 2015.

The shapes, sizes and orientation of plots that are resulting after subdivision are uneconomical and constrained to fit some of the designs that architects can provide. Strips of land are dominant in the area mainly done during the time of inheritance of land with a notion that it must front the road and river (the lower part of it) as a way of showing fairness. For instance there are plots that measure 20m by 100m. Such plots are still being subdivided further. This leads to uneconomic plots of various sizes for both development and agricultural purpose; a characteristic of urban sprawl. Poor provision of a wide and up to standard accessibility of the properties has been the result. This puts the area at risk from disasters, such as fire outbreaks and inability to access quick security and medical response.

**Figure 5.8:** The state of land subdivision in Mutuini location.



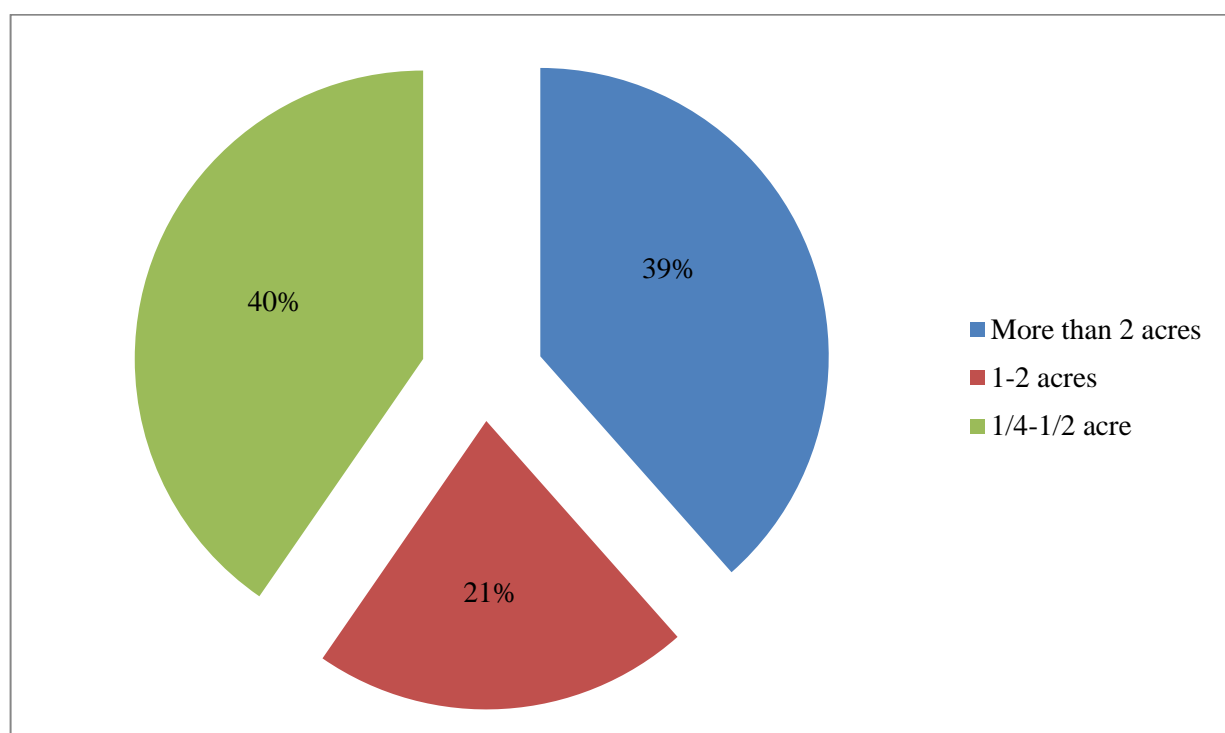
Source: Author, May 2015.

From figure 5.8, 70% of the subdivisions carried out in Mutuini location are for inheritance purposes, 25% for sale; while a mere 5% is for development. This trend enhances unplanned settlements in the area and denies it of the impetus required for the area's development. Being a

factor of production, for the area to develop, increasingly more land resources should be availed for development purposes. Increased subdivisions also reduce the amount of land available for meaningful economic activity, especially in the farmlands.

This negates the intentions of the land-use planning that had part of Mutuini location designated as township, while the other was farmlands. The subdivisions have resulted in the escalation of unplanned settlements in the areas that had hitherto been planned as farmlands. This has negatively affected access to fresh foods, especially vegetables that were being produced from the farmlands for use, the surplus of which was sold off to the township area to earn income for the households. Figure 5.9 shows the average acreage size currently owned by the residents of Mutuini location.

**Figure 5.9:** The average land ownership in acreage in Mutuini location.



Source: Author, May 2015.

#### **5.4.1.1 Main actors in the control of land subdivision in Mutuini**

There are two main actors that control of land sub division in Mutuini. These are the planning department Nairobi County and Dagoretti land board.

- (a) City planning department: application for permission to sub divide land is done by a developer through a registered planner to the city planning department. The city planning department requires a submission of the subdivision drawing together with PPA1 forms. The plan circulates to the relevant offices within the county authority for them to give recommendations.
- (b) Dagoretti land board: the land board is chaired by the district Officer (government representative) and members include the various village elders. The land board is mandated to give consent for subdivision of agricultural land.

#### ***5.4.1.2 Reasons behind poor land subdivision***

Three key factors were given for the poor subdivision of land. These are:

- (a) **Poor administration both at the county level and at the land board:** The board is lacking the relevant professionals to advise on matters of land subdivision. For instance the district planner and surveyor about to be members of the land board. The process of approvals has been quite tedious in the former regime at the city council offices.
- (b) **Lack of planning interventions in the area:** There are no existing plans and development guidelines to control development in Mutuini.
- (c) **The traditional and community belief:** there is a notion among the community that for equal ad fair subdivision of land for inheritance by sons, land must be subdivided in a way that everybody benefits from all the advantages of the land. The advantages are the road and the river (or if not river they assume that the lower parts are more fertile). This has resulted into long strips of land that are uneconomical. There is also the notion from the land owners that the beneficiaries (the children) will sell land to strangers after subdivision.

About 83% of residential houses in Mutuini are mainly single-iron sheet, timber or stone houses. Other types of houses identified during the study were Bungalows (2%) and maisonettes (15%). Bungalows are low houses with broad front porches. They either have no upper floors or upper rooms set in the roofs. Maisonettes are apartments that occupy two or more floors of a larger building and often have their own entrance from outside. Reasons for fewer bungalows in the area include poor security, land ownership challenges, small spaces (which the owners prefer for their own residence at the same time develop some rooms to earn rents), poverty, inaccessible roads, etc. Lack of bungalows is an indicator of migration of affluent members of the community to other areas. Maisonettes are mainly occupied by the middle class from the community as well as tenants from other tribes. Majority of these work as teachers in nearby schools or have business enterprises in Mutuini or its neighbourhood. Though Mutuini seems to lack permanent housing typologies a case of apartments have been identified at the boarder of Mutuini and Karen location though situated at Mutuini as depicted in plate 5.25.



**Pate 5.25:** Apartments in Mutuini bordering Karen



Source: Author, May 2015.

#### ***5.4.2 Energy source management***

Energy is essential to economic and social development as well as improved quality of life, (Ryan & Campbell, 2012). It is needed for cooking, heating and lighting of households, power for industry and transportation. Households, commerce and industry in Mutuini use a combination of fuel sources, including firewood, paraffin, candles, charcoal, liquid petroleum gas (LPG) and electricity. Firewood, charcoal, paraffin and LPG were the energy sources that are used for cooking. Firewood and charcoal accounted for 52% of the energy sources for cooking while paraffin accounted for 37%. LPG only accounted for 11% of the energy sources

for cooking. On lighting, despite the black-outs that were reported to be frequent, electricity accounts for 57% of the energy source for lighting. Plate 5.26 shows the electricity transmission line network in Mutuini.

**Plate 5.26:** Electricity transmission lines.

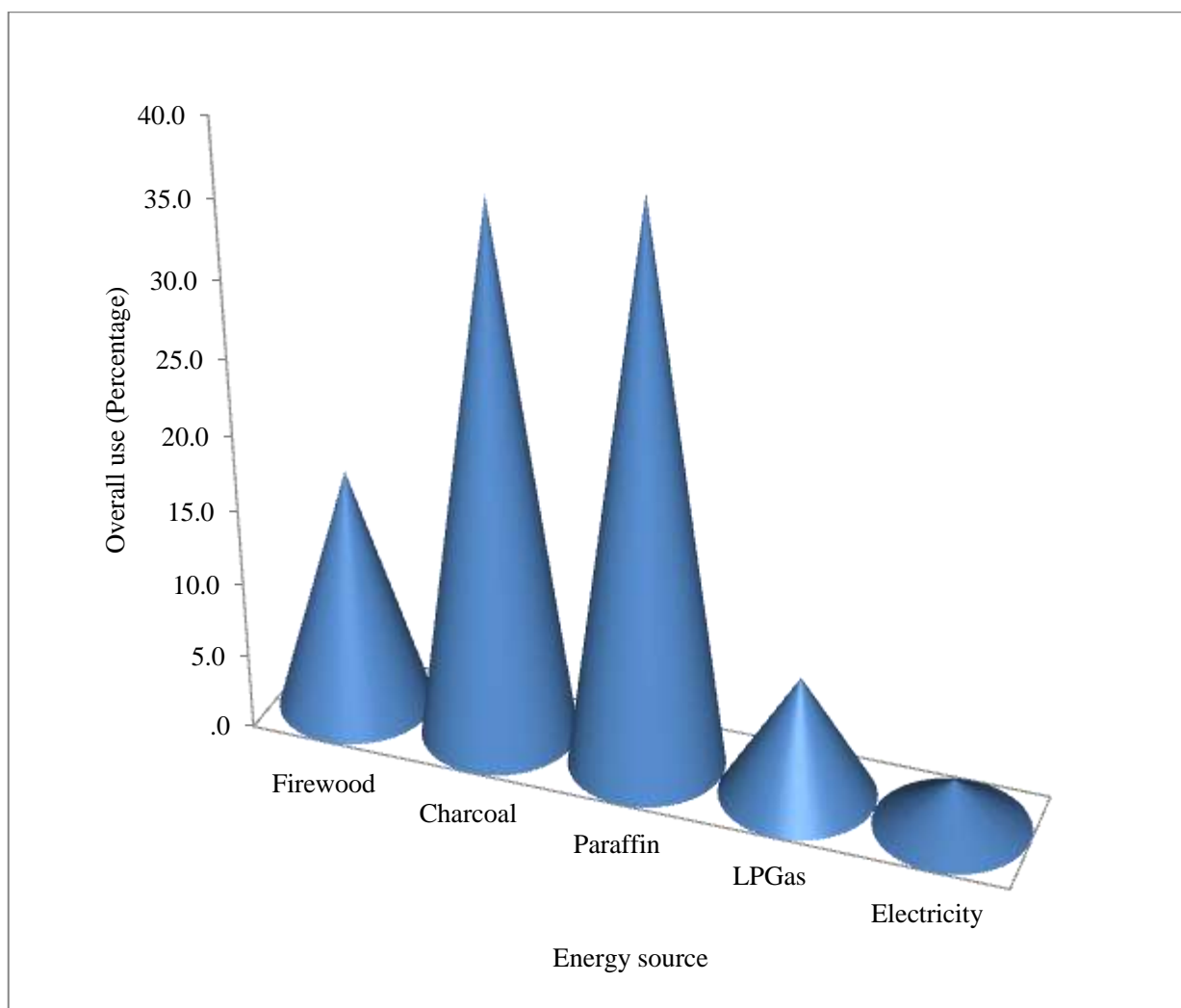


Source: Author, May 2015.

Candles are used when black-outs are experienced by households that rely on electricity for lighting, and account for 11% of the energy sources for lighting. Candles are also used by some churches during their services. Paraffin lanterns (*kanyitira*) are used by households that are not connected to electricity; accounting for 32% of energy sources for lighting. On heating, affluent members of the Mutuini community reported using electric heaters, while majority of the residents were found to use charcoal. The factors that determine choice of a particular energy

source depend on its relative price and the appliances that are required. Income levels, the availability of the fuel source and the relevant appliances on the market, as well as the cultural persuasions also have great bearing on the choice of fuel source. Figure 5.10 shows the general extent of fuel source use in Mutuini location. Overall, there is extensive use of non-renewable energy sources, namely firewood (16%), charcoal (36%) and paraffin (37%). Together, these fuel sources account for 89% of the energy requirements of the location.

**Figure 5.10:** Appetite for various energy sources in Mutuini location.



Source: Author, May 2015.

Appetite especially for charcoal and firewood in the area can be associated with the inadequate tree population in the area as is reflected in plate 5.27.

**Plate 5.27:** Inadequate afforestation in Mutuini.(part of Njiku cemetery)



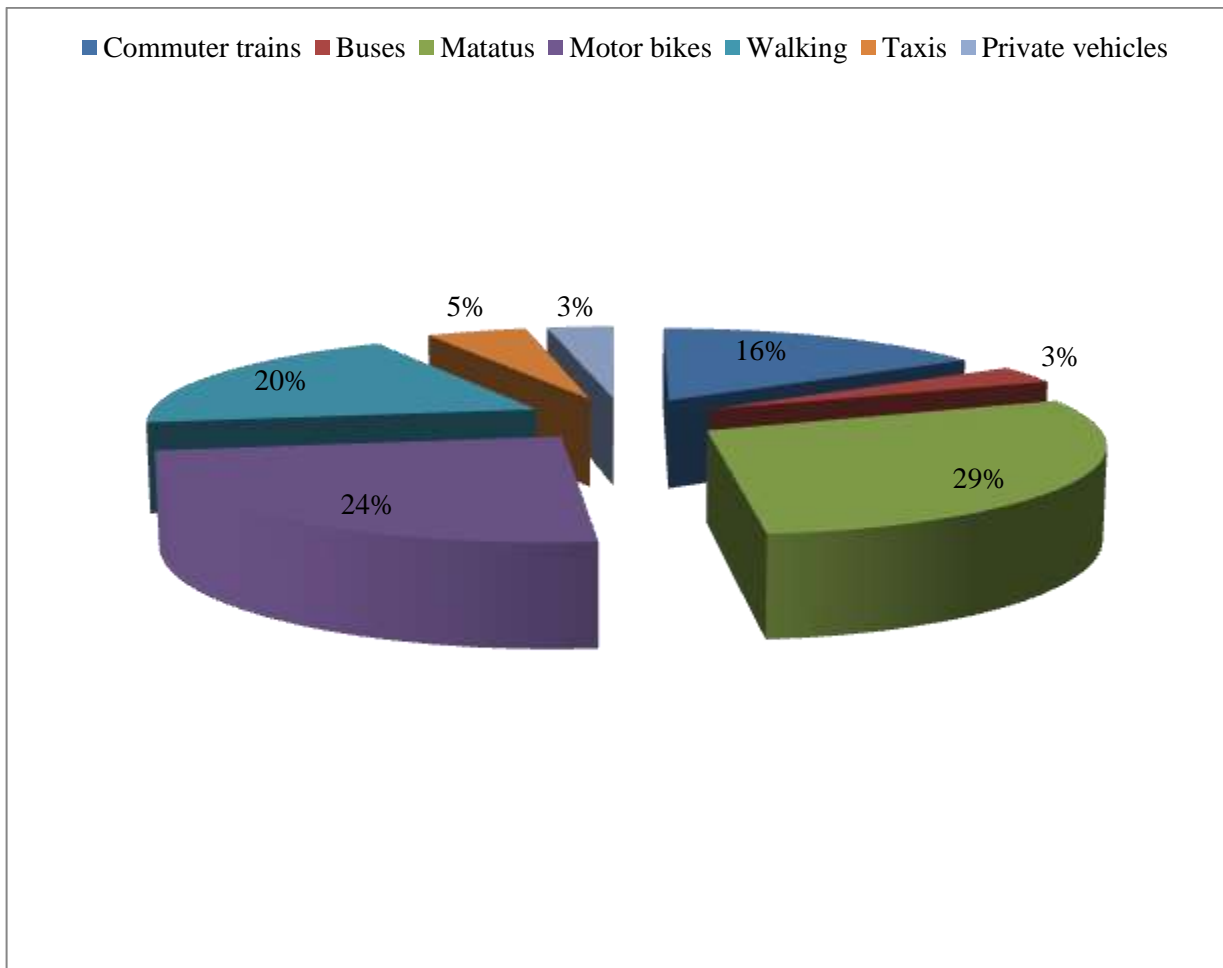
Source: Author, May 2015.

#### ***5.4.3 Mobility and travel***

Dealing with urban mobility must be considered as an economic, social and environmental priority. Phenomena like traffic jams, pollution and inadequate pedestrian facilities and cycle lanes represent real setbacks to the productive capacity of any economy, hence affecting all segments of society. In Mutuini, this study established, as indicated in figure 5.11 that five

categories of transport, namely, private vehicles, buses, *matatus* (minibuses), commuter trains and taxis are the most used.

**Figure 5.11** Modes of transport and mobility in Mutuini location.



Source: Author, May 2015.

Some non-motorized forms of transport, such as donkey-pulled carts, handcarts (*mkokoteni*), walking and cycling were also been reported to be mobility and transport forms that should not be ignored. For the majority of the population, however, the only practical alternative to walking or use of public transport was reported to be the use of motor bikes. This was linked to the state of the roads in Mutuini, majority of which are narrow and not all-weather. This was indicated by some respondents as one of the reasons why many people migrate from Mutuini

area to other places, where the road networks are less limiting. Non-motorized forms of transport like bicycles were said to serve dual purposes of providing means of transport as well as livelihood support when used as commodities of trade or for facilitating service occupations such as deliveries. Plates 5.28 to 5.33 show some of the forms of mobility and travel within Mutuini location.

**Plate 5.28:** Walking, bicycle and motorbike transport in Mutuini.



Source: Author, May 2015.

**Plate 5.29:** Walking in Mutuini.



Source: Author, May 2015.

**Plate 5.30:** Motorbikes waiting for customers in Mutuini.



Source: Author, May 2015.

**Plate 5.31:** Donkey-pulled cart in Mutuini.



Source: Author, May 2015.

**Plate 5.32:** *Matatus* in Mutuini.



Source: Author, May 2015.



**Plate 5.33:** Commuter train from Mutuini.



Source: Author, May 2015.

#### ***5.4.4 Road infrastructure***

The transport sector is an important pillar of economic growth and development of any economy. A sound road network enables efficient mobility of people, goods and services, and facilitates trade between different regions. A good road network also attracts investors in an area as well as an influx of residents to an area. In Mutuini, the road network is poor and inadequately maintained. Plates 5.34, 5.35 and 5.36 show the state of roads within Mutuini.

**Plate 5.34:** State of Mutuini roads 1.



Source: Author, May 2015.

**Plate 5.35:** State of Mutuini roads 2.



Source: Author, May 2015.

**Plate 5.36:** State of Mutuini Roads 3.



Source: Author, May 2015.

Most of the access roads range between 3m to 6m. They are too narrow for both provision of pedestrian and vehicle passage. In addition 6m which is the official size of the street is not sufficient to pass infrastructure and services. The surfaces of the streets are rough and dusty during the dry season and muddy during the wet seasons. The streets are long (over 100m, narrow and are characterized by dead ends). They form a highly disconnected streets pattern. This has reduced the level of mobility and accessibility to different points of the residential area. According to physical planning handbook, such dead end streets should be provided with a cul de sac and should not exceed 60m long. Streets in Mutuini are not named. There has been no intervention on lighting the streets in Mutuini. This has resulted to low street orientation and insecure to users at night.

#### ***5.4.5 Infrastructure design principles***

##### ***(a) Nodes***

The junction at Dagoretti Market to Kirigu forms a node which has generated more functions and human interactions. The node is currently being used as a matatu, bodaboda terminus and gives a good view for placing billboards. Hawking activities are also observed. Plate 5.36 captures the Dagoretti Market-Kirigu node.

The commercial centre has no planned parking space. The most suitable area that could have been utilized for parking is the space in front of the shops. Unfortunately this has been taken over by the Jua Kali sector (vehicle garages and metal works). This has become an issue since there is more added need for parking space with the rapid expansion the streets are also not lighted. Plate 5.37 shows the haphazard parking of vehicles in front of businesses in Mutuini.

**Plate 5.37:** Junction to Kirigu.



Source: Author, May 2015.

**Plate 5.38:** Haphazard *matatu* parking in Mutuini.



Source: Author, May 2015.

***(b) Functions interactions***

The conflicting land use between the retail shops and jua kali and parking was observed. The jua kali (motor garages) have located themselves access space next to the shops hence blocking passage of pedestrians and vehicles passages. There are driving forces behind the increase of business in the area are the presence of a threshold population to provide market for goods and services. The population that is moving in is of different characteristics and requires a variety of goods and service.

***(c)The southern by pass construction***

Mutuini residents were positive that the construction of the bypass would open up the area for development attracting investors .there is still high anticipation that the value of land in the location will appreciate and hence increase land subdivisions in the location. Residents consider that the road reserves will trigger the development of other infrastructure facilities amenities such as the power line, water and drainage. By passes have been noted to pose considerable impact on economic sustainability, social welfare, mobility patterns, urban design elements, environmental and settlement area on which a bypass road traverses. Urban design elements were not incorporated into the development of structures along the southern by pass since there is inadequate provision of accessibility and mobility infrastructure facilities leading to poor community circulation with and outside the settlement. The excavations during the construction cut the available access roads leaving some residents fronting settlements without access from the bypass.

Based on the findings that despite, that EIA and SIA for the construction of the southern by pass along Mutuini settlement was done, there were long term environmental impacts which raised environmental concern for the resident fronting the bypass. The impacts such as increasing waste disposal as facilitated by the noted increase in the population in the area may spill over into the road reserve, into the road drainage channels leading to water bodies as

manifested in other highways such as the Thika super highway at Githurai under pass. This informs the need for an environmental development management plan for this area to contain the situation.

#### ***5.4.6 Commerce development***

Mutuini location's initial commercial centre still exists. It is characterized by shops of the old colonial design as illustrated in plate 5.39. The upcoming commercial developments as depicted by plate 5.40 are for both goods and service delivery. There are few cases where the initial developments are being redesigned to fit the current needs.

**Plate 5.39:** The Initial commercial centre of Mutuini.



Source: Author, May 2015.

**Plate 5.40:** The upcoming commercial developments in Mutuini.



Source: Author, May 2015.

#### ***5.4.7 Residential function as an economic activity***

Residential function is an economic activity that normally replaces agricultural activities in most peri-urban areas. It is a slow economic activity that is replacing agricultural activities. Middle class houses are being put up with very high competition of providing housing of good standards. Considering the issue of highest and best use of land it is a profitable venture since a small size of land can give high revenue especially if a developer decides to develop vertically. In Mutuini most of the people who practice agriculture get average gross returns of approximately Kshs. 5,500 per month for dairy farming approximately Kshs. 10,000 annual return for crop farmers. Approximately 10 percent of the farmers were engaged in subsistence farming hence they do not get any returns from the activity.

On the other hand, the average return for a unit of a house is roughly Kshs. 7,900. Therefore for a residential apartment with five units, the owner will get a return of roughly Kshs. 40,000 per month. Most of the crops that are grown and livestock kept in the area take more than one

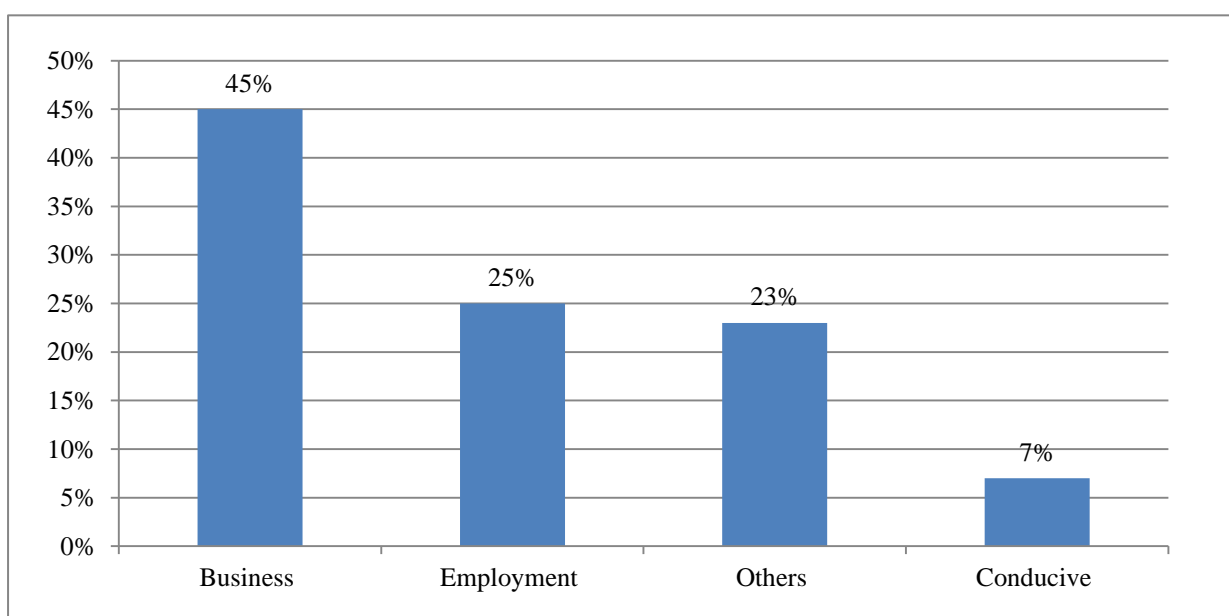


month to mature. Therefore no revenue is expected in between planting and the time of harvesting except those that practice dairy farming. In addition, land remains idle between the end and start of seasons. This is contrary to the residential function since there is a guarantee in getting revenue so long as the units are occupied. Mutuini residence should consider the highest and best use of land since the proximity of the location to the CBD of Nairobi allows residential functions.

#### 5.4.8 Migration trends

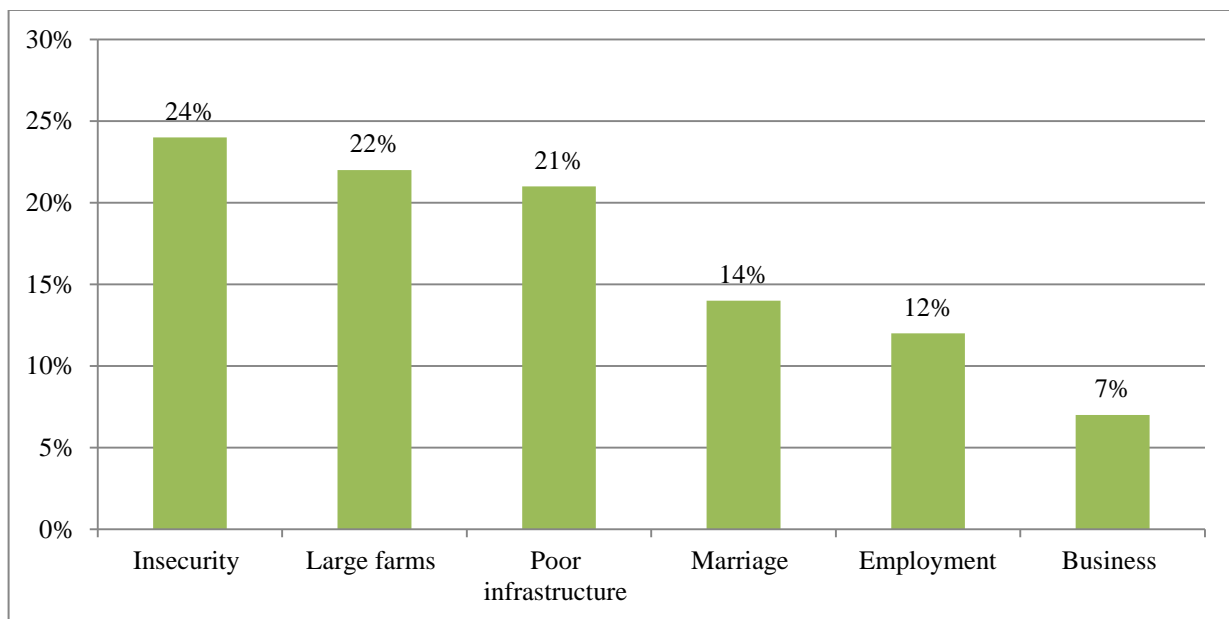
The area is experiencing in migration and out migration but minimal in migration. In the areas of commercial activities are new immigrants where 17 per cent have migrated percent from other parts of Nairobi. This clearly explains that immigrants from other parts of the country are rare in Mutuini. On the other hand the level of out migration from Mutuini to other parts of the country is about 25 per cent have migrated within Mutuini, 27 per cent within Dagoretti and 48 percent outside the county of Nairobi due to reasons shown in graph. Figures 5.12 and 5.13 indicate reasons for migration of people into Mutuini and out of Mutuini, respectively.

**Figure 5.12:** Reasons for movement into Mutuini location 1.



Source: Author, May 2015.

**Figure 5.13:** Reasons for movement out of Mutuini location 2.



Source: Author, May 2015.

Business opportunities account for 45 per cent of movement into Mutuini followed by employment (25%), others (23%) and the conducive environment that the area offers (7%). Insecurity leads as the main reason causing people to move out of Mutuini (24%), large farms (22%), poor infrastructure (21%), marriage (14%), employment (12%) and business (7%).

#### **5.4.9 Land tenure, land development and land-use changes**

Changes in the nature of land use activities often results in land cover changes. A large area especially in the Mutuini farms have undergone rapid changes in land cover because of human activities and natural phenomena but land cover today is altered principally by direct human use. land cover relates to the composition and characteristics of land surface elements (Cihlar 2000). The term land cover originally referred to the kind and state of vegetation, but it has broadened in subsequent usage to include human structures. (Meyer 1995). Land cover categories generally include cropland, forests, wetlands, pasture, roads, and urban areas. The pressure on the land has enormous impacts in terms of land degradation, ecosystem resilience, and soil and water conservation. Mutuini has undergone land cover changes with vegetation

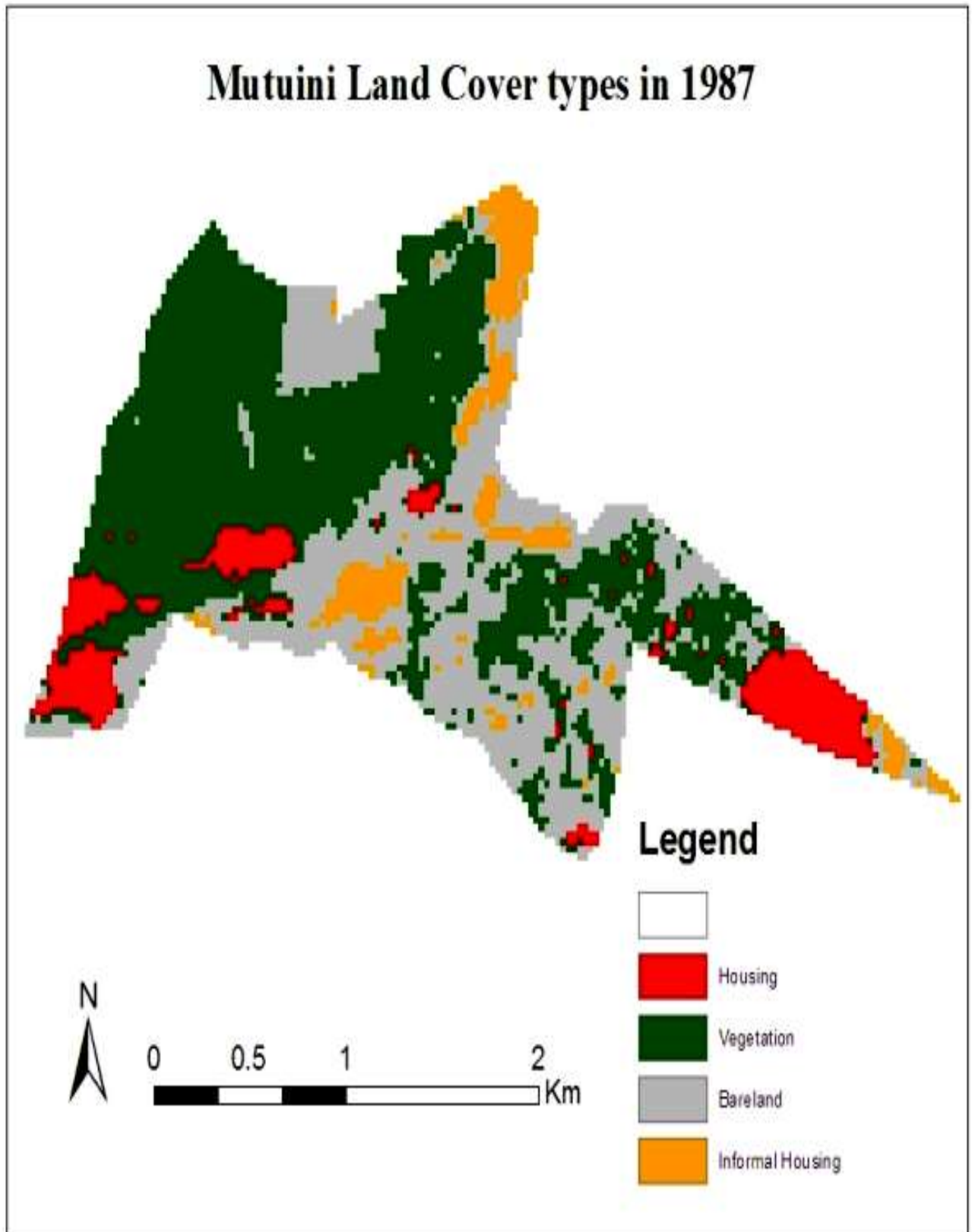
replaced by settlements. The land use patterns in Mutuini may be justified from the models captured in figures 5.14 to 5.16.

The land tenure system in Mutuini is predominantly freehold with a small percentage of government land. Residents of the area have harbored the assumption that freehold land is not subject to restricted developments. Subdivision of land has been to uneconomical plot sizes for agriculture and housing. There is limited land banking to meet future demand for infrastructure facilities and services. The land tenure in Mutuini is predominantly freehold with a small percentage of government land. Land values in Mutuini have remained static for a long time with minimal changes in the values and there is limited land banking to meet future demand for infrastructure. Characteristic of the area also is the fact that the indigenous residents have kinship ties through the clan or families, and most land though registered with title deeds, still undergoes some neo-customary procedures before being transferred.

Although the planning area is zoned as zone 15 by the then Nairobi city council there exists no zoning plan. Mutuini has developed as an area of mixed units and settlements. It has both middle and low income groups. The area is developed with commercial activities and also light industrial activities but it is mainly a residential area. There exists no recreational facilities in the area and both primary and secondary schools exist in the area. Some are squeezed on such small plots whose land is not satisfactory for the activities in the schools. Public purpose plots are few within the area. The various land uses in Mutuini location are clearly indicated in the **annexed map of Mutuini land use.**

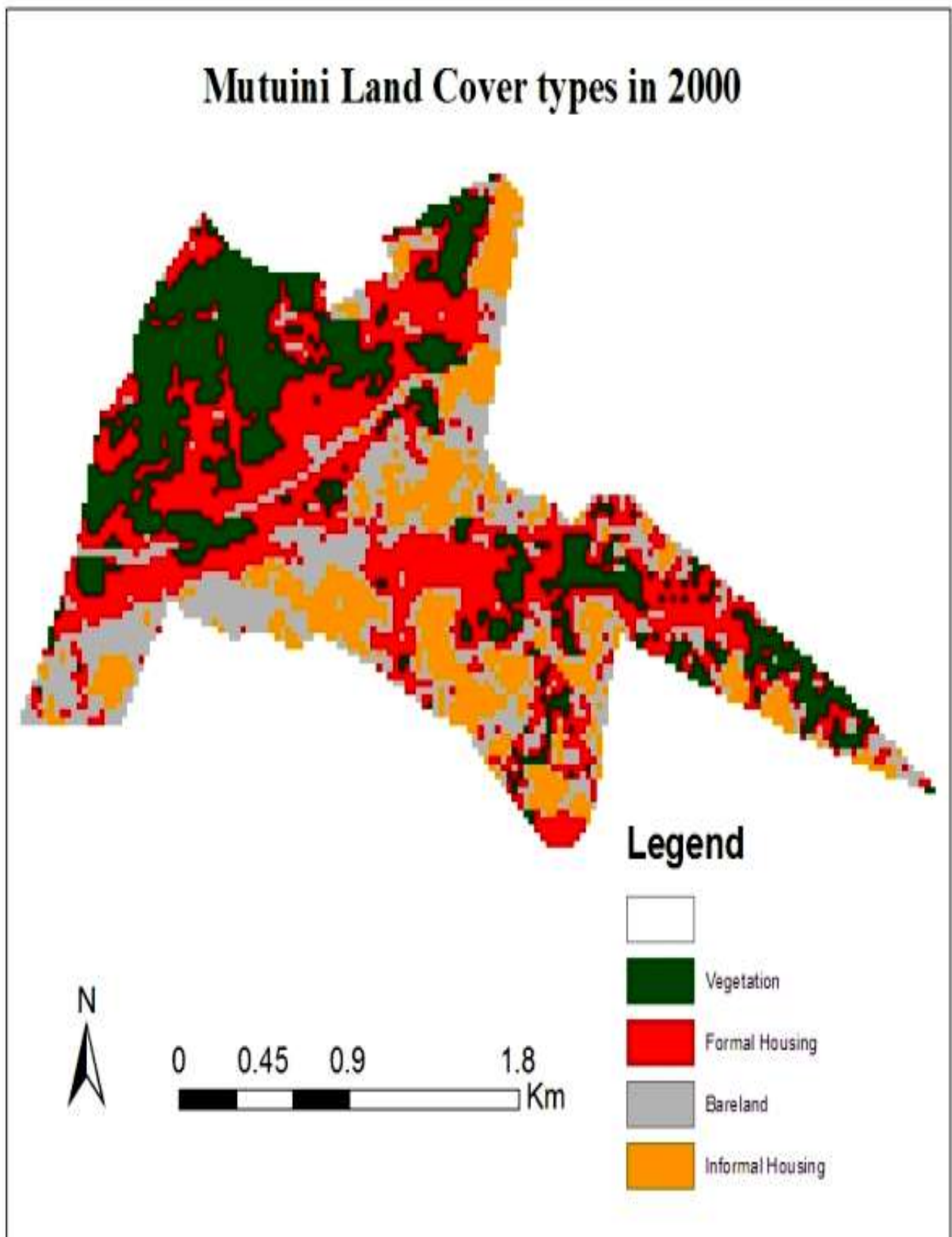


**Figure 5.14:** Mutuini land cover types in 1987.



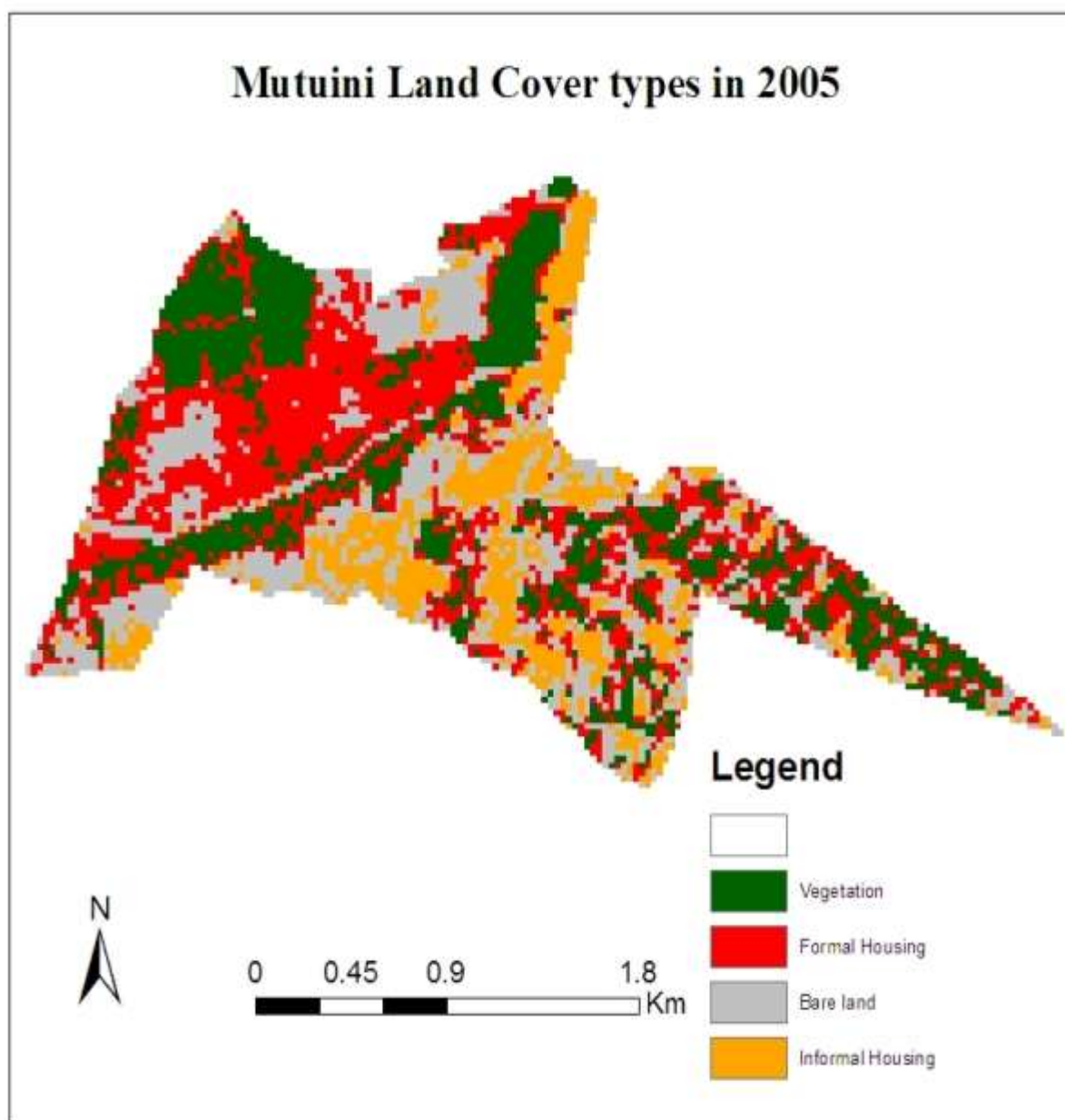
Source: Landsat Images May 2014

**Figure 5.15:** Mutuini land cover types in 2000.



Source: Landsat Images May 2014

**Figure 5.16:** Mutuini land cover types in 2005.



Source: Landsat Images May 2014.

Land cover patterns have considerably changed from the year 1987 to 2005 in Mutuini as illustrated by the models in the figures 5.15, 5.16 and 5.17 that were generated using Landsat<sup>TM</sup>. The intensity of vegetation has been considerably regressing giving way to formal housing. Areas that were bare in 1987 had considerably given way to informal housing in 2005.

### ***5.3.10 The institutional environment***

On the macro-scale, land management in Kenya was found to be typified by a range of different policies, legislation, programmes and actors. All these seek to improve the area according to the specific logic of that particular intervention. The profusion of these activities stemming from the wide range of interventions from actors like the Ministry of Lands, the National Lands Commission and the Nairobi County government's random legislations has resulted in confusion and conflict as to what the exact outcomes of the various interventions will be and who exactly will be involved in them. The tensions are reported to be felt at various peri-urban areas in Kenya, especially where historical land issues exist, like in Mutuini. Indeed, Mutuini's current land use dynamics are a reflection of these underlying tensions.

## **5.5 Effects of the Current Land-Use Management in Mutuini**

The land-use management practices in Mutuini location have varied effects. Some are positive and require strengthening, while others are negative. The following sub-sections will identify the effects associated with each of the identified land-use management practice.

### ***5.5.1 Effects of the physical development***

Poor physical development characterized by life and health threatening homes and neighborhoods, as evident in Mutuini has effects on residents' well-being. First, the crowding of people as was established to be the case in the informal settlements creates conditions very favorable to the rapid spread of a variety of infectious diseases, often in the form of disastrous epidemics such as cholera, tuberculosis, acute asthma, etc. This tallies with a World Bank study that suggested that, in contrast to higher-income urban dwellers and some rural populations, the urban poor have a lower life expectancy at birth and higher infant mortality rate, (Bradley, Sandy, Trudy, & Carolyn, 1991).



Physical development in Mutuini has also resulted in the consuming of farmland that was hitherto used for agriculture and its conversion into housing and commercial purposes. There has also emerged a strong sense of socio-economic stratification, and to some degree, thenicity based on the way that housing is segregated. Those that live in single-roomed houses are seen to be at the bottom of the socio-economic stratum, with those living in Bungalows seen as belonging to the apex of the socio-economic stratum. This segregation, coupled with the unwillingness of land owners to sell or transfer the lands to their children has been linked to the migration of the affluent residents of Mutuini to other areas so as to escape the socio-economic stratification in the context of the land ownership challenges that are replete in the area, and which make it impossible for them to live their true status as they find it difficult to develop lands that they have not inherited or rather, lands belonging to their fathers or grand fathers; some who may have long deceased.

### ***5.5.2 Effects of the energy source management***

Indeed, every energy source has varying degrees of environmental externalities that affect human health, ecological stability and economic development. These effects can occur at the household, community, regional, national as well as transnational levels. Mutuini residents' reliance on firewood, charcoal, paraffin and LPG have various effects. First, though biomass is usually regarded as renewable, its excessive use without replenishing makes it unsustainable. Use of firewood and charcoal in Mutuini is not met by replenishing of trees for future firewood harvesting or charcoal burning. In fact, the area is losing its tree cover as was established during the study. This practice has resulted in unprecedented incidences of soil erosion and general environmental degradation. Burning of firewood, charcoal and use of fossil fuel sources like paraffin and LPG has been linked to environmental pollution that is in turn associated with the increase in greenhouse gases that cause global warming and climate change, (Otakwa, Simiyu, Waita, & Mwabora, 2012). The energy sources are therefore not friendly to the environment as

they result in ecological instability. Further, the gases released by the burning of firewood, charcoal and paraffin are dangerous to human health.

### ***5.5.3 Effects of the state of mobility and travel***

Mutuini has a number of forms of transport and travel. This is in spite of the narrow roads that characterize the area. There is intense competition from the operators of the various forms of transport, which encourages the operators to violate traffic rules. This endangers people who use the roads as pedestrians or users of other forms of transport. The different forms of transport and travel are however good as they give choice to the customers and have different cost demands.

The effect of the vibrancy in forms of mobility and transport on land use planning was evident from the number of ‘*jua kali*’ sheds where many young people as well as some men eke out livelihoods from the informal repairs to the various forms of mobility and transport. Despite the existence of such opportunities in Mutuini associated with the mobility and transport sub-sector, several factors appear to be responsible for their widespread use in the area. These are, roads in the area not being safe for use by the various forms of transport, inadequate infrastructure, motor bikes high costs and cyclists having a low status. Private vehicles are mainly used by the middle and upper income groups, owing to the high costs associated with their purchase and maintenance. Wastes from repairs of motorized forms of transport appear to be haphazardly disposed and injure the ecosystem, hence contributing to land use and land management dynamics in the area.

### ***5.5.4 Effects of the state of road infrastructure***

The poor road network, characterized by narrow roads in Mutuini inhibits efficient mobility of people, goods and services, and hence trade between the area and other regions. Unlike other peri-urban areas of Nairobi City, Mutuini has failed to attract investors and residents from other

ethnicities because of the poor road network. The poor road network has also been blamed for the rampant cases of insecurity. This is because during insecurity incidents, the police are usually unable to reach some sections of the area using a vehicle due to the bad roads. This gives the law breakers time to commit their acts of insecurity, like house breaking and other forms of thuggery with ease.

Mutuini residents are however positive that the construction of the southern bypass is a good initiative that will open up the area for development, hence attracting investors. They anticipate that the value of land in the location will appreciate and hence increase land subdivisions in the location. Residents consider that the road reserves will trigger the development of other infrastructure facilities amenities such as the power line, water and drainage. By passes have been noted to pose considerable impact on economic sustainability, social welfare, mobility patterns ,urban design elements ,environmental ,and settlement area on which a bypass road traverses. Urban design elements were not incorporated into the development of structures along the southern by pass since there is inadequate provision of accessibility and mobility infrastructure facilities leading to poor community circulation with and outside the settlement as excavations during the construction cut the available access roads leaving some residents fronting settlements without access from the bypass.

#### ***5.5.5 Effects of the state of water supply and sanitation***

The perennial water supply problem in Mutuini has resulted in an increase in water vendors charge more than the tariff paid by those who are connected to the NWSC water supply. The safety of the water that is sold by the water vendors is worrying as nobody knows where they get the water from. In fact, many waterborne diseases have been reported to result from the water supplied by water vendors or collected from rivers and boreholes. As observed from the study also, there is proliferation of boreholes. These are usually dug without proper professional advice and cases of contamination are rife. This is because the area also uses pit latrines.

### ***5.5.6 Effects of the farming practices***

Sections of Mutuini area have adopted sustainable agriculture, including kitchen gardens, zero grazing, etc. These have many effects. Economically, they increase household incomes. There are however some farming practices that result in soil erosion, especially along the rivers and high lands. Some residents are participating in knowledge and skills training in sustainable farming in urban areas and are incorporating agro forestry, animal condition management, breeding programmes, business and financial planning, chemical contamination avoidance, community and industry participation, crop rotation, effective management of labour and resources, environmental monitoring and benchmarking, integrated pest management, managing for weather and climate variation, soil conservation, tactical grazing, tillage and stubble management, etc.

### ***5.5.7 Effects of the institutional environment***

As earlier indicated, the confusion currently being witnessed among the actors on land issues, namely, the Ministry of Lands, the National Lands Commission and the Nairobi County has resulted in confusion and conflict as to what the exact outcomes of the various interventions will be and who exactly will be involved in them. The tensions are felt in Mutuini just as in other areas in Kenya.

## **5.6 Implications of the Effects of the Current Land-Use Management Practices on development in Mutuini**

Effects of the land management practices in Mutuini location have varied implications on the development of Mutuini. The following sub-sections will identify the implications associated with each of the identified effects of land management practices in Mutuini.

### ***5.6.1 Implications of the effects of the physical development***

Unless appropriately planned and regulated, the physical development in Mutuini has the following implications on the area's development:

- Poor health will result in weak workforce, hence decline on economic participation. This could ultimately result in the area lagging behind other areas in development;
- Poor housing could potentially put many families at risk, especially when disasters such as fires break. This could result in losses that will impact of the area's development.
- Increased conversion of farmland into residential and commercial interests could deny the area income from farm produce.
- Stratification of residents based on the socio-economic perspectives arising from the kind of houses they stay in could result in disintegration of community unity, hence jeopardising on unity in development.

### ***5.6.2 Implications of the effects of the energy source management***

Reliance upon non-renewable sources of energy by Mutuini denies the area opportunities to make savings by utilizing sources of energy, like solar energy that may be capital intensive, but have a reasonably good pay-back time. Indeed, the cost of non-renewable sources of energy will continue to increase world-over as the reserves get depleted. Reliance on these forms of energy will therefore demand more and more financial resources for their purchase; resources that could have been spent on other developmental needs in the area.

### ***5.6.3 Implications of the effects of the state of mobility and travel***

Though the various forms of travel and transport in Mutuini are laudable, the competition with which they handle their business is a threat to development. There is also concern that insecurity flourishes in the area aided by motor bikes. These concerns need to be addressed to ensure that they do not stand in the way of Mutuini's development. The vibrancy in forms of

transport also denote increased job opportunities for young people in the informal repair sector, which is good for development in the area.

#### ***5.6.4 Implications of the effects of the state of road infrastructure***

The implications to the poor road network in Mutuini fans insecurity, which hinders development. The state of road infrastructure also hinders potential investors from coming to invest in the area. This slows down the development of the area when compared to other areas that have opened up their economies to investors through improved road infrastructure. Regarding the southern bypass, its implications are phenomenal to residents of Mutuini. They, as indicated, have high anticipation that the value of their land will increase, hence prompting them to subdivide and make good sales from the land.

#### ***5.6.5 Implications of the effects of the state of water supply and sanitation***

The implications of water being supplied by water vendors or collected from rivers and boreholes are grave and of health nature. Diseases like cholera are very likely, and could result in workforces that are unable to engage in development initiatives. Financial resources planned for development could also be diverted for medical purposes in these cases.

#### ***5.6.6 Implications of effects of the farming practices***

As observed during the study, a good number of residents of Mutuini area have adopted sustainable agriculture, including kitchen gardens, zero grazing, agroforestry, animal condition management, breeding programmes, business and financial planning, chemical contamination avoidance, community and industry participation, crop rotation, effective management of labour and resources, environmental monitoring and benchmarking, integrated pest management, managing for weather and climate variation, soil conservation, tactical grazing, tillage and stubble management, etc. These have potential of increasing farm yields, hence household incomes that can be put into other development initiatives that will benefit Mutuini.

### ***5.6.7 Implications of the effects of the institutional environment***

Implications of the confusion currently being witnessed among the actors on land issues, namely, the Ministry of Lands, the National Lands Commission and the Nairobi County and the tensions that it is causing in Mutuini include anxiety of the residents, which inhibits their effective participation in the development of the area. Of particular concern are the settlements that cannot be permanently developed by the residents, hence denying the area the freedom that is required to effect development changes. The neglect of the area by Nairobi County also has negative implications on the area's development as it is not clear what the County could decide to do if residents engaged in some form of development of the settlements.

## **CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

### **6.1 Summary of findings**

The land tenure system in Mutuini is predominantly freehold with a small percentage of government land. Residents of the area have harbored the assumption that freehold land is not subject to restricted developments. The economic base in Mutuini for a long time has been dominated by small scale subsistence agricultural activities. Farming in Mutuini can be looked at in terms of 'peri-urban agriculture'. Farming in Mutuini is still carried out in small scale levels for commercial and for subsistence purposes farming activities include both livestock rearing and crop growing. Given the increasing population growth, there is apparently emerging land use (mixed use) in Mutuini especially residential, agricultural, and commercial uses. The major problems associated with the mixed uses are congestion as it promotes indiscriminate on-street parking and poor sanitary conditions as no provision is made for such activities prior to conversion.

Analysis of land use location and relationship showed that there is high level of land use incompatibility in Mutuini because of the dominance of residential development. However, major cases of land use incompatibility identified included a noisy making and obnoxious odour emitting industrial activities such as metal products, processing firms and a poorly managed abattoir(Nyonjoro slaughter house) all located in the midst of the residential areas. These activities need to be grouped on a clearly defined location to internalize the problems associated with them.

The hierarchies of roads identified in Mutuini are primary, secondary and access roads. The primary road is the kikuyu road and the newly constructed southern by pass. Apart from the primary road, all the secondary and access roads are in poor conditions and this hinders easy and smooth vehicular accessibility within the location. The roads are dusty and usually become immotorable in rainy seasons also with residents having encroached on the road reservations while the development of access roads has not kept pace with physical development making parts of the area inaccessible. . It was realized that in areas where the access roads exist, they are in deplorable conditions which render them unusable by motor vehicles especially during rainy seasons. The roads are too narrow for the provision of pedestrian and vehicle passage. Mutuini is also characterized by poor internal circulation. The physical survey of the location



showed physical development has encroached on most of the access roads and lanes. This happened through the extension of buildings, erection of fence walls and inappropriate siting of “containers” Mutuini residents were positive that the construction of the bypass would open up the area for development attracting investors .There is still high anticipation that the value of land in the location will appreciate and hence increase land subdivisions in the location. Residents consider that the bypass construction will trigger the development of other infrastructure facilities amenities such as the power line, water and drainage. Plots in Mutuini are uneconomically subdivided resulting to poor provision of a wide and up to standard accessibility of the properties has been the result. Poor provision of a wide and up to standard accessibility of the properties has been the result. This puts the area at risk from disasters, such as fire outbreaks and inability to access quick security and medical response.

As a typical peri-urban area, Mutuini depicts three distinctive spatial zones. The zones include the core or indigenous, agricultural area or rural shadow with mixed use of residential and agricultural and the commercial area. The core or indigenous area is where physical development started and is dominated by multi-family compound houses with most of them having existed for more than forty years. The zone is characterized by mixed land uses due to the conversion of buildings to commercial and residential uses by the house owners for commercial purposes. For the commercial land use, this consists of areas allocated for different businesses including markets, lorry parks, warehouses, hotels and shops. Most commercial activities are largely concentrated in the Dagoretti market area of the location generating traffic management challenges as the market center has become relatively congested since the matatu terminus is located here and the commercial centre has no planned parking space. Mutuini location’s initial commercial centre still exists. It is characterized by shops of the old colonial design. There are few cases where the initial developments are being redesigned to fit the current needs. Educational land use in Mutuini is limited with four public basic schools and a number of private schools. Currently all the private schools are located on residential plots as a result of the uncoordinated development in the Mutuini. The absence of undeveloped land for educational use is likely to affect future construction of schools in the location and has the tendency to create congestion in the existing schools.

According to the utility service providers, the insecurity of tenure has hampered the provision of service provision in these area with a high population not served with water and electricity respectively in the town .Flooding is a major problem in some areas Mutuini of increasing rate of informal settlements and unguided physical development. Although the town has not experienced any major flooding, there are water lagging conditions in Mutuini, a situation which affects residents' movement especially during heavy downpours. This phenomenon has emanated from the construction of houses in water ways and waterlogged areas especially the Kandutu village.

It was realized from the study that physical development in the area has occurred in a spatially fragmented pattern, due to land ownership issues. This has resulted in the presence of patched of undeveloped land (brown fields) located within the built up areas. These undeveloped patches of land serve as den for criminals and sites for indiscriminate disposal of refuse leading to wasteful and unsustainable use of land. As a result of increasing population growth, there is a significant reduction in the size of the undeveloped land

Despite the emergence of mixed uses, none of the house owners acquired permit before effecting the changes in the use of their buildings. This indicates the extent of non-compliance to planning regulations which is a threat to orderly and sustainable physical development. This concept depicts what was found in Mutuini new urban immigrants seeking to reside where house costs are low in the suburbs. Though Mutuini seems to lack permanent housing typologies a case of apartments have been identified at the boarder of Mutuini and Karen location though situated at Mutuini At the same time, Mutuini was found to be home to a society that is aging empty nesters that have raised their children and are now approaching retirement age or are in retirement, and have adequate wealth and income from investments to afford an urban lifestyle but not adopting to it. A rail system passes through Mutuini and accommodates the high rate of low earning resident immigrants in the area

Civic and cultural land use in the location covers public buildings such as churches, administrative buildings, offices of some public institutions like police station and hospitals. There has been increase mainly due to the development of new churches in the area. The civic and cultural land uses add to the aesthetic qualities of the townscape beyond their respective defined roles. However, the poor location of noise making churches on residential plots makes them a source of nuisance to residents. Mutuini is predominantly Christian area.

The survey results showed that there is limited supply of refuse disposal sites which has resulted in indiscriminate dumping of refuse in the town especially in the newly developing areas. The indiscriminate disposal is mostly done on acquired but undeveloped plots within the built up area. This is likely to promote the spread of sanitary related diseases such as malaria and diarrhoea in the town if this practice is unchecked for there is no sanitation land use for refuse disposal sites and public toilet facilities. Solid waste disposal is a perpetual problem in Mutuini. Sanitation in Mutuini settlements situation is deplorable in the informal settlements of Mutuini.

Mutuini area has a perennial water supply problem that has its roots in the original service provider, namely, the Nairobi City Council. Most of the area's households suffer from lack of piped water supply highlighting the consequences of unplanned physical development due to the area's apparent neglect by the Nairobi County Government.

Mutuini area is very lucrative for both residential purposes as well as growing of vegetables for sale to Nairobi residents. This reality uniquely influences land use management in the area. This is because the area's topography, bedrock and soil types, coupled with its proximity to Nairobi City. These factors have made the community that lives in the area very unwelcoming to any possibilities of selling their land to developers or outsiders.

Land cover patterns have considerably changed from the year 1987 to 2005 in Mutuini . The intensity of vegetation has been considerably regressing giving way to formal housing. Areas that were bare in 1987 had considerably given way to informal housing in 2005.

The land-use management practices in Mutuini location have varied effects. Some are positive and require strengthening, while others are negative. Poor physical development characterized by life and health threatening homes and neighborhoods, as evident in Mutuini has effects on residents' well-being. The energy sources used in Mutuini are not friendly to the environment as

they result in ecological instability. Roads in the area are not safe for use by the various forms of transport, inadequate infrastructure, motor bikes high costs and cyclists having a low status. The poor road network, characterized by narrow roads in Mutuini inhibits efficient mobility of people, goods and services, and hence trade between the area and other regions. Unlike other peri-urban areas of Nairobi City, Mutuini has failed to attract investors and residents from other ethnicities because of the poor road network. The poor road network has also been blamed for the rampant cases of insecurity. The perennial water supply problem in Mutuini has resulted in an increase in water vendors who charge more and increase in many waterborne diseases. Sections of Mutuini area have adopted sustainable agriculture .These has economical effects with increase in household incomes. There are however some farming practices that result in soil erosion, especially along the rivers and high lands. The confusion currently being witnessed among the actors on land issues has resulted in confusion and conflict as to what the exact outcomes of the various interventions will be and who exactly will be involved in them. The tensions are felt in Mutuini just as in other areas in Kenya

Effects of the land management practices in Mutuini location have varied implications on the development of Mutuini. Implications of the effects of the physical development unless appropriately planned and regulated, the physical development in Mutuini will result to poor health ,Poor housing ,Increased conversion of farmland and stratification of residents. Reliance upon non-renewable sources of energy by Mutuini denies the area opportunities to make savings by utilizing sources of energy

## 6.2 Conclusion

The general assertion and theory confirms that peri-urban areas experience rapid physical development and that they are characterized by high rates of physical growth rate with the potential of tripling in physical size. The pattern of physical development in peri urban areas is influenced by a number of local factors and they include: land tenure system and its associated traditional land management challenges; the categorization of planning institutions under different parent institutions, the syndrome of planning chasing development and the government housing policy. Mutuini location's characteristics seemed not to conform to this inclination, especially in relation to land use and management. This study undertook to investigate this peculiarity by examining the land use and management practices in the area, and assessing the challenges associated with these practices. The aim of this study was to assess the existing land use and management dynamics so as to recommend appropriate and informed policy interventions for effective land use planning and management for the area.

Land use and management in Mutuini was found to strongly hinge on the history of modifications of land resources in the area. It also acts within the cultural limits of the dominant community residing in the area. The ways in which land resources have been modified have been influenced by adaptation of the area's agriculture. Contrary to what would be expected by the Nairobi County, Mutuini practices mixed farming, involving both livestock rearing and crop growing. Mutuini's incidence of unauthorized developments, spatial unit zone and non-contiguous developments and land use changes are catastrophic. The mushrooming of informal settlements is phenomenal. This due to limited influence from the Nairobi County Government (formerly Nairobi City Council) and pronounced land use management by the residents.

Land in Mutuini is under freehold ownership the area was zoned as an agricultural area with a restriction of land subdivision up to a minimum of 0.1 ha. Currently it has not been attracting many though its proximity to the city of Nairobi is approximately 11 kilometers. There has not

been restriction on its land use. Land subdivision in Mutuini has been slow and has necessitated by three factors; inheritance, facilitating development or sale. Mutuini peculiar land use and management characteristics were also found to stem from the residence factor in the area. The area is in a flux; gradually but slowly urbanizing as more of its agriculture gives way to mushrooming informal settlements that are favored by the increasing migrant workers. Most of the area's population gravitates towards Nairobi City, in a transformation that can be regarded as suburbanization – with new urban immigrants seeking to reside where house costs are low. The presence of empty nesters was also established in Mutuini. These people were noted to shape opinions on culture, and land use and management. They indeed are a strong influence to the current land use and management dynamics in Mutuini. Some of the stances that they have regarding land ownership, land use and management are rigid appear to be held hostage by cultural considerations. This makes their younger kinsmen find them not accommodating, hence resulting in their migration to other peri-urban areas, such as Ngong and Kiserian to establish their residences there. In fact, there exists an assumption among locals in the area that freehold land ownership is not subject to restrictions in land use, which has not been countered. The trend where affluent individuals from Mutuini migrate to other areas makes improvement of the land use management situation slow down.

The inadequacy of water supply and the poor sanitation coupled with challenges related to management of physical developments also discourage potential land use management change agents, like affluent members of the community from residing there and contributing to the area's transformation.

A gender role trend has also emerged in Mutuini, where men have left farm and home chores to women. As it is known that female-led land use practices result in less focus on development of residential settlements but more of basic grain production, the land use management dynamics in Mutuini reflect this gender-based paradigm. It is also reported that women-led practices

pursue more labour-intensive options, which are associated with land cover degradation. This was found to be evident in Mutuini and is further compounded by the absence of family members, many of who have migrated; a practice that Hans et al (2006) have associated with land use management changes.

Religion was also found to influence Mutuini people's attitudes regarding land use management. There appeared to be a link between unplanned developments and the proliferation of protestant churches in the area. Churches are generally associated with developments, hence, this characteristic of Mutuini is peculiar, but can be explained by account of the pressures of life that the area's residents grapple with – including lack of education, extreme poverty, unemployment, seclusions, etc. Turning to spiritual solace shields them from the gravity of the pressures. Age and educational attainments of the residents of the area were also found to be critical factors in influencing land use management. These factors affects attitude stability regarding life choices, including land use management. Apart from the biophysical factors, societal factors, such as the cultural attachments to land; attitude towards land sub-division; mobility and travel; energy resource management; road infrastructure and infrastructure design principles; the development of commerce; migration trends; land tenure, development and use changes; and the residential function as an economic activity, also foster the peculiar land use management in Mutuini. Effects of these apparent dominant land use management influences include the poor state of physical development in the area; environmental degradation due to use of wood and fossil fuels, and poor soil management practices; difficulty in mobility due to impassable and narrow roads; insecurity; poor water supply and sanitation; and unsustainable aspects of farming practices. These have been negatively associated with the high levels of poverty, a high prevalence of communicable diseases, neglect of the area by regulatory institutions, such as the Nairobi County Government,

inefficient economic and social initiatives, dilapidated physical environments, and positively with innovative aspects of farming, including zero grazing, kitchen gardening, agroforestry, etc.

The trend of unplanned subdivisions enhances unplanned settlements in the area and denies it of the impetus required for the area's development. Being a factor of production, for the area to develop, increasingly more land resources should be availed for development purposes. Increased subdivisions also reduce the amount of land available for meaningful economic activity, especially in the farmlands.

Most of these peculiarities do not conform to what is expected of Mutuini based on land use management theory and practical experiences from other peri-urban fringes. Pragmatism in dealing with these issues will result in massive improvements in Mutuini, thus make the area vibrant like other peri-urban areas that border Nairobi City.

### **6.3 Recommendations**

Agriculture and green spaces in Mutuini and other peri-urban areas should have the perspective that makes the areas sustainable. For this to happen, it is necessary to promote concepts such as multifunctionality in planning processes of peri-urban areas, so as to support sustainable development of numerous interactions in these areas. Towards this, the contribution of local planning practices would be in planning commitments that provide instruments that favour multifunctional agricultural use of agriculture and conservation of the attractive and functional rural landscape in a ring round the urban centres, instead of the current planning that is characteristic of rigid spatial planning solutions.

Nairobi County and Mutuini should embrace and support planning approaches and practices, as well as research that cover sustainable urban-rural relationships.



A detailed plan for Mutuini should be developed to act as a guide in transforming the area. These plan should take into consideration the:Felt concerns of the locals of the area and the attendant land use management issues, Informed knowledge regarding the cultural inclinations to land by the relevant communities in the area, The histories of land modifications so that underlying concerns can be addressed either programmatically or through relevant policy;

There is the need to re-establish the balance between sustainable agriculture and urban, spatial and economic dynamics in Mutuini to incorporate the existence of many opportunities as well as challenges in Mutuini land use management that should be reflected in strategic policies and strategies concerning the area. In relation to these then, there is need for an integrated approach to all activities and land uses occurring within the area and regulate accordingly; and the need for policies or support for urban areas that shoulder the many pressures for urban areas, such as the energy challenges, infrastructure inadequacies, water and sanitation problems, poverty, etc.

#### **6.4 Suggested Areas of Further Research**

The areas suggested for further research are:

- (a) Investigation of the extent that current land use management dynamics in Mutuini have affected the quality of the green spaces in the area;
- (b) Assessment of the local initiatives involved in agricultural production in Mutuini and their contribution to land use management dynamics in the area;
- (c) To determine the differences between Top-Down and Bottom-Up approaches towards strategy and legal framework design for agricultural preservation as well as green spaces in Mutuini;
- (d) Evaluate planning approaches and practices, as well as researches carried out in respect of Mutuini land use management to establish the extent to which they foster sustainable urban-rural relationships.

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## APPENDICES

### APPENDIX II: HOUSEHOLD QUESTIONNAIRE

**UNIVERSITY OF NAIROBI  
DEPARTMENT OF URBAN AND REGIONAL PLANNING**

**LAND MANAGEMENT PRACTICES IN PERI URBAN AREAS IN KENYA: THE  
CASE OF MUTUINI LOCATION, NAIROBI COUNTY.**

**Declaration:** *This information is confidential and it will be used purely for Academic purpose only*

Questionnaire No. .... Date of Interview .....

Plot no. ....

Location ..... Sub-location .....

#### **SECTION 1: RESPONDENT'S INFORMATION**

1. Name of Respondent (Optional) .....
2. Relationship with HH.....
3. Age ..... (Over 18 Years)..... (If not, skip to next H)

4. Sex

Male	
Female	

5. Marital Status

Married	
Single	
Divorced/Separated	
Widowed/Widower	

6. Religion

Protestant	
Catholic	
Muslim	
Other	

7. Other demographic characteristics of Household head

Highest Level of education	Main occupation	Location of occupation	Other occupation	Location of other occupation

**SECTION 2: DEMOGRAPHIC CHARACTERISTICS OF MEMBERS OF HOUSEHOLD:**

8. What is the household size?

(Primary level = 1, Secondary level = 2, Tertiary = 3)

Members of HH	Sex	Age	Highest Level of education	Main occupation	Other occupation

**SECTION 3: MIGRATION TRENDS**

**Immigration**

9. Have you lived in MUTUINI since birth?

Yes   
 No

(If yes, how long have you been a resident of Mutuini? -----)

(If no, where were you living before you came to Mutuini? -----)

Please specify Village, Location or District of origin

If No, state the reasons for coming to Mutuini (Tick where necessary)

i.	To work	
ii.	Purchased land	
iii.	Allocated land by government	
iv.	Inherited land	
v.	Got married here.	
vi.	To do business	
vii.	To farm	
viii.	Other (Specify)	

**Emigration**

10. Have any of your household members left to permanently settle elsewhere?

Yes   
 No

11. If Yes, where to?

Moved to (give locality)	Number of		Reason
	Male	Female	

**SECTION 4: LAND TENURE**

12. What is the size of the land you reside on?

.....

13. Do you own the land in which the household resides?

Yes

No

14. If yes to (13) above,

a) How did you acquire the land?

Method of acquisition	Tick	Price	Year
Inheritance			
Lease			
Allocation by government			
Allocation by local authority			
Cooperative shares			
Purchased			
Others (Specify)			
Gift			

15. What is the nature of the land ownership?

a. Freehold / Agricultural.
b. Leasehold.
c. Customary inheritance.
d. Squatting.
e. TOL (Temporary Occupation License).

16. A) what is the size of your land?

- a) 15 x 30m
- b) 50 x 100m
- c) Less than ¼ an acre.
- d) ¼ acre – ½ acre.
- e) 1-2 acre.
- f. More than 2 acres



B) What ownership documents do you have?

Document	Tick
Titles	
Lease	
Temporary Occupation License	
Share certificate	
None	

C) Do you own other parcels of land besides this one?

Yes

No

If yes, state the location and size

Parcel No.	Year of acquisition	Location of land	Acreage	Price

17. If you have a Government title deed for your land, which procedure did you follow to acquire it?

.....

18. How long did it take to process the title for your land?

.....

19) Have you ever done the following on your land?

- a) Subdivided.
- b) Effected change of user.
- c) Extended lease
- d) Converted tenure from freehold to leasehold?

20. If yes what procedures did you undertake before being granted an approval for the above?.....

.....

21. In dealing with your land, whose professional services have your sought?.....

.....

22. What in your opinion is the major setback of developing your land?.....

23. What activities do you carry on your land?.....

24. Was your land part of a bigger parcel that was subdivided? (Provide Layout at the back)

Yes	
No	

If yes, provide the following

Initial size of land	Subdivided into how many portions	Size of the portions	Transferred to		Price
			Male	Female	

## SECTION 5: SOCIO-ECONOMIC CHARACTERISTICS

### 25. Incomes and Expenditure

Salary Code:

1=less than 5000,                      2 =6000-10000,                      3=11000-15000,                      4=16000-20000,  
 5=21000-25000,                      6=26000-30000,                      7=31000-35000,                      8=36000-40000,  
 9=41000-45000,                      10=46000-50000,                      11=over 50000

a.) What is your total monthly income?

Source	Amount (Kshs/P.M)
Salary	
Crops Sale	
Livestock Products Sale	
Business profits	
Other (specify)	
Total Income	

b.) What is your household expenditure?

Item	Cost per Month
Food	
Clothing	
Health	
Education	
Rent	
Water	
Energy	
Other (specify)	
Total	

26) Do you have access to credit facilities?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

b.) If no, why .....

c.) If yes,

i.) For what purpose did you apply the latest loan.....

ii) From which institution do you obtain these facilities? .....

iii) What collateral/security do you use for the above loans?

(1) Title deed (2) Farm produce (3) Household Items (4) Others (specify)

iv.) How much and how did you use the loans?.....

v.) How has the loan helped you improve the HH income.....

vi.) What has been your experience with institutions that give loans?

---

vii.) Do you get any financial management advice from these financial institutions?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

viii.) If yes (above) which ones?

---

---

## SECTION 6: INFRASTRUCTURE FACILITIES AND UTILITY SERVICES

27) Indicate the distance of these facilities from your homestead to the following services

For the providers of the above facilities, insert numbers as follows:-

1-CCM                      2-Church                      3-NGOs (specify)                      4-Private individuals  
5-Government    6-others (specify)

For the conditions of the facilities, insert numbers as follows:-

A) Very poor    B) poor    C) fair    D) good    E) very well

For the adequacy of the community facilities, insert numbers as follows:-

Well provided = 1, Moderate = 2, Inadequately provided = 3, None = 4

Services	0-2KM	2-10KM	10+KM	Provider	Condition	Remarks on adequacy
Nursery school						
Primary school						
Secondary school						
Village polytechnic						
Tertiary institution						
Hospital with in-patient facilities						
Health centre/dispensary						
Religious facilities (church, mosque, temple)						
Administrative/civic offices						
Security/Police post						
Social hall/youth centre						
Recreational facilities/public park						
playing field						
General retail shop (duka)						
Open air market						
Supermarket						
Bank						
Rehabilitation Centres						
Piped water						
Electricity						
Tarmac road						
Bus/matatus terminal						
Cemetery						
Land fill (solid disposal)						

### Water

28) Where do you get the water used in the household?

Source	
Rain water	
Piped	
Well/ Borehole	
Spring (s)	
Stream/ river	

Water vendors	
---------------	--

a) Are there any water conservation measures undertaken by the community/ individuals?

.....

.....

.....

**Transport**

29) What is the mode of transport to the following service points?

MODE/ACTIVITIES	Walking	PSV	Motorcycle	Car	Cycling
Church					
Schools					
Work					
Market					
Shops					
Hospital					
Others					

**Sanitation**

30). How do you dispose solid waste from the house?

Method	Tick as Appropriate	
<b>solid waste</b>	Bury	
	Burn	
	Compost pit	
	Garbage collection	
	Other (specify)	

31). How do you dispose liquid waste?

Method	Tick as appropriate
Water closet to sewerage system	
Pit latrines	
Septic tank	
Open drain	
Others (specify)	

**Energy**

32).What is the type of energy used?

Type of energy	uses	Source
Electricity		
Kerosene		
Charcoal		
LPG Gas		
Bio gas		
Firewood		

Other (specify)		
-----------------	--	--

**SECTION 7 BUILDING ISSUES.**

**33 a).Housing conditions**

Code for condition: 1-Excellent    2 – Good                            3 – Fair                            4- Poor

		Main house	Other houses on the plot (specify)			Other structures
			kitchen	Workers	Young men	
Number of rooms						
Foundation	Materials					
Floor	Materials					
Wall	Materials					
Roof	Materials					
Conditions						

**Type of house**

Type of house	Tick	Number of rooms.
Bungalow		
Flat		
Massionette		
Single rooms		

34).Do you have an approved building plan for your house?

- a) If yes, who drew it for you?
- b) If no state why.

At the construction stage, were you visited by the county council officials? Yes/no

**SECTION 8: LEADERSHIP AND LOCAL DEVELOPMENT**

35). who has contributed most towards development of your sub-location?

Actor	Position	Reasons

36).What projects have the persons identified above initiated

Name	Location	Impact on the lives of the community

37a). What kind of development would you like to be initiated in the area?

.....

b). Why are such developments important to you?

.....

38).How do you rate the process of development in this Mutuini location?

Slow
Very slow
Fast
Very fast

a) What do you think could be the reason to the above?

39) In comparison to the neighbouring location, do you think Mutuini has been lagging behind in development? Yes/no.

If yes above what do you think could be the reason?.....

.....

40)Which are the major challenges in the development of the Mutuini location?.....

.....

41)When you look into the future of this area what kind of Mutuini would you like your children and grandchildren to live in (*Vision*)?

A Mutuini that is:

.....  
 .....  
 .....

.....  
.....  
.....

**SECTION 9: CONFLICT RESOLUTION**

42a). Are there any land related conflicts in this area                      Yes..... No.....

b). If yes, of what nature?

.....  
.....  
.....

c). what effects do these conflicts have on development of this area

.....  
.....  
.....  
.....

d). Who assists you in conflict resolution locally?

Type of conflict	Institution

43) Are they effective in resolving conflict?

Yes   
No

Give reasons.

- a. ....
- b. ....
- c. ....

**New Constitution, Planning and Public Participation**

44) Are you aware of planning and resource allocation provisions in the new constitution?

Yes   
No

If yes, what do you know?

.....  
.....



.....  
.....

**SECTION 10: ENVIRONMENT & RESOURCES**

45) What kind of environmental challenges does this area face?

Flooding.
Pollution in the area
Inaccessible roads.
Dust
Human Household refuse.
Others (Specify)

46) What have been the effects of the above environmental challenges?.....

.....  
.....

47) What intervention measures as an individual have you put in place to mitigate above environmental challenges? .....

.....

48) What intervention measures has community put in place to mitigate above environmental challenges? .....

- a. Are there other agencies/ stakeholders that are involved in environmental conservation in this area? a. Yes \_\_\_ b. No. \_\_\_\_\_

If yes, indicate the agencies involved ....., .....

**GENERAL.**

1. In your opinion, what do you consider to be major land management problem in this area?

.....  
.....  
.....  
.....

2. What do you think would have been the cause of the above problems?

.....  
.....  
.....  
.....

3. How could this be resolved

.....  
.....  
.....  
.....

4. In your opinion, what do you consider to be major planning problem in this area?

.....  
.....  
.....  
.....

5. Which interventions do you think are appropriate?

.....  
.....

**THANK YOU**

242500.000000 244000.000000 245500.000000



# M U T U I N I L A N D U S E M A P

Ruthimitu




Waithaka

Thogoto

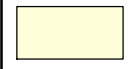






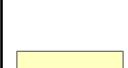



Karen

Ngong Road Forest

## Legend

-  Railway Line
-  Rivers
-  Planning area

## Land use

-  Agricultural
-  Commercial
-  Educational
-  Industrial
-  Mixed Use (Comm./Residential)
-  Mixed Use (Residential/Agri)
-  Mixed use (Agri,Comm, Res)
-  Public Purpose
-  Residential
-  Transportation
-  Forest

9857500.000000

9857500.000000

9856000.000000

9856000.000000

Scale : 1:15,000

242500.000000 244000.000000 245500.000000