

**IMPACTS OF UNIVERSITY LOCATION ON RURAL NEIGHBORHOOD LAND
USE**

**A CASE OF KENYA METHODIST UNIVERSITY MAIN CAMPUS IN MERU
COUNTY**

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Declaration

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This planning research thesis is my original work and has not been submitted or presented for examination in any other university, either in part or as a whole.

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This planning research project has been submitted for examination with my approval as the university supervisor.

Signature Date.....

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Abstract

University education in Kenya has experienced phenomenal growth which has not been in tandem with the physical growth of the Universities thus causing a strain on the physical infrastructure of the universities and a spill-over effect into their neighborhoods. Further, it is not clear how the location of the universities has impacted the immediate neighborhood as far as land use and spatial development is concerned. This study was carried out to determine the current land use characteristics and development pattern of KEMU neighborhood, examine how land use change has occurred in KEMU neighborhood in the last fifteen years, determine the socio-economic impacts of KEMU on its neighborhood over the past fifteen years and propose spatial planning interventions for organized development of KEMU neighborhood. Review of literature was done to collect secondary data. Primary data was collected through face to face interviews with 80 landlords and 80 tenants using semi-structured questionnaires. Additional data was collected from key informant through interviews. Other methods used included mapping, observation, photography and focused group discussions. Landsat TM images of the study area were analyzed diachronically on spatial growth trends and on time-space development. The data collected was analyzed using SPSS and Excel software. The results indicated that the leading land uses in the study area were residential, commercial and transportation. Other notable ones were recreational and educational uses. Agricultural land use was the dominant land use prior to the establishment and growth of KEMU University main campus within the locality. The dominant house typology was bungalows (39%) closely followed by flats of 1 and 2 bedrooms (31%), maisonettes (16%) and bedsitters (14%). Considering height, majority of the buildings were one storey (79%) followed by non-storey buildings (14%) and two storey ones (7%). Vegetation cover had reduced by 16% while the built-up area had increased by 13%. There was no significant change in forest cover. Major benefits from land use change included more business opportunities (65%), growth of more and better physical infrastructure (12%) and improved transport networks (16%). Negative impacts included increased security risk (42%), loss of privacy (7%) and increased pollution (7%). Property values improved by 19 times within a radius of 1 km and 16.5 times within 2 km. radius. This agrees with the central place theory. Establishment and expansion of KEMU main campus was the major contributor to the shift in land uses within the study area. However, there is disorganized development and in-efficient utilization of the land resource due to lack of a zonal spatial plan for the neighborhood. The study recommends formulation, implementation and enforcement of such a plan with sufficient attention on security of the neighborhood in the design aspects of the plan. It also recommends deliberate integration of the student population and the neighborhood population for harmony in their relationships.

Dedication

This thesis is dedicated to my mum, Agnes Ng'endo Ngochi, as a token of appreciation for bringing me up. Since my childhood you inculcated in me values of fear of God and hard work are key to success. My life, today, is a fruit of these values.

Further, I dedicate this thesis to my beloved wife, Dorcas, my daughter, Felistus, and my sons, Austin and John Paul, for always encouraging me to finish my studies and celebrate with me the ultimate success. Quoting Gary Ryan Blair,

”You can’t finish

What you don’t start

And you should

Never start what

You’re not committed

To finish.”

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Acronyms

CBD	Central Business District
ERSW&EC	Economic Recovery Strategy for Wealth and Employment Creation
FPE	Free Primary Education
GDP	Gross Domestic Product
GIS	Geographical Information System
HEIs	Higher Education Institutions
HMO	Houses of Multiple Occupancy
ICIC	Initiative for a Competitive Inner City
IVS	International Valuation Standards
KM	Kilometers
KNBS	Kenya National Bureau of Statistics
KURA	Kenya Urban Roads Authority
MCADP	Meru County Annual Development Plan
MCK	Methodist Church of Kenya
MEWASS	Meru Water & Sewerage Service
MLS	Ministry of Lands and Settlement
MOEST	Ministry of Education, Science and Technology
MOL	Ministry of Lands
NARC	National Rainbow Coalition
NGOs	Non-Governmental Organizations
NSP	National Spatial Plan
OECD	Organization for Economic Co-operation and Development

R&D	Research and Development
ROK	Republic of Kenya
RTPC&STs	Rural Trade and Production Centers and Small Towns
SDGs	Sustainable Development Goals
SQ.KM.	Square Kilometers
THE	Times Higher Education
UN	United Nations
UNESCO	United Nations Education and Science Organization
US	United States

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Every century, the world undergoes a revolution. The nineteenth century was the agricultural revolution. The twentieth century was the industrial revolution. The twenty first century is the knowledge revolution. To represent this global revolution, better descriptors have emerged. These descriptors comprise of phrases like information age, new economy, knowledge society, network society, post-Fordism, age of knowledge capitalism, post-industrialization among others (Carnoy et al. 1993; Castells, 1996, 1997; Peters & Besley, 2006; Morrow & Torres, 2000; Stromquist, 2002; Slaughter & Rhoades, 2004; World Bank, 2002). Here in Kenya, it is loosely referred to being digital as opposed to being analogue.

Well before the other continents according to Joseph Ki-Zerbo, Africa, for example in Egypt, the "Universities of Northern Sahel" and others, was an education and teaching systems producer. He posits:

"It is forgotten, all too often, that Africa was the first continent to know literacy and to institute a school system. Thousands of years before the Greek letters alpha and beta, roots of the word alphabet, were invented, and before the use of the Latin word schola, from which the word school derives, the scribes of ancient Egypt wrote, read, administered, philosophized using papyrus, (Ki-Zerbo, 1990, p. 15)."

As is the case in most countries, university education, given its colonial origins, has mainly been an urban, elite-driven phenomenon that was meant to cater for the educational needs of a few students, mainly earmarked for providing workforce requirements for central government departments. The government, educational planners and administrators reformed education at independence based on manpower models that emphasized secondary and tertiary education (Sifuna and Otiende, 2009). They attributed this to the high demand for human capital required to fill void left vacant by Kenyan colonialists. Further, colonial authorities considered higher education a preserve for

themselves and hence overlooked Africans for higher education. As a result, colonialists neglected both secondary and higher education for Africans (ibid). However, the above scenario has changed in the last two decades. University education has become a major investment for a majority of households. This lends credence to the saying by Nelson Mandela, “Education is the most powerful weapon which you can use to change the world.”

Universities are now considered as engines of economic growth. This reality has been realized and embraced by many countries. The 2002 report by Initiative for Competitive Inner Cities (ICIC) and the first issue of Economic Development Information Coalition’s (EDIC) quarterly magazine evidenced this by devoting the role of universities in contributing to economic growth (ICIC, 2002). Of late, discussions on the role of universities are not centered solely on curriculum programs and campus layouts in the way they separate from the surrounding areas only. Universities are now expected to have the welfare of the surrounding environment at their heart by responding to their needs in a co-operative and positive way.

1.2 Statement of the Problem

The role of universities is constantly evolving. Traditionally, universities have been associated with the twin roles of education and research. Universities are embracing a third mission by increasingly getting involved in initiatives for community development that have traditionally not been considered to lie within their mandate. Universities in urban areas are particularly in recognition of their strong influence that they have to directly intervene to manage the decline of their surrounding neighborhoods.

University education in Kenya has experienced phenomenal growth in the last few years with its rapid expansion leading the other subsectors of education in Kenya. Demand for university education has continued to increase consistently over the last few years. Many students are now being absorbed in newly created public, private universities and constituent colleges. Previously many students who qualified for university admission could not get admitted due to limited opportunities. The elevation of several tertiary

colleges to universities, government's commitment to provide quality education and training and the adoption of Free Primary Education (FPE) policy in 2003 have contributed to increased ease of access and a surging demand for higher education (KNBS, 2017; ROK, 2003).

As a result, the government increased its investment in higher education and more private universities were established to meet the demand. Along with that also has been the fact that education is viewed as an investment in human capital and human capital is a key determinant of economic growth (MOEST, 2005). Thus, there has been rapid growth of universities with as many as thirteen universities obtaining charters by March, 2013. This was intended to promote economic and spatial growth within university localities.

Further, it is not clear how the location of the universities has impacted the immediate neighborhood in regards to land use and spatial development. This study examines the impact of the location of universities on the land use using the case of KEMU main campus and its surrounding neighborhood. It is expected that rapid expansion of the university is likely to lead to increased land use change in the immediate neighborhood. The study endeavors to make policy recommendations that in the perspective of the author will continue to push forward the agenda of comprehensive spatial development of the university neighborhood.

1.3 Research Questions

- 1 What is the land use change, characteristics and development patterns that have occurred in KEMU main campus neighborhood in the last fifteen years?
- 2 How has KEMU main campus influenced socio-economic characteristics of its neighborhood in the last fifteen years?
- 3 What spatial planning interventions are required for organized development of KEMU neighborhood?

1.4 Research Objectives

These are consistent with the research questions and they are as follows:

- 1 To assess land use changes, characteristics and development patterns in KEMU main campus neighborhood in the last fifteen years.
- 2 To determine the socio-economic impacts of KEMU main campus on its neighborhood over the past fifteen years.
- 3 To propose spatial planning interventions for organized development of KEMU neighborhood.

1.5 Geographical and Theoretical Scope

The research project covers Nyaki West assembly ward of North Imenti Sub County of Meru County. The entire ward covers an area of approximately 47.40 sq. km. Since KEMU borders a gazetted forest, Imenti Forest, which forms a buffer to the West, a radius of approximately 2.5km from KEMU was used to form the study area of interest. The radius of 2.5km was the study area of interest since beyond this radius; developments fade away and give way to farmlands. The specific affected areas comprised of Kithoka, Runogone and Kaaga all of which have since been elevated to the location category.

The theoretical scope was limited to spatial changes in land use as one of the impacts of the university location. The land uses were classified and coded based on the researcher's experience of the study area. The land use characteristics and development patterns that have evolved as a result of the university location were determined.

The relationship between university location and its socio-economic impacts on the neighborhood were examined as well. Among the economic impacts analyzed were property values examined from two perspectives: market rent and market value. Market rent value was for rented properties while market value considered was for vacant land only. Social impacts were also investigated, key among them being social infrastructure facilities changes and influence on the community.

1.6 Study Hypothesis

The study validated the field data findings by testing the following hypothesis:

Ha: There was no significant relationship between rapid land use changes in the KEMU Neighborhoods and KEMU Main Campus location.

Ho: There was a significant relationship between rapid land use changes in the KEMU Neighborhoods and the location of KEMU main campus.

1.7 Purpose and Justification of the Study

The purpose of the study was to examine the impact of the rapid expansion of universities on land use change in their immediate neighborhoods using the case of KEMU main campus and its surrounding neighborhood.

The philosophy and practice behind the permeation of physical planning in majority of the non -industrialized nations appear to perpetuate concepts that have been borrowed from the industrialized world. These borrowed concepts hugely differ with people's socio-economic conditions and prevailing lifestyles in the non-industrialized countries. Following these arguments, a lacuna is identified between the current planning practices and real-life situations of the people worked for by planners and other change agents. The body of knowledge generated from this study is considered to contribute towards the reorientation of physical planning settlements design so as to contemporary challenges. This was achieved by the attempt of the study to identify and analyze the changes in use of land and house typologies, densities, settlement pattern, space use and spatial qualities within the context of an unindustrialized and rapidly urbanizing rural neighborhood. The variables were analyzed from the point of view of the user. Interviews were used to acquire users' perspectives and opinions some of which comprised of the elements of judging the physical environment's spatial quality.

Additional aim of the study was to provide a foundation for rational decisions in aspects related to designing of neighborhoods adjacent to universities. This means that the analysis

of changes in land use provided prospects for linking design, knowledge and practice which are the core tenets of the physical planning profession.

The examination of socio-economic trends in the study showed that value is derived from demand. Where demand for property is low, the value is low. Conversely, where demand for property is high, the value is high. In turn, this influences the intensity of use of land. The study illuminates the discussions on the need for land optimization and the use of semi-public and communal spaces within the precincts of the prevailing land uses.

Finally, the methods employed in this study provided a basis for analyzing other neighborhoods in other contexts that have similar socio-economic, cultural and physical conditions to those prevailing in Meru.

1.8 Assumptions

The study assumed that other factors such as natural increase in local population, impact of devolution and other institutions have no impact in the study area. Market value considered was for vacant land as reported by property owners and as assessed by Government Valuer. The value of developments on land was ignored as it called for more detailed assessment and valuation.

1.9 Definition of Terms

Land use is defined by Chrysoulakis et al. (2004) and Zubair (2006) as “the intended employment of and management strategy placed on the land cover by human agents, or land managers to exploit the land cover and reflects human activities such as industrial zones, residential zones, agricultural fields, grazing, logging, and mining among many others”.

Land use change refers to any physical, biological or chemical change on land that is attributed to its management. This may comprise of conversion from cropping to grazing and vice versa, drainage improvements, change in use of fertilizers, plantations, installation and use of irrigations, construction of farm dams, land degradation and pollution, change

of fire regimes, removal of vegetation, spread of weeds and exotic species, and conversion to non-agricultural uses such as industries, commercial use among others (Quentin et al., 2006).

Land use and land cover changes can be categorized into two major categories of conversion and modification. Conversion is the change from one form of land cover to another. Modification entails the maintenance of the broad use or cover in the wake of its changing features (Baulies and Szejwach, 1998).

Market rent is defined as “the estimated amount for which a property would be leased on the valuation date between a willing lessor and a willing lessee on appropriate lease terms in an arm’s length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion (IVS, 2011)”.

Market value according to IVS (2011) refers to the approximated price that an asset or a liability can exchange at on a date of valuation where a willing seller and a willing buyer concur at an arm’s length transaction following proper marketing and each party acting prudently, knowledgeably and without compulsion.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section describes the role and evolution of universities in Kenya, reviews related literature, analyzes case studies of other successful universities on their impacts of their neighborhoods in America, Europe and Asia and provides the policy, legal, institutional and theoretical framework.

2.2 Importance of Universities

2.2.1 Global Perspective

At the fulcrum of global transformations from industrial to post-industrial knowledge society is higher education. Higher education, in an emerging connected global knowledge society, is no longer on reality of the social or political margins in its usual real of comfortable ivory towers. Rather, higher education has been brought at the core as a critical factor in national modernization and competitiveness (UNESCO, 2013). There is a ubiquitous acceptance that higher education is plays an essential role in the economic welfare and development of a country. According to a UNESCO report, there is a strong correlation between higher education and development (UNESCO, 2007). Higher education is indeed considered as an important prerequisite that enables nations to compete in a globalized economy and augment leadership in knowledge sectors. The rapid rise in demand for higher education has been fueled mainly by challenges posed by globalization while, at the same time, most countries have devoted additional colossal investments in higher education sector to improve the skills levels of their populations.

UNESCO observes that enrollment in higher education institutions increased tremendously from 68 million in 1991 to 164.5 million in 2009. The organization notes that gross enrollment ratios exceeded 50 percent in most European countries in 2009 (UNESCO, 2013). Approximately 1.4 percent of GDP in majority of OECD countries is invested in higher education every year (OECD, 2009).

Universities are evidently complex establishments that carry out a variety of different activities which could impact on the economy of a country. These activities include universities roles as purchasers, employers, knowledge creators, creators of human capital, knowledge transfer, technological innovation through research, regional leadership, capital investment, knowledge infrastructure support and impacts on regional milieu (Drucker and Goldstein, 2007). According to Arbo and Benneworth (2007), “more and more aspects of the academic enterprise are thus perceived as being significant to the regeneration and transformation of the regions”. Universities thus play the role of transforming academic knowledge into economic knowledge. It is referred to as the developmental role of universities.

Universities are largely non-movable institutions that are fairly inelastic to fluctuations of business cycles. This makes universities presence in the community steady. Universities tend to attract revenues from external sources that are far away from the immediate location through tuition, endowment incomes, or even state tax allocations while also attracting substantial human capital being students and employees from a national context that can contribute significantly to the economic growth of an area especially their locality (Steinacker, 2005). The stability of universities makes them appropriate tool for influencing development policy measures.

Universities are increasingly, however, getting involved in initiatives for community development that have otherwise not been considered as traditional to their realms. Most precisely, universities located in urban areas are realizing that they have to intervene directly to stem decline of their surrounding neighborhoods.

2.2.2 Regional Perspective

Education is particularly important in Africa, mainly because growth is critical if the continent is to break the poverty vicious cycle. Development agencies have in the past decade placed a major emphasis on primary education until more recently attention was given to secondary education. Higher education has obviously been neglected despite its being central towards economic growth and poverty mitigation. For instance, the Dakar

summit on Education for All held in 2000 backed primary education as the only driver of broad social welfare. Regrettably there was no mention of higher education at all. Further, the policy paper on education sector in the early 1980s hardly had less than one or two pages about higher education in at least 100 pages of text on education (World Bank, 1980).

The World Bank, at an African vice-chancellors meeting held in 1986 in Harare, depicted higher education in Africa as a luxury. The bank was of the view that majority of African countries were better off training graduates overseas and closing universities at home. The Bank later modified its agenda upon realizing that the calls for closure of universities were unsustainable politically. It subsequently advocated for the trimming and restructuring of universities in Africa to produce specialized skills as demanded by the market. Such an agenda was the basis for the restructuring of universities in Africa, as was the case in the late 1980s in Nigeria (Mamdani, 1993).

The deficiency on empirical evidence on universities' impacts on poverty reduction and economic growth contributed among the reasons for the inattention towards higher education within development initiatives (Tilak, 2003). A few economists, post-the Second World War, such as Jacob Mincer, Milton Friedman and Gary Becker, came up with the theory of human capital in order to examine the benefits education for society and individuals. Friedman et al. (1980) had originally suggested a lack of evidence that higher education produced more social benefits in addition to those accrued by the students. Contrastingly, they developed a hypothesis that higher education has the potential to champion political instability and social instability.

Recent evidence, in a stark contrast to the initial views, proposes that higher education is both a determinant and a source of higher income, and can produce both private and public benefits (Bloom et al., 2006). Higher education has potential to generate high salaries, greater tax revenues, increased savings and investments and lead to a more civic and entrepreneurial society as shown in Figure 1. Higher education can also improve the health of a nation through improved life expectancy and high quality of life, contribute to reduced

population growth, improve technology, strengthen governance, adopt better public policies, safeguard environment and improve the security of a country against both internal and external threats. India's leap onto the world economic stage is attributed by observers as emanating from the country's decade long efforts towards provision of technically oriented high-quality tertiary education to a significant number of her citizens. This denotes the benefits higher education accrues to the economy of a country.

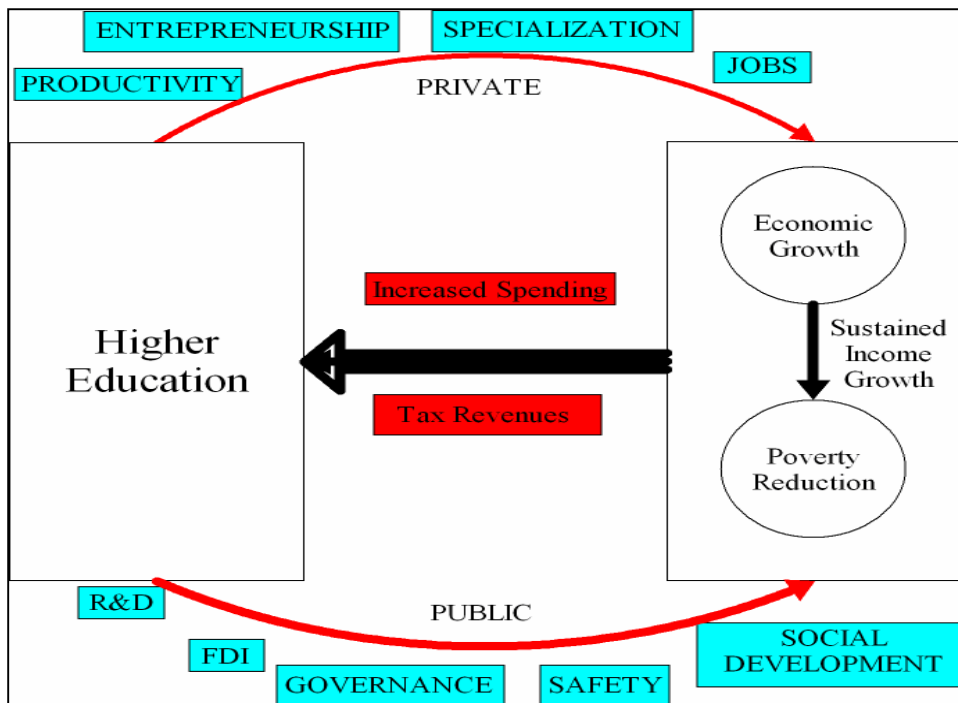


Figure 1: Conceptual Links from Higher Education to Economic Growth

Source: Bloom et al, 2006

The framework given in Figure 1 suggests multiple routes through which economies can benefit from higher education even though none of the outcomes is inevitable. Later, the study will examine if university is a determinant of its land uses and property values to enrich the above discussion.

2.2.3 Kenyan Perspective

Among the most rapidly expanding sectors of education in Kenya is the university

education sub-sector. Student university enrolment in Kenya is reported by the economic survey of 2014 to have grown by 34.9 percent from 240,551 in 2012 to 324,560 in 2013 (KNBS, 2014). The university education demand has continued to increase. Further, students seeking university education and are unable to get admission locally seek admission in universities abroad.

According to Oanda and Jowi, this expansion has been explained in terms of a response to social demand and developmental imperatives. The globally driven liberalization in the provision of higher education is associated with three developments that have fueled this expansion. The adoption of practices and policies that promote establishments of new private universities and privatization of public universities is the first development. Secondly, the continuing pressure to establish and locate universities on a regional basis by the political elite. This is evidenced by the conversion of previously technical and mid-level vocation institutions into constituent university colleges of existing public universities. This has additionally contributed to the emergence and growth of the town campus phenomenon. This idea of town campus has witnessed each and every of Kenya's universities locating a campus or obtaining spaces in buildings within the major rural and urban areas so as to take advantage of the growing number of students interested in enrolling and attending evening and weekend classes. Lastly, the third development fueling higher education expansion in Kenya has been the ongoing opening up of open- learning and extra-mural centers across the country. These are meant to offer academic programs through virtual technologies and distance learning. This is also fueled by the increasing establishment of credit-transfer systems and twinning arrangements with a diversity of mid-level colleges (Oanda & Jowi, 2013).

These developments have transformed the university in Kenya from 'the ivory tower' perception label it used to attract from government bureaucrats into an institution that operates closer to the people in the rural areas in terms of location and access and a focused student catchment area.

The location of universities is influencing land uses in their immediate neighborhoods in a remarkable way. However, the nature and magnitude of the impacts have not been adequately studied. There is need to examine and understand both the positive and negative impacts in order to inform future university location in rural areas.

2.3 Evolution of Universities in Kenya

2.3.1 Introduction

Boit and Kipkoech (2012) have identified three phases in the expansion of universities in Kenya starting from pre-independence to around the year 2010.

2.3.2 The First Phase

The expansion and growth of universities between 1956 and 1984 was well coordinated and controlled. The phase was mostly dominated by the University of Nairobi. During this period, the country's civil service was being Africanized following the departure of colonialists. The Africanizing of civil service required skilled man power. As a result of this necessity, the period was characterized by the government increasing its investments in training programs for high level skilled man power. Production of highly learned elites was considered as the fundamental role of universities over this period. These educated elites were required to take up vacancies in the civil service and especially those that were left by expatriates leaving Kenya as a result of the country's independence in 1963. Therefore, the principal role of the university was considered to be the production of educated high-level professionals for the local industry, commerce and civil service (Boit and Kipkoech, 2012).

University education was planned carefully during that period. The development of university education was well in sync with national process of planning and development. This was mainly to ensure the government availed sufficient resources that would enable universities achieve effectively the required national responsibilities.

2.3.3 The Second Phase

Phase two of university development in Kenya occurred in the years between 1985 and 1990. It started in the early 1980s with some form of political sanction with the universities

intended to respond to the imperatives of rural development. In 1981, a Presidential Working Party for working out modalities of establishing Kenya's second public university produced The Mackay Report which emphasized this rural approach to the setting up of universities as an approach to development (ROK, 1981). Moi University that was subsequently established as Kenya's second university had this rural emphasis.

Public university education witnessed unparalleled growth over this period. Two universities and two constituent colleges were created in a span of five years between 1985 and 1990. Consequently, according to World Bank (1991), the enrollment of students and student numbers rose to levels that exceeded projections made while planning for the expansion of university education in the initial 1980s. As a result, the expansion was to a greater extent unplanned and came about as a result of the "double- intake" to absorb the students from both the 7-6-3 and 8-4-4 system of education.

Public universities appeared inadequately ready to manage such a huge number of students particularly in regards to the available physical infrastructure facilities within their localities. Some universities were still going on with the building of more infrastructure amenities which had being initiated at the inception of double student's intake program in 1987. These constructions had however stalled in some other universities owing to financial constraints. For universities to be in a position to manage the high student numbers that had tricked in their doorsteps, it was essential that the additional required physical infrastructure facilities had to be provided for by the government. The middle level personnel training colleges were the casualties of the crises of student accommodation and teaching spaces that universities faced. Some of these mid-level personnel training colleges were phased out by the government and their facilities turned into universities. This was the beginning of phasing out middle level colleges to create universities, a trend that has continued to date.

The former Moi Science Teachers Training College, Government Training Institute, Maseno, and Siriba Diploma Teachers College were taken over by Moi University. Egerton

University took over the former Laikipia Teachers Training College. Kenyatta University utilized the Kasarani International Sports Complex facilities to accommodate students and lecturers albeit temporarily. The University of Nairobi was supported by the government to take over physical facilities that belonged to a few institutions owned by the government within the city region. Among the institutions to surrender their facilities to the University of Nairobi were the Parklands' based Government Secretarial College, Kikuyu's Institute of Adult Education and the Kenya Institute of Administration located at Lower Kabete.

2.3.4 The Third Phase

Phase three of university development in Kenya began in 1991 through 2007. The phase began by the introduction of policy measures by the government. These measures were meant to stabilize, rationalize and control development of universities. Of these measures included the introduction of a policy on cost-sharing as a means for recovering costs in all public universities (Boit & Kipkoech, 2012). Further, universities were for the first time demanded to prepare development plans covering a period of ten years. These plans were for purposes of guiding their physical, academic and staff development programs. Additionally, universities were required to justify and rationalize their budgets, establishments and academic programs.

2.3.5 The Fourth Phase

The Fourth Phase (2007- to date) has been characterized by rapid expansion through establishment of town campuses and constituent colleges and the rise of private universities. A total of fifteen (15) public universities have been established (all in 2013) and 9 private universities in addition to the eight (8) that already existed. The enactment of a legislation to guide university operations namely the Universities Act, Number 42 of 2012 was one the notable milestones that occurred during this period. The enacted legislation brought under the same legal framework the establishment, governance and administration of universities. Further, the existing seven Acts of parliament that legalized the operation of the seven universities each under its own Act were repealed. Moreover, some constituent colleges of the existing public universities that had been established through legal orders were upgraded under the new law to fully fledged public universities

(CUE, 2013).

Before the enactment of Universities Act Number 42 of 2012 and its coming to effect in December 12, 2012, individual acts of parliament were used to establish universities with each university operating under its own act of parliament. Upon coming to effect of the Universities Act, universities ceased being established through individual acts of parliament but rather by awarding of a charter. Upon the repealing of individual universities Acts, the existing universities were re-accredited through awarding of charter following institutional quality audits. There are now a total of thirty (30) public universities and eighteen (18) private chartered universities in Kenya (KNBS, 2017).

The above background shows the journey traveled as far as university education is concerned and why we need to incorporate university location as a major influence of land uses and values when formulating educational policies.

2.4 Universities and their Impacts on their Neighborhoods

2.4.1 Main Roles of Universities in Cities

There are five main roles of universities in cities that have been identified following a secondary document appraisal on university campus within the context of an urban area. Interrelated factors with potential to affect the university campus planning and management at diverse geographical levels influence on the five main roles of universities in cities.

The first of the five main roles of universities in cities is the function of universities in a city's economic growth. According to De Jonge and Den Heijer (2008), cities are faced with the challenges of appealing and retaining large business establishments such as conglomerations and corporations that can aid in their economic growth. They attribute this to continuing changes in the economy mainly shifting from an industrial and agriculture based one to a services and knowledge economy. For example, a city that generates and or supports the growth of the economy by making higher education institutions relevant to its growth considered and made research and development and

education core to their operations. In a similar manner, Van den Berg and Russo (2004) outlined two main factors that make education relevance to the economic development of cities. They observe research and education activities have quantifiable effects that influence the economy directly by creation of additional jobs, services and revenues. They posited the second factor that the availability of human capital referred to “knowledge spill-over” or the non-tangible effect that is associated with the direct interactions among knowledge centers and private companies so as to facilitate dissemination of knowledge. This intangible effect is therefore related to the existence of education and research centers in cities. Noyelle & Stanback, 1983 cited in Berg & Russo, 2004 consider the most significant element of the role of universities in an economy is their ability to counter the periods of economic recession by rejuvenating and stimulating its growth. Accordingly, the main objective of a larger proportion of people attending universities is to acquire skills that make them employable in the difficult of tasks available in the job market. As a result, universities are therefore core elements for economic regeneration strategies especially for transiting regions.

The second main role of universities in cities is closely linked with the first one. Role number two illustrates universities as engines that shape, appeal and retain knowledge laborers that are relevant to the growth of knowledge economy at the regional scale. Empirical research on the importance of knowledge to the spatial economic growth provides evidence that urban employment and growth in production are highly corelated to factors associated with innovation and knowledge workers as opposed to those of research and development (Raspe & Oort, 2006). They however propose that in the process of establishing the economic potential of cities policy makers and urban research should take into consideration all knowledge economic factors. Faggian & McCann (2009) while underscoring the knowledge workers relevance to the economy in this context postulates that migration has witnessed some of education’s long-term effects as shown in recent research on agglomerations, universities and mobility of human capital. As per the study, evidence is provided that the more people are educated the more geographically mobile

they become. The study further elaborates people can only concentrate in a place mainly due to the intrinsic value of the place or due to the presence of a pool of labor that matches with their skills. As regards this, Den Heijer (2008) outlines the manner in which “creating sense of a place” and “building community” have become agendas of many university boards. A university basically represents the physical infrastructure necessary for the development of human capital and improves the city and regions status in a socio-economic environment that is relatively new. This is largely so considering that learners enrolled in universities and their instructors can easily relocate to other places and therefore cannot fully represent a university as they are not permanently attached to its existence. Similarly, Van den Berg & Russo (2004) detail human capital’s standing in determining the competitiveness of cities, this demands city policies that target the student community of city users to be proactive. Nevertheless, the authors observe that despite universities being at the forefront local economy activities, the associations between student and citizen communities are to a greater extent hugely intricate in major cities where the academic community’s impacts on the economy are more tenuous. This implies that community building on one hand; and on the other the potential of cities to attract and retain human resources for their economies may to a large extent have to reflect on the size of the university in vis-à-vis the size of the city.

Another major role of universities in cities considers universities as nodes in a network of collaborations. Empirical investigations on the university campus management in a context of an urban set up by Den Heijer (2008) differentiate two major networks of collaborations where universities act as the nodes of the networks. Universities links partners such as private parties, public parties and universities in a single location from a community level to a regional one. The participation of different stakeholders in the process of campus management is for instance outlines with their visions and resources. This standpoint is echoed by Schmitt (2007). Schmitt (2007) postulates that of the three conditions to new academic or corporate campus development, “shared vision” is the first on top of “complementary programs” and “integrated sustainability concept”. Den Heijer (2008)

distinguishes the second network as one that connects associates in similar process of research and education to resources and goals sharing opportunities hence their consideration of this collaborative network as inter-institutional collaboration. In a similar manner, this viewpoint could be related to Schmitt (2007) second condition. Schmitt (2007) second condition considers the addition of “complementary programs” must be depended on to support life in campus and augment with similar procedures the participation of industry and society players.

The number four role of universities considers universities as cities within a city and as such address the association between a city and a university campus as a symbiotic one. Hoeger (2007) is quoted as “Cities and campus interact with each other, by influencing each other’s developments”. Consequently, the present and future campus vision emanating for the campus philosophical foundations is attached to the campus cultural and socio-economic urban setting and is expected to being both physically and socially intertwined with their surrounding neighborhoods.

Accordingly, the urban context of the campus provides a relevant feature that explains universities’ physical type of associations they have with the arrangement of the city. Hoeger (2007) in regard to this illustrates two campus types being the greenfield campus and the classical inner-city campus. In a similar way, Van den Berg & Russo (2004) identified two campus settlement types that defined the social types of associations. The Van den Berg & Russo (2004) kinds of campuses comprise of the formal and informal campuses. Formal campuses are those university campuses that are separated from the urban environment physically. Their character is largely conservative in nature. Informal campuses are those settlements downtown rich in fruitful opportunities for cultural cross. According to the authors, both forms of university campus settlements may be suited for particular settings but they should avoid settlements that are unplanned and segregated. Size is a matter of importance in these types of social relationships since large student settlements pose more risks and more opportunities for integration as well. Moreover, in her Dutch University Campus study, Den Heijer, (2008) demonstrates three kinds of

university campus settlements as consisting of university campus as a gated community settlement that may or may not have actual gates, university campus as a city on its own, that is, campus as a separate city and a university campus that is integrated with the city. The latter classification considers the integration of both physical and social types of associations that exist between the city and the university campus. Depending on the context, this relationship can either be positive or negative. Figure 2 illustrates the relationship the three university campus perspectives have with the city.

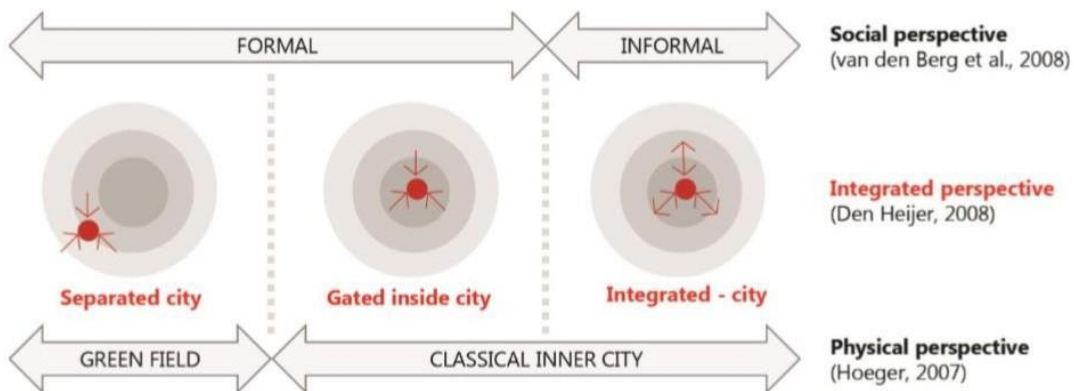


Figure 2: Connecting the different views on campus categories and their physical and social relationships with the city

Source: Magdaniel, 2014

It is critical in this context to highlight the many functions that are assigned in campus and have been witnessed under various different viewpoints as either threats or benefits to their immediate neighborhoods. For instance, as far as the liveliness is concerned, some functional mix of say leisure with services and physical infrastructure such as parking bays may be perceived as beneficial to the city (Trip, 2007). Equally, other research findings among them Van den Berg & Russo, (2004) consider the student community as playing a major role in influencing infrastructure development. This, they attribute to the fact that majority of cultural and recreational facilities within a city largely depend on the student demand for facilities like theatres, sport halls, multimedia workshops, music assembles, cinemas among others. Therefore, an improved quality of life is attached to the provision of these services and infrastructure facilities. Accordingly, this leads to a city's

attractiveness to both workers and business people to work and live. On the other hand, despite the fact that managers of universities are well versed with the potential of their institutions in generation of additional incomes and accruing benefits to the urban communities, other research findings presuppose that the expansion requirements mostly noticeable in inner city campuses can be considered as threats for displacing tenants and those households with low incomes within the surrounding neighborhoods (Calder & Greenstein, 2001). In a similar way, Van den Berg & Russo (2004) provide a detailed outline of the manner in which variations in timetables between communities of students and the organization of activities within the city could become a source of increased prospects for city dwellers while also having the possibility of provoking disagreements in their social routines. For instance, a culture shock may be created through poor management of functional mix in public spaces. This has the potential of causing the university a bad reputation and as such limit its function as a driver of local developments.

The last main role of universities in cities is their role as real estate developers and urban change agents. According to Sherry (2005), a university plays vital roles in multiple ways that are not usually related to their traditional ivory tower roles. Sherry (2005) considers universities as engines of economic growth, employers, purchasers, place branders, innovators, cultural mecca and most importantly, as real estate developers. Equally, Perry et al. (2009) empirical studies provide proof that universities consistently rank among the leading employers in metropolitan areas. Universities are among the most and largest permanent owners of land and buildings (ibid). The American university has gained increasing opinion support in recent times being viewed as a major driver in the overall urban development by mainly analysts and public officials (CEOs-for-Cities, 2002). Further, Kellogg Commission (1999) adds that the university managers and leaders represent their institution as “engaged” with the programs of urban areas.

Sherry (2005) observes that changes in nation state nature and structure is a result of economic restructuring, changing demographics, new political alliances and decentralization of mandates and responsibilities of government. This can bring about

radical changes in United States universities real estate development policies. Additionally, empirical studies on Universities Real Estate Development (URED) reveal a tendency where institutions in urban centers are in an expansion process just outside or within the edges of existing campus boundaries (Wiewel, Kunst, & Dubicki, 2007). The trend illustrates the push by universities to obtain additional space and grow so as to meet their needs. One of the crucial needs of universities is indeed student accommodation. The student housing accommodation has strong impacts on a city's urban morphology.

The increase in prices and rise in the rigidities of the housing market arising from the variations between students and host communities spending patterns together with limitations of housing facilities dedicated for transient students matching their likings are good examples of universities as developers of real estate and urban structure agents (Van den Berg & Russo, 2004).

On the contrary, regeneration of an area following a university settlement policy results to an increase in the value of housing within the regenerated area to the benefit of the property owners. Nevertheless, the policies' costs and benefits have to be carefully assessed in advance in order to avoid creating social divisions and tensions. Planning solutions that favor multiple users and mixed functions in cases where universities' presence could be positive in relation to each case could provide a solution to this apparent contradiction.

2.4.2 Perceived Impact of the Universities' Roles on Urban Development

The universities current position relevance in cities of today proposes a growing complexity of campus decision making processes. This may call for innovative solutions at functional, spatial, strategic and financial levels so as to fulfill present and future needs of universities. Undoubtedly, the solutions largely depend on institutional demands as well as specific cities' goals, structures, planning and policies. Simultaneously, universities roles might impact differently on the urban development of cities.

Explaining the levels of urban scale of the roles of universities in cities provides a systematic way of proving these impacts. The practice of universities in development of

real estate engages these methods at critical scales of spatial urban development. This includes universities' surrounding neighborhoods, central business district or downtown commercial development and broader city-wide development approaches for which collaborations between the city and university are meant to partake.

Researchers certainly demonstrate the manner in which university leaders implant the agenda of their institutional developments into the broader city-wide redevelopment agendas. They do so through entertainment, arts, tourism and sporting facilities. Still, they propose a framework of the association as work related and therefore temporary and, in most cases, attached to political agendas.

These practices can, however, be considered to differ according to roles universities play in today's knowledge's cities. Similarly, the consequences of roles of university in cities can be considered at their different levels with the scales at times overlapping. For example, the impacts associated with the roles of universities as major elements in cities economic growth and central to attracting and retaining knowledge workers could be highly perceived at the district scale and city-wide levels.

In contrast, universities' roles as cities within the city and as developers of real estate and urban growth and developments agents might strongly be perceived to impact at district scale level. In the meantime, universities' roles as nodes in a network of collaborations could have impacts that are perceived at the inclusive scale depending on the particular network that the university collaborates with (which could be networks either in process or in location). This understanding can be well demonstrated by classifying the five main roles of universities in cities by the scale of their impacts in urban areas as shown in Figure 3.

To begin with, the quality of education a university provides as a relevant economic function of the city must be supported by quality facilities at the universities and in their surroundings. This would indirectly affect the universities' competitive advantage which is ultimately very crucial in attracting to a region both students and knowledge workers. Consequently, for universities to make strategic preferences that differ according to their

socio-economic contexts they must collaborate with urban governances at the city-wide level.

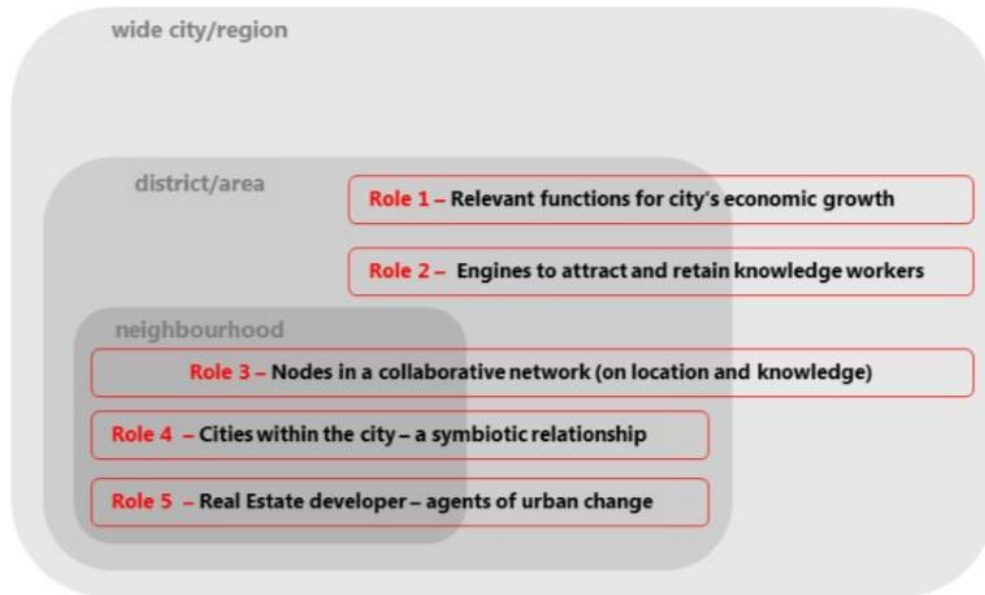


Figure 3: Positioning the perceived impacts of urban roles of the university in today's cities at different scales.

Source: Magdaniel, 2014

Secondly, for purposes of urban development, it is essential for the strategic action of a university to exploit fully the strengths and opportunities of both the communities of students and knowledge workers. A university's urban campus strategy is important in that it should address the preferences, aspirations and demands of future knowledge workers and students. McCann (2012) observes that a good campus design possesses the potential of changing a place and it is therefore very critical for amenities to be available within the university surroundings. The conversation between cities and universities should therefore be totally bi-directional. It must bring additional stakeholders to the decision-making process of the university campus. This status emphasizes the "collective process" components of university campus decision making, whose main goal according to Den Heijer (2008) stresses a "shared responsibility" between actors of both cities and universities. Therefore, universities' success in appealing and retaining human capital to a

greater extent relies heavily on knowledge cities' performance where synergies are needed at both district and city-wide scales of the planning processes.

Additionally, the function of universities as nodes in a network of collaborations the distribution of resources and visions with comparable organizations may have perceived impacts at both district and wide city scales as well as regional and area scale levels. Leasing and renting of buildings to or from similar knowledge institutions, research institutes or even business start-ups on one side and the adoption of a common use of costly resources with limited space occupancy and frequency ratios with other research or education institutions so as to join efforts in research and education might possibly be a solution for the network university (Den Heijer, 2008). Solutions like this combined with future uncertainties of higher education institutions' spatial demands in cases where flexibility is completely inevitable at campus and building levels, mainly in manner of financial and adaptation mix of leased, rented or owned building space and in best use of existing institutional capacity (Den Heijer, 2011).

Moreover, the universities role as cities in a city brings about reciprocated advantages that are highly apparent at the levels of district scales. An interdependent association is reflected by the requirements for social facilities in a university campus and its surrounding neighborhood as supported by recent empirical research findings in a Netherlands University Campus (Den Heijer, 2011). A good example is that the aspects of developments in strategic plans by universities provide a full proof that universities are progressively getting overly reliant on the availability of space types for non-academic purposes within their surrounding neighborhoods. Examples of these types of space include leisure and retail, related business and residential functions, a required mix which can as well be supplied in campus. Nonetheless, according to Den Heijer & Magdaniel (2012) comparative studies, the location of a university campus within the city together with the state of the settlements physical facilities have a significant influence on the provision of the needed mix of space within or without the university campus. Similarly, the interactions and synergy between host communities and university campuses' adoption of the

functional mix of space is of equal importance in order to accrue the mutual advantages of universities and their surrounding neighborhoods, and thus accelerate changes in infrastructure and promote a conflict free long-term stability of the parties.

Finally, the universities role as real estate developers definitely affects the spatial growth of universities' neighboring urban centers at locational and regional scales. Universities achieve this by construction and expansion of their physical infrastructure while simultaneously reconstructing the city. A good example is that the university's need for expansion of its physical infrastructure might inspire the transformation and (re)development of urban areas likely to benefit particular districts or neighborhoods that are in transition with the new infrastructure development together with attractive amenities with the potential to increase private markets roles in development of university campuses whose involvement must be balanced with key features like universities contributions to the cities that host them and the form of the policy that governs higher education (Sherry, 2005). In essence, it is observed the manner in which universities role as engines of urban transformations of those defined scale levels requires both expertise as well as a great understanding of local politics for successful development process of universities.

In conclusion, the intricate and elaborate position of higher education colleges in cities of today and the impacts of universities on urban set up has led to participation of several outside shareholders on the university decision-making process. These external stakeholders play different roles in regards to the three different urban scale levels. Cities and university planners and managers face the challenges such as that of exploiting the available resources and their ability to steer their organizations to make efficient utilization of these roles or positions. Undoubtedly, interactions between private and public actors are highly required in this process with negotiation practices and politics proving crucial for university leaders.

2.4.3 Other Literary Perspectives

A large body of literature confirms that universities have a profound influence in their land uses and socio-economic impacts.

Current literature on the 'engaged university' portrays a wider and more adaptive role for universities (Gunasekara, 2006a, & c; Chatterton and Goddard, 2000 & OECD 2007). Universities are considered as drivers and pillars of regional development that embed a greater focus on their mandates within a wider base of partnerships with both government and non-governmental entities. It therefore comprises of higher education's contributions to socio-cultural and environmental development through participation formally and informally and representation of external stakeholders as an institutional partner in regional governance, learning and innovation networks (Boucher, 2003).

The focus in this context shifts from considerations of systems and processes of knowledge transmission by a university to a superior attention needs of a region and universities' adaptive responses. The most approachable function is an indication of a greater alignment between the various functions of a university to trajectories of regional development. Besides carrying out their traditional research and education functions and an isolated regional mandate, university's regional attention is entrenched in its entire critical mission consisting of the provision of foundation for development of skills, promotion of social mobility and inclusion, and stimulation of origination through research and development. The orientation of these three mandates demands sufficient combination of incentives and policies at different stages of governance. Universities, apart from being bound regionally, are perceived as intricate organizations that are sheltered within the frameworks of nationwide policy attempting to combine procedures at various stages and integrate research, teaching and community components of their engagements at regional levels (Charles, 2006).

Arbo & Benneworth (2006) developed a multi layered governance prototype for developments at regional level that centered its features on the shared influence of higher education institutions at the regional policy. In a global-regional innovation system, it is expected that universities act as the nodes of consolidative networks with the capacity to syndicate external resources and influences with the local needs (Bathelt et al. 2004; Benneworth and Hospers 2007). The civic role of universities, all be it not a new concept,

has recently been of greater interest for university managers and policy makers who perceive it as central in their organizational mission.

This phenomenon has been known as the "reemergence of the civic university" by John Goddard (THE, February 7, 2008). John, in regards to universities' national funding sources, argued that the primary focus on national needs and blue-sky research gave way in the 1990s to a broader attention of the local and regional context. This was partly as a result of greater awareness of the universities importance to local businesses and the quality of the local environment for talent attraction (Chatterton and Goddard, 2000).

ICIC in 2002 delineated the agenda for actions by community, university and city leaders, and business leaders. The argument was that universities can play a role, hitherto unknown, in the plans and strategies for economic development with a collaborative economic development strategy in the inner cities. A fairly high level of interest on universities' impacts on land markets and housing has been received since its publication. The observed interest is not limited to campus master plans or studies on economic impacts. It considers the university as an anchor and a primary source of economic renaissance in communities around it and thus go beyond the piecemeal efforts geared towards addressing short term needs.

Charles and Conway, 2001 posted that the business interaction survey on higher education undertaken in 2001 had exposed the increased contemplation by universities on the local and regional areas being important to their mandate.

These efforts in development are not short of problems. A study by OECD (2007) reported on the experience 14 regions mobilizing institutions of higher education to backing regional development. The findings of the study showed rather few attempts that had fruitful engagements. Most of these successful engagements were short term, small scale and bottom up initiatives that were championed by notable individuals. Additionally, the undertaking determined a few impediments that prevented entrenchment or mainstreaming of this kind of interactive activities in broader regional policies. They comprised of

uncoordinated coherence of nationwide policies at regional levels, constrained capacity for enabling the involvement of regional and local agents on affairs of higher education, funding and incentives inadequacies characterized by inexistent metrics and monitoring of results and constrains to leadership within the institutions of higher education.

Gunasekara (2006a) while undertaking a comparative assessment of Australian universities cites university senior management's commitment towards a regional engagement, economic and political conditions and the university's history of linkages with the region as among the major factors that influenced universities' regional impacts.

These studies consider incentives and performance indicators of university engagement in third strands as inadequate and outdated. Limited set of metrics are used to determine measurements. These metrics are most often unable to capture developmental activities and most likely get to a point of distorting the behavior towards those activities that are easily measured. Additionally, instruments that are formula based like the higher education innovation fund (HEIF) in the United Kingdom (UK) would most likely be for rewarding those universities with the best demonstrable performance instead of channeling funds to address HEIS with greater challenges as regards regional development (OECD, 2007).

Regional engagement is also confined in relation to specific geography and diversity of higher education, and the scale, number and synergies between institutions of higher education within local or regional systems of innovation (Boucher, 2003). In the higher education and business engagement survey of 2001, newer or modern universities gave economic development more priority at 86 percent as compared to 44 percent score by older universities (Charles and Conway, 2001).

Young universities, according to OECD (2007), have a tendency of presenting external mechanisms that are better suited for engagement than older ones. It noted that age influenced location with longer established institutions of higher education having emerged and grown mainly in larger cities whereas younger institutions tend to be more spatially dispersed often with a specific remit to attend to specific territories.

Moreover, the degree and type of regional engagement probably may differ in relation to the number of university formations in a given region, the extent to which the universities are entrenched in a seamless regional development strategy and the significance of collaboration and/or competition between them (Boucher 2003; Kitagawa 2004). Competition for research funding, weak interest, lack of support from and coherence of national policies and the difficulty in agreeing to a clear division of tasks constrains collaboration between universities (OECD, 2007; May and Perry, 2006). Kumar (2006) defined a more rigorous procedure for estimating the geographical extent of impacts on land markets and housing as a result of the expansion of university campus. The study assessed the impacts through spatial hedonic pricing models.

Drawing insights from spatial statistics established a more rigorous methodology to estimate the geographical scope of the impact of university expansion on housing and land markets and estimated the impact through spatial hedonic pricing models.

The discussion above draws insights on some of the notable challenges for universities including their inability to balance a broad range of new tasks on top of their usual central mission. May and Perry (2006) postulate that there appears to be a missing middle “between the possibilities represented in attempts to embed universities in their localities and the realities of actual implementation”. Moreover, there is no evidence base on the advantages and impacts related to the different forms of engagement that go beyond a handful of cases.

2.5 Theoretical Framework

2.5.1 Concept of Studentification

According to Smith (2002), studentification refers to growth in students’ concentrations within the precincts of higher education institutions frequently accommodated within houses of multiple occupancy (HMOs), but largely in flats purposely built for students (Smith, 2002). Smith (2002) further identified social, cultural, economic and physical dimensions as among the elements associated with studentification.

Social dimension refers to the replacement and/or displacement of established residents comprising of a transient, generally middle-class social grouping of mainly young and single, comprising of new social concentration and segregation patterns.

Cultural dimension is the growth of concentrations of young people with a purportedly shared culture and lifestyle and consumption practices, which in turn results in the increase of certain types of retail and service infrastructure.

The physical dimension is related to the initial upgrading of the external physical environment while properties are being converted to HMOs. Afterwards, depending on the local context, this can result to downgrading of the physical environment.

Finally, the economic dimension involves the revalorization and inflation of the prices of properties and a change in the balance of housing stock resulting in neighborhoods becoming dominated by private rented accommodation and houses in multiple occupation and decreasing levels of owner-occupation. This restructuring of the housing stock gives rise to a tenure profile which is dominated by private rented and decreasing levels of owner-occupation.

2.5.1.1 Typical Stages of Studentification

According to Tyler (2008), there are distinctive stages that may be identified in the process of studentification namely: the ivory tower stage, the cloister stage, the settlement stage, the studentification stage and the de-studentification stage (Richard Tyler, 2008).

I. The Ivory Tower Stage

This is the stage at which the university establishes a campus to accommodate its core business. Among the facilities established are lecture rooms, library, laboratories and administration offices.

II. The Cloister Stage

At this stage, non-local students are provided with purpose-built accommodation by the university. These purpose-built student accommodation facilities are usually erected in

close proximity to the ivory tower. They are also cloistered from the host community.

III. The Settlement Stage

This stage of studentification is characterized by students spilling over the cloister settlements and settling in private accommodation facilities within the surrounding neighboring host community.

IV. The Studentification Stage

As a result of the growth and expansion of student numbers, additional pressure from, and domination by, students who have already settled in areas around the cloisters.

Hence, studentification is said to have occurred. If the proportion of HMO occupants remains at (or below) one in five, it is readily accommodated. This indeed has been the case in many university towns in over a period of many years. Stresses appear when this proportion is exceeded. The character of the area and social cohesion challenges are impacted when student number one in four. The disproportion is marked when students' number one in three. The student community attains autonomy and ends up being the dominant social group. Cohesion is therefore lost. In some instances, there may be an increase in imbalance, and as such the number of students equal or outnumber the rest of the entire combined population numbers.

V. The De-studentification Stage

The evacuation of neighborhoods to either new cloisters or purpose-built housing in the aftermath of studentification results to loss of demand and collapse of the local housing market.

The above background shows the different stages through which a university and surrounding evolve and why we need to incorporate university location as a major influence of land uses and values when formulating planning policies and strategies.

2.5.1.2 Benefits of Studentification

The broad macro-level benefits that universities and students bring to towns and cities are expected to ‘trickle down’ to local neighborhoods. Among the benefits of studentification can be classified as socio-cultural; economic and physical benefits.

I. Socio-cultural benefits

Authors note the effects of the social dimension of studentification on a university town consist of the development of a new social group of transient and young middle-class residents that displace the originally established residents of the area (Kenyon, 1997; National HMO Lobby, 2005; Smith, 2005). In a university precinct, according to research, the absolute numbers of young adult learners of higher education provoke an assumed distinct lifestyle, culture and consumption patterns associated with particular retail service outlet provisions (Smith, 2005; Chatterton, 1999; Smith and Holt, 2007 and Smith and Denholm, 2006). This explains the cultural dimension arising from the effects of studentification (Chatterton, 1999; Rugg et al., 2000; Chatterton and Hollands, 2003; Hubbard, 2008 & Gopal, 2008)

Lastly, according to Smith and Fox, 2019, studentification introduces area to more flexible local workforce of young and educated people which potentially raises the aspirations and expectations of the local young population. Further, it creates a potentially healthier and active population, and the provision of sports facilities. It also increases levels of volunteering (via student governments and other clubs and volunteer groups) in local communities for social and environmental programs. Lastly, it sustains the demographic structures of populations through in-migration and retention.

II. Economic benefits

According to research, inflation of property prices generally marks the effect of studentification impacts on the economy in as university suburb. This is buttressed by the recommodification of ‘single family’ houses or the remodeling of privately rented houses to supply houses of multiple occupancy (HMOs) for higher education students (Smith and

Denholm, 2006; Rugg et al., 2000& Smith, 2005).

Smith and Fox, 2019, in their view, state that, among the benefits of studentification, is enhancement of spending power for the purchase of goods and services in the local economy, and sustaining local retail and leisure businesses and jobs; creation of demands to sustain public (e.g. transport/health care/dentists) and private services (e.g. pubs/clubs, cafés, restaurants, retail, leisure), and jobs in these sectors; addition of more diversity and vibrancy (e.g. music, art, festivals, sporting events) to local cultural offerings, and support for the development of local creative economies; support for buoyant (rental/owner-occupied) housing markets and associated trades such as building, plumbing, property maintenance, as well as rental and real estate agency/insurance/finance markets; acting as a catalyst for urban regeneration and capital investment programs; driving-up the demand for the provision of high-quality modern accommodation and better-managed housing and residential environments; making places, directly and indirectly, more appealing for tourists, visitors and investors; sustenance for the business of universities and higher education institutions (and secondary services/industries) and a range of jobs in these sectors.

III. Physical benefits

The studentification effects impacts on the physical environment initially by upgrading the physical environment, motivated by the valorization of prices and property rentals, mainly induced by the conversion of stocks of single family dwelling to HMOs so as to meet the needs of accommodating large numbers of higher education student population (Martin et al., 2005; Smith, 2005; Cox, 2000; Doward, 2009; National HMO Lobby, 2005; Osborne, 2009 & Smith and Denholm, 2006).

2.5.2 The Central Place Theory

The central place theory was proposed by Walter Christaller in 1933. The theory concerns itself with the size, number and distribution of central places within a system. Encyclopedia Britannica observes that the theory attempts to illustrate the manner in which settlements

are located in relation to each other, the quantities of market areas a central place can control and why some central places function as cities, towns, villages or hamlets. According to the theory, the provision of goods and services to the surrounding market area is the principal purpose of a settlement or a market town. The towns are centrally located hence central place. A central place is a settlement that provides goods and services, one or more, to its surrounding population. That is to say the main function of a central place is to provide goods and services to the surrounding population.

Specialized services such as universities are said to be of high order while simple basic services such as grocery stores are said to be of low order. High order central places are those settlements that provide more goods and services than does other places. Lower order central places have small market areas and the goods and services they provide are more frequently purchased than high order goods and services. High order central places are fewer in number and more widely distributed than lower order places. Having high order services implies availability of low order services around it and not vice versa. Low order settlements are those settlements that provide low order services while the settlements that provide high order services are high order settlements. The area under the influence of a central place is the sphere of influence.

In developing the central place theory, Walter made the following assumptions: -

- i. An even (isotropic) terrain – that a hilly and a non-flat terrain would create impediments to development. He prefers a flat area that promotes growth of the central place.
- ii. Population is evenly distributed – residents are dispersed over the land area and not concentrated in one single place
- iii. Evenly distributed resources – all places compete under a perfect market condition; no place is resource advantaged over another
- iv. Consumers possess similar purchasing power – this based on assumption that

wealth is evenly distributed hence consumers have similar purchasing power

- v. Consumers' preference for the nearest market – this means that humans will always acquire goods from the nearest place offering them and will most likely avoid long commuting. This essentially keeps prices constant.
- vi. The costs of transportation are equal in all directions and proportional to distance – the cost incurred in transporting products to the market are equal and proportional to the distance travelled
- vii. Perfect market competition – no excess profits. Prices are subject to the laws of demand and supply. People will always purchase at the lowest price offered and hence, no seller has advantage over another.

With these basic assumptions at play, Walter established two core concepts that are the basis for the development of central place theory. These concepts include 'threshold' and 'range'.

The threshold is the determining factor for the location of any central place. Threshold refers to the minimum population that is required for a good or service to be viable at a given central place. Goods or services will otherwise not be provided at a given central place if the minimum threshold is not reached. Range of good and services refers to the maximum distance a consumer is willing to travel to acquire goods and services. Beyond this distance consumers will not travel to purchase the good or service since the traveled distance for the good or service far outweigh the benefit. The market area of a central place is therefore defined by range and threshold. The market areas for a group of central places that offer the same order of goods and services extend each an equal distance in all directions in a circular manner. This develops both the upper and lower limits of goods and/or services. The area beyond which no buyer will be willing to travel is the upper limit. The lower limit denotes that area a firm needs to make profits and have sufficient demand.

Based on population of settlements, Walter Christaller gave a system of five sizes of

settlement. These included a Hamlet which is the smallest unit considered a rural community. The regional capital or the metropolis is the largest unit. He ranked the central place settlements in ascending order. The ascending order of central places therefore is Hamlet, Village, Town, City and Regional capital/Metropolis. Markets and services usually tend to be nested hierarchies with smaller towns that serve smaller markets. Border effects and transportation can however shift the distribution of towns away from theoretical uniformity.

The central place is located at the vertexes (points) of equilateral triangles as shown in Figure 4. Central places serve those consumers that are evenly distributed in close proximity to them. When the vertexes connect form a series of hexagons. Hexagons are ideal in that they allow the triangles created by the vertexes of the central place to connect. Additionally, hexagons clearly epitomize the hypothesis that consumers will visit the nearest place offering the good or service they are in need of.

The hexagon shapes were suggested by Christaller owing to the fact that the circular shapes of the market areas resulted to areas that were either unserved or overserved. There are a fewer high order cities and towns within a given area in relation to lower order villages and hamlets. Settlements theoretically in any given order are equidistant from each other. Higher order settlements are further apart from each other as opposed to the lower order ones.

Central place has three principles or orders that determine the arrangement of central places, namely: the marketing principle; the transportation (traffic) principle and lastly, the administrative principle. The marketing principle shown as $K=3$ where K is a constant has it that if the distribution is based on the range of goods entirely, then the result would be an evenly spaced central places that have hexagonal markets area. The different orders of settlement arrange themselves in a hierarchy. Market areas at a certain level of the central place hierarchy in this system are three times larger than the next lowest level. The different levels therefore follow a progression of threes indicating the number of the next level

increases threefold. For instance, two cities are surrounded by six towns, 18 villages and 54 hamlets.

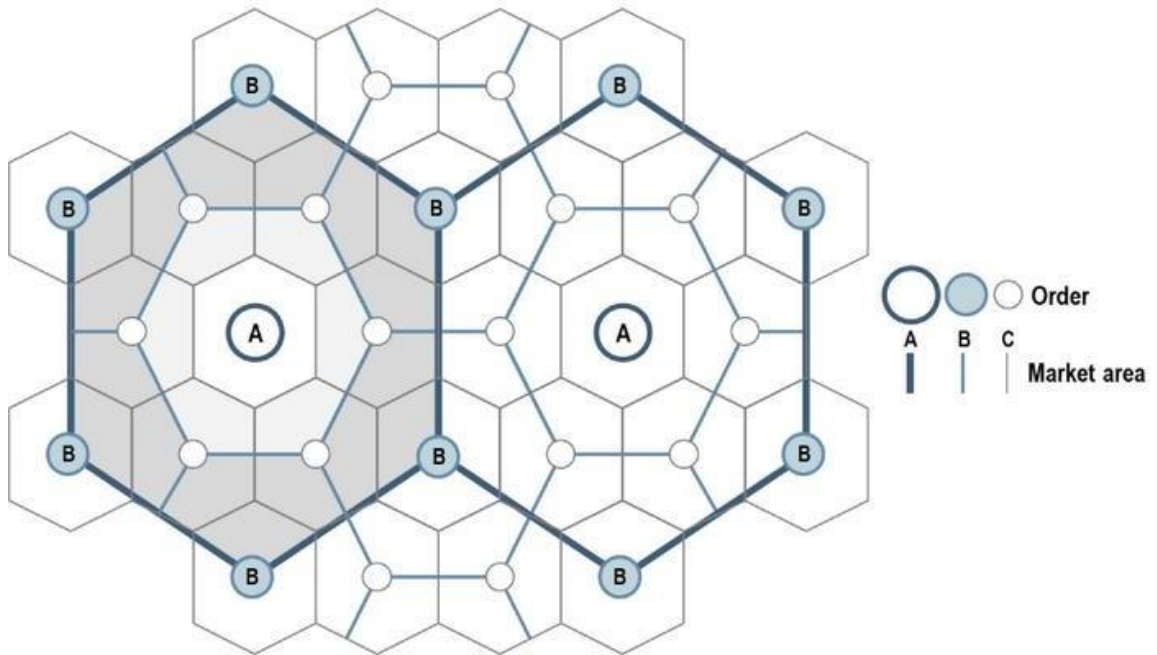


Figure 4: Central Places Theory

Source: Bairoch, 1988

The traffic principle ($K = 4$) postulates that the distribution of central places is most favorable when as many as possible important places lie on one traffic route between two important towns, where the route is established as straightly and cheap as possible. The more unimportant places maybe left aside. The central place would therefore be lined up on a straight traffic routes that fan out from the central point. The transport principle is based on the premise that if a central place (city) is smaller in size than expected is as a result of lower accessibility (it not falling along a major transport route) and vice versa. The transport principle provides for the most efficient transport network. Lower order centers in this system are located along the roads that link higher order centers. This alignment of central places along transport routes reduces the road length. for each higher order center in the transport principle there are four centers of immediate lower order as

opposed to three in marketing principle.

The administrative principle is commonly shown as $K = 7$ and also known as the political – social principle. The variations between lowest and highest orders in this system increase by a factor of seven. The highest order trade in this principle totally covers the lowest order hence the market serves a larger area. The hexagon of the higher order center covers completely all lower order centers. All lower order centers are fully subordinate to the higher order center. In this hierarchy, efficient administration is the control principle. Since tributary areas cannot be administratively split, they must be exclusively allocated to a single high – order central place.

The theory provides a broad perspective that informed the study. The spatial arrangement and distribution of settlements from the central point provided the basis upon which land use changes occurred. The university is a high order good in this context. Understanding the linkages of the university location to the furthest hamlet was in line with the objectives of the study. The theory therefore provided a greater insight in understanding the linkages between the KEMU main campus, the emergence of towns around it mainly Kaaga, Runogone and Thiiri and the university influence on the type of goods and service provided in these centers. Therefore, the central place theory was fully dependent upon to draw a broad understanding of the study subject.

2.5.3 The ‘Civic University’

According to Goddard, 2013, the civic university has the following attributes:

- i. It has *a strong sense of place*. A university recognizes the extent to which its unique identity as an institution is shaped by its location though it can carry out its operations at a national or international level;
- ii. Universities take *a holistic approach* to engagement. This is considered as an activity for the entire institution and therefore should not be limited to particular teams or individuals;
- iii. It is *actively engaged* with the entire world just as well with the local community

where it is located. This engagement is achieved by a university through collaborations and dialogues with individuals, groups and institutions locally, country wide and internationally;

- iv. A university is *willing to invest*. This is based on its interests to have influence that goes beyond its academic profiles. University investments may comprise of distribution of finances to unlock external funding sources or to support certain projects;
- v. A university has *a sense of purpose*. The university understands both that which it is good at and also that which it is not good at. This provides an explicit connection to its broader socio-economic sphere. This can be considered as its aspiration to handle specific problems and challenges facing the society regardless of whether these challenges or problems are local or international or even a combination of both;
- vi. It is *transparent and accountable* to the wider public and to its stakeholders; and lastly
- vii. It uses *innovative methodologies* like team building and social media in its activities of engaging with the world at large.

In his conclusion, he refers to a civic university as a “a social innovator that behaves as a multi-level actor linking the global, national and local domains; it works across the silos of the disciplines and of the public sector and links with both business and the community; it develops the boundary spanning and social entrepreneurship of the professionals it trains; it tests research ideas in ‘living labs’ and discovers the future through action rather than solely through analysis”.

Hence, the study of attributes of a civic university helps us to understand how university location correlates with its land uses for mutual benefit.

2.6 Policy, Legal and Institutional Framework in Kenya

2.6.1 Policy Framework

The policy framework is discussed under the Global Human Settlement Goals, the Sustainable Development Goals and the National Development Policies.

a) Global Human Settlement Goals

Achieving a sustainable human settlement development in a rapidly urbanizing world and attaining adequate shelter for all are the main goals of global human settlement. The fundamental principle of these goals comprises of poverty eradication, equality, sustainable development, livability, and civic engagement and government responsibility (UN HABITAT, 2003). Livability is the one which concerns most in this study as it deals with the spatial characteristics and physical conditions physical conditions of villages, towns, and cities which have to be taken into consideration. Additionally, it must take into account the land use patterns and city layout, building and population densities and ease of access to adequate public facilities.

b) Sustainable Development Goals (SDGs)

Kenyan Government, being part of the global community, subscribed to the United Nation's Millennium Development Goals (MDGs) that seek to ensure sustainability of the environment by integrating into the country's policies and programs the principles of sustainable development and reverse the loss of environmental resources(UN, 2000). Further the Kenyan Government has embraced the United Nation's Sustainable Development Goals (SDGs). SDG Goal 11 provides for making cities and human settlements inclusive, safe, resilient and sustainable, (UN, 2015). Hence, land resource and its utilization which form part of the study is relevant.

c) National Development Policies

The **Sessional Paper number 10 of 1965** on "African Socialism and its Application to Planning in Kenya" was adopted in 1965. The paper became the core policy frameworks for the economic development of all sectors of Kenya's economy. The paper provided for

the correction of imbalances in development that had been created by previous policies. It recognized the role of regional, urban, local and rural development levels in the national economy as well as that of decentralizing and redistributing planning and development. Since 1966, five-year comprehensive development plans that address development needs in all sectors and regions have been prepared based on this paper (ROK, 1965).

An **urban and rural development human settlement strategy** was developed in 1978. It provided an overall framework for the future management of urban growth and the location of physical developments in both urban and rural areas so as to come up with an organized system of human settlement. The strategy stressed on the policies for service and growth centers. The growth center policy centered on identified growth centers for stimulating developments in the hinterlands intended to reduce rural urban migration into larger cities like Nairobi (MLS, 1978).

The **Rural Trade and Production Centers and Small Towns project (RTPC & ST)** was initiated in 1986 to establish centers that would be regional growth nodes so as to catalyze development of their hinterlands and also act as mechanisms of dispersion to de-concentrate development from major towns (MOL, 2010).

A policy shift was witnessed in the country in 2002 following a regime change in the country's political dispensation leading to a strategy paper, **the Economic Recovery Strategy for Wealth Creation (ERSW&EC) policy** document that was published in 2003 (ROK, 2003).

In 2002, the country witnessed a shift of policy with a change in the political dispensation. **The Economic Recovery Strategy for Wealth and Employment Creation policy (ERSW&EC)** document was published in 2003 (ROK, 2003). To spur economic growth, the strategy determined the necessary policy actions. They included: -

Rapid growth of the economy through adoption of measures to harness collection of revenue, restructuring of expenditure and a monetary policy that backs up the achievement of economic growth without jeopardizing price stability; physical infrastructure

rehabilitation and expansion especially railway lines, roads and telecommunications; governance institutions to be strengthened; and, human capital investments particularly the poor.

The strategy was considered as a key instrument for providing the required stimulus for economic recovery and growth. Manufacturing and infrastructure segments of the economy were considered as playing pivotal role in the economy revitalization process.

The **Kenya Vision 2030** blueprint was developed upon the expiry of the ERSW&EC policy (ROK, 2007). The vision 2030 is Kenya's long-term national development blueprint. The blue print is anchored on three main pillars of economic, social and political pillars.

The realization of this desired socio-economic transformation is founded on key factors among them, land, which forms the basis for anchoring the implementation of the flagship projects. In respect to this, land reforms are highly emphasized in the vision with the preparation of the **National Spatial Plan (NSP)** which is among the flagship projects taking a center stage in land reforms agenda. The NSP 2015-2045 was envisaged to guide the prudent use of national resources, space and sectoral co-ordination and as such provide a spatial framework for the implementation of Vision 2030 projects.

Vision 2030 blue print is implemented through a series of medium term five year rolling plans. The 2008 – 2012 plan was the first on the series succeeded by the 2013 – 2017 plan. A spatial framework for implementing the vision is hitherto still missing. Until recently the national spatial plan was launched.

Sessional Paper No. 3 of 2009 on National Land Policy is intended “to guide the country towards efficient, sustainable and equitable use of land for prosperity and posterity”. The paper makes provisions for the overall framework and definitions of key measures needed to address serious matters of land use planning, land administration, environmental degradation, compensation for historical injustices, conflict resolution, outdated legal framework, informal settlements proliferation, information management and institutional framework. Land use planning is the key principle in the policy. It is acknowledged as

critical for sustainable and efficient management and utilization of land and land-based resources.

The National Housing Policy in Sessional Paper No. 3 of 2004 acknowledges the lack of comprehensive land use management plans. The aim of the paper is to facilitate the creation of comprehensive plans in administration of land for sustainable future housing developments.

The Environment and Development policy is established under Sessional Paper No. 6 of 1999. The main objective of the paper is to integrate aspects of the environment in the planning process for national development. The paper gives comprehensive procedures for attaining sustainable development with regard to development effects on the environment. The policy further advocates for provision of safe and clean household water for consumption. It sets out the procedures for reforms in the water sector necessary to overcome operational and institutional weaknesses in the water sector.

The Regional Development Draft policy of 2007 among other objectives it aims at facilitating the reduction of social and economic inequalities between and within regions and provides the development guidelines for investments in areas that can most significantly contribute to the overall national and regional development.

The Integrated National Transport draft policy of 2003 proposes transport planning procedures that support appropriate strategies like land use planning and efficiency, national development and the establishment of transport infrastructure and services that link industrial centers in urban areas, production zones in rural areas and markets so as to induce robust socio-economic activities and growth.

2.6.2 Legal Framework

Kenya's planning and building sector is guided by The Constitution of Kenya and a host of other statutes. The Land Planning Act was the main planning legislation before 1996. The Planning Act was enacted in 1968. The main aim of the Act was to control urban land developments. It made provisions for the preparation of town plans. The machinery of the

preparation of the plans and their contents were not clearly outlined in the Act just as was its limited application in rural areas. The Physical Planning Act of 1996 was enacted eventually repealing the Planning Act of 1968. The Land Registration Act, National Land Commission Act, Urban Areas and Cities Act, Environment Management and Coordination Act of 1999 (EMCA), Agriculture Act Cap 318, Public Health Act, Water Act of 2002, Energy Act, Roads Act and Regional Development Act among others are just but a few of the other legislation that have a bearing on planning and building sector in Kenya. The Commission on University Education (CUE) has also developed university standards and guidelines to guide universities in their planning and community service engagements among other guidelines.

2.6.2.1 The Constitution of 2010

The Constitution of Kenya under social and economic rights under Article 42 gives every citizen right to a clean and healthy environment. Under Article 43 (b), it gives every citizenry right to affordable and adequate housing and to reasonable standards of sanitation.

2.6.2.2 Other Statutes

The other statutes that were critical in undertaking the study comprised the following:

I) The Physical Planning Act of 1996 (Repealed)

The Physical Planning Act of 1996 now repealed provided for the formulation of guidelines, strategies and policies on national, regional and local physical planning. Further, the Act provided for the preparation of local and regional development plans. Section 5 of the Act required the Physical Planning Director to: -

- i) Be responsible for all regional and local physical development plans preparations;
- ii) Formulate policies, guidelines and strategies for national, regional and local physical developments;
- iii) To advise the commissioner of lands on issues related to land alienation under the Government Lands Act and the Trust Land Act correspondingly;

- iv) To initiate, direct or undertake from time to time research and studies on matters regarding physical planning;
- v) To advise the lands commissioner and local authorities on the most suitable use of land including land management like extension of use, change of use, lease extensions, land subdivision and amalgamation; and,
- vi) Require local authorities to ensure the proper implementation of physical development control and preservation orders.

In respect to Section 5 (f), the Physical Planning Act 1996 Section 29 empowers local authorities to: -

- i) To control or prohibit development and use of land and building for the interests of proper and organized development of an area
- ii) To control or prohibit land or existing plots subdivision
- iii) To consider and approve all applications for developments and grant permissions for all developments
- iv) To ensure proper implementation and execution of physical development plans that have been approved
- v) To formulate by-laws for regulating zoning in respect to use and density of developments
- vi) To reserve and maintain all land planned for parks, open spaces, green belts and urban spaces in line with the approved physical development plans

This Act was repealed to be in accord with the Kenya 2010 Constitution.

II) The Urban Areas and Cities Act, 2011

The Act stipulates the functions of city and large municipality council. Section 26 (1) indicates their functions among others includes exercising control over use of land,

subdivision of land, land development and zoning by private and public sectors for any purpose including industry, agriculture, markets, commerce, shopping and other employment centers, recreation, entertainment, parks, residential, passenger transport, transit and freight stations within the framework of spatial and master plans for city or municipality.

Section 26(2) of the Act states that, in collaboration with the relevant national and county planning agencies, a city and large municipality council shall prepare spatial plans including land use plans, zoning and functions for which the city or municipality is responsible within the framework of the spatial or master plans.

In section 61(1) of the Act, a city or municipality is required to prepare an integrated urban development plan that should include among its contents a spatial development framework consisting of basic procedures for a city or municipal land use management system.

III) Land Act, 2011

In Section 5 (1), the Cabinet Secretary shall regulate the use and development of land and formulate general principles of land planning and coordinating by the counties among other functions.

A land control board in making decisions whether to grant or refuse a consent in regards to a controlled transaction according to section 153(1) shall: -

- i) have regard to the effect which consent grant or refusal is likely to have on the economic development of the land in question or on the maintenance or improvement of standards of good husbandry within the land control area;
- ii) act on the principle that consent ought generally to be refused where in the case of the division of land into two or more parcels, the division would be likely to reduce the productivity of the land among others.

IV) Land Registration Act, 2011

Section 19(1) states, “every proprietor of land shall maintain in good order the fences,

hedges, stones, pillars, walls and other features which demarcate the boundaries or riparian reserves pursuant to the requirements of any law”.

Subsection (3) provides that the Registrar of Titles may order in writing which of the adjoining land holders shall be responsible for maintenance of any feature that demarcates their common boundary. Any proprietor ordered to be responsible and permits the boundary feature or any of its part to be in disrepair or be destroyed or removed shall be guilty of an offence and liable to a fine not exceeding Kenya shillings two hundred thousand.

Section 20(1) stipulates, “any person who defaces, removes, injures or otherwise impairs any boundary feature or any part of it unless authorized to do so by the Registrar shall be guilty of an offence and liable to imprisonment for a term not exceeding two months or to a fine not exceeding two hundred thousand shillings or to both”.

V) The Environment Management and Coordination Act, 1999

EMCA makes provisions for a sustainable environmental development. It requires that plans for development should adopt the preparation of Participatory National Environment Plans with sectoral linkages and coordination as well as measures to conserve the environment.

VI) The National Land Commission Act, 2012

The National Land Commission Act relates to the planning and building sector in in the sense that it articulates the meaning of Government land hence manipulating the manner in which land is planned and utilized.

VII) The Public Health Act Cap 232

The Public Health Act mandates each health authority to take all necessary, lawful and reasonably practicable procedures for upholding its region in clean and sanitary condition, preventing or causing to be prevented or remedied all conditions responsible to be injurious or dangerous to the health arising from the construction or occupation of unhealthy

dwellings or premises or the erection of dwellings or premises on unhealthy sites or on sites of insufficient overcrowding construction, condition or manner of use of any factory or trade premises and take proceedings against any person causing or responsible for the continuance of any such conditions and thwarting the occurrence therein of or remedying or causing to be remedied any nuisance or condition liable to be injurious or dangerous to health and take proceedings at law against any person causing or responsible for continuance of any such nuisance or condition.

VIII) The Water Act, 2002

The Act creates and regulates institutions that are accountable for water and sewerage services provision together with those that are in charge of large-scale infrastructure developments for harnessing water resources. The Act outlines the framework for allocation strategies for management of water resources.

IX) The Agriculture Act, Cap 318

The Agriculture Act is endowed with the promotion of agricultural development throughout the country. The Act does so by inspiring for the conservation of soil and water resources. The Act strives to enhance sustainable use of agricultural land through regulating the utilization of various land categories in Kenya for different agricultural uses. Further, the Act endeavors to ensure rural and urban populations food security

X) The Forest Act, 2005

The Forest Act makes provisions for the creation, control and regulation of forests in Kenya. The Act encourages conservation of all kinds of vegetation hence contributes to immense greening of urban areas.

XI) The CUE University Standards and Guidelines

The guidelines stipulate that a university is responsible for providing services to students that are proportionate to its population of students. Further, these standards and guidelines require a university to engage in community outreach programs that encourages social and

cultural life of the society. The mandate of CUE is limited to facilities within a university.

2.6.3 Institutional Framework

Internationally, the UNHABITAT, which is domiciled in Kenya, in the goal of providing adequate shelter for all, it promotes environmentally and socially sustainable towns and cities. Locally, an intricate institutional arrangement affects physical development planning. Besides the fact that the department of physical planning domiciled in the ministry of lands is legally mandated to undertake land use planning, there exist other multiple institutions that undertake these activities at different levels in the country. They include the forty-seven (47) county governments and various other public agencies.

i) Ministry of Lands and Physical Planning

The Ministry was established under Executive Order No. 2 of 2016. This is the government agency mandated to formulate policies and standards on land and physical planning among other functions. The Ministry, through its Department of Physical Planning, is responsible for all physical planning, land use planning included. The implementation of physical planning has been devolved to the Counties.

ii) The Forty-Seven Counties

The Constitution provides for two levels of government, namely: National Government and County Government. In Article 6 of the Constitution, the two levels of government are inter-dependent and distinct. Under Schedule 4 of the Constitution, County planning and development is among the devolved functions.

iii) National Environment Management Authority (NEMA)

The Environmental Management and Coordination Act (EMCA) No. 8 of 1999 establishes the National Environment Management Authority (NEMA) as the principal tool by the government while implementing all policies and legislation related to the environment.

NEMA is therefore mandated to protect and enhance environmental quality through research, coordination, facilitation and enforcement, while encouraging responsible

corporate, individual and collective participation towards sustainable development. NEMA developed a strategic plan for the year 2010-2013 which builds on the national priorities as spelt out in Vision 2030 and it contains definite robust programs and actions that focus on ways and means of improving our environment.

The preceding discussion on policy, legal and institutional framework shows that though the framework has been in existence, it is not adequate and comprehensive enough to cover emerging needs as those presented by university location and its impact on land use.

2.7 Case Studies

The study borrows concepts and findings from the case studies. Two case studies including San Marcos and Texas State University in the United States of America and the city of Amherst, Massachusetts and the University in the United States of America were reviewed.

2.7.1 San Marcos and Texas State University in the United States of America

According to Lisa et al, 2016, the city of San Marcos and Texas State University takes a research-based approach to common sources of conflict in a university town. The city and the university are the Leading Practice in Achieving Community Together (ACT). Many university towns place enormous amounts of funding into fighting the usual outcomes of studentification, rather than the core issues.

The City of San Marcos was dealing with large numbers of students living in the community through an over-reliance on police enforcement, especially patrolling, investigating, arresting, and prosecuting without detailed understanding of the specific social, economic and physical nature of the studentification process. In 2008, realizing that noise complaints were the #1 call type for police officers, the city decided to deal with the core issues of the problems through a detailed understanding of the research and planning required in dealing with these complex problems.

ACT was developed following collaborations between San Marcos city and Texas State University. To decrease common sources of conflict in Act, the ACT committee oversees it. The ACT committee is made up of representatives from the city, the university and the

community. The committee is made up of the Vice presidents of student affairs, the dean of students, director of housing and residential life, attorney for students, offices of Off Campus Living, University Police Department, Student Health Center, Parent and Family relations and Student Diversity and Inclusion. The committee also includes representatives from the City of San Marcos Assistant Chief of Police, offices of Code Enforcement/Neighborhood Services, Community Liaison, the Central Texas Dispute Resolution Center including members of the Council of Neighborhood Associations and the community at large.

ACT represents a substantial change in the manner in which communities deal with the impacts of studentification by integrating research, planning, education, innovation, and relationship building between the key actors across the community. The symptoms of the problems are now dealt with by understanding the core characteristics of the dimensions of the process, with a focus on the occupants and the places they occupy-noise and housing have become the focus.

ACT in collaboration with the department of Housing and Residential Life at Texas State developed “ACT Ally” for dealing with housing. Innovative approaches for addressing quality of life matters for a successful out of campus living experiences are deployed through ACT Ally. Resources are available to aid in the management of disputes with roommates, landlord, concerns of maintenance and leasing issues to assist in resolving conflicts.

ACT Ally links students with the rental housing industry through ACT members and affiliates, who advocate for a healthy living environment and illustrate a pattern of fair and equitable business practices in related products and services delivery. A rental property, an apartment complex, a service or product provider who participates in ACT Ally is included in a select group to help parents and students make more informed decisions while selecting off campus housing.

A key issue in dealing with the effects of studentification requires a thorough understanding

of the complexities of housing and student behavior in those off-campus structures and neighborhoods where students choose to live. By dealing with those directly responsible for the ownership, planning, occupation, and behavior of student occupied structures, San Marcos has been able to establish expectations on the overall quality of life of these areas through a model for both students and businesses that are engaged with students living in the community. Through ACT, the university administration works directly with San Marcos police and code enforcement officers on issues with students living off-campus, including follow-up with student noise violations and housing property maintenance standards. They work with housing providers and other businesses to create a balance of power between landlords and tenants, as well as event management that does not market using excessive alcohol consumption, as well as planning, zoning and inspection of rental properties.

The results of the ACT program have been impressive, with a 34% reduction in noise complaints from 2008-2015 and noise complaints no longer the most frequent police call type, dropping from 6.1% of total calls to just 3.4%. Arrests and citations have been reduced by a staggering 63.4%, allowing police resources to be devoted to other issues and areas of the city.

San Marcos has shifted the allocation of resources from dealing with the symptoms of the problems to delving into the core issues behind the studentification process. Through a shared response, both city and university have made an enormous improvement in the overall quality of life, created positive off-campus living arrangements, reduced citizen complaints, and created patterns of fair and equitable housing and business practices as the core issues.

2.7.2 The City of Amherst, Massachusetts and the University in the United States of America

According to Ziomek et al 2016, the relationship between the Town of Amherst and its university was observed to be, “Physically disconnected and disengaged over time”. The question was: “How does a community that has been home to a state university campus for

over 150 years find itself at this point of benign neglect, where the presence of the university is often identified with the physical, social, cultural and economic issues at the root of the studentification process?”

Amherst is certainly not alone, in terms of a real or perceived gap in university community relations, yet its recognition of the need to identify and take action on the issues associated with studentification are noteworthy. In 2013, the university chancellor and the Town of Amherst committed to a long-term analysis of the key issues associated with the relationship and the creation of a “University/Town Collaborative”. Beyond dealing with the daily, more immediate issues of large, unruly gatherings, student behavioral issues, noise and parking infractions, a consulting firm was engaged to work with the Collaborative in addressing short and long-term strategic issues by examining planning documents, transportation plans, housing market supply and demand data, as well as strategic economic development goals and innovation plans as the key to realizing the underlying causes of the episodic problems of student attending university and living in the community with their neighbors.

The University/Town of Amherst Collaborative, supported by civic and university leadership, have recognized some significant ways forward by addressing the recommendations for change, including a focus on mixed-use housing and planning for land use compatibility as a key area, as well as fostering local innovation, start-up and creating an entrepreneurial community. Recognizing a shared responsibility for town and gown relations, the Committee has now taken the lead on creating an “innovation ecosystem”, where there is recognition of the high value of research activities, creative fields and activities, entrepreneurship and start-up activities, as well as advanced manufacturing. Including the innovation and economic drivers within the university is a key change, as is sharing the university’s housing and services needs with the larger community.

In the months since its inception, the Collaborative has now created sub-committees with

co-chairs from the town and university, to identify key goals, initiatives and interventions within the community. In particular, there have been three key areas addressed:

- i) Housing (including student housing, housing for faculty and staff, and affordable housing);
- ii) Economic Development (including university partnerships, entrepreneurship and start-ups, food retail, and amenities); and
- iii) Quality of Life (including public safety and student behavior).

All of these developments represent a significant cultural shift in university-community relations in Amherst and this approach represents a leading practice in addressing the root issues associated with studentification. Both town and university are confident that they have created a shift in the culture that engages old and new stakeholders in shaping their long-term town gown success.

In particular to quality of life, the University of Massachusetts-Amherst and the local Amherst community have had a long history of off-campus parties, including large daytime neighborhood gatherings and “night rages” at apartment complexes that spill- over into non-student residential neighborhoods, there has been a significant set of impressive leading practices that have emerged in response to these issues. The concentrations of student housing enclaves have tended to defy traditional crime prevention and enforcement efforts with strained relationships between local residents, student renters and law enforcement officials, with significant safety and liability risks, detrimental images of the town and the university, as well as the overall quality of life in the community.

Crime Prevention Through Environmental Design (CPTED) is a multi-disciplinary approach to incorporating theories of design, psychology and sociology, where it is found that physical environments, structures and landscaping, can be designed to change behavior, reduce crime and safety issues, and improve the overall quality of life there.

Working together, various university offices and local government law enforcement

agencies have shifted from response to reported crimes, to one of crime prevention through changes to the residential design and occupant behaviors. For example, natural surveillance refers to the placement of physical features, people and activities in ways that give the maximum ability to see what is happening in a given space. Territorial reinforcement uses fences, buildings, pavements, signs and other objects to express ownership or to explicitly demarcate the shifts from public to private space. Access control refers to the physical guidance of people getting into or out of a space through appropriate installation of entrances, egresses, landscaping, fencing, secure premises and other barriers to open access. This approach relies upon regular maintenance of each of these measures, be it lighting, fencing or landscaping, it requires to be consistently checked on a regular basis.

2.7.3 Lessons from the Case Studies and their Applicability in Kenya

There is need to establish a framework that brings together and captures the aspirations of the overall quality of life for both the university students and the neighborhood community. Through ACT model, San Marcos has been able to establish expectations on the overall quality of life for both students and businesses that are engaged with students living in the community. The university administration works directly with San Marcos police and code enforcement officers on issues with students living off-campus, including follow-up with student noise violations and housing property maintenance standards.

They work with housing providers and other businesses to create a balance of power between landlords and tenants, as well as event management that does not market using excessive alcohol consumption, as well as planning, zoning and inspection of rental properties. KEMU main campus lacks a similar model with local security providers and county government enforcement officers.

A university neighborhood, due to its unique needs of segments of its population, needs to adequately provide for each segment. Further, student demand for accommodation is likely to be diverse and evidence suggests that preferences shift over the student life course. University/Town of Amherst Collaborative effort has a focus on mixed-use housing and planning for land use compatibility as a key area. A similar strategy should be adopted for

KEMU Main campus and its neighborhood. Such a focus aligns housing supply to housing demand, regulates quality of housing in terms of management and maintenance, and creates residential clusters for each population which can easily be served with necessary services.

Universities being the research institutions can engage and share with their neighborhood's new knowledge and innovations. At Amherst, the Committee has now taken the lead on creating an "innovation ecosystem", where there is recognition of the high value of research activities, creative fields and activities, entrepreneurship and start-up activities, as well as advanced manufacturing. Including the innovation and economic drivers within the university is a key change, as is sharing the university's housing and services needs with the larger community. KEMU needs to establish linkage with its neighborhood especially in areas such as rural agriculture, medical and ICT which are some of its popular programs.

A crime prevention strategy through environmental design which is a multi-disciplinary incorporating theory of; design, psychology and sociology, where it is found that physical environments, structures and landscaping, can be designed to change behavior, reduce crime and safety issues, and improve the overall quality of life there. This approach taken by Amherst has remarkably reduced crime incidences. KEMU main campus and its neighborhood are characterized by security risks as derived from the study. Hence, a crime prevention strategy which is incorporates design elements such as maintenance of live hedges, physical barriers of through access road, street lighting, Closed Circuit Television Cameras among others is necessary.

Partnership and involvement of all stakeholders is very important in coming up with a sustainable university neighborhood. Involvement of all stakeholders ensures a very inclusive design that guarantee livability all users such as university students, faculty and other staff and neighborhood residents who can either be residents or tenants. In such an approach, the interests of all the users are catered for. Unlike the situation in San Marcos and Amherst, there is minimal involvement of the stakeholders in KEMU main campus

neighborhood in any kind of development. It should therefore be set as a mandatory requirement as provided for by the Cities and Urban Areas Act and Physical Planning Act. The involvement of stakeholders may be significant in boosting the good neighborliness, social cohesion and sense of belonging among the neighborhood community and all the other actors in the development process.

2.8 Conceptual Framework

Drawing from all the preceding discussions in this chapter, the researcher was in a position to put together a model that encapsulated that policy-decision making on university location by Governments or its agencies have potential to influence land use, how university location impacts land uses, development patterns and values and the strategies to surmount the problem. The model is schematically represented in Figure 5. The Figure 5 demonstrates the main elements and relationships for the university location and its surrounding neighborhood. Solid arrows in the main panel denote influence between elements; the dotted arrows denote links that are acknowledged as important, but are not the main focus of the study. The thick colored arrows below and to the right of the central panel indicate different scales of time and space, respectively.

University location refers to where the university is situated. This location has assets of students, staff and the community. The benefits of university location to the immediate are in the form of demand for and supply of goods and services. On one hand, the university students and staff buy goods and services from the immediate neighborhood.

On the other hand, the university supplies goods and services to the surrounding community. The immediate neighborhood refers to the surrounding area of the university. This neighborhood is in the form of the built-up area, the human population and its social and financial components as influenced by the university location. “Drivers of neighborhood land use change” refers to all those external factors that affect university location assets, the immediate neighborhood, and the benefits accruing to it as a result of university location and lastly, the sustainable university location with its immediate

neighborhood. They include policies, legal and institutions systems and direct drivers such as natural growth of population and climate among others.

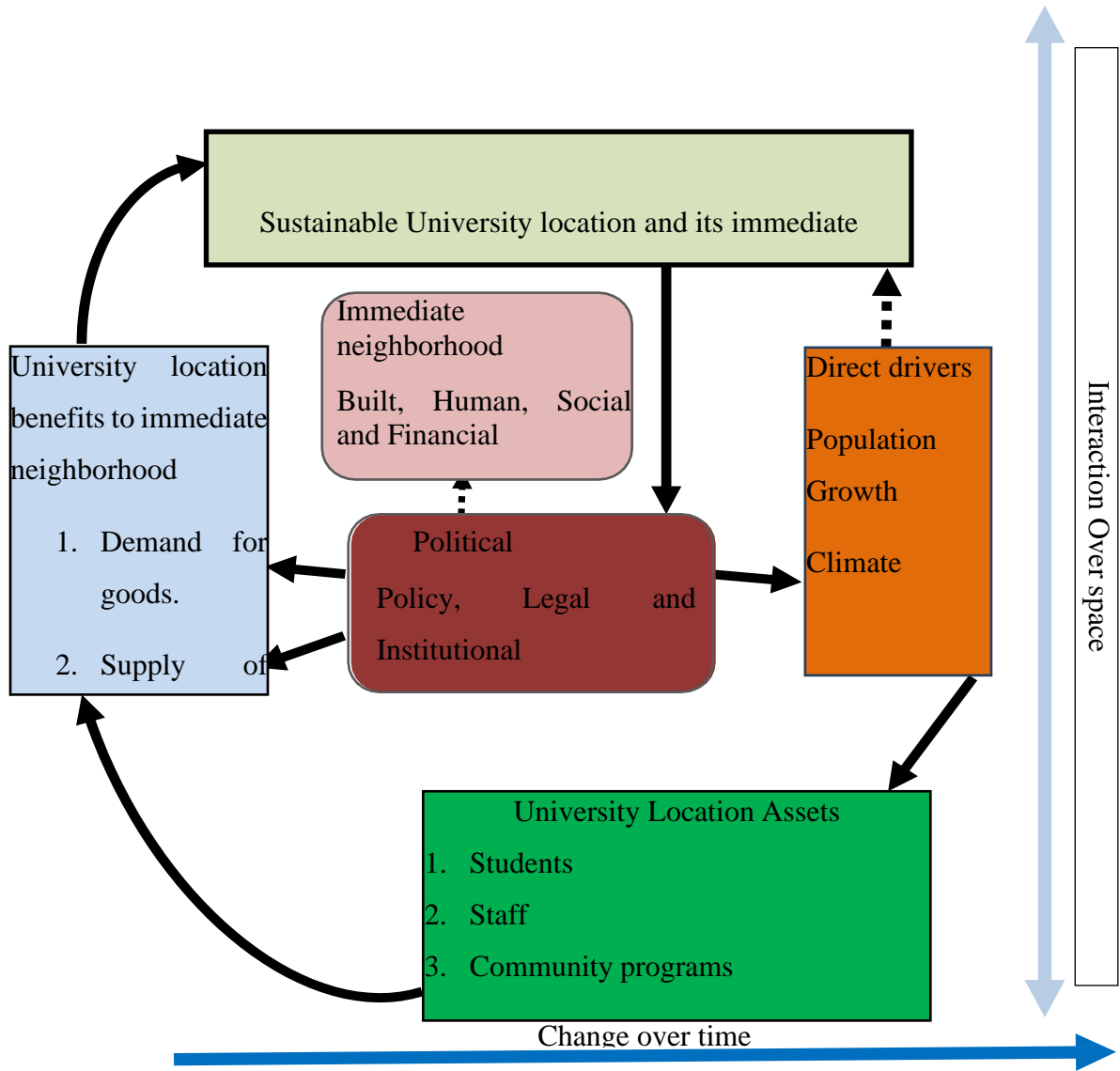


Figure 5: Conceptualizing university location to neighbor land uses changes

Source: Author, 2018

Policies, legal and institutions systems influence are key levers of decision making available to regulatory authorities. Universities, on their part, are required by CUE to observe the prescribed standards as earlier described in this section whereas the immediate neighborhoods are constrained by regulations in use of their land.

Sustainable university location with its immediate neighborhood is the achievement of a fulfilled and harmonious university-neighborhood life. This is a notion which demonstrates symbiotic relationship where the university benefits from its immediate neighborhood and the immediate neighborhood benefits from the university. It is a concept borrowed from the principle of good neighborliness.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Chapter three provides the foundations upon which and the process within which the study was birth and executed. The chapter point out the tools that were employed for identifying and analyzing land use changes, determining their characteristics, examining the trends of property values and drawing conclusions. The chapter outlines the manner in which the research is designed and the overall study strategy.

3.2 Research Design

The nature of the research problem, being the need for identifying and analyzing land use changes signifies both exploratory and causational approaches were adopted in carrying out the study. This highlighted the requirement for choosing cases for comprehensive empirical inquiries. Descriptive accounts of a phenomenon are often required in responding to questions related to understanding the phenomenon.

Defining what constitutes change of land use an urban type and applying this definition in real life context was the starting point of this study. The notion of change implies the conversion from one use to another. This is done through a process which calls for a methodical approach in identification and assigning references to various uses of land on basis of pre-determined criteria. The study preferred a case study approach as a suitable research strategy. According to Yin (1994:13) a case study refers to the empirical enquiry in the investigation of a contemporary phenomenon within the confines of its real life, particularly where boundaries between a phenomenon and context are evidently unclear.

A mixed-methods approach was used to obtain data. The review of related literature was conducted to get information on the study area. Information included physical, economical and socio-cultural characteristics of the study area among other details. The trends in land use through the different five-year time periods were obtained from remote sensing and analyzed diachronically and change determined. Then ground truthing was done by at both

reconnaissance and survey phases to triangulate with the ground position. The approach used aided to obtain both qualitative and quantitative information to answer the research questions.

3.3 Population

Since KEMU borders a gazetted forest, Imenti Forest, which forms a buffer to the West, a radius of approximately 2.5km from the university point (Latitude -1.099453 and longitude 37.013823) was used to create the region of interest. The polygon with an area of approximately 19.63sq.km was then used in the image acquisition, pre-processing and interpretation. The population of interest to the study comprised of the households in the three locations, namely: Kithoka, Kaaga and Runogone which were 1178, 787 and 693 respectively. The total number of households was 2658 (KNBS, 2010).

Landsat images for the years 2000, 2005, 2010, 2014 and 2018 were acquired with the spatial resolution of 30m. Five different classes of color bands were used to reflect the changes that have occurred on the land over the years. The following classes were used, namely:

- i) Vegetation. (This included agricultural land, plantation and grassland)
- ii) Bare ground.
- iii) Built up area.
- iv) Wetlands.

Interpretation in the class changes in area (sq.km) were computed using GIS and analysis done on the same.

3.4 Sampling Design

The 2658 households formed the sampling frame with the household as the sampling unit. Random samples of individual households were drawn from the sampling frame to elicit data for the study. Table 1 shows how the sample size was computed. In the formula below,

the value of p was not known. Therefore, an estimate of value of 0.5 was substituted for p in the equation in order to obtain a conservative sample size. This was made with a bound on the error of estimation of magnitude B at 0.075.

Table 1: Formulae for determining the sample size

<p>The formulae given below assisted to calculate the sample size</p> $n = \frac{Npq}{(N-1)D + pq}$ <p>Where: $p=1-q$, $D=B^2$</p> <p>4</p> <p>N=Population of Interest</p> <p>n =Population sample</p> <p>p=Population proportion</p> <p>q=The opposite of p</p> <p>B=Marginal/bound error, which must be smaller than the value of p</p>

Source: Schaeffer, 1979

Table 2: Calculation of sample size

$$n = \frac{2658 \times (0.5 \times 0.5)}{\{(2658 - 1) \left(\frac{(0.05 \times 0.05)}{4} \right) + (0.5 \times 0.5)\}}$$
$$= 173$$

173 x 0.91 (is the error bound) = 157 households.

Source: Author, 2018

The three sampled sub locations were selected as they fall within the specified 2.5km radius from KEMU main campus. Table 3 shows the number of households sampled from each sub location based on the proportion of a location's household population to that of the total population of the study area equivalent to the total sample size of 157 households. A total of 98, 38 and 24 households were selected from Kithoka, Runogone and Kaaga locations respectively. For each of the identified landlord respondent, a corresponding tenant was identified as the matching respondent. This ensured that equal proportion of landlords and tenants were interviewed by use of household questionnaires, validating the eventual results of the research. Further, it guaranteed a wide spread varied view of the same concept with availability of rich experience and information from the tenants and that of the landlords and hence, aiding accuracy, authenticity, reliability and verifiability of collected data.

The sampling methods employed were purposive random sampling of the three locations; cluster and stratified proportional random sampling methods as shown above were adopted in distributing the questionnaires. The location was treated as a cluster and the landlords and tenants as strata. Within each location, there were several villages, which formed clusters, from which a sampling frame of landlords and tenants was chosen.

Table 3: The Distribution of Respondents

Sub location	Area in sq. km	Questionnaires	Landlords	Tenants
Kithoka	13.0	98	49	49
Runogone	5.0	38	19	19
Kaaga	3.0	24	12	12
Total	21	160	80	80

Source: Author, 2018

As Patton (1987) argues, the power of statistical sampling depends on selecting a truly random and representative sample that permits generalization and the power of purposeful sampling lies on selecting information-rich cases for in-depth studies. Systematic sampling was then used since the number of landlords and tenants in each village had been established from the village elders. Such a design allowed the selection process to start by picking some random starting point in the lists of landlords and tenants in each village and then every n^{th} element (sampling interval) was selected until the desired number was secured. The simple random sampling removed bias as each landlord and tenant in each village had an equal probability of being selected as the first respondent.

The key informants in the private practice and officials in both County and National Government were identified using purposive non-random sampling as they were well known. Key informants composed of respondents who were particularly well-informed and with deep understandings that were valuable in aiding the researcher comprehend what occurs (Patton, 1982). Interviews with key informants and officials provided an objective basis for triangulation of information gathered from other sources including documentary analysis. Interviews with officials also provided a ground to make inferences on policy issues, perceptions of the institutions they represented with respect to planning and management of land uses occurring in the KEMU neighborhood.

3.5 Data Needs Matrix

Questionnaires were used to collect the required data. Gay (1996) elaborates that descriptive data are generally gathered by use of questionnaires. Questionnaires were preferred due to their ability to easily reach a broad group of respondents within a short period of time and at manageable costs. Four types of questionnaires were administered. Structured and non-structured questionnaires for land lords and secondly for tenants were administered. The third type included a discussion guide for focused group discussions with National and County government staff dealing with land related matters such as planners, land surveyors, valuers and housing officers. Lastly, there was a questionnaire to private practitioners in the land and housing sector such as planners, land surveyors, valuers and architects who have at least five years' experience of private practice in the area. All questionnaires contained both open-ended and close-ended questions. The close-ended questions were used to guide the response to the questions relating to the study area and also to help the respondents to make quick decisions. Some questions were on 2- and 3-point rating scales. The former is a test on elements of plot and house either liked or disliked. The latter is a perception test on the change of land use in the KEMU neighborhood for the last fifteen years as either Positive or Negative or No change.

Open-ended questions were used to enable the respondents express their opinions in its original format and not captured by the close-ended questions. Available data for property values declared and assessed for stamp duty from the Government valuer's Meru county office were obtained for sales which have taken place during the period under review. Satellite images from Regional Center for remote sensing were used to show land use changes through the selected time periods, namely: 2000 to 2005 and 2005 to 2010 and lastly, 2010 to 2015.

3.6 Data Collection Methods

All the five types of data collection methods, namely: instrument administration; interviewing; observation; photography and examination of documents, materials and artifacts were used. With the aid of eight well trained research assistants who were well

versed with the study area, the researcher was able to administer the questionnaires to the identified respondents of the study area. The assistants were trained on the aim of the study, the survey process and general research ethics like seeking permission to interview, use of courteous language, appreciating the cooperation of the interviewee and maintaining confidentiality. This method hastened the process of data collection by not only introducing the aims of the study to the respondents but also in developing rapport with them. To enhance reliability, a shorter version of set of questions was administered.

Through use of mobile communication and a lead research assistant, the researcher was able to monitor progress until all the questionnaires were completed. The researcher administered the instrument or questionnaires for the key informants due to securing the appointments with them and the open-ended nature of the questions. He also conducted a proportion of the household interviews in each sub location in the three locations.

Observation of housing conditions and plot layout was done. A checklist was be used to record the housing conditions. The plot lay out was sketched to show the arrangement of activities on the land. Land use changes for the KEMU neighborhood was observed and monitored at three intervals: 2000 to 2005 and 2005to 2010 and lastly 2010 to 2015. The dates of the three Landsat TM images were as closely as possible in the same season to eliminate the effect of weather.

To ensure validity of data, the study used complementary data, information and other cases to rule out rival explanations. The selection of two categories of landlords and tenants was deliberate. It elucidated competing explanations over study phenomena of land use and house characteristics and property values. Further, the corroboration of the multiple sources of evidence enhanced validity. However, it is important to mention that due to the exploratory and descriptive nature of this study, at times, it was a bit challenging to corroborate all information. This is due to lack of alternative sources of information.

To ensure reliability of information, the study adopted a coherent data collection method in all cases. For instance, in analyzing land use types and characteristics, the same

variables, such as land use type, plot and house characteristics among others were used. The application of the same variables for all cases facilitated cross-case analysis and pooling up results from these cases.

3.7 Data Analysis Plan

The data gathered through field survey was edited first so as to detect and remove inconsistencies and errors if any by the respondents. To translate the responses into specific meaningful categories the edited data was coded. Code numbers were assigned to each answer of survey question and from this a coding list or frame was obtained. Coding ensures organization and reduction of research data into manageable summaries. The coded items were keyed into the computer for analysis using Statistical Package for Social Sciences (SPSS). Descriptive statistical analyses such as means, percentages, frequency distributions, CHI square and ANOVA were used to describe data. Landsat TM images of the study area were analyzed diachronically on spatial growth trends and on time-space development or changes.

3.8 Data Presentation Plan

Presentation of data was done on tables, pie charts, bar graphs and landsatTM images.

CHAPTERFOUR: STUDY AREA

4.1 Introduction

This chapter illustrates geographical location of the study area from national, regional and local contexts. It also describes the study area KEMU neighborhood context and gives the historical background of KEMU.

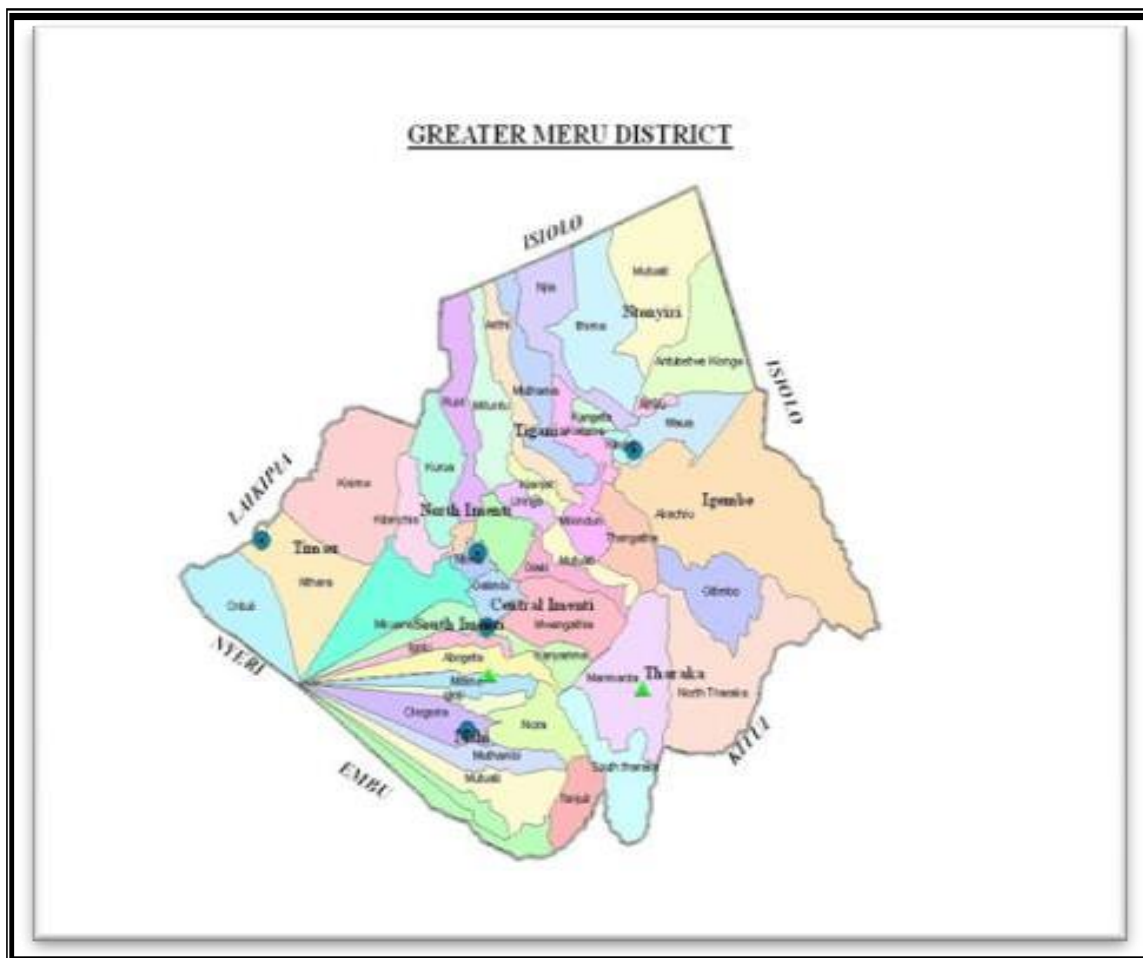
4.2 Geographical Location

KEMU neighborhood is situated in Nyaki West county assembly ward, Nyaki location in Imenti North Sub County, Meru County, (Maps 1, 2 and 3). It is approximately 256 km North East of Nairobi. It is situated about 6 km north of Meru town which is the headquarters of Meru County, and the sixth largest urban center in the country. The area falls within latitudes $0^{\circ} 3' 0''$ N and longitudes $37^{\circ} 39' 0''$ E. The study area covers an area of about 47.40sq.km.



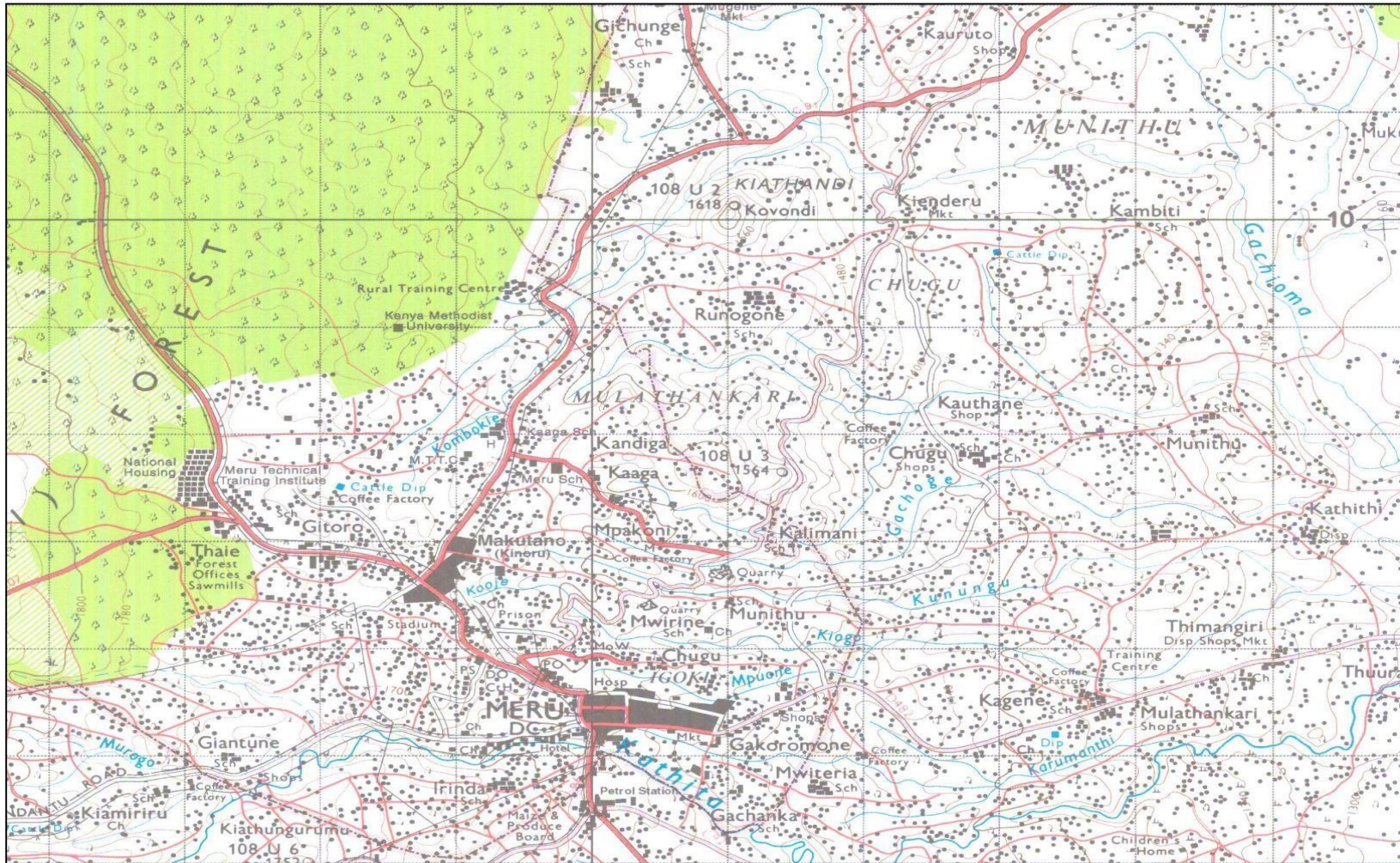
Map 1: Meru County in the National Context

Source: Ministry of Lands & Physical Planning, 2018



Map 2: Meru County from a regional context

Source: Ministry of Lands & Physical Planning, 2016



Map 3: KEMU Neighborhood from a Local Context

Source: Ministry of Land, Housing & Urban Development, 2015

4.3 Demographic Characteristics

The county has a population growth rate of 2.1 percent. The county had a projected population of 1,443,555 as of 2012. Of these projections, 713,801 were males while females stood at 729,754. Table 4 provides Meru county population projections that were useful in guiding the study. In 2015, the Meru county population was projected at 1,536,422 and was expected to hit 1,601,629 in 2017 (MCADP, 2014). The study area, which had a population density of 427, had a total population of 5554 with 2872 males and 2682 females in 2009 (KNBS, 2010). The growth in population, both as a result of rural urban migration and increase in absolute numbers of persons, puts strain on the available resources such as land.

Table 4: Population in Meru County

Year	Male Pop	Female Pop	Total Pop	Density sq km
2009	670,656	685,645	1,356,301	196
2012	713,801	729,754	1,443,555	209
2015	759,721	776,701	1,536,422	222
2017	791,964	809,665	1,601,629	231
				National Average 66

Source: MCADP, 2014

The Ameru sub-tribes of Tigania, Imenti and Igembe are the dominant residents of Meru County. The Ameru (Meru) tribe is closely related to other major tribes that live around the Mt. Kenya region mainly the Kikuyu and Embu people. Just like Meru town which has a significant cosmopolitan population through interactions of individual business people, public and private sector workers and students, intermarriages, the study area exhibits similar characteristic due to its close proximity to Meru town. Additionally, many people visit the county from within and outside the country some on a daily basis for different

reasons comprising of leisure and business.

Meru county dwellers are predominantly Christians with mainstream churches such as Presbyterian, Methodist and Roman Catholic among multiple other denominations portraying missionary works that have roots in the county since colonial times. Besides the dominant locals, the county is also home to minority groups mostly of Indian descent with Hindu being their dominant religion. Muslim is also practiced by a few African/Arab residents within the County. Additionally, the county is also home to a few Europeans majorly of British origin who have settled within the county since the colonial days mainly engaged in large scale agriculture.

4.4 Socio-economic Characteristics

Meru town is the commercial capital and agricultural center of upper-eastern region of Kenya. It hosts a currency center for the Central Bank of Kenya which serves the upper-eastern region of Kenya. Meru has 22 different banks. They comprise Equity, Postbank, Barclays, Standard Chartered, Co-operative, Diamond Trust, National Bank, Family Bank, Commercial Bank of Africa, Fina Bank, K-REP Bank, Eco-Bank, CFC Stanbic, NIC, Housing Finance and KCB. Kenya Women Finance Trust and Faulu Microfinance Bank have branches in town centre and some in Makutano which is a peri-urban center of Meru town. Several micro-finance institutions are also available. They include Mwalimu Cooperative Savings & Credit Society Limited, (Mwalimu Sacco), Yetu Sacco, Afya Sacco and Ntima Sacco. The study area hosts an Equity ATM at the KEMU main campus gate. These financial institutions facilitate trade within the town; offer access to credit facilities and provide a linkage for international finance transfers through foreign currency exchange and funds transfer activities among other functions.

The area has small shopping centers such as Gakurine, Mwanika and Runogone which have shops, cyber cafes, milk bars, bars, butcheries, tailoring shops, furniture making shops and hard ware shops. These are the lowest order shops serving the area residents. Large supermarkets such as Nakumatt, Tuskys, Uchumi, Samarat and Budget are found in Meru town and Makutano. Wholesale shops, clothing stores, electronic and electrical goods shops, chemists, animal feeds shops, hard ware stores such as Silver Spread, Mohammed

Moti, Meru Famous, Harun and Sikander among others are also found in Meru town and Makutano. Gakoromone open market and Makutano market are in Meru town. Several industries such as Mount Kenya Dairy, Mount Kenya Millers, animal feeds industries, Silver Spread, Mafuko industries among others are in Meru town and Makutano. Most of them are agro-based industries sourcing their raw materials from the County. Petrol stations are found along the major tarmac road, Meru-Maua road, traversing the area.



Plate 1: Gakurine Shopping Centre

Source: Field Survey, 2018

The area falls within the Kenya highlands and possess a high potential for agriculture. The area is capable of supporting a successful agricultural sector owing to its location on the rainy harvesting slopes, young volcanic soils and appropriate altitudes. Land is the dominant source of livelihood to largest proportion of the people residing in the study area. The average farm holdings in the area are small with many households occupying less than one acre of land. Appendix VI is a registry index map showing the subdivision of land in Nyaki/Kithoka registration sheet 10.



Plate 2: Mwanika Shopping Centre

Source: Field Survey, 2018

The dominant food crops grown in the area are maize, beans, potatoes and fruits such as paw paws, bananas and mangoes.



Plate 3: Poultry Farming in Gakurine

Source: Field Survey, 2018

Owing to the small landholdings, the food crops are mainly for subsistence. The main cash crop grown in the area is coffee but it is being substituted with horticultural crops. Additionally, livestock rearing of dairy cattle, meat goats, dairy goats, sheep, rabbits and poultry is also

practiced. Fish farming is gaining currency in the area. Close proximity to Meru town offers a ready market for livestock products such as milk, eggs and fish among others.



Plate 4: Vegetable Farming in Kithoka

Source: Field Survey, 2018

Additionally, the farming systems also comprise of afforestation and agro-forestry. Altitude, climate, soil fertility, soil types and the socio-economic subsystems determine the farming system adopted by residents. The most common tree species are grevillea and blue gum grown for timber production.

Farming is generally rudimentary and it is carried out by the use of hand-held tools such as hand hoe, (chop-down-and-pull), fork jembes and pangas. This is dictated by the miniature size of the farm holdings. Harvesting of crops is also manually done. Source of farm labor is family and occasionally the use of hired labor.

In the livestock sector, dairy cattle are zero grazed, fed with farm produce feeds combined with industrial feeds. Milking is largely accomplished through the use of manual labor. Other livestock enterprises such as sheep and goat, poultry keeping, fish, rabbits, also rely exclusively on manual labor, local feeds and industrial supplements.



Plate 5: Zero Grazing in Kithoka Village

Source: Field Survey, 2018

The area borders Imenti Forest which is part of the gazetted Mt. Kenya Forest which has a cultural and religious significance. Elected and hierarchical council of elders have governed the Ameru since the 17th century. The hierarchy that governs the Ameru people runs from the clan level way up the ladder to the supreme council of elders commonly known as Njuri-Ncheke council. Being a Njuri-Ncheke council member is the highest social rank that Meru man can dream of becoming. Njuri-Ncheke is made up of carefully selected elders who must be respected, composed, mature and incorruptible members of the community. These attributes are especially very critical in that the council work calls for great personal discipline, wisdom, and knowledge of the Ameru traditions. Also, the Njuri-Ncheke is the apex of the Meru traditional judicial system. Edicts by the Njuri-Ncheke council apply across the entire Meru community.

The Njuri-Ncheke is mandated to undertake functions including making and executing community laws, settling disputes and transmission of community norms, values and knowledge across generations in their role as the custodians of Meru traditional culture. Disputes resolutions are invariably addressed across the ranks with the local disputes entering the community judicial system at the lowest rank of elders known as Kiama, it then follows through to the middle rank referred to Njuri before it would finally be handled

at the highest rank of Njuri-Ncheke council. Njuri-Ncheke does, however, not handle matters that involve people who are non-Meru. It also does not handle matters that are expressly under the common law of Kenya. Interestingly, cases are determined by Njuri-Ncheke in a manner similar to common law processes and hugely rely on case law and precedence.



Plate 6: Njuri Ncheke Shrine gate

Source: Field Survey, 2018

The Njuri-Ncheke also is responsible for overseeing and enforcing rules and regulations that control conservation and use of open grasslands, forests and salt licks. This is a lesser known yet very important function of the Njuri-Ncheke in the management and conservation of land use and protected areas. Njuri-Ncheke work as conservationists extends to the preservation of sacred sites.



Plate 7: Njuri Ncheke Shrine

Source: Field Survey, 2018

4.5 Social Infrastructure

This includes schools, health facilities and recreational facilities.

4.5.1 Educational facilities

There are ECDE centers, primary schools such as Gichunge, Runogone and Kaaga and private academies such as Fred's Academy, Bishop Lawi Mathiu Boarding school and SOS kindergarten, public day secondary schools in the area. KEMU main campus, our main interest in this study is found in the area. In the area, there is SOS Village and Ripples International, both NGOs which cater for the orphaned and vulnerable children. The latter runs a model primary school called the Nahal Academy.

Meru town is an educational center for the upper eastern region. Many primary and secondary schools are located within the town. Major educational facilities within the town and in close proximity to the study area include the Meru Primary, Kaaga Boys, Kaaga Girls, Meru High School just to mention but a few. Campuses of various universities including Egerton, the University of Nairobi Extra Mural Centre, Mount Kenya University, Co-operative University College, and Africa Nazarene University among others are in the area. Meru University College of Science and Technology and the Kenya Methodist

University are the main university institutions domiciled mainly in the county with both having their main campus in close proximity to Meru town.



Plate 8: Freds Academy in Kithoka

Source: Field Survey, 2018

Additional facilities for higher education within the town consist of Meru technical Training institute, Kenya Medical Training College (KMTTC) Meru campus, Nkabune Technical Institute, Kenya Institute of Management and Meru teacher Training College.

4.5.2 Health facilities

The area has a dispensary at KEMU main campus which caters for both the students and the local residents. The Consolata sisters run a mobile clinic at Mwanika Catholic Church. In Meru town, there is Meru Level 5 referral hospital and private hospitals such as Woodland and Milimani. Church owned hospitals such as Nkubu, Kiirua, Tigania, Charia and Chogoria serve the larger Upper eastern region.

4.5.3 Worship facilities

Churches in the area are Mwanika Methodist, Mwanika Catholic, KAG Kithoka, Runogone Catholic and Retreat center and Kenya Assemblies of God, Gakurine among others.



Plate 9: KAG Kithoka

Source: Field Survey, 2018

Hotels in the area are Meru Guest Villas and Thiiri Centre. Olive gardens, KEMU open grounds and hall are also found in the area. They host weddings and other parties. Other hotels found in the nearby Meru town and Makutano area include Meru County Hotel, Alba, Paramount Hotel, White Star Hotel, Blue Towers Hotel, Hotel Three Steers, Royal Prince Restaurant, Meru Safari Hotel, Brown Rock Hotel, Simba wells, La Vienna Restaurant, West Wind hotel, Nevada hotel, Shade Net Hotel, All Smiles Hotel, Gatimene Springs and Meru Slopes Hotel.

Recreational facilities in the area are the Imenti Forest which has a water point where people go to view elephants taking water, elephant migratory corridor along Meru-Ruiri road, Thiiri Centre and Fred's school which have swimming pools.

Other recreational facilities are the Kinoru stadium which is Tuskers FC adopted stadium and it is being renovated to international standards. Meru museum in Meru town and Njuri-Ncheke shrine in Nchiru display the rich culture of the Ameru people. The Nyambene Hills is one of the views of the area. There is an elephant migratory corridor near Kithoka area. Meru County has Meru National Park which is about 70km to the northeast of Meru town. There is also Rutundu log cabins situated 20 km west of Meru town where Prince William

proposed to the Duchess of Cambridge.



Plate 10: Runogone Catholic Church

Source: Field Survey, 2018



Plate 11: Entrance to Thiiri Centre

Source: Field Survey, 2018



Plate 12: Elephants in Meru national Park

Source: Field Survey, 2018

Tourist attractions of worth on the Meru side of Mt. Kenya National Park comprising of Semwe Salt lick, Vivien Falls, Lake Alice, Ithanguni, the sacred Lake Nkunga and Lake Ellis. Other recreational facilities are Ngare-Ndare Forest Trust in Timau, Samburu, Lewa Downs and Buffalo Springs National Reserves all located approximately 50 km north of Meru, with Samburu and Buffalo Springs in Isiolo County.

4.5.4 Physical Infrastructure

This include Pedestrian walk ways, roads, railways, airports, water supply and sewer system, power supply solid waste collection systems.

a) Roads, railways and airports

Pedestrian walk way and street lighting are provided near KEMU main campus gate to ensure student safety. Meru County is linked to Nairobi by a paved road, B6, whether from the south around the east side of Mount Kenya, via Embu, or from the northwest around the west and north side of Mount Kenya, via Nanyuki and Timau. An international airport exists at Isiolo, 35 km away, via a tarmac road through Ruri. Isiolo town is a resort city within the LAPSSSET corridor. Hence, it will benefit from the standard gauge railway line which forms part of the project. Within the town, roads and parking facilities are in good

condition due to efforts by the Kenya Urban Roads Authority (KURA) and Meru County Government. KURA has also constructed bypasses intended to decongest the town by diverting vehicles going to Nanyuki, Maua and Isiolo from town. This has generally benefited the study area by easing accessibility. Major feeder roads in the larger Meru county have also been done or in the process of being done.

b) Water Supply and Sewerage System

The study area is served by Meru Water and Sewerage Services (MEWASS) which have expanded water reticulation supply. There are community water projects in the area such as Gichunge and Gakurine. Septic tanks and pit latrines are the most prevalent but for KEMU main campus, they have open lagoons.

c) Power Supply

The area has both single and three phase power supply. Power supply is from Kaithe station.

d) Solid Waste Collection system

Meru county garbage truck visits the area up to Ruri junction thrice a week for garbage collection. Solid waste for the rest of the area is open pits.

4.5.5 Natural Physical and Geological Features

The area is characterized by hills such as Karima ga Ntuiko and Karimene. Altitude ranges from 1120m to 2600m. Rivers in the area originate from Lower Imenti forest, which is part of the larger Mt. Kenya Forest and flow eastwards. Streams highly dissect the area characterized by rugged structure. Gaciuma River is found in the area. The Aberdares create a range of volcanic mountains that stretch 160km long and rise to approximately 4,000m above sea level. The mountain range is highly dissected and is dominated by steep slopes roughly above the 2200m contour. The transition between the volcanic and basement rock systems provides the best site for observation of significant slopes. Foot ridges, valleys and plateaus are the other notable topographical features. Several springs and wetlands are found in the area especially within the Lower Imenti Forest. Several renowned wetlands are present in the area including Gatimene even though none of the

significant wetlands is categorized under the Ramsar Convention since they are mainly small in size with just a few of them covering 10km² or above. Wetlands are crucial for recharging ground water, regulating the flow of water, as temporary water storage before later releasing the water to water courses and as sinks for wastes and pollutants hence serving cleansing roles. In the study area, wetlands are highly threatened mainly through conversion of land to agricultural uses.



Plate 13: Gaciuma River

Source: Field Survey, 2018

The geology of the area comprises of low bulk density basaltic volcanic tuffs and pyroclasts of Nyambene eruption of the Pleistocene age. The soils are young geologically except for the forested parts. The major soils are nitisols with some gleisols in the wetlands and andosols on hill slopes. The soil structure is poor. Hence, on steep slopes, the soils are prone to erosion and mass movement. The geology results in soils with high infiltration rates resulting in little or no surface drainage especially in upper zones.



Plate 14: Karima ga Ntuiko Hill

Source: Field Survey, 2018

Vegetation zones and species distribution are distinguished according to the different climatic zones and altitudes, most obviously through variation in vegetation structure, cover and composition. The main vegetation types in the area are namely: the natural forest (Lower Imenti Forest), the crop vegetation, and the built-up area. In the marginal coffee zones, there are remnants of natural vegetation along the riverine corridors and some indigenous trees are found in the farmlands. The tree mix consists of both indigenous and fast-growing exotic species.

4.6 Climatic Characteristics

The climatic conditions range from humid to semi humid. The area experiences a bimodal rainfall pattern, which varies from approximately 900 to 2300mm a year. The long rains are experienced from March to May while the short rains are experienced from October to December. The area experiences a cool season usually with drizzles and frost during June to August and a short dry season from December to February. The spatial rainfall distribution in the area and its temperature pattern are easily correlated with the natural vegetation cover and topography.

The mean temperature in the county is 18.55° C. July and August are the months during

which the lowest temperatures are experienced, whereas January to March is the hottest period.

4.7 History of Kenya Methodist University (KEMU)

KEMU is a chartered private university founded by the Methodist Church of Kenya (MCK). It is situated within woodland on the Northern Eastern slopes of Mount Kenya, 5km from Meru town. The town is about 250 km east of Nairobi. The evolution of KEMU is based on the 1906 Methodist Church education policy that resulted in the development of schools, industrial institutes and colleges. In 1956, The Methodist Mission approached the Meru County Council and requested to be allotted land. Their request was granted and they were allotted 50 acres of land where they established the Methodist Training Institute in 1958. This institute grew over the years and merged with two other colleges to become The Kenya Methodist University, one of Kenya's largest private universities.

In 1987, the MCK formed a Working Committee to work out modalities of establishing a university in the central eastern region. In 1995, the CHE made an inspection visit of the project, and later in June 1997 granted a Letter of Interim Authority, giving approval for the establishment of KEMU. This authority paved the way for the creation of academic programs, research and post graduate training. KEMU became a fully Chartered university in June, 2006.

CHAPTER FIVE: RESEARCH FINDINGS

5.1 Introduction

This chapter gives the analysis of data collected during the field data collection exercise from the sampled respondents using household questionnaires. The analysis and results are presented in line with the research questions of the study.

5.2 General Characteristics of Respondents

This section presents the general characteristics of the respondents included in the study. The respondents in this study were categorized into two major categories that is, landlords and tenants. The following is a presentation of the demographic characteristics of the respondents sampled to participate in the study.

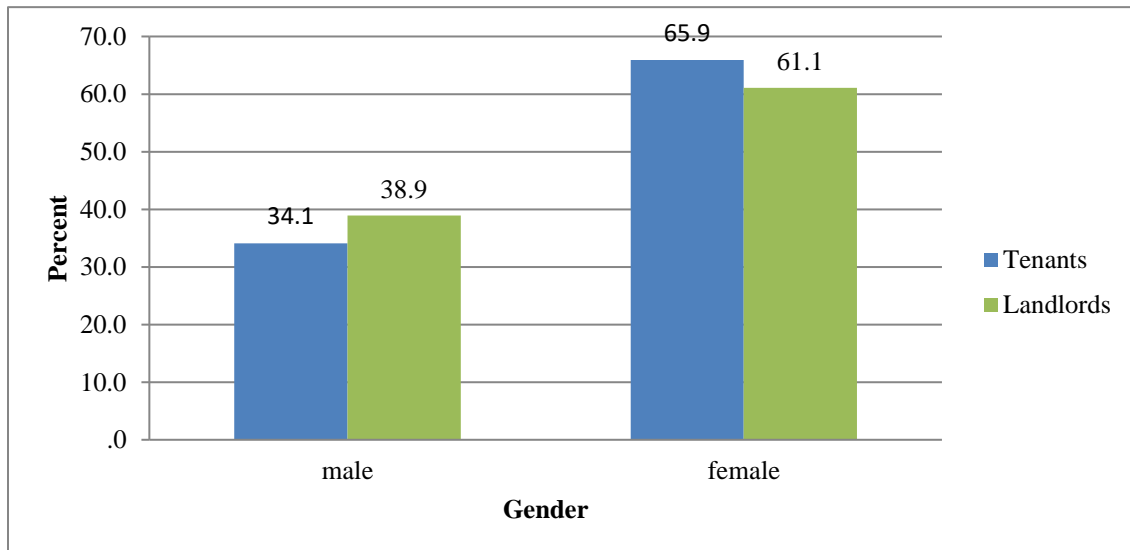


Figure 6: Gender of Respondents

The results in Figure 8 indicate that the respondents who participated in the study were mainly female. In the category of respondents who were tenants, 66 percent of them were female while 34 percent were male. In the other category of respondents consisting of landlords, 61 per cent were female whereas 39 percent were male. Ideally, majority of the respondents were females at approximately over 60 percent with males at about 40 percent.

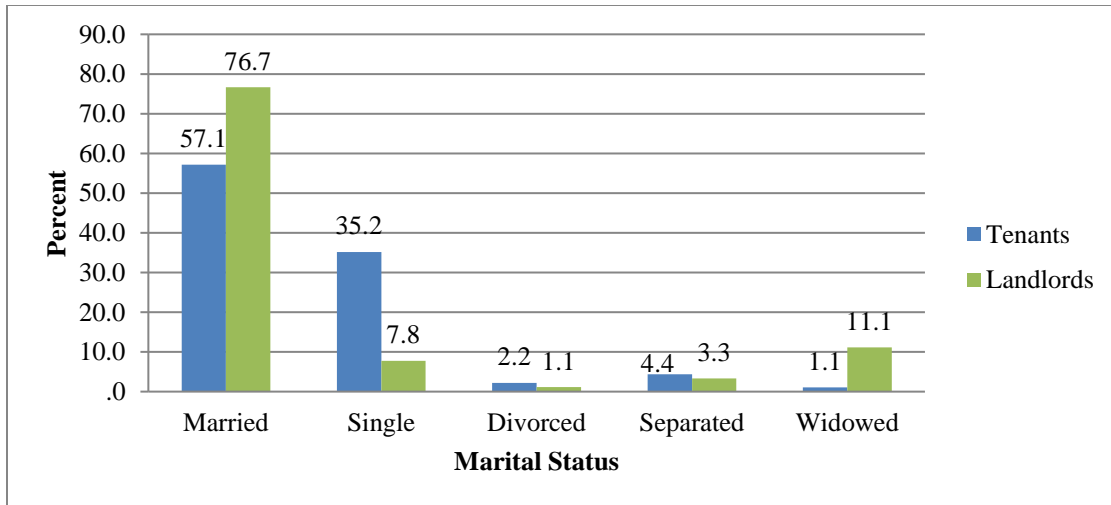


Figure 7: Marital Status of Respondents

The respondents both tenants and landlords who participated in this study were married. This is illustrated by the results in Figure 9 where 77 percent of the respondents who were landlords were married same as 57 per cent of respondents who were tenants.

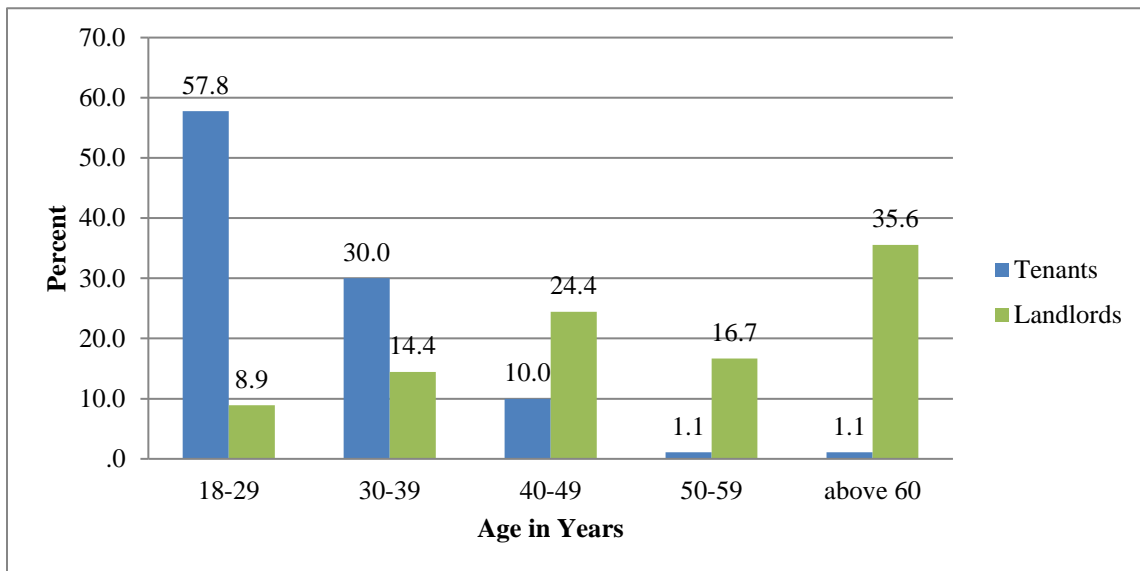


Figure 8: Age of the Respondents

The results for the respondents' age varied across the respondent's categories. Majority of the respondents who were landlords were aged above 60 years old. On the contrary, most (58 percent) of the respondents who were tenants were aged between 18- and 29-years old majority of whom are likely to be KEMU main campus students.

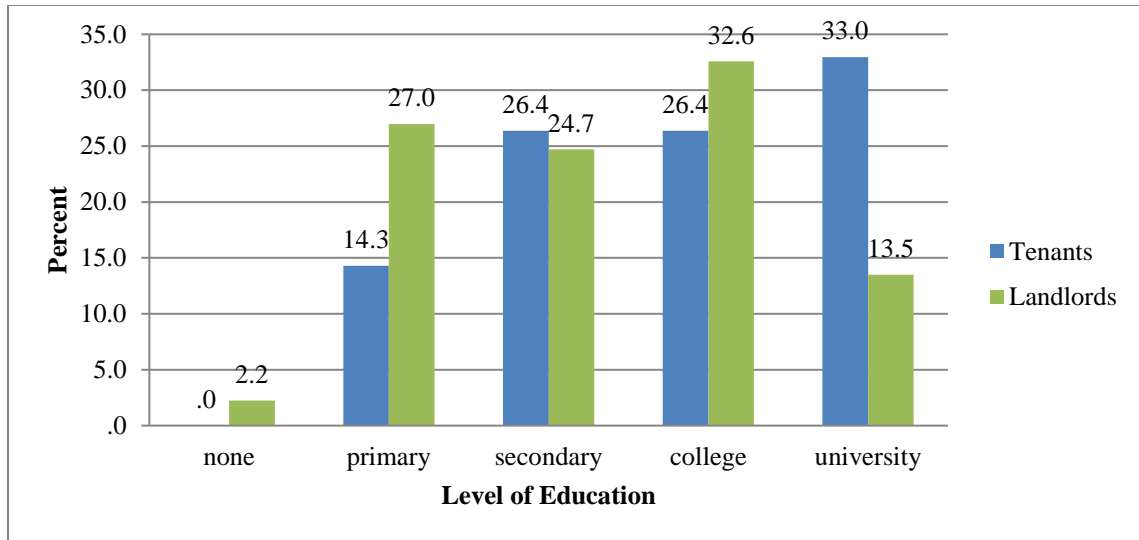


Figure 9: Respondents' Level of Education

Source: Field Survey, 2018

The level of education for the respondents who were landlords was distributed between college at 33 percent, primary at 27 percent, secondary at 25 percent and university at 14 percent. The education level for other category of respondents who were tenants was mainly university at 33 percent with the least education level for this category being primary at 14 percent.

Respondents were asked to select an income category for their respective household. The results displayed in Figure 12 indicate the income categorization of the respondents included in the study. Majority (31 percent) of the respondents who were landlords included in study were in the income category of above Kshs. 45,000 per month. This was followed by those in income category of Kshs. 7,499 – 15,000 per month (18 percent), less than Kshs. 7,499 per month (16 percent) and those Kshs. 15,001 – 22,500 and 22,501 – 30,000 (12 percent each) amongst others. The other category of respondents who were tenant, 23 percent were in income category of above Kshs. 4,500 per month, 21 percent in income category of 7,499 – 15,000 per month, 19 percent in income category of Kshs. 15,001 – 22,500 and 13 percent in income category of less than Kshs. 7,499 per month among others.

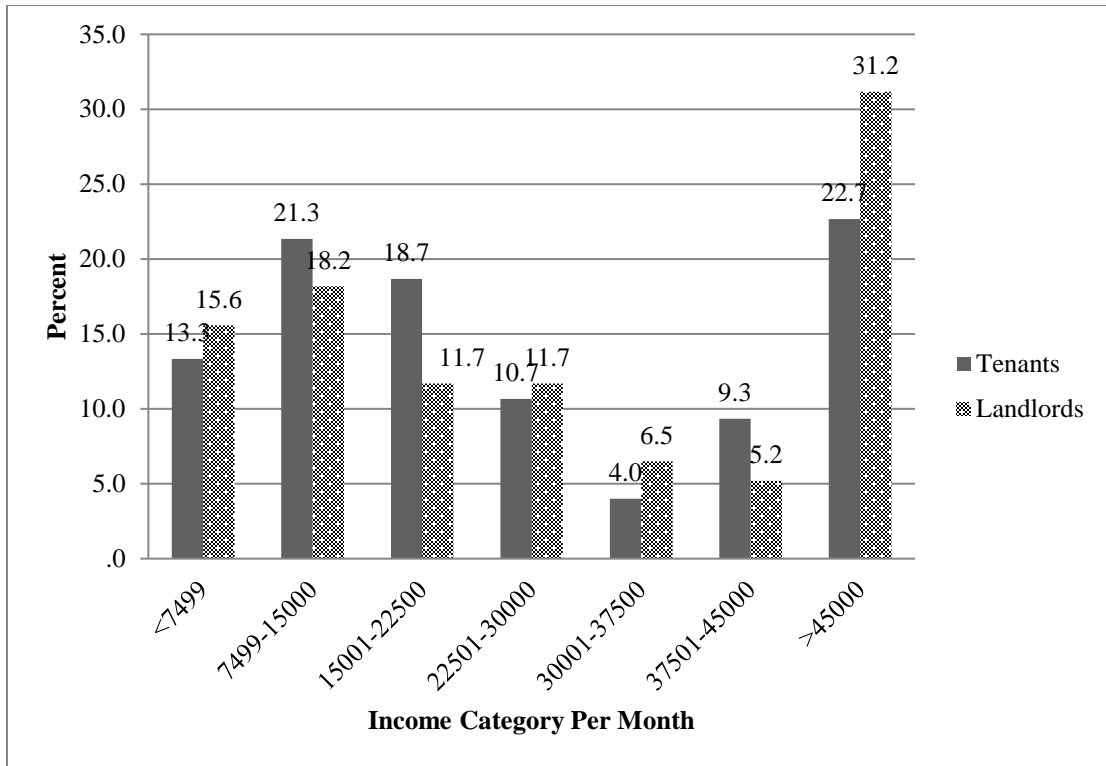


Figure 10: Total household income per month

5.3 The Current Land Use Characteristics and Development Patterns in KEMU

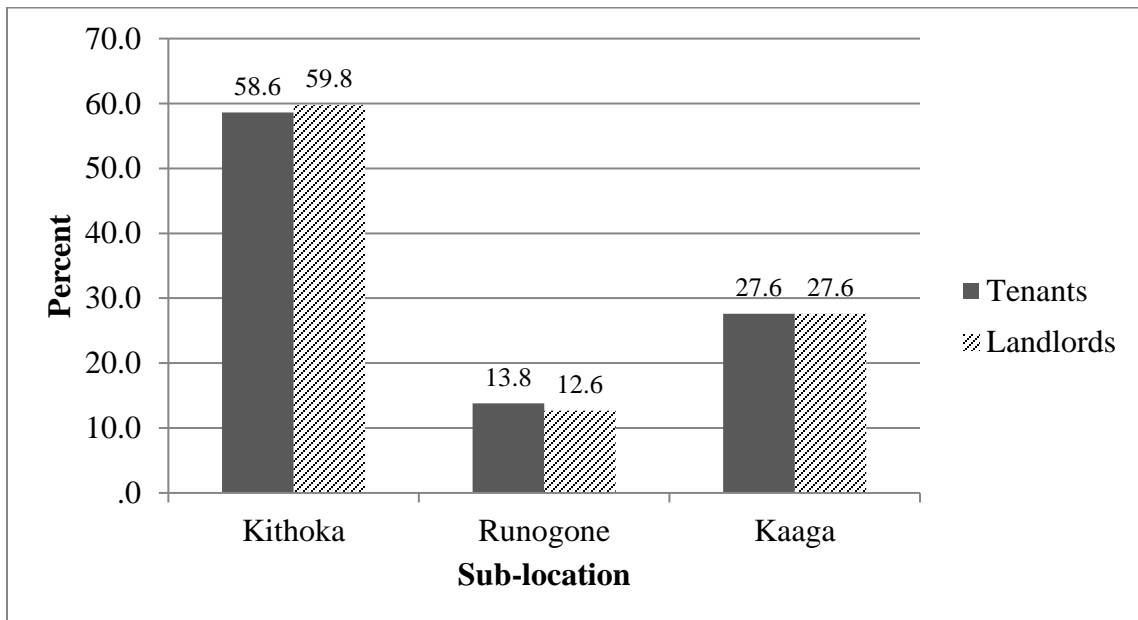


Figure 11: Sub-location respondent is living

The results displayed in Figure 13 indicate that 60 percent of the respondents who were

landlords and 59 percent of the respondents who were tenant came from Kithoka sub-location. Other respondents also came from Runogone and Kaaga sub-locations.

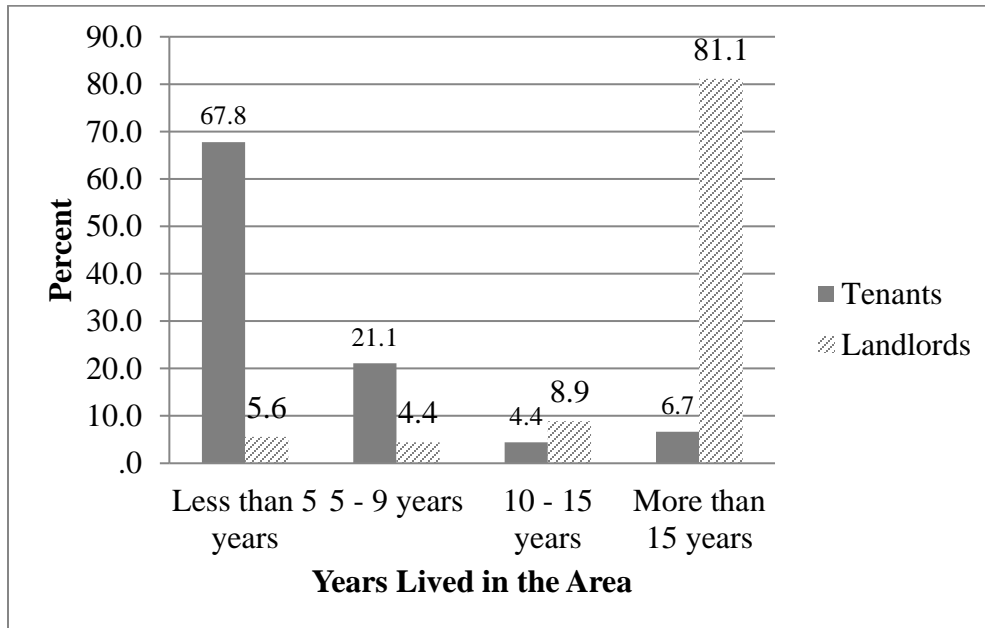


Figure 12: Period respondents have lived in the area

The study findings in Figure 12 illustrate that about 81 percent of the respondents who were landlords had lived in the area for more than 15 years. On the other hand, 68 percent of the respondents who were tenants had lived in the area for less than five years.

Majority (91 percent) of the respondents who were landlords included in this study were from within Meru town as shown in Figure 13. There were however, contrary findings in the case of respondents who were tenants as about 57 percent originated from within Meru town and the other 43 percent coming from outside Meru town.

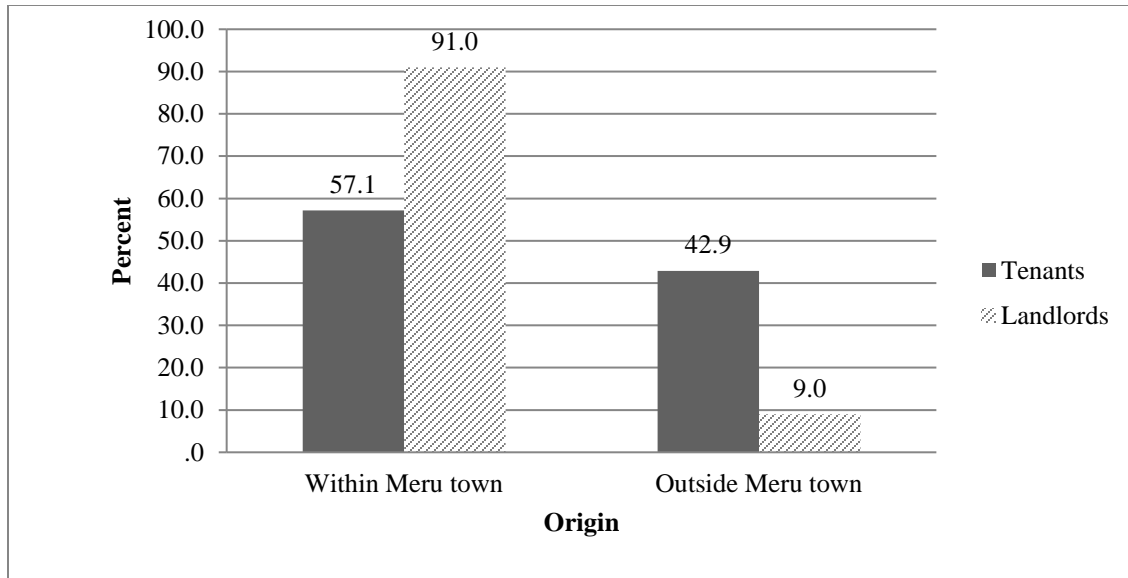


Figure 13: Origin of the Respondents

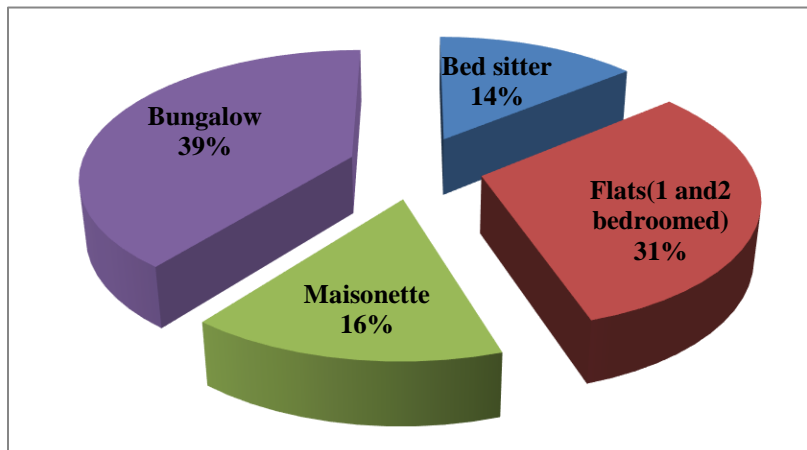


Figure 14: House Typology

The results in Figure 14 give the house typology as observed during the field data collection. The results show that 39 percent of the houses around KEMU were bungalows as mentioned by the respondents. This was followed by flats for 1 and 2 bedrooms at 31 percent while majority of the buildings were one storied at about 79 percent with non-storied buildings and two storied ones at about 14 and 7 percent respectively as shown in Figure 15.

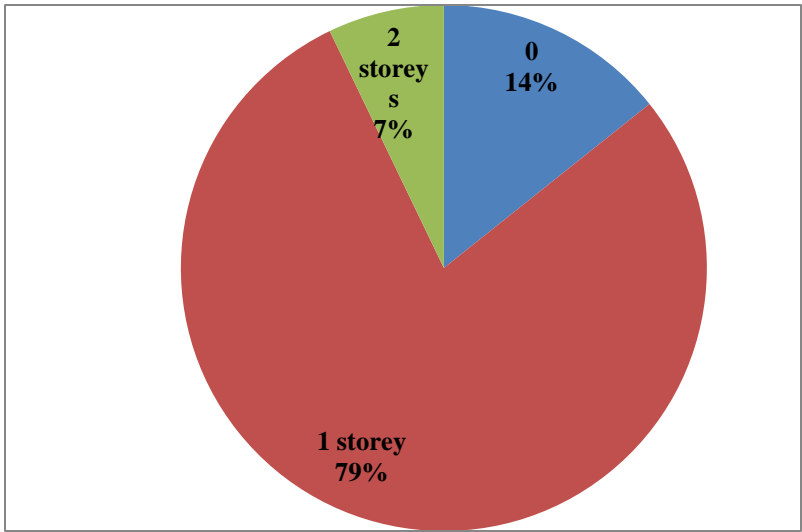


Figure 15: House Height

5.4 Land Use Changes in KEMU Neighborhood within the Last Fifteen Years

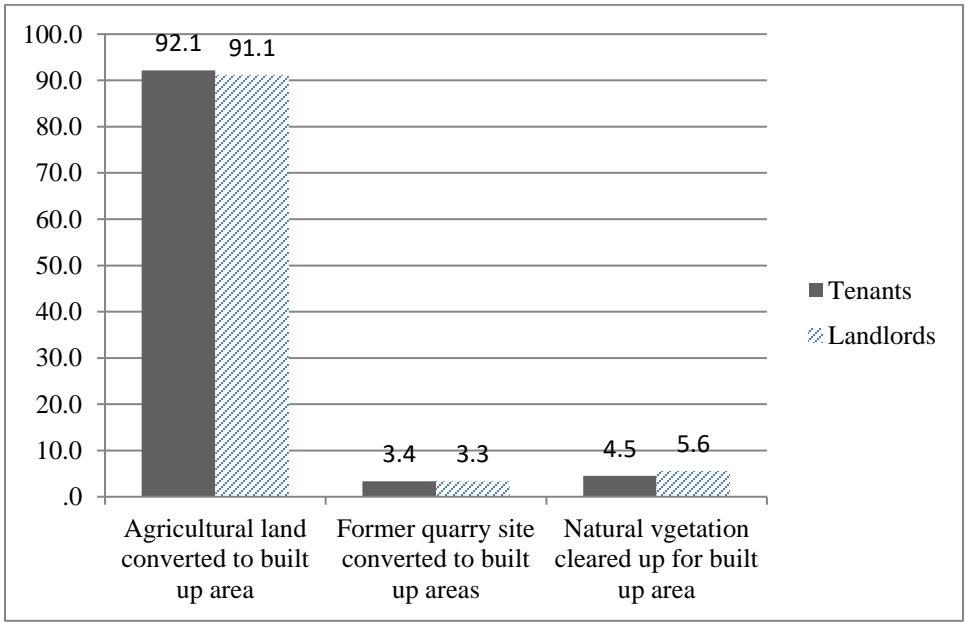


Figure 16: Major shift in land use witnessed by respondents

The major shift in land use witnessed by residents of KEMU was transformation of agricultural land into built up area. This was illustrated by response given by respondents both landlords and tenants at 91 percent and 92 percent respectively as represented in Figure 16. Other shifts in land use witnessed though not major were conversion of former quarry into built up area and clearing of natural vegetation for buildings. The shift from

quarry to built-up area could be insignificant yet with huge impact on the quarries noting there are only a few quarries within the study. On the shift of land use from vegetation cover to built-up use could as well be attributed to the fact that prior the establishment of the university within the location, majority of the land was bare without any vegetation cover at all rather were existing farms which had informed the clearing of vegetation for agricultural produce.

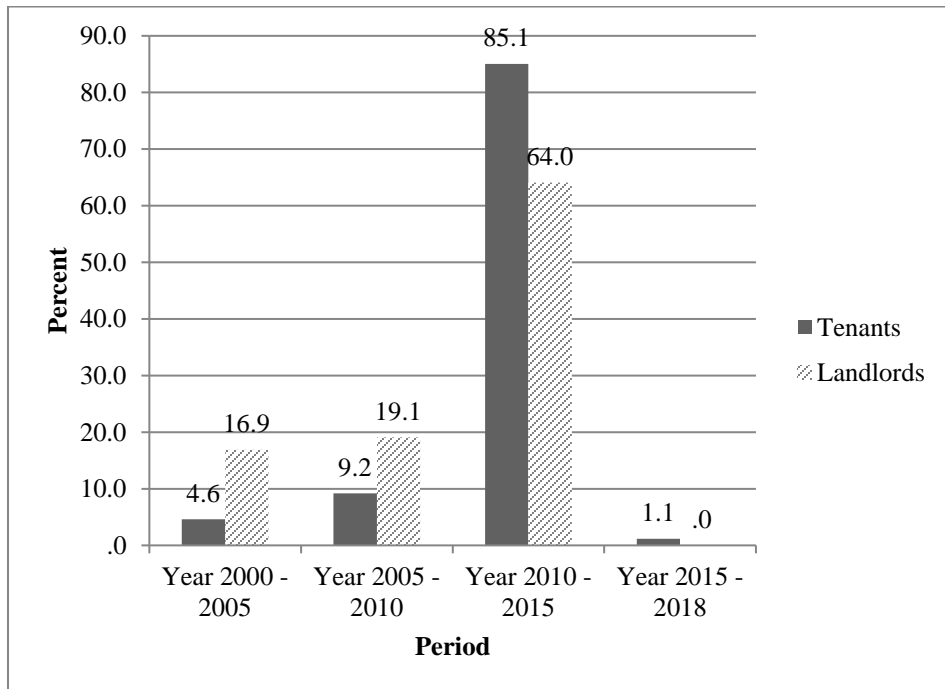


Figure 17: Period when land use in KEMU shifted most

The respondents were asked to state the period they thought the land use in KEMU shifted greatly. According to the results presented in Figure 17, the greatest shift in land use was witnessed in the period between 2010 and 2015 as confirmed by 85 percent of respondents who were tenants and 64 percent of respondents who were landlords. The shift on land use changes is seen to have increased gradually from the year 2000 and was at its peak by 2015 followed by a very steep decline after 2015.

There was an equal response from both the respondents who were landlords as well as from those who were tenants in terms of increased student population of KEMU's main campus as the main reason in shift in land use between 2010 and 2015. The results as illustrated in

Figure 18 show approximately 57 percent of both the respondents who were tenants and landlords indicated that the major shift in land use witnessed between year 2010 and 2015 was because of expansion of KEMU main campus in terms of student population. Another 30 percent of respondents who were landlord and 25 percent of respondents who were tenants indicated that the shift in land use witnessed was due to natural increase of KEMU neighborhood residents.

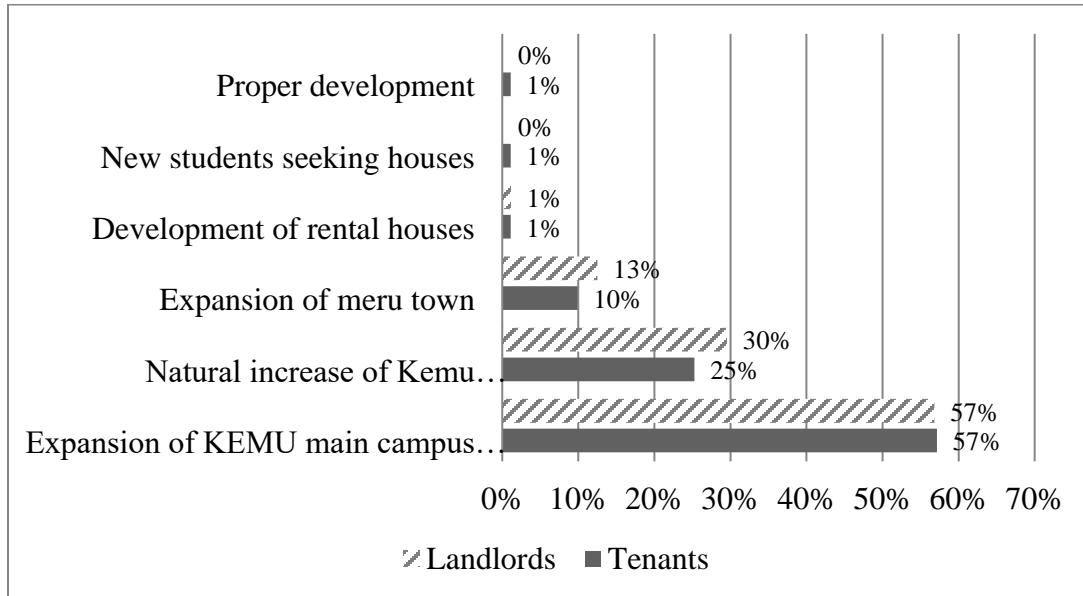


Figure 18: Reasons for Major Shift in Land use in KEMU Neighborhood

Other reasons given by the respondent for the shift in land use included expansion of Meru town, development of rental houses, new students seeking houses and proper development in the area. Suggestively, expansion of Meru town, absolute natural increase in population within the KEMU neighborhood and expansion of KEMU main campus in terms of student population were the major drivers of land use change within the KEMU neighborhood.

The greatest benefit from current land use in KEMU as mentioned by the respondents both tenants and landlords were business opportunity at 69 percent and 60 percent respectively. This was followed by improved transport network, more physical infrastructural facilities, more reliable public transport and finally new neighbors.

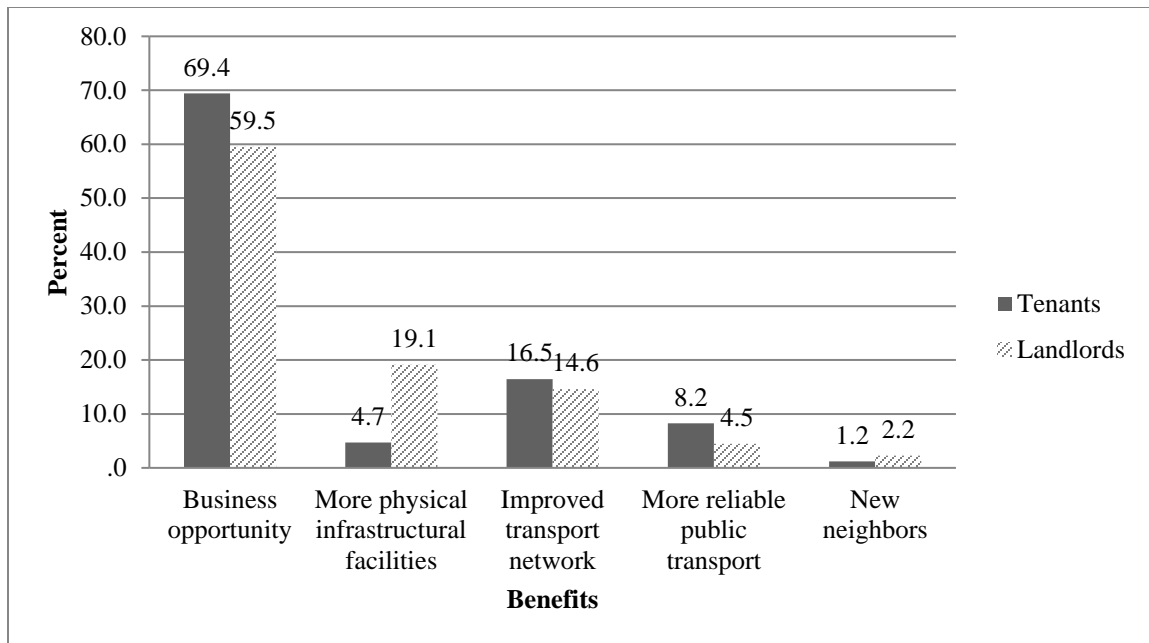


Figure 19: Benefits from current land use in KEMU neighborhood

The greatest problem mentioned by 43 percent and 41 percent of respondents who were landlords and tenants respectively were security risk as shown in Figure 20. However, a substantial number of respondents believed that there was no problem brought about by the current land use in KEMU neighborhood. This was demonstrated by 36 percent and 34 percent of tenants and landlord respondents. Further polluted neighborhood, loss of privacy and incompatibility of land uses were reported as the other major issues of concern affecting both landlords and tenants as a result of the current land uses with the neighborhood.

Observation determined the presence of incompatibility of the land uses. This is evidenced by the presence of garage within the students’ residential areas in the study area. Plate 15 shows the location of the garage within a residential locality, mostly occupied by students and members of the local community. This was attributed to uncontrolled development and failure to observe planning regulations and a laxity in enforcing the same.

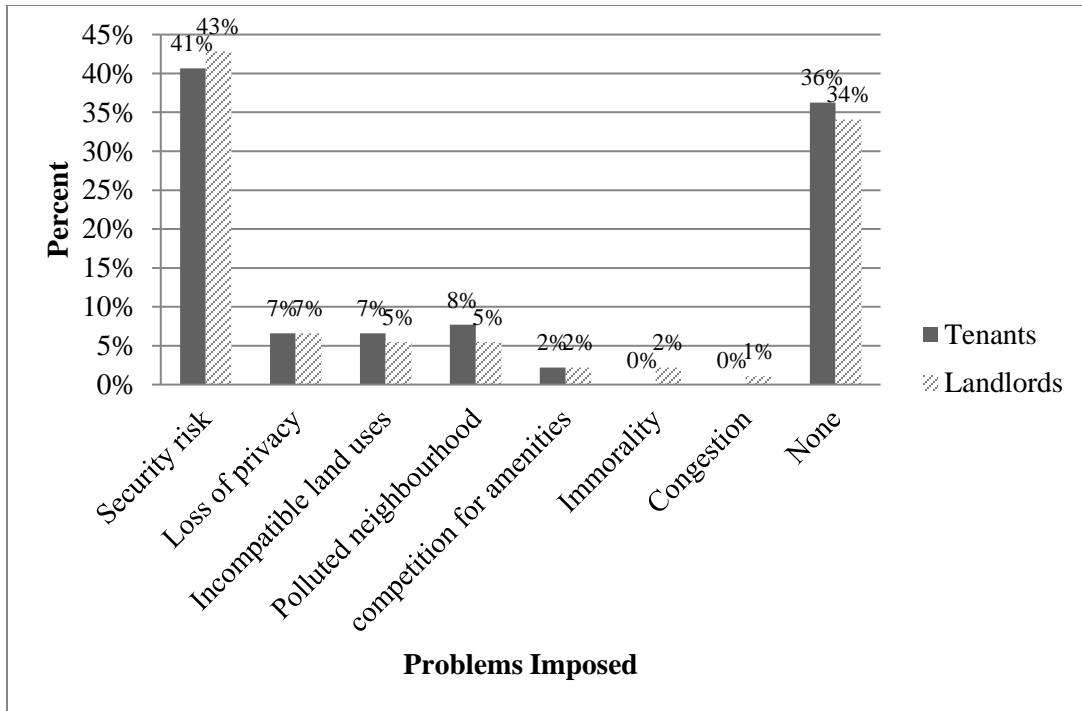


Figure 20: Problems imposed due to current land use in KEMU neighborhood



Plate 15: Incompatible Land Uses

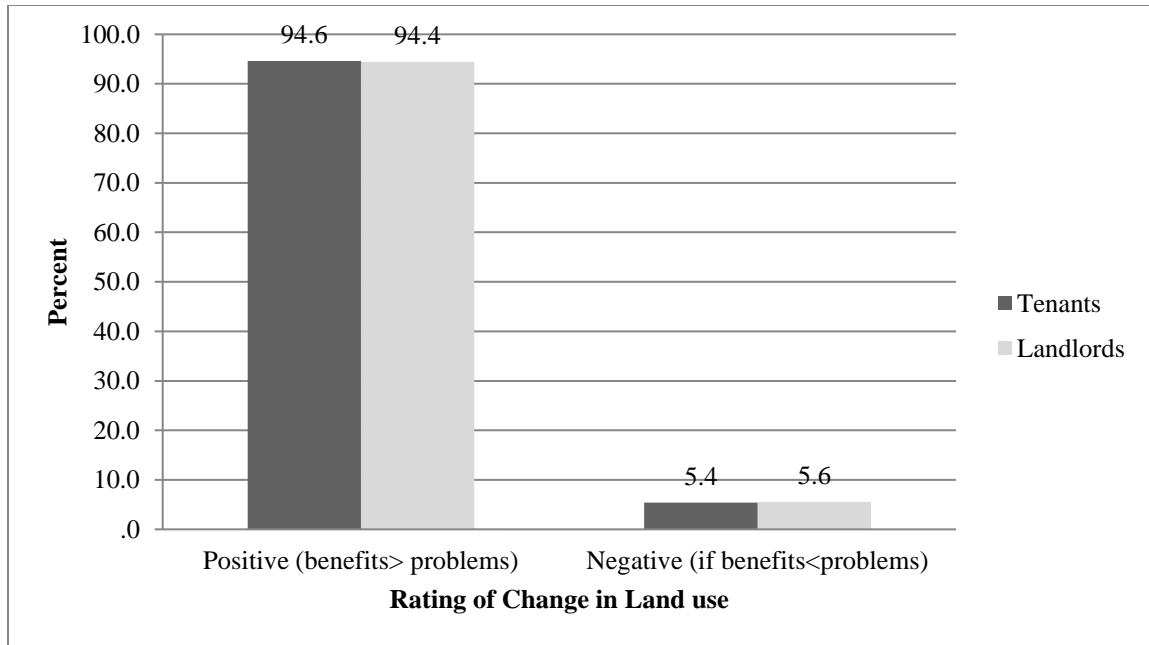


Figure 21: Rating of land use changes in KEMU over the last 15 years

The response on rating of change in land use in KEMU over the last fifteen years was almost uniform. Approximately 95 percent of respondents who were tenants as well as 94 percent of respondents who were landlords rated as positive the changes in land use in KEMU neighborhood. At roughly 6 and 5 percent for landlords and tenants respectively, the negative benefits if at they existed were largely insignificant.

Table 5: Percentage of Land Cover

	2000	2005	2010	2014	2018
VEGETATION	60.43%	57.34%	51.90%	45.10%	44.25%
FOREST	25.03%	25.48%	26.16%	25.65%	26.80%
BUILT UP AREA	13.28%	16.45%	21.25%	26.61%	28.61%
BARE GROUND	1.26%	0.73%	0.70%	2.64%	0.35%

Source: Field Survey, 2018

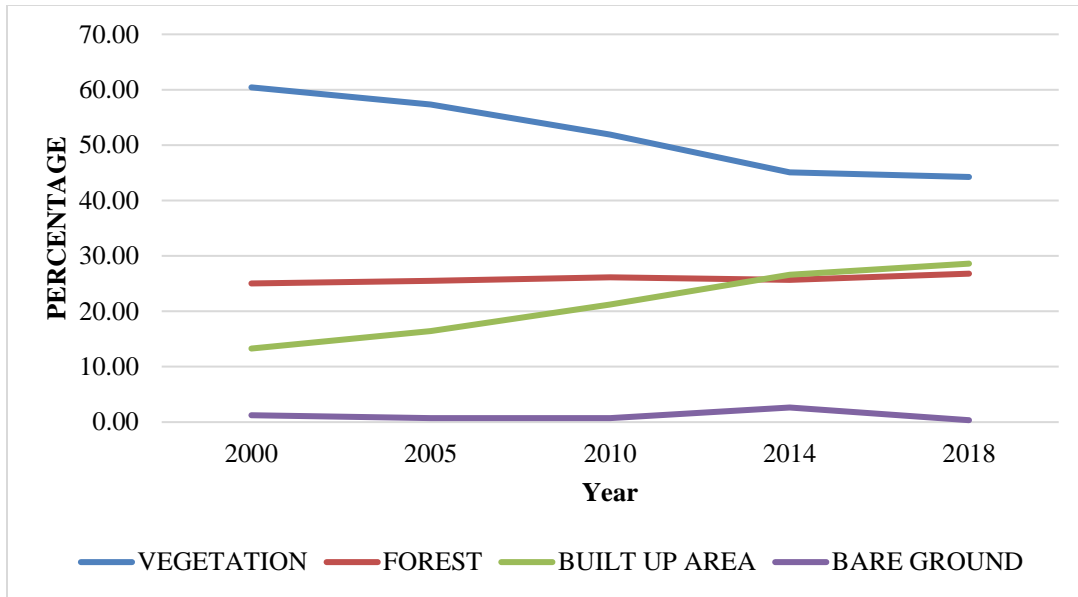


Figure 22: Change of Detection

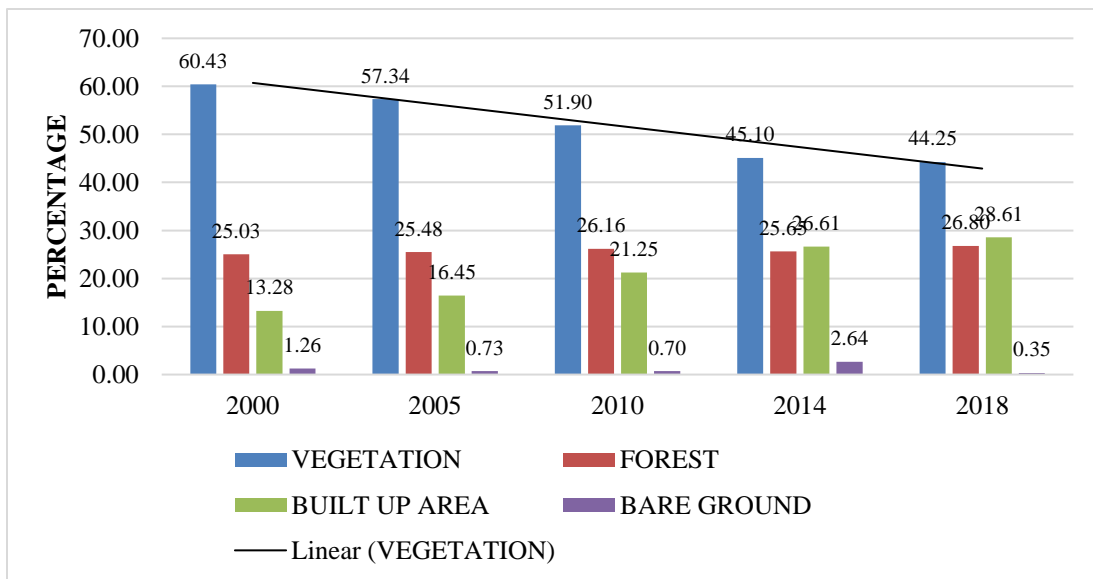


Figure 23: Trend line of Change of Detection

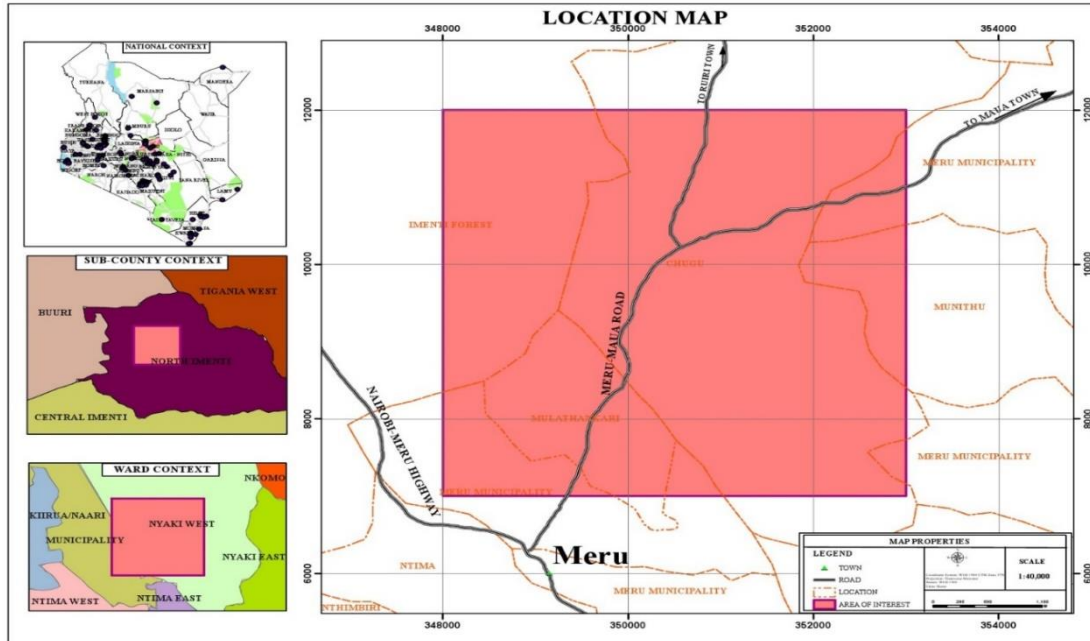
Table 6: Land Use Changes in Square Meters

	2000	2005	2010	2014	2018
VEGETATION	15203318	14393224	13026026	11264875	11173570
FOREST	6297906	6394921	6565880	6406315	6765868
BUILT UP AREA	3340960	4128475	5333217	6646377	7222856
BARE GROUND	317912	183526	175068	658396	87606

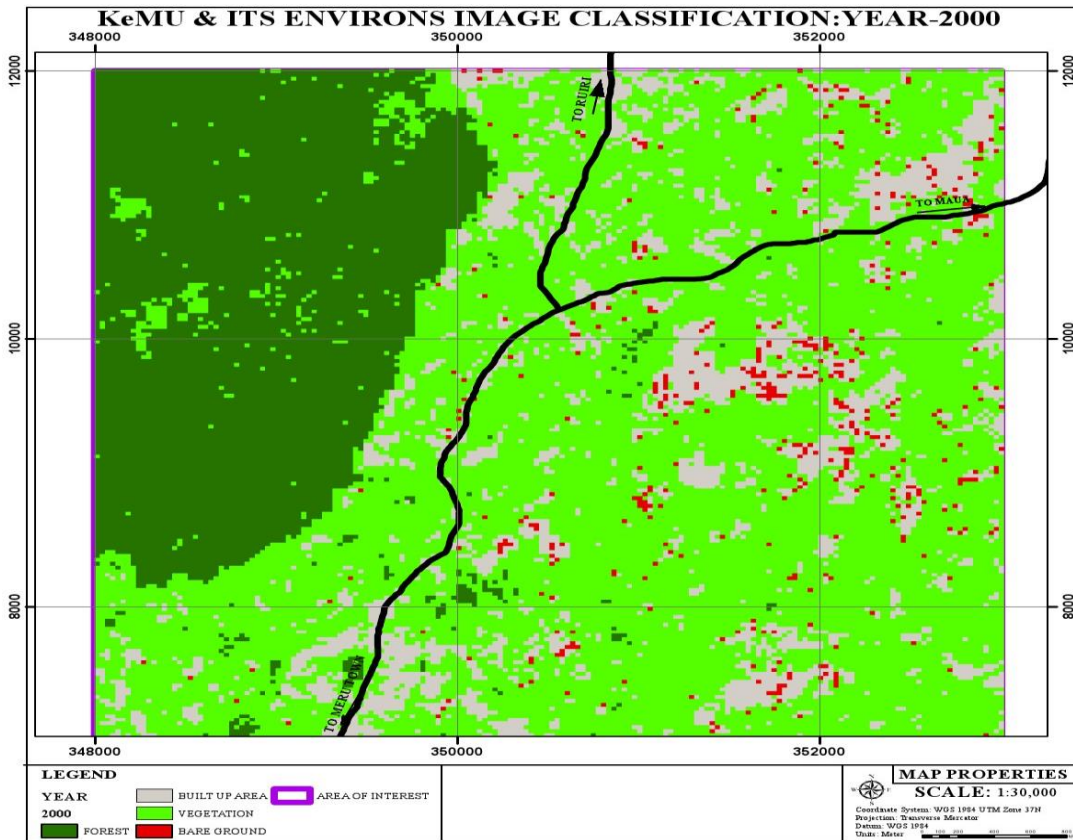
Source: Field Survey, 2018

As can be deduced from the change of detection, the vegetation cover and bare ground have been on the decrease from year 2000 to 2018. The vegetation cover was the major affected ecosystem having decreased from approximately 60 percent in 2000 to about 44 percent in 2018 as indicated by the trend line on Figure 25 and in Figure 24. Further, there is little or no change at all on the area under forest cover while bare land has experienced a very minimal change largely attributed to its insignificance since the base year as it is the lowest form of land cover throughout the study period. KEMU university main campus is established within the gazette Meru forest, its acreage was hived from the university, however, the number of acres hived from the forest were too small for the change on forest cover to be significant as shown on Table 6. Nevertheless, it explains why the vegetation cover has suffered most since the vegetation comprising of the forest vegetation was the form of land cover that bore the brunt of the university's location at the site.

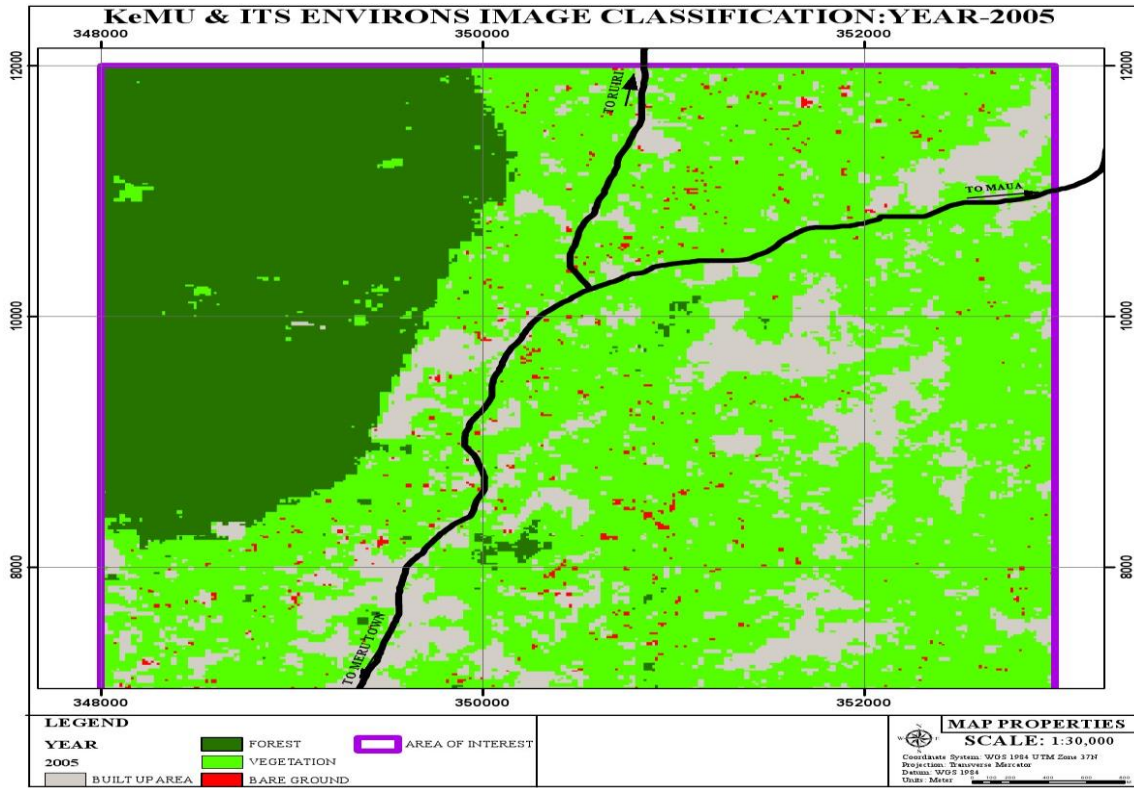
Map 4: Trend Location Map

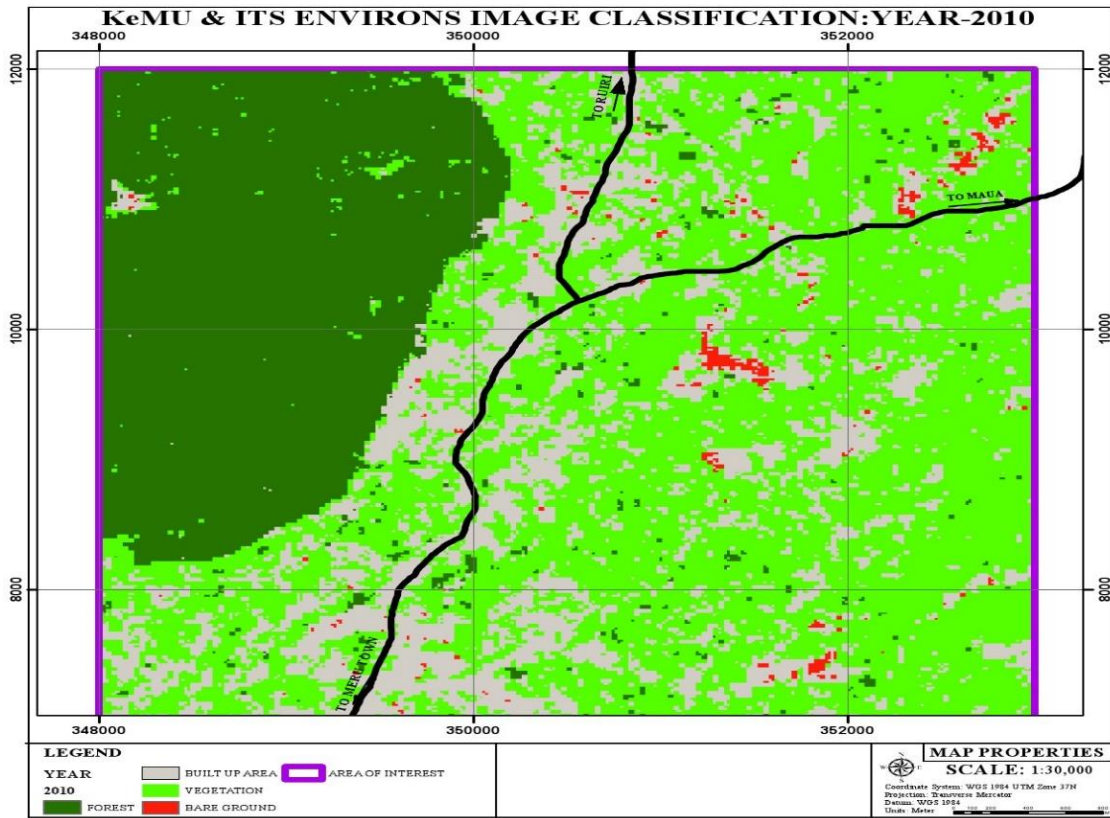


Map 5: Change in Land Use Trends in 2000

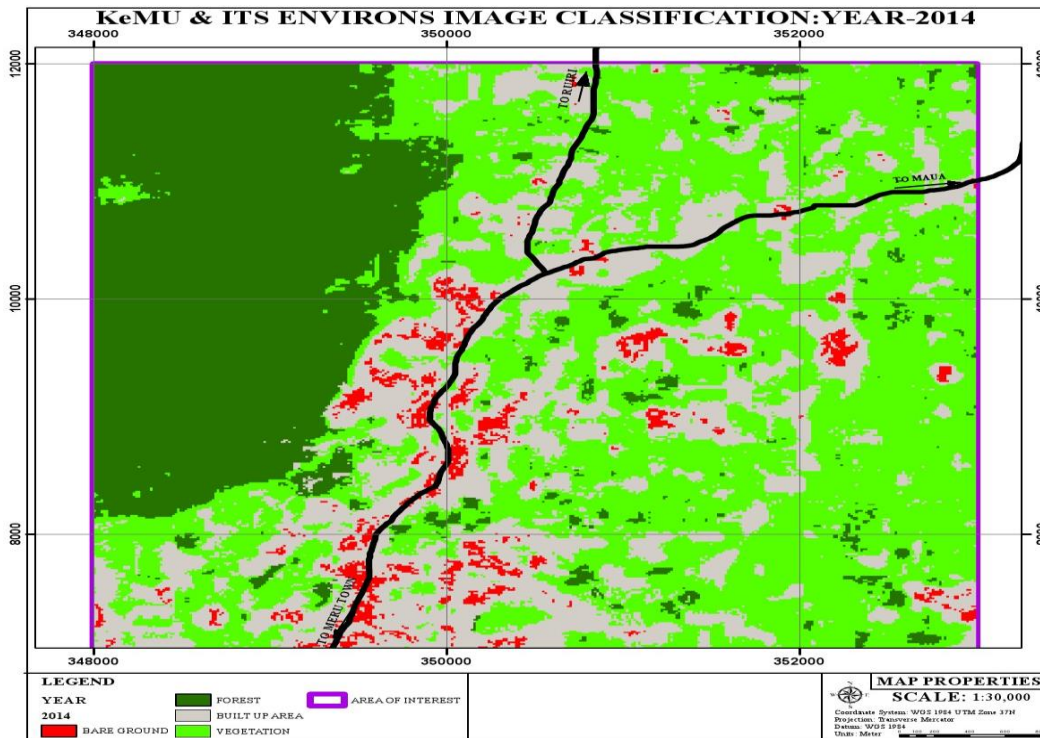


Map 6: Change in Land Use Trends in 2005

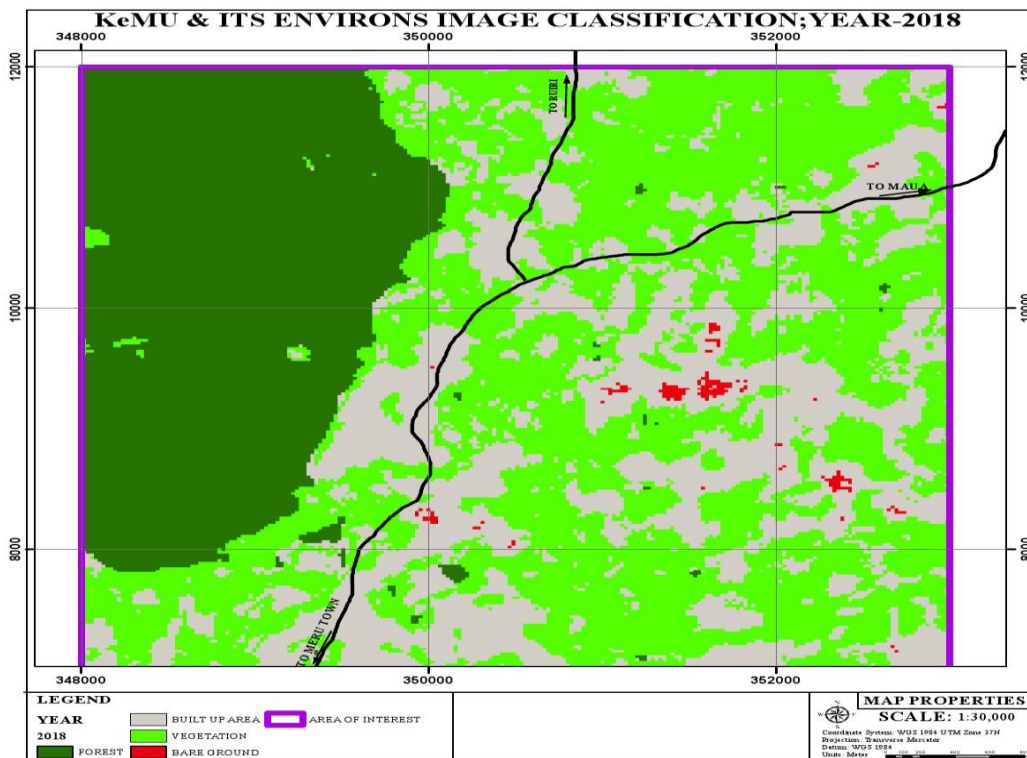




Map 7: Changes in Land Use Trends in 2010



Map 8: Changes in Land Use Trends in 2014



Map 9: Changes in Land Use Trends in 2018

As can be seen from the analysis maps above, land use change has been a trend over the period of time the study was investigating. Most significant from the land use analysis of LandsAT images from the year 2000 to 2018 is the growth of area under buildings. The trend indicates that vegetation cover has been over the years together with bare land paving way for construction of buildings. This explains a significant change in land use and is largely attributed to the construction of the university.

As can be deduced from the land use analysis images and from the change detection charts, the change in land use/cover had the largest impact in 2005 and has been growing uncontrollably through and through and appears to have stilled in 2018, explaining a steep growth from 2005 and a plateau in 2018, possibly at peak. However, observation and photography can verify that the growth of the built up area is still at an accelerated pace despite the setback of decrease in student population over the last one or two years preceding the study and attributed to changes in enforcement of exam management policy that has seen fewer and fewer students join universities as well as turbulent in the management of the mother institution to the university.

Despite this, the built-up area has been on the rise. The trend shows a decrease in vegetation cover and a rise in bare land especially in 2014 where bare land was at its peak and further slump in 2018. This inconsistency in bare land is attributed to an increase in human activity in the preceding years that exposed the non-built land to erosion noting that vegetation had since been cleared. Further, the growth in open spaces for non-bitumen road surfaces to accommodate transportation could have attributed to the rise in bare land by 2014. But continued covering of the bare land with establishments have seen it slump to the current levels witnessed during data collection. Notably, only bare land that will eventually ceases are the earth and marram roads and as they get upgraded, buildings keep sprouting covering the open spaces and controlling wind erosion as well as drainage systems prevention water erosion, the bare land will most likely fade away in a while.

5.5 The Socio-Economic Impacts of KEMU Main Campus on its Neighborhood Over the Past Fifteen Years

The socioeconomic impacts of the location of KEMU main campus are categorized in two

major ways: the social impacts and the economic impacts.

5.5.1 The Social Impacts of KEMU Main Campus on its Neighborhood

The social impacts were categorized into two, positive and negative impacts. Cumulatively, the location of KEMU main campus was reported by 74 percent of all respondents as having brought positive social impacts to the neighboring community while 26 percent thought otherwise. Social infrastructure growth and increased security were the major impacts that were highlighted by the majority 74 percent of the respondents while moral decay/culture crash together with rise in petty crimes were the negative social impacts of the location of KEMU main campus to its neighborhood.

The participants were asked to determine the rate of change of social infrastructure for the last fifteen years preceding the study by ranking the social infrastructure rate of change as not changed = 0; least changed = 1; moderate change = 2 and rapid change = 3. The findings were presented in the table below.

Table 7: Rate of Social Infrastructure Facility Change

Social infrastructure	Rate of change over the last fifteen years (Percentage)			
	No Change = 0	Least = 1	Moderate = 2	Rapid = 3
Education	5	10	20	65
Transport	2	36	43	19
Healthcare	12	41	44	3
Sports and recreation	8	23	32	37
Information	2	8	24	66
Public safety	8	12	38	42
Art & Culture (Religion)	16	18	32	34

Source: Field Survey, 2018

The findings denote changes in social infrastructure facilities with the study area. Most importantly, the changes in social infrastructure were felt by the neighborhood and that shaped the current social fabric within the study area. To better understand the changes, the respondents were asked to determine whether the changes had either positive or negative impacts on their society. The results are presented inform of a bar chart as shown in Figure 24.

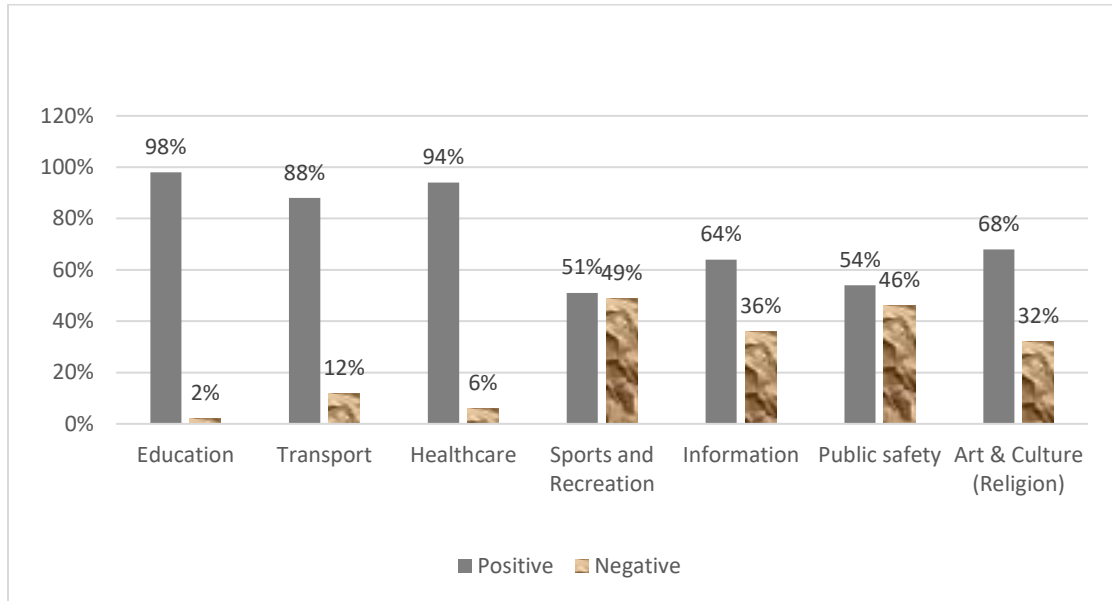


Figure 24: Impacts of Changes in Social Infrastructure Facilities

As shown in the chart, the positive impacts outweighed the negative impacts at an average 74 percent of the changes in infrastructure facilities in the study area. The positive impacts identified as having been originated from these infrastructure changes included ease of access to education and health care facilities by the well interconnected roads that have been on the upgrade since the inception of KEMU main campus. That education and health facilities had increased tremendously, both public and private and so were in close proximity to the residents as compared to fifteen years ago when the university was setting up.

Further, the growth and expansion of KEMU main campus brought with information technology accessibility mainly through cybercafes that have increased within the neighborhood while movement was increased by road upgrades. The street upgrades,

lighting of main roads within the study area and maintenance of pathways is seen as a positive social infrastructure growth within the study area. Many churches have sprung up within the study area and are all attributed to the university location with students deemed to play key roles in the growth of these churches. This promotes religion in the study area. Finally, the university has opened up opportunities for access to recreation and entertainment facilities. The university recreation facilities, especially the stadia, though restricted to the public is seen as a growth point while open spaces and entertainment joints have increased within the university neighborhood allowing for social interaction and growth with the area.

The presence of students is therefore seen as the major reason these social infrastructure changes have been on the trajectory. The interaction between the community and the students is at the core of developing a new social interaction and growth platform, with it the benefits attached to the expansion of the university. Safety is deemed to have increased with the presence of students and is more guaranteed when students are in session the cases of insecurity are hugely minimal. The benefits are further supported in Figure 18 with the property owners and tenants denoting that increased infrastructure access has opened more business opportunities and it's all attributed to the growth and expansion of KEMU main campus within the study area.

The negative impacts determined included rise in petty crimes while students are in session. However, to a large extent, the situation was considered managed especially by the administrators within the study area and with the erection of administration police post, the matter has decreased tremendously. Increased police patrols have also aided the situation and so increased security confidence among the residents. Culture crash and moral decay is seen as the other social challenge emanating from studentification.

Clubbing and the rise of bars in the study area is deemed to play a key role into this while student dressing mode is seen as contributing to moral decay and clashing with the local community's culture and beliefs. Figure 20 provides the analysis that are associated to changes in land use with polluted neighborhoods, security risk and loss of privacy being the major social challenges that have been attached to the presence of KEMU main campus

and the presence of students within the study area. This linkage between key informants, group discussions and household interviews confirm indeed both positive and negative social impacts are at interplay within the study area.

5.5.2 The Economic Impacts of KEMU main campus on its Neighborhood

The changes in property values were used to underscore the core economic impacts of KEMU main campus to its neighborhood. A detailed analysis of property values and their changes was done to establish the rate of economic impacts that can be attached to the presence of KEMU main campus together with the studentification aspects it brought up in the area. In order to achieve this, the study sought to understand if there was a variance in the property values before and after establishment of KEMU University within the study area. Trend of findings were present as either rising rapidly or slowly after the establishment of the university in the locality.

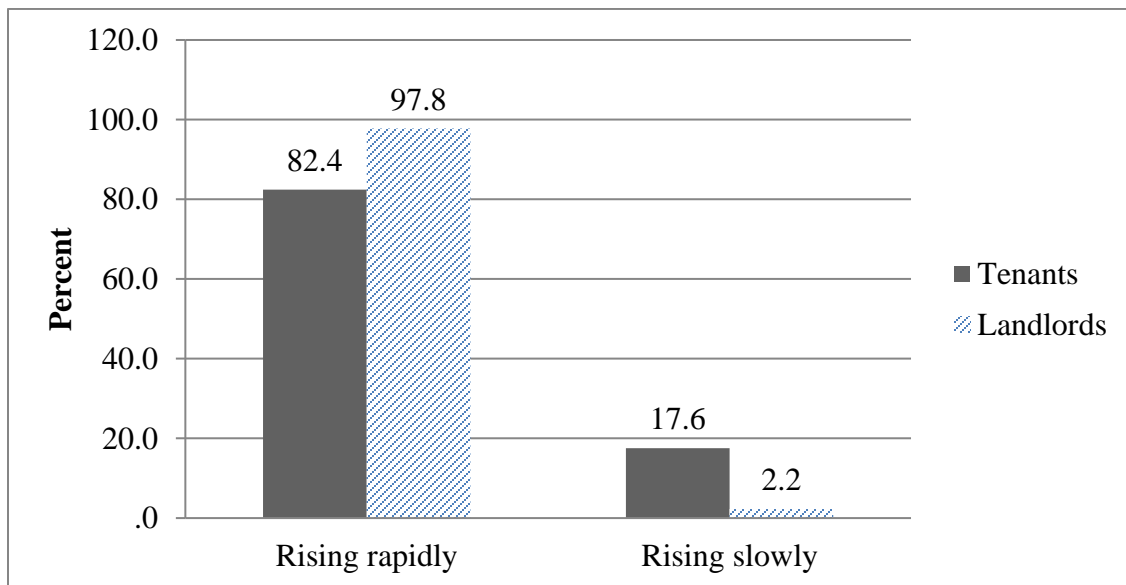


Figure 25: Trend of market rent/land value in KEMU since year 2000

Respondents were asked to describe the trend of market rent or land value in KEMU since the year 2000. The findings displayed in Figure 25 illustrate that 98 percent of respondents who were landlords and 82 per of respondents who were tenants described the trend and rising rapidly since year 2000. This was in contrast to 82 percent of tenants and 84 percent of landlord respondents who reported that trend in market rent/land value rose slowly prior the year 2000 as in Figure 26. Further, about 11 and 8 percent landlord and tenant

respondents respectively reported that land/rent values were stunted and not falling or rising the years preceding 2000 with about 2 percent of landlords reporting a downward trend in land/rent values in the said period.

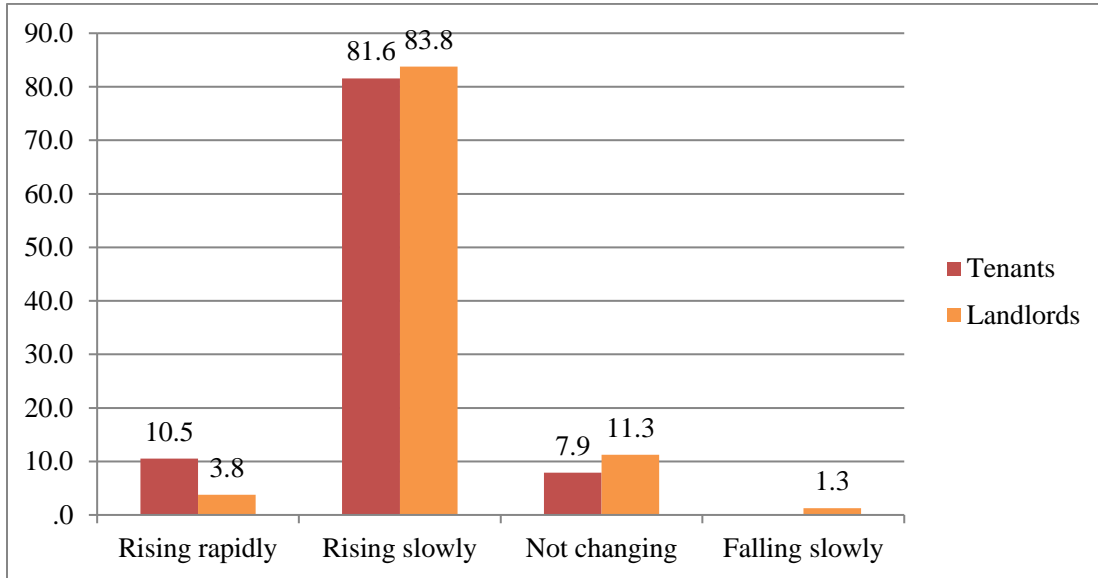


Figure 26: Trend of market rent/land value in KEMU before year 2000

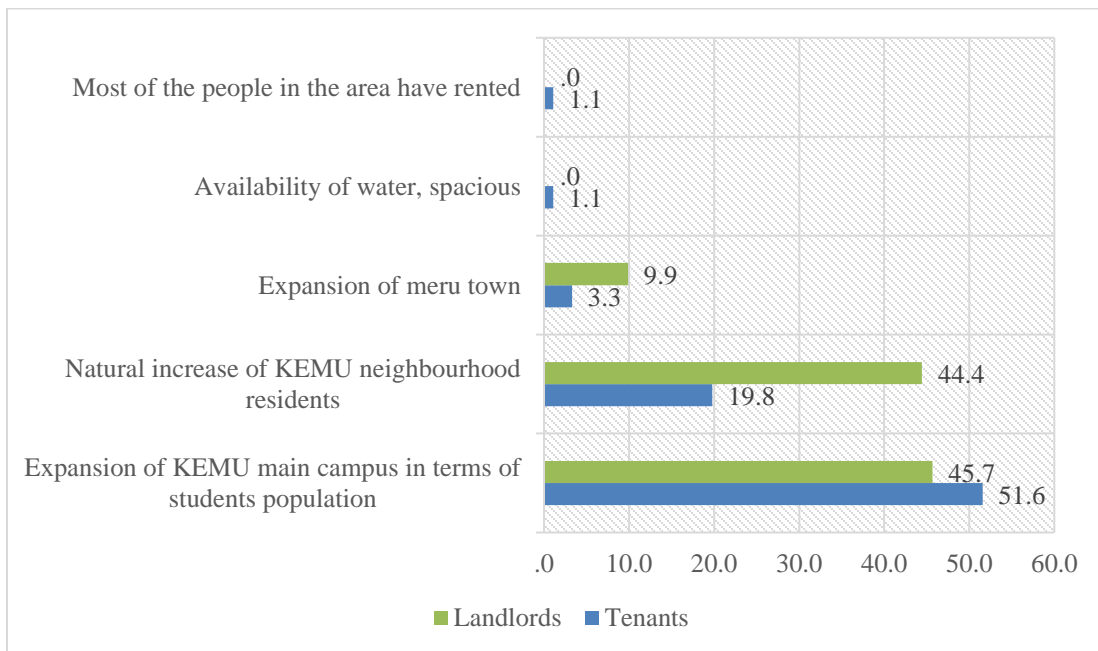


Figure 27: Reason for rapid rise in market rent/land value in KEMU since year 2000

Respondents were asked to indicate the major contributors to the rapid rising trend in market rent or land value in the KEMU neighborhood since the year 2000. The respondents who were tenants mentioned expansion of KEMU main campus in terms of student population (52 percent) and natural increase of KEMU residents (20 percent) as leading contributors. The respondents who were landlords equally mentioned expansion of KEMU main campus in terms of student population (46 percent), natural increase of KEMU residents (44 percent) as well as expansion of Meru town (10 percent) as the leading contributors. Most notably, the landlords and tenants were in agreement that expansion of KEMU University in terms of increase in student population together with natural population increase in the vicinity and expansion of Meru town were the major contributors to rapid growth and expansion of development within the KEMU neighborhood.

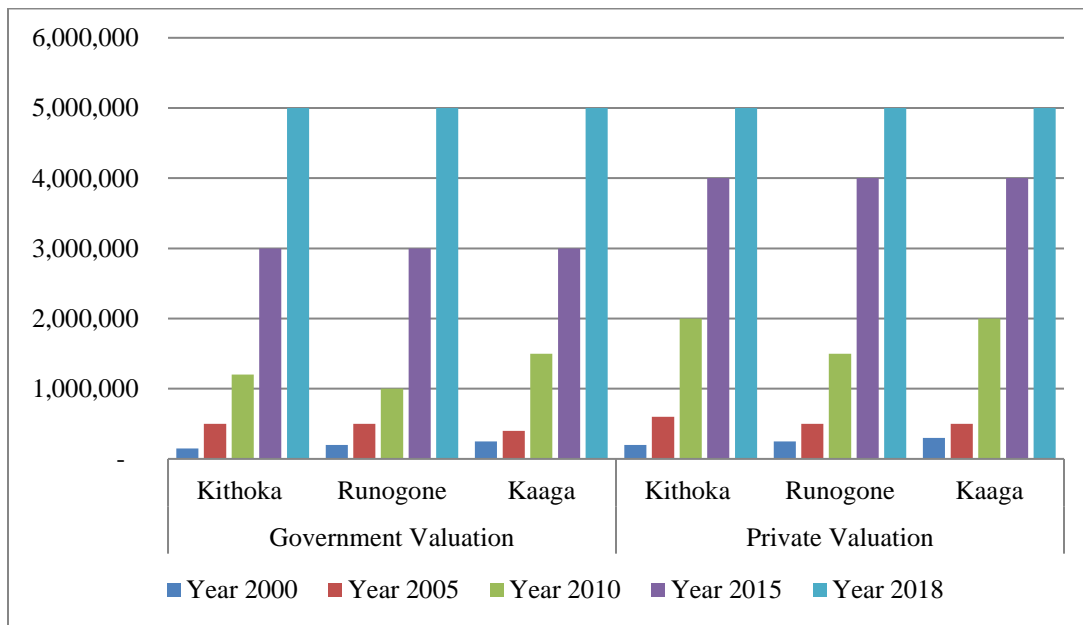


Figure 28: Average prices in Kshs of 0.25 acre of land within a radius of ≤ 1 km from KEMU Main Campus

The trend in average prices of land indicates that land prices were lowest in year 2000 across all locations within the KEMU neighborhood. It can be deduced from the Figure 28 that a quarter an acre cost less than Kshs 500,000 in the year 2005 and below across all sub-locations surrounding the KEMU neighborhood. After 2005 and 2010, the land prices had a rapid shift from slightly above Kshs 1 Million to approximately about Kshs 4 Million.

Further, the trend appears to be varied on basis of proximity to the university by both the government and private valuers. A further shift was experienced between 2010 and 2018 when the quarter acre prices skyrocketed, leaping from between Kshs 3 Million and Kshs 4 Million to current Kshs 5 Million across all localities of less than a kilometer radius from the university’s main campus. These shifts could be explained majorly by policy changes to the university. Firstly, the university was chartered in 2006 making it a fully-fledged institution and hence a point of attraction. By the year 2013, all the effect of free primary education transiting to tertiary and colleges was felt and a government push for 100 percent transition meant a steep rise in student population pushing high the demand for housing to host the students further coupled with admission of public financed students into private universities that saw admission rate of the university increase tremendously.

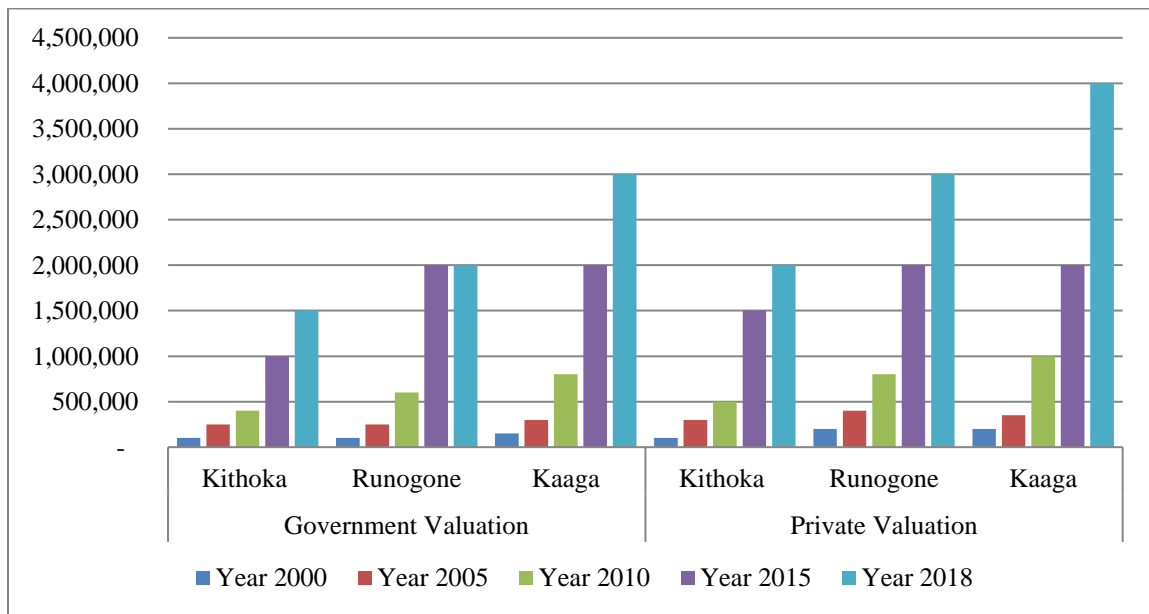


Figure 29: Average prices in Kshs of 0.25 acre of land within a radius of ≤ 2km from KEMU Main Campus

The Figure 29 acts to provide a comparison on land prices. As can be noticed from the findings, the further away from the center of interest, the land prices have been falling. Land prices for quarter an acre of land has as well increased from below Kshs 250,000 in 2000 to between Kshs 1 Million and Kshs 2 Million by the year 2015 and have hit Kshs 4 Million for the immediate location to the KEMU main campus and stood between Kshs 2

Million and Kshs 3 Million for the rest of the localities within 2-kilometer radius from KEMU main campus. A comparison between land prices at less than a kilometer and more than a kilometer from the KEMU main campus, a bid rent theory reflecting 'The Transect' is experienced in the study areas. In this context, land prices are higher at the point of interest, the central place theory, and decrease as they get farther away from the central place. This explanation provides the variance in interest on land as being higher at the central place and diminishing as someone moves away from the point of interest.

As clearly depicted by the trends in changes of market values of land and the comparisons before and after the year 2000, it is clear that the value of properties has been on a rapid increase including the rent value of properties and are all attached to the presence of KEMU main campus within the study area. Detailed analysis point to the fact that the presence of the university brought with it major economic impacts most of which are positive to the community where it is located. Most importantly, the economic growth of the area took an urban approach. The growth of rental properties is attributed to studentification with the focus being to offer accommodation to the students and therefore increase income to the landlord. The analysis pointed out that some other landlords comprised actually of people letting out their residential homes to students and that explains the high number of zero- and one-story building typologies discussed earlier in this chapter. This implies that the demand exceeds supply or rather shortage of residential facilities in the study area and so increased income to the neighborhood community particularly landlords who turned their homes into residential facilities for letting to the students.

Another aspect of the economic impacts of the presence of KEMU main campus is the growth of development centers – mainly residential centers. A rapid urbanization of Kaaga and Runogone is purely as a result of the presence of the university. This too being an urbanization aspect of the location of KEMU main campus to its neighborhood. These towns have grown at accelerating pace and was clearly explained by key informants mainly administrators. Almost 70 percent of the buildings coming up as at the time of the study were residential hostels targeting students. The main challenge is the centers were largely unplanned.

The need to provide for quality housing for the university staff were also advised to be the reason for the growth and expansion of Kithoka. While a few students have residential areas within Kithoka, mainly attributed to the tarmacking of Meru – Ruiri-Isiolo highway and the link to the Meru bypass that makes easy access to the university, Kithoka is hugely a commuter zone to the university premises. Most of the teaching staff have found high end residential areas within Kithoka. This has witnessed rapid expansion of the town offering middle order goods that meets the standards of the teaching staff and other rich personalities within the larger Meru township. The recreational facilities here are of high quality and hugely accessible to high class citizens. Therefore, the economic aspects of KEMU main campus have far reaching impacts into the entire community.

Local shops have emerged to cater for the needs of the students and further growth are providing sufficient reasons why students and staff need not travel to Meru town to access basic goods and services. The growth of the physical infrastructure facilities, mainly roads, and especially the Meru bypass is attached to the presence of KEMU main campus and has huge economic impacts to the local community. These road upgrades were supported by 96 percent of the respondents as having opened up market opportunities for the farm produce. This is to mean that Maua, Isiolo, Nkubu were now easily accessible by the farmers for selling their produce especially for them that couldn't match competition from the readily available market of the university population. They attributed the upgrading of access roads to the presence of the university together with the lighting of the streets pathways and roads that lead to the university. Further, the increased rate of electricity connectivity was attributed to the location of KEMU main campus. This was reported to have huge security impacts on the community.

The students and staff have also provided ready market for fresh agricultural produce mainly vegetables and fruits and this has seen a huge transformation of the agricultural sector with farmers' incomes steadily increasing over the years since the inception of KEMU main campus. Perhaps, this also explains the presence of multiple butcheries in the study areas indicating increased meat consumption and therefore increased benefits to the farmer. It is therefore evident that the presence of KEMU main campus has had huge

economic impacts to every individual within the community majorly through increased incomes, property values and market for both raw and manufactured products.

5.6 Spatial Planning Challenges of KEMU Main Campus Neighborhood

The concerns of rampant land use changes, mostly from agricultural to build up areas were discussed with the key informants in order to get valuable and reliable information on possible planning interventions. The key informants comprised of real estate agents, NLC Land Administrator – Meru County, Meru County Urban and Regional Planner, private practitioners - an urban and regional planner and a surveyor, all professionals located at Meru town. They highlighted a weak enforcement, inadequate professional and inadequate co-ordination among the different agencies mandated with land use planning, as key challenges which have contributed to uncontrolled subdivisions; high rental values; poor housing maintenance and uncoordinated development within the neighborhood.

5.7 Application of the Concept of Studentification

The concept of studentification stood out clearly in the literature review. Empirical statistics on this concept were not part of the study objectives. However, observation and photography aided in getting a glimpse of how the concept played out within the case study. Findings provide sufficient grounds to confirm the concept at play albeit to a given extent. The social, cultural, physical and economic dimensions of the concept of studentification are clearly at work in the case study.

The social aspects of the concept are characterized by established residential areas for single and young middle-class social groupings within the study area. They have their own cultural beliefs and practices that local residents do not approve of, as shown in earlier findings of this study, bringing out the cultural aspects of studentification. The physical facilities surrounding the university have been hugely improved/developed with road upgrades, street lighting and residential homes for the local residents being converted to houses of multiple occupancy to earn rental income from the students.

The economic aspects of studentification have been broadly described above indicating the shifts in prices of properties. Government and private valuers have proved this aspect of

studentification beyond doubt by indicating property prices within the study area have increased in value threefold since inception of KEMU main campus. Further, privately rented accommodation in the area is the order of the day within the university neighborhood. New buildings are completely in favor of student accommodation.

The stages of studentification are explicitly evident particularly up to the settlement stage. The ivory tower stage is evidenced by the fact that the university campus has been established purposely for its core mandate. Administration offices, library, laboratories, lecture halls among others are already in place to aid the university in undertaking its core business. The university hostels have been established to accommodate non-local students and staff setting the stage for the cloister stage. While these facilities are in place and are visible from a distant, they are insufficient to accommodate all students and staff needing their services. As a result, due to their inadequacy and increase in number of students, a spill over in search of these accommodation facilities has taken place ushering in the settlement stage of studentification. At this stage, the surrounding neighborhood is hugely settled by students who have spilled out of the cloister. These students have settled in private accommodation spanning the entire study area. The physical aspects of the concept are at interplay to accommodate the large number of students without accommodation within the cloister and hence conversion of single-family dwellings into HMOs, construction of story facilities for student accommodation and purpose-built hostel to fill the remaining void. It is therefore evident that to a greater extent, approximately 85 percent of the concept of studentification is adopted within the study area. This is evidenced by observation, photography and even empirical analysis of some of the aspects of the concept.

5.8 Hypothesis Testing

To validate the findings, the study had hypothesized as below:

H_a: There is no significant relationship between rapid land use changes in the KEMU Neighborhoods and KEMU Main Campus University location.

H₀: There is a significant relationship between rapid land use changes and the location of KEMU University main campus.

A paired t-test was done with the responses from both tenants and landlords on what were the notable shift in land use and what they attributed such changes to as the variable. The results were presented in the Table 8.

With $t = -4.404$ and $sig = 0.00$, the null hypothesis is rejected and the alternative hypothesis accepted since sig is less than $\alpha = 0.05$. The study thus concluded that there exists a significant relationship between university location and rapid land use changes within the KEMU university main campus neighborhood. This implies that university location has impacts on the neighborhood land uses with majority of respondents observing that rapid developments within the area were occasioned by need to provide housing and other amenities to university students and as a result the growth and expansion of KEMU main campus was the single largest contributor to rapid changes in land uses, particularly from agriculture to residential and commercial uses.

Further, paired sample statistics of the same variables gave a standard deviation of 75 percent, indicating the relationship between the variables is very strong and reliable and therefore sufficient to support the alternative hypothesis. Further, all the key informants validated these findings by observing that the said neighborhood was rapidly being converted from an agricultural land to a built-up area, comprising of mainly residential, entertainment and commercial uses.

Table 8: Comparison of Means: University Location Vs Land Use Changes in KEMU University Neighborhoods.

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Major shift in land use that has occurred in the neighborhood for the period you have lived there Reason do you attribute to your choice in question 15	-.432	.920	.098	-.627	-.237	-4.404	87	.000

CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter provides a brief summary of the findings and study conclusions based on objectives of the study. It also covers recommendations and makes suggestions for further research.

6.2 Summary of Findings

6.2.1 Land use Characteristics and Development Pattern

There are various land uses that are apparent within the study area. As noted from observation, residential, commercial and transportation were the leading land uses respectively. Recreational and educational land uses were the other notable ones. The development pattern in the study area was examined through house typology and height. The dominant house typology was bungalows closely followed by flats of 1 and 2 bedrooms. Maisonettes and bedsitters were also observed. In terms of house height, majority of the buildings were one storey followed at a distant by non-storeyed buildings and two storey ones.

6.2.2 Land Use/Cover Changes

There has been a major shift in land use within the study area. As stated earlier, agriculture was the dominant land use with residential being the only other form of land use where tenants resided on their agricultural parcels. However, the study findings indicated that a major shift in land use was experienced between 2010 and 2015 reported by approximately 85 percent of the respondents. The rate of growth of other land uses within the study area began in 2005. Further, an estimated 57 percent of the respondents reported that expansion of KEMU main campus was the major contributor to the shift in land uses within the study area. The other major contributors to land use and land cover changes within the study area were natural increase of the population and expansion of Meru town. This was reported by 28 and 12 percent of the respondents respectively.

There was a reported shift in land cover changes as well. Vegetation land cover change

was the most affected, having declined by 16% from 60 percent in year 2000 to 44 percent in year 2018 in 18 years. The study area had a rise in the built-up area of 13% from 13 percent in year 2000 to 26 percent in year 2018. Forest and bare land cover were insignificantly affected and hence no major change had occurred. The high rate of land use and land cover changes was reported to have both benefits and challenges. The land use changes were rated positively by 95% of respondents.

Major benefits emanating from land use changes included growth of more business opportunities, establishment and growth of better physical infrastructure facilities and improved transport networks by 65, 12 and 16 percent of respondents respectively. Thirty-five (35) percent of the respondents reported absence of problems associated with the land use changes whereas other respondents reported increased security risk, loss of privacy and increased pollution as the major problems by 42, 7 and 7 percent of respondents respectively. The researcher observed that despite the reported positive impacts, the developments were disorganized and un-coordinated in space hence impacting negatively on the landscape design of the neighborhood.

6.2.3 The Socio-Economic Impacts of KEMU Main Campus on its Neighborhood over the Past Fifteen Years

The study identified that the presence of KEMU main campus in that location had both social and economic impacts on the community within the study area that covered a radius of 2.5km from the main campus of the university. Positive social impacts were supported by 76 percent of the respondents as opposed to 24 percent who thought KEMU main campus had brought negative impacts. Social infrastructure facilities were considered to have rapidly changed over a fifteen-year period since the inception of the university and they were the instruments used to measure the social impacts of the university to its neighborhoods. Their positive influence to the neighboring community stood at 98, 94, 88, 68, 64, 54 and 51 percent respectively for education, healthcare, transport, art and culture, information, public safety and sports and recreation.

The economic impacts were identified in form of property values. Property values have risen rapidly within the study area. Prior to the year 2000, approximately 83 percent of

the respondents reported that property values (that is market rent and land values) were rising slowly. About 10 percent of the respondents reported that the values were stagnant and thus not changing at all. After the year 2000, an estimated 90 percent of the respondents reported that the market rent and land values were rising rapidly while about 10 percent of them reported property values as rising at a slow pace. This was attributed to three major factors of expansion of KEMU University in terms of student population, natural increase in population within the KEMU main campus neighborhood and the growth and expansion of Meru town at 49, 32 and 7 percent respectively.

Consequently, the prices of properties have been changing, mostly rising, over time. Both Government and private valuers indicated that there is a trend of very steep growth in property values. Findings showed that a quarter of an acre within a kilometer radius from KEMU main campus stands at Kshs. 5 million (valuation of both government and private valuers) while the same parcel of land cost less than Kshs. 250,000 in 2000. This is 19 times higher. Further, within a two-kilometer radius from KEMU main campus, a quarter of an acre of land cost between Kshs. 3 million and Kshs. 4 million as compared to the same parcel that cost less than Kshs 200,000 in 2000. This is 16.5 times higher. This explains the decrease in prices of land from the central point further away on one hand. On the other hand, land prices rise as one approaches the center and so does the interest on land.

Besides property values, other economic impacts of KEMU main campus to its neighborhood included the development of growth development centers being Runogone, Kithoka and Kaaga centers. These centers, occupied by students saw uncontrolled and rapid growth as accommodation nodes for university population comprising of residential hostels for students in the three localities and high-end mansions for staff particularly in Kithoka. Further, availability of ready market for farm produce from surrounding farmers have seen a surge in local shops and kiosks to serve the university population and increased income to the neighbors for both fresh farm and livestock produce. Infrastructure growth especially roads linking the study area and the neighborhood and the major urban areas being Meru, Maua and Isiolo have seen increased business activities. All these factors have

huge economic impacts on the neighborhood residents who now have enhanced market for their produce and can easily serve beyond the university population.

6.3 Conclusions

According to Sherry 2005, universities are major players in many activities not traditionally associated with the ivory tower. They are employers, purchasers, engines of economic growth, innovators, cultural Mecca, branders of place and, increasingly, major real estate developers". This has been evidenced by the study findings. Most critical of the findings to support Sherry (2005) is the continued growth of the built-up area, an effect of land use change from agriculture that has been attributed to the growth and expansion of KEMU University's main campus. The study concludes that the location of KEMU University has been a significant contributor to land use and land cover change with the main change being from agriculture and general vegetation cover to residential, commercial and transport uses as well as to educational and recreation uses. The land use changes have rapidly occurred in the last two decades coinciding with the inception and expansion of KEMU main campus.

The location of the university is the basic ground upon which social infrastructure facilities have been established. The growth of health facilities including private clinics, the emergence of new churches in the locality, the growth of entertainment facilities and recreational joints are all as a result of the location of the university within the neighborhood. These facilities were initially found within Meru town and have since devolved to cater for the needs of the university population. New cultural trends and lifestyles were reported that supports the conclusion that cultural aspects of the neighborhood have been influenced by the presence of the university. These are both positive and negative effects to the indigenous culture of the local community. A digital generation has witnessed the tremendous growth of casino, cinema and movie joints within the study area. All these are attributed to the location of the university. Additionally, the study concludes that the loss of privacy and rise in petty crimes within KEMU university main campus neighborhood are associated to its location. Therefore, the university location has impacted positively and negatively on the social characteristics of its neighboring

community. This is projected to modify the cultural beliefs, norms and trends of the local community with time.

Further, the economic status of the area has gone higher with booming business activities to cater for the studentification phenomenon as described by Tyler, 2008 and attain necessary amenities to meet student needs as observed by McCann, 2012. The rental buildings majorly bedsitters and the conversion of residential homes to rental houses by local community is the clearest indication of the impacts of studentification especially at the cloister stage. The physical infrastructure facilities comprising of improved road infrastructure and street lighting are attributed to the presence of the university at the location. These have boosted trade and its worth concluding that the economic status of the neighborhood has soared over the last fifteen years. Additionally, the presence of ready market for hinterland agricultural produce sold on the now expanding Runogone, Kaaga and Thiiri growth and development centers all dominated by students and university staff have seen a huge economic benefit to the neighborhood farmers.

Further, property values have been on a rising trend and projections are that the trend is set to continue as the university grows. The findings provide the basis for concluding that property values and market rent and land prices are on a trajectory trend as a result of the university location and will continue soaring as long as the campus continues growing and expanding.

6.4 Recommendations - Planning Interventions

Recommendations are designed to address and give solutions to the planning issues identified by the study. The study identified the main planning challenges associated with studentification in KEMU main campus neighborhood as: lack of zonal plans and poor neighborhood design; lack of student accommodation strategy; lack of neighborhood community strategy; weak stake-holding and partnership; poor political good will and social and economic sustainability of neighborhoods. The recommendations in this study were informed by the knowledge that was gathered from the two successive case studies, the study findings and the literature review.

6.4.1 Preparation of a Zonal Plan for KEMU Main Campus Neighborhood

There is need for organized development to be undertaken through the preparation and implementation of a zoning plan as the basic framework for guiding development within Meru Municipality and the County as a whole. Densification should be prioritized to reduce conversion of agricultural land to residential and commercial use. The plan should provide for development and enforcement of land use policies, strict adherence by developers to approved plans, elimination of uncontrolled land subdivisions. The county government is mandated to ensure coordinated development within the neighborhood. Its close collaboration with all key stakeholders during the planning process is vital.

6.4.2 The Neighborhood Design

Among the vital considerations for neighborhood design should include crime prevention through appropriate environmental design. An environmental conservation and protection plan should be adopted. Lastly, a street address design should be embraced.

A crime prevention through environment design by ensuring natural surveillance through the placement of physical features, activities and people in ways that maximize the ability to see what is occurring in any given space. Territorial reinforcement uses the buildings, fences, signs, pavement, or other objects to express ownership or to clearly delineate the transition from public to private space. Access control is the physical guidance of people coming and going from a space by the appropriate placement of entrances, exits, fencing, landscaping, secure premises, and other barriers to open access. This approach relies upon regular maintenance of each of these measures, whether it is lighting, landscaping, or fencing, needs to be checked on a regular basis.

Further, areas of environmental nature should be protected and conserved as they form students' recreational areas. Imenti forest which has an elephant corridor along Meru- Ruiru road is a good example. The County of Meru can construct an elephant viewing deck and install street lighting. The Kenya Highway Authority can construct pedestrian walkways to segregate pedestrian traffic from vehicular traffic.

Hill climbing in Karimaga Ntuiko should be promoted by ensuring that the road is accessible and has directional signs for easier location.



Plate 16: Unmaintained Pathway

Source: Field survey, 2018

Access streets from main Meru-Maua highway should be well-identified and defined by names to allow for ease of establishing routes, property identification including student accommodation hostels, locating businesses and social infrastructure and recreational facilities which are of interest to students and affording accessibility in case of evacuation for of emergencies and disasters among them ambulances, fire and security services.



Plate 17: Site for Proposed Elephant Viewing Deck

Source: Field Survey, 2018

6.4.3 LEAP Model

Both the university and neighborhood community should collaborate and develop a joint initiative which will leverage on the positive benefits of studentification and address the negative impacts of studentification. The study recommends a LEAP model which incorporates a student accommodation strategy and a community strategy. The LEAP model is a creation of the author and is represented in Table 9.

Table 9: LEAP Model

Linkage	Between students and neighborhood community by facilitating access to transportation networks, events and resources for mutual benefits.
Engagement	<p>Encourage neighbors and students to live up to the maxim of, “who is your neighbor?”</p> <p>Embrace individual accountability and responsibility when dealing with students’ affairs which relate to their neighborhood community.</p> <p>Educate all university students about obedience to and respect for law and order in the neighborhood – “Life At University impacts Life After Graduation”</p>
Advocate	<p>For community aspirations and pressing needs, Rights of neighbors and students and neighborhood improvements</p> <p>For empowerment on tenant rights and obligations, and public order and safety in the community.</p>
Promote	<p>Good neighborliness– Students and community being friendly; amiable and approachable; quiet; respect the environment; handle situations maturely; helpful when and where necessary and trustworthy.</p> <p>Volunteerism – students working in the community</p>

Source: Author, 2018

To implement the above model, a **student accommodation handbook** guiding rights and responsibilities, safety standards, house maintenance standards, dispute resolution mechanisms and neighborhood helplines among others is necessary. An information portal of properties which have complied with agreed standards can be developed and

shared with students and neighborhood community. The portal can also include available student accommodation for letting and rent payable per month.

Further, to know your neighbor, the university and the neighborhood can come up with an **Annual Good Neighbors Day** where university students and the community converge for sports and games, culture and arts and environmental campaigns such as garbage collection and tree planting.

6.5 Enforcement Strategy

The Physical and Land Use Planning Act should be strictly adhered to. It is recommended that development control should be strictly enforced with any development adhering to land use and physical planning regulations in place. The County Government in collaboration with the university, development partners, national government departments and agencies on land use, physical planning and development and other stakeholders should establish a common ground to implement the outcomes of the proposed zonal development plan. The developments aspect to be incorporated in the proposed zonal development plan must be strictly adhered to for coordinated and sustainable development.

6.6 The Food Security Strategy

The study recommends adoption of urban agriculture within the study area to boost food security challenges posed by replacement of arable land with university-related infrastructure facilities. This is not only in recognition of the fact that area is highly arable but also to cushion the neighborhood residents from high cost of living caused by high food prices. Further, the market is assured by the neighborhood population which is working. Urban agriculture can be employed in a number of ways, namely:

- a) Adoption of flat roofs on buildings for rooftop agricultural activities and hanging gardens on balconies.
- b) Adoption of modern technology in agriculture such as hydroponics which require less physical space for food production.
- c) Verandah and gunny sacks vegetable farming within homesteads

6.7 Green Infrastructure Strategy

The study further recommends a greening strategy to maintain clean and healthy vegetation covered environment. The proposal can be actualized by ensuring tree planting along main streets and access roads/pathways is mandatory, ornamental tree projects within homesteads, encourage use of live fence/hedge and landscaping of pathways and open spaces that are unutilized.

6.8 Recommendations for Further Research

Further research involving multiple cases of Kenyan Universities, thereby widening the population and the reach of the inferences and generalizations, is necessary. This will bring out city/town-specific issues.

It would also be relevant to conduct detailed studies of known properties with perennial student occupancies, as well as such issues as the trade-offs between the apparent profitability of the ‘student market’ and the challenges of urban management in such areas.

In addition, further studies are needed to delve into the patterns of the ‘exclusive student zones. Studies on what influences such formations and their impacts on the neighborhood are necessary to inform spatial planning.

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APPENDICES

Appendix I: Household Questionnaire for Landlords

HOUSEHOLD LEVEL QUESTIONNAIRE

This questionnaire is prepared to collect data about land use and land cover changes, their impacts on property values in KEMU main campus neighborhood. It is expected to generate and provide helpful information for policy makers and development practitioners about magnitude and trends of land use and land cover change and its impact on property values. Hence, your inputs as a stakeholder to fill this questionnaire is highly appreciated and information provided will stay confidential and your right to involve or not is also respected. Please tick where it is applicable.

Part I-General Background Information (To be filled by landlords only)

1. Date of interview (Day, Month and Year).....
2. Name of interviewee.....Tel./Mob. No.....
3. Start timeEnd time..... Time elapsed.....
4. Name of interviewee.....Tel./Mob. No.....

Part II-Land Use Changes and their Characteristics

5. Name of Sub location. Tick One.

Kithoka

Runogone

Kaaga

6. How long have you settled in this sub location?

(a) < 5 years

(b) \geq 5 years < 10 years

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(c) ≥ 10 years <15 years

(d) ≥ 15 years

7. Where did you come from?

(a) Within Meru County (Specify).....

(b) Outside Meru County (Specify).....

8. Why did you settle in this area of residence?

(a) Close proximate to place of work
(Specify).....

(b) Serene neighborhood

(c) Easily accessible by public transport

(d) Accessibility to high quality social facilities
eg. educational, health and recreational
(Specify).....

(e) Others (Specify).....

9. Total land owned(acres) or(ha)

10. What is the tenure of your land?

- (a) Freehold
- (b) Leasehold (Specify term).....
- (c) Others (Specify).....

11. Fill out the Table 1 for land use change details.

Table 1: Land use change details at Parcel level

Type of land	Approximate Size in acres of each land use				Underlying reasons
	Now	5years ago	10years ago	15 years ago	
1: Vegetation (Agricultural land, plantation and grassland).					

2: Open space					
3: Built up area					
4. Wetland					

12. What major shift in land use has occurred in your neighborhood for the period you have lived there?

(a) Agricultural land converted to built up area

(b) Former quarry sites converted to built up areas

(c) Natural vegetation cleared for built up area

(d) Wetlands converted to built up area

(e) Others (Specify).....

13. Which of the following best describes the trend of land use in the KEMU neighborhood after year 2000?

a) Changing rapidly

b) Changing slowly

c) Not changing

14. Which of the following best describes the trend of land use in the KEMU neighborhood before year 2000? To be filled by landlords who opted (d) in question 6.

(a) Changed rapidly

(b) Changed slowly

(c) Not changing

15. In your opinion, which time period has land use of KEMU neighborhood changed most?

(a) Between year 2000 and year 2005

(b) Between year 2005 and year 2010

(c) Between year 2010 and year 2015

16. What reason do you attribute to your choice in question 15?

(a) Expansion of KEMU main campus in terms of student population

(b) Natural increase of KEMU neighborhood residents

(c) Expansion of Meru town

(d) Others (specify).....

17. What benefits do you get from the current land uses of KEMU neighborhood?

(a) Business opportunities

(Specify).....

(b) More physical infrastructural facilities

(Specify).....

(c) Improved transport networks

(Egs. roads, pedestrian walk ways, paths and street lighting)

(d) More reliable public transport

(e) Others (Specify).....

18. What problems do the current land uses of KEMU neighborhood impose on you?

(a) Security risky

(b) Loss of privacy

(c) Incompatible land uses

(d) Polluted neighborhood

(e) Others (please specify).....

19. In your opinion, how would you rate the change of land use in the KEMU neighborhood for the last fifteen years?

A. Positive (If Benefits >Problems)

B. Negative (If Benefits <Problems)

C. No change (If Benefits=Problems)

Table 2: Rating of Land Use Change in the Neighborhood level

Time period \ Type of land	Now-5years ago	5-10 years ago	10-15years ago
Built up area			
Vegetation (agricultural land, plantation and grassland)			
Bare land			
Wetland			
Quarry sites			

20. What elements of this plot and house do you

- (a) Like most?
- (b) Dislike most?.....

Table 3: Plot and House Characteristics

Rating \ Element	Like	Dislike	Reasons for like or dislike
Plot size			
Plot configuration			
Plot boundary definition			
Plot topography			
Plot lay out			

Privacy			
Building height			
Accessibility			
Others (Specify).....			

Part III: Land Use Changes and Property Values

21. Which of the following best describes the trend of market values of land in KEMU neighborhood since year 2000?

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

22. Which of the following best describes the trend in market values of land in KEMU neighborhood before year 2000? To be filled by landlords who opted (d) in question 6.

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
-

(d) Falling slowly

(e) Falling rapidly

23. If your answer to question 21 is (a), what do you think are the major contributors of the trend?

(a) Expansion of KEMU main campus in terms of student population

(b) Natural increase of KEMU neighborhood residents

(c) Expansion of Meru town

(d) Others (specify).....

24. Describe new practices & regulations that influence land use planning in your neighborhood at different points in time and their impact?

(a) Last 5 years.....

(b) Between 5 and 10 years ago.....

.....

(c) Between 10 and 15 years ago.....

.....

(d) Others

(Specify).....

.....

25. What are the major changes in land use and management you noted in communal properties such as road reserves, rivers, wetlands and forests over the last 15 years and the institutional changes that go along with these.....

.....

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

26. Are there external factors that are out of your control? Describe and explain while differentiating between:

(a) Natural factors:.....
.....
.....

(b) Demographic factors:.....
.....
.....

(c) Institutional factors, laws:.....
.....
.....

(d) Political factors, policies:.....
.....
.....

Part IV: Specific Background Information for the Household

A. Household Information

27. Fill out Table 4 below for household information

Table 4: Household Information

Position	Age	Gender	Education	No. of children	Occupation
1. Married	1. 18-29	1. Male	1. None	1. None	1. White collar job (Civil Servant)
2. Single	2. 30-39	2. Female	2. Primary	2. 1	2. White collar job (Private company)
3. Divorced	3. 40-49		3. Secondary	3. 2	
4. Separated	4. 50-59		4. College	4. 3	
5. Widowed	5. 60+		5. University	5. 4	
				6. 5	
			7. Others (specify)	7. Others (specify)	3. Blue collar job (tradesmen, e.g. bricklayer, carpenter, etc)
			4. Self Employed (Specify)...
		
			5. Unemployed

B. Income and Expenditure Information

28. List sources of incomes to the Household

.....

.....

Fill out Table 5 below for income and expenditure information

Table 5: Income and Expenditure information

Total Household income per month		Household Expenditure per month in Kshs.	
Amount in Kshs.	Tick where appropriate	Item	Estimated Amount in Kshs.
<7499		Food	
7499-15000		Health	
15001-22500		Education	
22501-30000		Fuel	
30001-37500		Clothing	
37501-45000		Transport	
>45000		Water	
		Entertainment	
		Support to parents and other relatives	

		Others (Specify).....	
		Total in Kshs.	

Comments of the interviewed person regarding the information provided/

Special remarks of the interviewer:.....

Thank you for participating in this Research!

Appendix II: Household Questionnaire for Tenants

HOUSEHOLD LEVEL QUESTIONNAIRE

This questionnaire is prepared to collect data about land use and land cover changes, their impacts on property values in KEMU main campus neighborhood. It is expected to generate and provide helpful information for policy makers and development practitioners about magnitude and trends of land use and land cover change and its impact on property values. Hence, your inputs as a stakeholder to fill this questionnaire is highly appreciated and information provided will stay confidential and your right to involve or not is also respected. Please tick where it is applicable.

Part I-General Background Information (To be filled by tenants only)

1. Date of interview (Day, Month and Year).....
2. Name of interviewee.....Tel./Mob. No.....
3. Start timeEnd time..... Time elapsed.....
4. Name of interviewee.....Tel./Mob. No.....

Part II-Land Use Changes and their Characteristics

5. In which sub location is the house you are living in situated? Tick One.

Kithoka

Runogone

Kaaga

6. How long have you lived in this area/sub location?

- (a) < 5 years
- (b) ≥ 5 years < 10 years
- (c) ≥ 10 years < 15 years
- (d) Others (Specify).....

7. Where did you come from?

- (a) Within Meru County (Specify).....
- (b) Outside Meru County (Specify).....

8. Why did you choose to rent a house in this area?

- (a) Close proximate to place of work
(Specify).....
- (b) Serene neighborhood
- (c) Easily accessible by public transport
- (d) Accessibility to high quality social facilities

eg. Educational, health and recreational

(Specify).....

(e) Others (Specify).....

9. What major shift in land use have you noticed in your neighborhood for the period you have lived there?

(a) Agricultural land converted to built up area

(b) Former quarry sites converted to built up areas

(c) Natural vegetation cleared for built up area

(d) Wetlands converted to built-up area

(e) Others (Specify).....

10. In your opinion, which time period has land use of KEMU neighborhood changed most?

(a) Between year 2000 and year 2005

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(b) Between year 2005 and year 2010

(c) Between year 2010 and year 2015

11. What reason do you attribute to your choice in question 10?

1. Expansion of KEMU main campus in terms of student population

2. Natural increase of KEMU neighborhood residents

3. Expansion of Meru town

4. Others (specify).....

12. What benefits do you get from the current land uses of KEMU neighborhood?

(a) Business opportunities (Specify).....

(b) More physical infrastructural facilities (Specify).....

(c) Improved transport networks

(Egs. roads, pedestrian walk ways, paths and street lighting)

(d) More reliable public transport

(e) Others (Specify).....

13. What problems do the current land uses of KEMU neighborhood impose on you?

(a) Security risky

(b) Loss of privacy

(c) Incompatible land uses

(d) Polluted neighborhood

(e) Others (please specify).....

14. In your opinion, how would you rate the change of land use in the KEMU neighborhood for the last fifteen years?

- A. Positive (If Benefits >Problems)
- B. Negative (If Benefits <Problems)
- C. No change (If Benefits=Problems)

Table 1: Rating of Land Use Change in the Neighborhood level

Time period Type of land	Now-5years ago	5-10 years ago	10-15years ago
Built up area			
Vegetation (agricultural land, plantation and grassland)			
Bare land			
Wetland			

Quarry sites			
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15. What elements of this house do you

- (a) likemost?
- (b) dislike most?.....

Table 2: House Characteristics

Rating Element	Like	Dislike	Reasons for like or dislike
Privacy			
Building height			
Room configuration			
Room arrangement			
Accessibility			
Others (Specify).....			

Part III: Land Use Changes and Property Values

16. Which of the following best describes the trend of market rents of houses in KEMU neighborhood since year 2000?

(a) Rising rapidly

(b) Rising slowly

- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

17. Which of the following best describes the trend in market rents of houses in Lusaka before year 2000? To be filled by tenants who opted (d) in question 6.

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

18. If your answer to question 17 is (a), what do you think are the major contributors of the trend?

- (a) Expansion of KEMU main campus in terms of student population
- (b) Natural increase of KEMU neighborhood residents
- (c) Expansion of Meru town

(d) Others (specify).....

19. Do you plan to move to other place because of the land uses taking place in your area?

Yes No

20. What is the major reason that is likely to force you relocating from the area where you are currently staying to somewhere else?

(a) Because rent has become too high

(b) The area has incompatible land uses

(c) Insecurity

(d) Loss of privacy

(e) Others (please specify)

Part IV: Specific Background Information for the Household

C. Household Information

21. Fill out Table 3 below for household information

Table 3: Household Information

Position	Age	Gender	Education	No. of children	Occupation
1. Married	1. 18	1. Male	1. None	1. None	1. Employed
2. Single	-	2. Female	2. Primary	1. None	2. Jua Kali job
3. Divorced	29		3. Secondary	2. 1	3. Self Employed (Specify).....
4. Separated	2. 3		4. Colleg	3. 2	4. Unemployed

5. Widowed	0		e	4. 3	
	-		5. University	5. 4	
	3			6. ≥ 5	
	9			I.	
	3.				
	4				
	0				
	-				
	4				
	9				
	4.				
	5				
	0				
	-				
	5				
	9				
	5.				
	6				
	0				
	+				

D. Income and Expenditure Information

22. List sources of incomes to the Household

.....

23. Fill out Table 4 below for income and expenditure information

Table 4: Income and Expenditure information

Total Household income per	Household Expenditure per month in Kshs.
----------------------------	--

month			
Amount in Kshs.	Tick where appropriate	Item	Estimated Amount in Kshs.
< 7499		Food	
7499-15000		Health	
15001-22500		Education	
22501-30000		Fuel	
30001-37500		Clothing	
37501-45000		Transport	
> 45000		Water	
		Entertainment	
		Support to parents and other relatives	
		Others (Specify).....	
		Total in Kshs.	

Comments of the interviewed person regarding the information provided/

Special remarks of the interviewer:.....

Thank you for participating in this Research!

Appendix III: Interview Schedule for Key Informants

INTERVIEW SCHEDULE FOR OFFICIALS

This interview schedule aims at analyzing impact of KEMU main campus location on its neighborhood land uses. The interview schedule is prepared to collect data about land use and land cover changes, their impacts on property values in KEMU main campus neighborhood. It is expected to generate and provide helpful information for policy makers and development practitioners about magnitude and trends of land use and land cover change and its impact on property values. Hence, your inputs as a stakeholder fill this questionnaire is highly appreciated and information provided will stay confidential and your right to involve or not is also respected. Please tick where it is applicable.

Name _____ of _____ Respondent/Position
(Optional).....
.....

Contact Number.....

Date of Interview.....

1. Are you aware of the current land uses in Kithoka, Kaaga and Runogone sub locations which form part of KEMU neighborhood?

Yes No

2. If yes, which are the current land uses in the area in order of dominance?

1. Very dominant 2. Fairly dominant 3. Less dominant 4. Not dominant

(a) Built up area

(b) Agricultural land

(c) Bare land

(d) Wetlands

(e) Others (specify).....

3. Which land use changes/conversion are taking place in the area?

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

4. How are you able to tell that land uses are changing in the area?

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

5. In which area of KEMU neighborhood do you think the land use changes are taking place most?

(a) Within 500m radius from KEMU main campus

(b) Within 1km radius from KEMU main campus

(c) Within 1.5 km radius from KEMU main campus

(d) Within 2km radius from KEMU main campus

(e) Within 2.5km radius from KEMU main campus

(f) Others (Specify).....

6. Which are the types of land use and house typologies are found within the areas specified? Fill Table 1 which follows for the types of land use and house typologies.

Radius in km from KEMU main campus	Dominant Land use	Dominant house typology	Underlying reason
	1. Built up area 2. Agricultural land 3. Bare land 4. Wetlands 5. Quarry sites II.	1. Bed sitters 2. Flats (1&2 bed roomed) 3. Maisonette 4. Bungalows 5. Others (Specify)	1. Expansion of KEMU main campus in terms of student population 2. Natural increase of KEMU neighbourhood residents 3. Expansion of Meru town 4. Others (specify)..... III.

7. When did you start noticing these conversions increasing?

(a) Before the year 2000

(b) After the year 2000

(c) Others (please specify)

8. In your opinion, which time period has land use of KEMU neighbourhood changed most?

(a) Between year 2000 and year 2005

(b) Between year 2005 and year 2010

(c) Between year 2010 and year 2015

9. What benefits do you associate with the current land uses of KEMU neighborhood?

(a) Business opportunities (Specify).....

(b) More physical infrastructural facilities (Specify).....

(c) Improved transport networks

(Egs. roads, pedestrian walk ways, paths and street lighting)

(d) More reliable public transport

(e) Others (Specify).....

.....

10. What problems do you associate with the current land uses of KEMU neighborhood?

(a) Security risky

(b) Loss of privacy

(c) Incompatible land uses

(d) Polluted neighborhood

(e) Others (please specify)

11. In your opinion, how would you rate the change of land use in the KEMU neighborhood for the last fifteen years?

A. Positive (If Benefits >Problems)

B. Negative (If Benefits <Problems)

C. No change (If Benefits=Problems)

Table 2: Rating of Land Use Change in the Neighborhood level

Time period \ Type of land	Now-5years ago	5-10 years ago	10-15years ago
Built up area			
Vegetation (agricultural land, plantation and grassland)			
Bare land			
Wetland			
Quarry sites			

12. Do you find it difficult to control developments in KEMU neighborhood where land use changes are taking place at an increasing rate?

13. What challenges do you find when controlling /monitoring/regulating developments in areas where land use changes are taking place at an increasing rate?

(a) impatient developers developing/upgrading their properties before change of user permit is granted

(b) Financial constraints

(c) Inadequate technical capacity

(d) Others (please specify).....

.....

....

14. Do physical planning standards and specifications get compromised or ignored as a result of a mixture of residential and commercial land use?

Agree Disagree

15. Which of the following best describes the trend of market values of land in KEMU neighborhood since year 2000?

(a) Rising rapidly

(b) Rising slowly

(c) Not changing

(d) Falling slowly

(e) Falling rapidly

16. Which of the following best describes the trend in market values of land in KEMU neighborhood before year 2000?

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

17. Which of the following best describes the trend of market rents of houses in KEMU neighborhood since year 2000?

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

18. Which of the following best describes the trend of market rents of houses in KEMU neighborhood before year 2000?

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

19. How many applications on land use change from agricultural to either residential or commercial does your institution receive in an average year?

- (a) ≤ 50
- (b) $50 \leq 100$
- (c) $100 \leq 150$
- (d) $150 \leq 200$
- (e) ≥ 200
- (f) Others (please specify)

20. Out of the received number of applications for land use change in an average year, how many get executed/ implemented within the same year?

- (a) ≤ 50
- (b) $50 \leq 100$

....

.....

....

23. Is there a legal framework/procedure that regulates changing an existing land use in Meru County generally and KEMU neighborhood particularly?

Yes

No

24. If yes, do you think it is working effectively?

Agree

Disag

25. Do you think all the people who are converting their land use are following the procedure, laid down in the laws?

Yes

No

26. . How would you describe the rate at which KEMU neighborhood land use conversions are taking place?

(a) Increasing at a fast rate

(b) Normal rate

(c) Very low rate

(d) Others (please specify)
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27. Do you have additional issues pertaining to the subject of land use changes in the KEMU neighborhood?

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.....
.....

28. Comments of the interviewed person regarding the information provided/
Special remarks of the interviewer:

.....
...

Thank you for participating in this Research!

Appendix IV: Interview Schedule for Private professionals in land and housing sector (real estate experts, planners, land surveyors, architects and NEMA experts)

INTERVIEW SCHEDULE FOR PRIVATE PROFESSIONALS

This interview schedule aims at analyzing impact of KEMU main campus location on its neighborhood land uses. The interview schedule is prepared to collect data about land use and land cover changes, their impacts on property values in KEMU main campus neighborhood. It is expected to generate and provide helpful information for policy makers and development practitioners about magnitude and trends of land use and land cover change and its impact on property values. Hence, your inputs as a stakeholder fill this questionnaire is highly appreciated and information provided will stay confidential and your right to involve or not is also respected. Please tick where it is applicable.

Name of Respondent (Optional).....

Contact Number (Optional).....

Position/Role/Name of Institution/ Department in the Land and Housing Sector.....

Date.....

1. Are you aware of the current land uses in Kithoka, Kaaga and Runogone sublocations which form part of KEMU neighborhood?

Yes No

2. If yes, which are the current land uses in the area in order of dominance?

1. Very dominant 2. Fairly dominant 3. Less dominant 4. Not dominant

(a) Built up area

(b) Agricultural land

(c) Bare land

(d) Wetlands

(e) Quarry sites

(f) Others (specify).....

3. Which land use changes/conversion are taking place in the area?

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

4. How are you able to tell that land uses are changing in the area?

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

5. In which area of KEMU neighborhood do you think the land use changes are taking place most?

(a) Within 500m radius from KEMU main campus

(b) Within 1km radius from KEMU main campus

(c) Within 1.5 km radius from KEMU main campus

(d) Within 2km radius from KEMU main campus



(e) Within 2.5km radius from KEMU main campus

(f) Others (Specify).....

6. Which are the types of land use and house typologies are found within the areas specified? Fill Table 1 which follows for the types of land use and house typologies.

Radiu s in km from KEM U main camp us	Dominant Land use	Dominant house typology	Underlying reason
	1. Built up area 2. Agricult ural land 3. Bare land 4. Wetland s 5. Quarry sites	1. Bed sitters 2. Flats (1&2 bed roomed) 3. Maisonettes 4. Bungalows 5. Others (Specify)... 	1. Expansion of KEMU main campus in terms of student population 2. Natural increase of KEMU neighborhood residents 3. Expansion of Meru town 4. Others (specify).....
Withi n 500m			
Withi n 1km			

Within 1.5 km			
Within 2km			
Within 2.5km			

7. When did you start noticing these conversions increasing?

(a) Before the year 2000

(b) After the year 2000

(c) Others (please specify)

8. In your opinion, which time period has land use of KEMU neighborhood changed most?

(a) Between year 2000 and year 2005

(b) Between year 2005 and year 2010

(c) Between year 2010 and year 2015

9. What benefits do you associate with the current land uses of KEMU neighborhood?

(a) Business opportunities (Specify).....

(b) More physical infrastructural facilities (Specify).....

(c) Improved transport networks

(Egs. roads, pedestrian walk ways, paths and street lighting)

(d) More reliable public transport

(e) Others
(Specify).....
.....
.....

10. What problems do you associate with the current land uses of KEMU neighborhood?

(a) Security risky

(b) Loss of privacy

(c) Incompatible land uses

(d) Polluted neighborhood

(e) Others (please specify).....

11. In your opinion, how would you rate the change of land use in the KEMU neighborhood for the last fifteen years?

- A. Positive (If Benefits >Problems)
- B. Negative (If Benefits <Problems)
- C. No change (If Benefits=Problems)

Table 2: Rating of Land Use Change in the Neighborhood level

Time period \ Type of land	Now-5years ago	5-10 years ago	10-15years ago
Built up area			
Vegetation (agricultural land, plantation and			

grassland)			
Bare land			
Wetland			
Quarry sites			

12. Which of the following best describes the trend of market rents of houses in KEMU neighborhood since year 2000?

- (a) Rising rapidly
- (b) Rising slowly
- (c) Not changing
- (d) Falling slowly
- (e) Falling rapidly

13. Which of the following best describes the trend of market rents of houses in KEMU neighborhood before year 2000?

- (a) Rising rapidly
- (b) Rising slowly
-

(c) Not changing

(d) Falling slowly

(e) Falling rapidly

14. Do you find it difficult to consult for developments in KEMU neighborhood where land use changes are taking place at an increasing rate?

15. What challenges do you find when consulting for developments in areas where land use changes are taking place at an increasing rate?

(a) impatient developers insisting on developing/upgrading their properties before change of user permit is granted

(b) Prohibitive development costs

(c) Developers disregarding approved plans

(d) Others (please specify)

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16. As a key stakeholder in land use planning, what measures would you wish to be put in place by the concerned authorities to ensure orderly spatial planning of KEMU neighbourhood?.....

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17. Do physical planning standards and specifications get compromised or ignored as a result of a mixture of agricultural, residential and commercial land uses?

Agree Disagree

18. Do you have additional issues pertaining to the subject of land use changes in the KEMU neighborhood?

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

18. Comments of the interviewed person regarding the information provided/
Special remarks of the interviewer:

.....

Thank you for participating in this Research!

Appendix V: Interview Schedule for Commission of University Education
INTERVIEW SCHEDULE FOR OFFICIALS

This interview schedule aims at analyzing impact of KEMU main campus location on its neighborhood land uses. The interview schedule is prepared to collect data about land use and land cover changes, their impacts on property values in KEMU main campus neighborhood. It is expected to generate and provide helpful information for policy makers and development practitioners about magnitude and trends of land use and land cover change and its impact on property values. Hence, your inputs as a stakeholder to fill this questionnaire is highly appreciated and information provided will stay confidential and your right to involve or not is also respected. Please tick where it is applicable.

Name _____ of _____ Respondent/Position
(Optional).....

Contact Number.....

Date of Interview.....

1. What are the key spatial considerations you look into before accrediting a university in terms of location?

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2. Does the Commission, when accrediting a university in terms of location, consider it in relation to the hosting neighborhood?

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3. What developmental roles can a university play in its neighborhood for cooperative and comprehensive growth?

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.....
.....
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4. Based on your Kenyan experience, which role have Universities best played in their immediate neighborhoods?

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5. Do you have suggestions to make to ensure that immediate neighborhoods of university location benefit optimally?

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