AN ANALYSIS OF FACTORS INFLUENCING CHANGES IN
LAND VALUES: A CASE STUDY OF KITENGELEA TOWN
(2007-2013)

BY

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A project paper presented in partial fulfilment for the award of degree in Bachelor of Real
Estate in the Department of Real Estate and Construction Management, school of Built
Environment of the University of Nairobi.
Declaration.

I Mutuku Stephen, hereby declare that this project is my own original work and has not been and is not currently being presented in any other university for a degree.

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(Supervisor)
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AFTER ALL, THE ALMIGHTY GOD FOR HAVING SEEN ME THIS FAR.
Dedication

This work is dedicated to my Mum, Mrs. Joyce Mutuku who never ceased to remind me that I had a future to build.
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<td>CBD: Central Business District</td>
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<td>ILRI: International Livestock Research Institute</td>
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<td>WWF: World Wildlife Foundation</td>
</tr>
<tr>
<td>KWS: Kenya Wildlife Service</td>
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<tr>
<td>GOK: Government Of Kenya</td>
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<tr>
<td>EPZ: Export Processing Zone</td>
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<td>KURA: Kenya Urban Roads Authority</td>
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<td>MoNMD: Ministry of Nairobi Metropolitan Development</td>
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<td>DO: District Officer</td>
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Abstract

Demand for real estate with the aim of accommodation or making investments has always been there. Real estate is one of the key pillars for a country’s economy as urban land value is influencing both in urban planning and in real estate activities. Identifying the factors influencing land values is of great importance in identifying future urban development and also in anticipating the probable changes.

The study covers Kitengela town and aims to discuss spatial and urban factors which influence the urban land values in the township and also establish the weight of each factor to determine the factor exerting the greatest change in land value. To study the factors influencing land values in the township, the following variables have been considered; structural variables, neighbourhood variables, natural and the built environment and also the social and economic characteristics of the built environment. The researchers interest is to establish the variations and see how the factors influencing the variations are in line with the factors advanced by theorists such as von Thunen as influencing value.

Variations of land values within an urban area are from one region to another or between various uses. The researcher found out that one location within the same township has different values from another location within the same urban area. There are also variations in land values in areas with similar land uses and between various land uses. It was also found out that there was increase in land prices as well as changes in land use activities. The main headlines that represent the factors contributing to these changes are population changes, accessibility, security, spatial configuration and increase in the level of economic activities in the township.

Based on the analysis, the researcher concludes that accessibility is the most effective factor influencing land values within the township. This study is of importance as it offers recommendations to the problem brought about by the high rate of increase in land prices which include; expansion of infrastructure and social amenities, comprehensive land use planning and provision of cheap housing.
CHAPTER ONE

INTRODUCTION

1.1. Introduction
Traditionally the value of land has been founded on its physical characteristics. Land has been valuable because of its capacity to provide essentials of life. Pre-historic man attached value to land depending on its productivity. As the art of cultivation began to develop, differentials in land fertility were discovered probably by trial and error and it was found out that certain lands were more productive because of better soil conditions and water supply. Highly productive lands were scarcer and imparted a higher value.

From the study of economics of urban land, origins of land value in modern times derive both from physical characteristics and from its location within the urban landscape. These two sources are also responsible for the value of agricultural land, a fact recognized by early economists such as Von Thunen. Physical characteristics of land, subsoil conditions for example influence value through affecting the cost of improving that land for urban uses.

Location of the land, the space relationship with other urban facilities and activities not only largely determines the use to which each parcel is to be put, but also does much to explain its productivity. However, the reaction of man to the environmental conditions is not only a natural reaction, but also a regulation action. Neither fire, nor earthquake, nor the V-1 bomb has detered man in his life to build.

Town and cities have continued to be on the rise and as they have grown in importance, the various social sciences have also increasingly become concerned with them. The internal structure of these cities, activities carried out and the impact of these activities to their neighborhoods has proved to be a subject of extra-ordinary richness and complexity.

The theory to be presented concerns the relation of land values to factors determining the market value of land. These factors will be analyzed and the weight of each factor is established as regards land value variations. Land values are dynamic when subjected to various forces. These forces directly contribute to changes in the aggregate demand and supply for land. This is
considered with reference to the distribution of different types of land uses with the subject area. The study looks into the factors and their extent of influence in land values. This involves considering the qualitative and quantitative facts of Kitengela land markets and seeking to discover the behavioral laws of social and economic factors governing urban land uses.

1.2. Problem statement.
One may propose a number of reasons why there has been shortage of land in cities around the world, but no one would deny that the single most important reason is population influx which has continued to rise in the past years. The sharp rise in land prices from the latter half of the 1980’s has aggravated the problem. It is widely recognized that the land problem is not the heart of housing problem only but also one of the most social and economic problem in the present day world.

Just like any other urban area of the country, kitengela town has been badly hit by shortage of land which is mostly brought about by population growth and landlessness in the surrounding area. The Shortage has brought about competition for the available land. This has led to increase in the land values within the town and also change of land use. Location of the town has also influenced the activities on the neighboring areas due to wide range of factors both internal and external. Increased demand has been carried along on waves of optimism and over confidence. This has led to loose financing and an upward spiralling of market prices to values that are unreasonably high in relation to the immediate income producing potentials of the properties involved. On the other hand, reduced demand can lead to depressed business conditions.

Left unregulated, land markets in general, and urban land markets in particular, suffer from endemic problems of ‘market failure’ (Cheshire, 2005). These problems arise in part because of the locational specificity of any legally defined plot of land, and the fact that the value that can be generated from that land and the welfare or enjoyment associated with its occupation are strongly influenced by the uses and characteristics of neighbouring plots of land.

The land variations can be reflected by the physical growth of Kitengela town. For example, the upcoming new buildings, increased number of schools, public improvements and construction of new tarmac road from Athi-river to Kajiado and population increase. Land variations can also be
reflected by the growth and shifting of the land value structure according to the different land uses. Commercial land use has the highest percentage rate of change, seconded by the residential land use and thirdly industrial land use. There is a cause, not yet adverted to, which must be taken into consideration fully to explain the influence of material progress upon the distribution of wealth. A close relationship is expected to exist between the physical growth of the area and the changes in its land values.

The study will therefore examine the factors influencing the changes in the market value of land and also find out the degree of influence of each variable. The knowledge of these factors and the degree of influence of each factor is of great importance since they result to changes in the levels of demand which has prompted considerable interest in ways and means that keep real estate markets from getting out of hand.

In conclusion, real estate market is heterogenous and complex. This creates the need to standardise land prices in relation to the market economy and the levels of income of the population. This ensures maximum benefit both for land users and land owners and leads to a growing economy.

1.3. Research Questions.
Given these conditions, the question behind the researcher’s mind is;
1. What is the reason behind the variations in land values within Kitengela town?
2. Are the variations as a result of the support services provided such as infrastructure or are they due to the population increase in the area?

1.4. Objective of the study.
Having identified the problem, the question that remains is how the problem can be solved. The goal of the research is to identify the major factors behind variation in land values in Kitengela town.

The sub objectives of the study are;
1. To analyse the trend in land value changes in Kitengela town
2. To examine the influence of the various land uses on land values
3. To find out which factors exert the greatest change in land values

1.5. Hypothesis

Increase in land values is as a result of changes in population in the area.

1.6. Scope.
This research was limited to the factors influencing changes in land value and the degree of influence of each variable in determining the value. The study also attempts to identify land uses within Kitengela town and their influence on land values. Therefore, structure and pattern of land value and land use in this study is in physical characteristic forms and in the composition of substances that creates the physical characteristic according to the human activities character in a plot of land. Recommendations on various ways of solving the problems identified in the area have also been made.

1.7. Significance of study
Land is very important in human existence and its use has substantial impacts in the economic and physical development of an area. An in depth understanding of the trends in land values and the factors that influence the land values is important in assessing the level of development in the area and also in predicting the future level of development in terms of commercial, industrial or agricultural development. The cause of these changes has also been determined to provide a better understanding of this phenomenon which affects the residents, policies and town development.

Further information is useful to potential investors as they can accurately predict the level of returns from the investment depending on the current trends of land values. Planners and other actors also come in and help in cultivating the correct measures in keeping the factors influencing land values under control. This study is very significant since it is the only one of its kind to be undertaken in the area. The study does not provide solutions to the problems brought about by the changes but opens a new insight on the implications of these land use changes to the residents, to the concerning policies and the city development as a whole.
1.8. Organization of the study

The study is organized into five chapters

(i). chapter one.
Covers the general introduction and setting of the study. This includes: introduction, problem statement, objectives of the study, research questions, hypothesis, justification of the study and scope of the study.

(ii). Chapter two.
Covers the critical discussion and summary of statistical literature that is of `general' and specialized' relevance on the study subject. It describes how the research is related to prior research and justifies the methodology. It will be discussing issues related to land values and major determinants of change in land values, land use patterns and urban growth patterns in general.

(iii). Chapter three
Presents the background of the study area (Kitengela town) in terms of its historical information, location, economic activities, planning, population and levels of infrastructure. This chapter also covers the research method, data collection and processing used in this study.

(iv). Chapter four
The major considerations in this chapter involve the analysis of the economic activities in Kitengela town. The findings of the study are also presented and the data analyzed in a scientific process to see how the data support (or do not support) the hypotheses.

(v). Chapter five.
This is the final chapter and covers the recommendation to the study. The chapter also provides a conclusion and areas of further study
CHAPTER TWO

LITERATURE REVIEW.

2.1. Introduction.
Different groups of people express diverse opinions as to what constitutes fair definition of the term “land”. Land economist views land use in terms of economic theory, with the use of land parcel determined in what he calls “the urban land market” and as a commodity traded in this market subject to the forces of demand and supply. All land is viewed as being in the market competing for the consumers’ money, and decision to buy or sell are prompted by the opportunities for maximizing returns from a transaction in the market. This brings the concept of price which according to the classical equilibrium theory becomes both a function of costs of making land productive and a function of the net income or return realizable by the development of that land.

Land is considered to have value because of its potential to produce. This value is based on what developers would be economically justified in paying for it according to an assumed plan for its use and development. The value of land as considered in this plan is the net land incomes that will accrue in perpetuity, discounted for the period of time that will elapse before they are received. According to Homer Hoyt’s version of land value, valuation of land involves prophesy as to the net income of the land for the future years. The net income of land varies, among other things according to the functional type of the area which it is situated. It also varies according to the overall pattern of land uses and with respect to sites within one particular type of use area.

Each parcel of land occupies a unique physical relationship with every other parcel of land. Each parcel is the focus of a complex but singular set of space relationships with the social and economic activities that are centered on all other parcels. To each combination of space relationships, the market attaches a special evaluation which largely determines the amount of the bid for that site. This explains why certain locations are more valued for residential use than other sites because of the greater convenience to shops, schools, centres of employment and recreational facilities. Thus to the economist, land is pressed into use by the existence of the value as established by the alternatives of land development. The use of a particular parcel is also
as a result determined in the operations of market forces by the price and the decision as to what alternative will yield the highest returns.

2.2. The nature of land

2.2.1. Definition of Land
Land is seen as one among the many forms of wealth. This is because its use decisions are made within the calculus of the decision-making unit. However, different scholars have tried to come up with the definition of land. This has led to the expression of diverse opinions as to what constitutes fair definition of the term “land”.

According to King’oriah (1987), land is regarded as an asset that is capable of generating a stream of cash flow over a period of time. He also goes ahead to explain that land is capable of generating use satisfaction that is quantifiable in monetary terms. This is the case where an occupier rents an alternative accommodation to obtain similar use satisfaction where he is not in possession of the land he owns. Early economists such as David Ricardo and Von Thunen viewed land as a factor of production where its supply and demand affects the rental and capital value of land. They take land as natural resource, a commodity and a primary source of wealth.

According to FAO, land is defined as the delineable area of the earth surface which encompasses all attributes of the biosphere above or below the surface. This include those of the near surface climate, surface hydrology, soil and terrain forms, ground water reserves, animal and plant populations, human settlement pattern and the physical results of both present and past human activity. This is further emphasised by Abbott (1986) who defines land as “a dry part of the earth’s surface”. This is an inclusive meaning including all that is fixed to land, whether by man or nature together with its natural produce above or under its surface.

According to Denman (1972), land to the Lawyer does not conform to the abstract concept of the Economist. In the legal sense, land is defined as a right that extends as far above and below the surface as is physically possible. This in theory means that legal authority for taking decisions
will therefore lie in the property rights over the land which will largely be determined by the local land law. Laws are enacted to direct and protect individual owners and users of land.

Dawson (1984) argues that land is specific in location and as a result, their physical characteristics of very paramount importance. This implies the need to recognize the physical characteristics of land as encapsulated in climate, geology, soils, water, and vegetation and their influence in land use.

2.2.2. Concept of Value
What do we mean by value? It is said that everyone has their own values. Is it in order to ask “how much” when one says, for example, I value truth or even I value my mother. Is it acceptable to say that there is a meaning to value for which the question of "How much?" is meaningless. If I had to pay ransom to save my kidnapped mother, or even had to lie in order to save her, wouldn't I then be forced to understand that my values were quantifiable? Value is meaningless outside of the act or possibility of exchange.

Study of land economics shows that origin of land value in modern times is derived from both physical characteristics and its location for both urban landscape and agricultural land, a fact recognized by early economists as Von Thunen. Physical characteristics of the land, sub soil conditions for example influence value through affecting the costs of improving that land for urban uses. Location of land and the space relationship with other urban facilities largely determines the use to which each parcel is to be put and also its productivity and value.

With the above historical background of value in mind, it is necessary now to define value itself. Miles, L.D attempts to give an explanation of what value is. He explains that a product or service is generally considered to have good value if that product or source has appropriate performance and cost. From this definition, it can be said that value can be increased by either increasing the performance or decreasing the cost. More precisely, value is always increased by decreasing costs while maintaining the performance. Value is dynamic in meaning and according to the content. Oliver Wendall Holmes in Towne V. Eisner, 245 US 418 describes value as the skin of living thought which varies according to the circumstances and the time in which it is used. At any
point in time the value of a commodity is a function of its utility, scarcity, taste and transferability. There are various types of values which include; aesthetic, political, social, economic, religious, and cultural values. However, Economists and appraisers are basically concerned with economic and market values.

2.2.3. Market Value of Land
The market value of land varies, among other things, according to the functional type of the area in which it is situated in the overall pattern of land uses and with respect to other sites within one particular type use area. Value can be classified in to two main classifications; utility value and market value. Market value is the value in exchange or the amount of money at which a property can be sold or exchanged at a given time or place. This is the price in terms of money for which a property would sell in the open market. Utility value is the value to the owner which includes the value of the amenities attached to the property, as in the case of the owner occupier.

The Uniform Standards of Professional Appraisal Practice (USPAP) define market value as the most probable price which a property should bring in a competitive and open market under all conditions subject to a fair sale, where both the buyer and the seller act prudently and knowledgeably and assuming that the price is not affected by any external forces. The definition of market value typically assumes an arms’ length transaction meaning that; The buyer and seller are typically motivated, a reasonable time is allowed for the exposure of the property in the open market, value will remain static throughout the period and that both parties are well informed and acting in what they consider their best interest.

The value so obtained or established will be for a particular time in a particular geographical location. In English statutes, the term market value is defined in a variety of ways. For example “the price which that property may reasonably be expected to fetch on sale of the open market” (Income and Corporation Tax Act 1970, S 167(1). According to the Development Land Tax Act of 1976, the market value of any type of an interest in land is the consideration which that interest may be reasonably be expected to fetch on sale at that time in the open market, but that consideration shall not be assumed to be reduced on the grounds that the interest in all the land in question is to be placed on the market at one and the same time. Therefore, the market value is
understood as the value of an asset with regard to cost of sale or purchase and with offsetting any associated costs.

2.2.4. Land values
Land as an economic commodity, in terms of demand and supply, has got an exchange value and therefore is capable of being sold and the price of land being determined by the interaction between supply and demand. Consideration of land values and land uses is of great importance in any discussion on economics of land. These terms are hard to define owing to their subjectiveness due to the unique characteristics of its demand and supply that are quite different from the general investment market. Soesilo (2000; 6-10) explains that the meaning of land price is related to financial terms like market land price and it can be looked at in two aspects;

1. Land price as a market price where the price is agreed during the buy – sell transaction.
2. Land price as assessed value, which someone who is an expert in land estimation (assessor) from private or public estimates the price with. This includes both the ‘opportunity cost’ obtainable in the future and the land price estimation.

Soesilo also explains that high demand on land in the city will cause competition between the buyers. He further states that in economic policy there is bid rent, which means the amount of money that is being paid by someone for a plot of land. It also explains the city’s ability to pay rent depend on certain factors such as; size of the city, level of economic living survivals, city land special use and availability of land in the city. Besides this, he also explained about tendency of land price changes that usually happen because of the changes of personal pleasure and life style, changes of expansion from the city area, mobility from the city and changes in economy together with the willingness of people to compete.

According to King’oriah (1987), land value is the present value of a stream of income expected from land. The stream of income is the periodic rent or income realizable from land and expected as net yield from the sale of the produce of land. Hotton (1973) defines value of land as the power to man’s needs or desires and the measure of it must pay for what they want or need.
According to American institute of real estate appraiser (1973) the measure of a property’s value is the degree of its utility and the scarcity of comparable utilities. Land which is so remote from human activity that man cannot make use of it has no value.

Land value is influenced by the physical nature of the land and its location, available capital and its distribution and the availability and cost of labor. It is also influenced by the social and political climate in which they operate. Transport is an important influence in land use economies and economics is an important influence on the type and intensity of land use and land values (Denman 1972). The term value conclusively means the ascertaining of the value of land. This is achieved by assessing the income that is considered appropriate to the plot of land or the buildings. Land values have a significant influence on the nature and type of land use patterns and hence the need to analyze the extent of the value in a given development plans.

2.3. Evolution of value theory
Land has unique characteristics compared to other economic goods; the supply of land is fixed except for land reclamation, every parcel has a fixed location, which is a unique property, and the use of a parcel of land affects the use and value of surrounding parcels. The term land value and land rent have always been used interchangeably. However a closer look shows that ideally land value is capitalization of land rent. Theories of land value use lend rent to explain land value; they fall under the following three categories:

1. Neo-Classical Economic Land Rent Theories
2. The Marxist Land Rent Theory
3. The land development process Theories

2.3.1. Neo-classical Economic Land Rent Theories
According to this theory, land values are dependent upon the economics of supply and demand, inflation trends and changes in real incomes, population growth, the availability and cost of credit and the role of institutions. These values will as a result remain dependent upon decisions of investors in the property market changing only when the desires of the investors and market conditions change. Earliest advancers of this theory are majorly David Ricardo and Von Thunen.
David Ricardo (1772-1823) defined land rent as a payment for the original and indestructible power of soil. This rent accrued to the land not because of the efforts of the owner but rather because of the excess demand for factors of production. Demand for these factors was a derived demand in that what was demanded was not directly land but rather for production of goods needed to support man's activities.

He argued that with an increasing scramble for land due to increased population and other factors, land that was not previously considered economically viable is brought into investment. This increases the cost of production and hence goods produced on it are sold at higher prices. Since all the entrepreneurs are assumed to be rational, even the owner of the advantaged piece of land increases his product prices creating uniformity in the market. In so doing he receives an unearned benefit. In any given economy this trend continues until the extensive margin of production is reached and it becomes uneconomical to bring more land in to production (See figure 2.1).

Figure 2.1 shows parcels of land arranged in a descending order of economic advantage (for example, distance from the market, soil fertility). The line CC represents the cost of factors of production. The Nth piece of land just manages to meet the cost of factors of production. This shows that what it produces just manages to pay for these factors and hence there is no surplus rents after factors of production have been paid for in the various farming enterprises. It is this surplus that is translated to represent unearned increment. It is generated as a result of the
relationship between advantaged and less advantaged parcels of land. In drawing up this theory Ricardo understood that value did not come to land only due to its quality and productivity but also due to its relative position with regard to the market place.

Von Thunen (1783-1850), like Ricardo, attempted to explain land value in an economy of agricultural activities. He argued that farmers would tend to locate near market place in an attempt to reduce on cost incurred during transportation of both purchases and produce. The competition among farmers for location in close proximity to the market place meant that only the highest bidder would possess the land. The amount a farmer would be willing to pay would depend on his production technology and how much he paid for this combination, and the amount he expected as profit. The surplus after these two were catered for represented what a farmer would be willing to pay for a given parcel of land. It therefore followed that people with the highest financial surplus from their agricultural enterprises could afford to bid highest hence occupying land nearest the market (King’oriah, 1987).

Financial surplus reflected economic rent and hence value. The further one moved away from the markets, he would pay less for land due to the increased incidence of transport costs and consequently less financial surplus. Von Thunen had assumed a landscape of uniform fertility on which he argued that the decline in financial surplus would be gradual being interrupted by natural factors such as rivers, or differences in modes of production.

The work of Von Thunen explains the rent bid theory which was mainly developed to explain the relation between urban land uses and land values (Koomen and Buurman, 2002). Households and companies make a tradeoff between the land price, transportation costs and the amount of land they use. This results in a convex land price curve with the highest land price near to the city centre. It is based on the idea that retail establishments wish to maximize their profitability, so they are much more willing to pay more money for land close to the CBD and less for land further away from this area.

Von Thunen’s and Ricardo’s works indicate that the value of land is dependent upon the forces of demand and supply. They however, assume that these operate in a perfect market situation. This is one of the major drawbacks of the neo-classical approaches. The land market is not transparent
and market information is not often to get. Other values other than the market price for land also exist like the social land value or non-revealed values as a result of zoning restrictions (Koomen and Buurman, 2002). Moreover the uniqueness of each piece of land, the small number of properties on the market at any given time, the unwillingness of monopolistic nature of land ownership and government policy render land markets imperfect (Ballchin and Kieve, 1985). In spite of this shortcomings, neo-classical theories have been used to explain land values in several cities in Africa including, Nairobi, Accra and Lagos (Wameyo, 1992).

2.3.2. Marxist Land Rent Theory

Marxist land rent theories view land value not only as the capitalization of rent but also as revealing social relationships between agents such as landowners and tenants or owners and developers (Ball et al, 1985). This emphasis on social agents means that land value must reflect the impact of the investment characteristics of land owners tradition and beliefs, racial discrimination and education levels of residents and local inhabitants. Attempts to explain land values in Africa using this theory have been minimal. However, there has been attempts towards this end in the western world through the use of advance methods such as Hedonic approach.

This approach to value lays an emphasis on social factors which have a bearing on value. It estimates the benefits obtained from environmental amenities such as parklands, pollution free air and freedom from noise (McMillan et al, 1980). In estimating this, the degree of environmental amenity is related to property value through the use of hedonic regressions. Unfortunately these regressions cannot be used singularly to ascertain land values as they reflect behaviour of only one determinant of land values. The regressions attempt to predict the reactions of investors in presence or absence of public goods. Hedonically estimated prices are therefore best used as inputs into a second stage regression designed to estimate value.

2.3.3. Land Development Process Theories

Land development theories represent an attempt to understand the land development process by focusing on the behaviour of actors in that process, their calculations of risk and reward and their strategies for assembling the physical, financial and other resources needed (Rakodi, 1991). This theory was advanced because of the dissatisfaction of land economists in the neo-classical and
Marxist approaches to value. Land development theory however, draws a lot from both the neo-classical and Marxist works.

From this theory, land values will be dependent upon prevailing economic conditions and political regimes as well as other factors including infrastructural facilities and government policies. It is ideally the best approach to value and it summarizes land value determinants to include alongside economic conditions and political regimes, plot size, time, accessibility, the presence of infrastructural facilities and other capital improvements, relative position, development potential land plattage, demand and public control.

2.4. Determinants of land values

The value of a property is a function of supply and demand and any factors which are likely to affect either supply of demand for the property Millington (1978). According to American institute of real estate Appraisers, real estate value is influenced by the following factors:

2.4.1. Social factors

Social forces include population growth and declines, shifts in population density, changes in size of families, geographical distribution of compatible groups, attitudes towards education and social activities, attitudes towards architectural design and utility and lastly factors emerging from man’s social instincts, ideals and yearning. Hoyt (1960) argues that there is no exact relationship between the increase in the number of people at an urban site and the increase in land values, because speculative influences may magnify the expected future increase beyond all reasonable possibilities. He further says that the effect of the population distribution upon land values will depend upon whether people prefer to live in small homes or in large apartment buildings which will depend in turn upon the size of the average family and upon social habits and customs. Thus the effect of the population upon land values will likewise depend on the distribution of the purchasing power between the members of that population and proportion of their income that is available for rent.
2.4.2. Economic forces
Includes the resources and effort of man to achieve his social ideals and are made up of such factors as natural resources i.e. their quality, quantity, location and rate of depletion, commercial and industrial trends, availability of money and credit, price levels, interest rates and tax burdens, lastly, all other factors that have a direct or indirect effect upon purchasing power. Expectations regarding future rates of inflation, mortgage, interest rates, development programs and other forces play a crucial role in determining land value Barlowe (1985).

2.4.3. Government regulations
These are created by politicians or political forces. This includes; zoning laws, building codes, rent controls, police power, fire regulations, national defense measures, priorities, allocations, special use permits and credit controls. Government regulations have the highest impact on value of properties than any other single factor. King’oriah (1987) argues that zoning restrictions ensure protection of agricultural land. Obala (1990) asserts that planning keeps conflicting land uses apart through devices such as zoning and density control. These devices allow land to move to its highest and best use. Also government sponsored housing and guaranteed mortgage loans and lastly monetary policies affect the free use of real estate, including all forms of taxation. Theoretically, a site without any legal obligation is capable of earning the highest income under prevailing economic circumstances of being put to the highest and best economic use. Such a site is defined legally as a freehold in absolute possession.

2.4.4. Physical forces
These are created either by nature of man and encompass climate and topography, soil fertility, mineral resources, community factors (such as; transportation, schools, churches, parks, recreational areas), flood control and soil conservation, characteristics of soil and subsoil and technological advances affecting land use. Natural features affect the cost of improving or making land suitable for use and therefore determining its value. Site improvement increases the land values in that the developer needs less capital to develop his piece of land.

2.4.5. Economy space
Shape of the land parcel affects its value greatly in that irregular plots are difficult to develop and are often limited in the choice of uses which can be made of them. A site or plot which
commands high value is one which allows higher and more intensive use. King’oriah (1987) says that the general economic climate of a particular country in market economics affects land rents and thus land values. Credit squeeze, the monetary policy and the fiscal policy affect property market so that real estate transactions are either slowed down or accelerated by government action in these economic policy areas and therefore affecting land values in the areas in question.

Apart from the above general factors affecting land values, there are specific factors affecting land values in specific land uses. For example, in a commercial site, that is shops, are affected by general location of the site e.g. retail productivity is highly dependent upon location. A shop located in a position where it is able to attract sufficient customers such as a site in such a prime location within the city will command higher land value than another site which is a secondary location or at a suburb location. Also a site with ample space for car parking will mean high value for the site although to some extent the designing of the premises is what determines this question of car parking space. Adequacy of necessary infrastructure e.g. water pipe installation, electricity and other necessary services ready for use will command higher value than those which will need prospective investor to install. Land value determines the pattern of land use in an area. Commercial land use has a higher land value than industrial use.thus occupies a more central location than industrial land use. Therefore land values are as a result of a network of many related factors. The factors establish and define the extent of land value for a specific land or property.

2.5. Land use.

2.5.1. Introduction
The way in which individual parcel obtains a value and is priced in the market cannot be separated from the aggregative view of all parcels and how their values are established. It is therefore important that one views the structure of land values as a whole and examine the relationship between land values and land uses in aggregate. The land economist sees the total pattern of land use as a cumulative result of sorting process of many market place decisions over a long period of time of the kind sorted above or the individual parcel.
2.5.2. Land use.
One of the real structures of space use pattern is land use. Land use is an allocation of the use and land occupancy that has been set up according to the current rules and planning space design. (Soefaat, 1997: 83). Land is determined by the main activity on the site. Land use is a form on land occupancy activity as an effort to give certain purpose in result or service and realized space design in keeping the environment function to survive. (Soefaat, 1997: 76).

According to the locational theories, users of land bid for sites in accordance with what will maximize their profits and minimize their costs. For example Land users in retail businesses and services tend to bid for space at the highest price and land best suited for these activities shows the highest values. In this case the revenue component in the above formulation on land values is based on the volume of sales expected at alternative sites and the cost component is based on the cost of doing business to obtain these sales at their sites. In Von Thunen’s model, concentric rings of agricultural activity develop around a city. The production of perishable goods and/or goods needing to get to the market quickly locate in the inner rings closer to the city, and other activities such as ranching locate in the outer rings.

Hoyt (1960) confirms a long accepted relationship between variations in land values, namely, that as the patterns of value change in time, user patterns change and conversely as the pattern of use change, the patterns of value also change in time.

Robin (1981) argues that landscape theoretically is defined as dealing essentially with the spatial aspects of all man’s activities on land and the way in which the land surface is adapted to serve human needs. Choices to which the land may be put and which at the time of valuation produces the most profitable land value determines the most optimal land use for that parcel of land. The use of land at any point in time is dependent on its “capacity”- its ability to produce. However, the use of land is a function of its physical characteristics, permitted use, intensity of use, location, technological factors, demand of end user and the availability of other factors of production such as capital, labor and management.
2.6. An urban area
An urban area refers to the physical and geographical factors of human life and to social characteristics. It can be defined as a large number of people who are permanently resident in a limited area and are separated from other such centers by a much greater area of thinly settled land (Lean 1996). He further explains that an urban area comprises all those socio-economic activities which require the concentration of people, building and machines in a relatively small area.

Beavon, (1977) in his re-interpretation of Walter-Christallers work emphasizes that commerce, administration, and small businesses are the main occupation in an urban area. Urbanization is a function of various processes of social, economic, and political development spurred by a relatively resilient monetary economy where there is a shift from agricultural to non-agricultural employment. Mitchell (1956) refers to urbanization as the process of becoming urban. This includes movement of people to urban areas, shift from agriculture to other activities common to cities and corresponding change to behavior pattern.

2.6.1. Roles and functions of urban areas
Urban areas have a predominant economic function apart from their political functions. According to Hoselitz, (1969; 239) they are centers in which new forms of economic activity and new types of economic organization are evolved. New markets and sources of supply are explored and conquered. Hoselitz also explains that urban areas are areas where the first signs of new class relations appear based on alterations in the social behavior of labour hence;

1. Urban centers constitute the parts of contact with the outside world.
2. Cities are loci of political and economic power.
3. Urban areas are agents and points of diffusion of social change, especially in their immediate hinterland.
4. Cities are receptacle of talent and constitute concentrated human resource bases
5. Urban areas are haves of investment.
2.6.2. Factors influencing urban growth
Andrew (1976) attempted to offer an explanation for the growth of any urban area based on the development of various economic activities. According to him, the economic functions of an urban area can influence growth. The expansion of basic industries brings more income and a new population to the town thereby increasing the demand for local services. The non-basis industries also expand, further increasing the population’s purchasing power and demand. This leads to rapid growth of the area.

Gerhart (1972) explains that rural development is vital for development of urban section. Agriculture earns foreign exchange vital for the urban sector. It provides food surplus to feed increasing urban population. Everywhere, the surging growth of urban centers in Kenya is the result of advantages perceived by various groups; manufacturers, businessmen, traders, e.t.c. Providers of advantages are not merely economic though that is undoubtedly the primary force there being social and political force.

2.6.3. Problems associated with urban growth.
Unmanaged urban growth depletes the available land resources and causes the degradation of the urban development through excessive pressure on social services and inadequate infrastructure such as electricity, telecommunications, water supply and urban transport (Olima 1993). According to Lean (1966), the rapidity of urban growth has resulted to numerous economic problems, like; inadequacies of income between urban inhabitants, the congestion of facilities especially public transport and road housing inadequacies.

Lean further explains that the existence of slums and blighted areas and the lag in public improvements also have their economic facets. Inadequate recreational facilities on the lives of city inhabitants, the existence of crime, the effect of noise, dirt and smoke are some of the problems experienced as a result of rapid urban growth (Lean 1966)

2.6.4. Urban Land use
Land use is connected with “land economic” theory. Land economic is a study about relationship of human economy with land (Barlow,1972; 4). Land economy focuses on use of human economy with natural resources and physical factors, biology, economy and institution that
influenced, formed, and controlled the use of this resource. One of the basic concepts of land economic is basic concept on land use type. This concept separates the land into ten-land use classification: residential land, commercial, industry, agriculture, grass field, animal husbandry, forest, mine land, recreation, transportation, service facility, infertile land and dessert (Barlow; 1972; 11). [According to land economic limitation, therefore residential and commercial land use are the main urban land use, which is the concern of this study.]

Clawson (1965) defines land use as mans’ activities on land which are directly related to land. Urban land use may be taken to mean the spatial distribution of city functions into its industrial, commercial, residential, retail, institutional and leisure activities. This can be viewed in two fold; first in terms of activity patterns of people in the urban setting and their institutions as they require space and secondly, in terms of physical facilities or improvements to the land in the urban setting which are made to accommodate them.

Syagga (1994) explains that there are certain inherent qualities in different classes of land and the allocation which makes them have a maximum return at a minimum expenditure of labour and capital. The physical characteristics of soil are important in any land use practice since different soils are suitable for different purposes. The environmental factors also have influence on the type of land use undertaken.

Urbanization is essentially an economic phenomenon and therefore it is only logical to expect that the internal organization of urban areas has evolved as a mechanism to facilitate the functioning of economic activities. An urban area consists of great variety of independent activities and the choice of location of any activity is normally a rational decision made after assessment of the relative advantages of various location for the performance of the activities in question. An activity will tend, in the long run, towards the location which gives it the greatest relative advantage.

Zulkaidi (1999) quoted that city land use follows the city development and that there are two basic types of urban development which include growth and transformation. According to Bourne (1993), the main processes of city development include;
1. Extension in suburb/peripheral
2. Rejuvenation in the city centre
3. Infrastructure development especially transportation
4. Growth and decline (removal of industry from city centre and the growth of public buildings and recreation centre in the suburb)

According to Zulkaidi (1999), type of land use changes include change of function (use), intensity and technical rule building period (bulk). He also explained that change in function is a change in activity type, whereas change in intensity is a change in allowable building density. Changing function brings big impact to the neighborhood.

Chapin and Keiser (1979; 28-31) explained that city space structure is much related to the following three systems:

1. Activity system, related to human and their institutional matter to deal with their daily business to fulfill their needs and interact with each other in time and space;
2. Land development system; focusing on space change processes and adjusting for human needs in order to accommodate their current activity within activity system composition
3. Environment system, related to biotic and abiotic condition. This is brought into use by natural process. It focuses on plants and animals existence and also basic processes that relate with air, water and material.

2.7. Factors determining the pattern land use
Before we look at the factors that influence land use changes, first it is necessary to look at the framework and concept of “land economic.” According to Barlow (1972; 5-6) land economic has the following three frameworks:

1. Physics and Biology
This framework has connection with natural environment where people try to use nature to know various characteristics from variety of their resources. This framework has important influence to supply and demand in land economics.
2. Economy
This framework is connected with the price operation system. Price influences individuals to make serious effort to make profitable use of their basic resources. This framework is related to human need to maximize their profits.

3. Institution
This framework is related with human’s cultural environment and social role and how they influence individual habit. It is also connected to the impact of culture, way of thinking, law framework, government programs, religion trust to human habits with human and human with land. Barlow (1972; 7-17) also explains that there are four concepts which provide the basis for land economic theory which include;

1. Land economy concept and land resource
This concept discusses control to all natural and artificial resources that exist on earth. The concept of land itself sees land as space, nature, production factor, goods consumption, situation, property and capital. Land resource concept, represents unification of land economy concept and land law concept. Included are also building and capital which can be given to the land and natural characteristic of land.

2. Land use capacity concept
This is the relative ability of a land unit to produce surplus or satisfaction on the use cost. Land use capacity concept has two main components; accessibility and resources quality.

3. The best and high of use concept
Landowners usually use their land resource for a promising purpose such as maximising profits. Land resource in its best and high use gives optimum return to the executives or society. Resources usually get bigger return when used for industry or commercial use (see figure 2.0 below). As a result, this type of use can sometimes change to other application almost in every location/site. This concept is interrelated with aspects such as legal, physical, financial and optimal value.
As known in the land economy theory, people start to think how to generate their income with the resources they have. This is without considering the activity’s influence to their social life as well as the efforts of their income generation activities to the environment. In the diagram below, it can be explained that the land use for commercial and industry still has the biggest land value and land rent and most of the space land use moves towards commercial land use rather than other functions which further decreases.

**Figure 2.0**

![Diagram of land use](image)

**General profile of Land Use**

Source: Land Resources Economic (Barlow, 1972; 15)

According to (Veldkamp, 1996) land use change is determined by spatial and temporal interactions between biophysical factors (e.g. soil, climate, vegetation and topography) and anthropogenic factors (e.g. size and density of population, level of technology, economic conditions, applied land use strategy and social values and attitudes). According to Harvey (1996; 202-206), factors which determine land use include;

**2.7.1. Accessibility**

Accessibility evaluates the net economic costs of moving persons and goods between one place and another. It is not only concerned with distance travelled between two places, but also with the time taken to travel that distance. It affects real costs incurred by movement and real benefit derived. Black (1981) however says that accessibility is a description of how conveniently land uses are located in relation to each other and how easy or difficult it is to reach there with the transport network.
1. **Public accessibility**
This is the profit obtained from a certain location in cover due to movement cost (including time) avoided in relation to level of capacity-income (including easiness) produced. Executives need public accessibility to get production factor (labour) and easiness to the market. Households need public accessibility for easiness to work place, store, school and recreation facilities. Another thing that needs to be taken into account is that city centre (CBD) gives a big accessibility. For CBD office location is the main point for supply of labour. Land is limited in CBD and competition to get a site or CBD location brings effect on high price/rent.

2. **Special accessibility – economy agglomerate**
Is a location placement decision that is influenced by external economy from two aspects which are concentration and complimentarity.

(i). Concentration
From external economy aspect, concentration can be formed from skill labour availability, public service and location reputation. Diseconomy from concentration can decrease public accessibility location.

(ii). Complementarity
This is used to mean the interdependence of land uses. It shows some different aspects that are related mainly in personal contact with each other such as stores that sell comparing goods, consumer service and small stores approaching dominant vendors. Both of these aspects are relevant to residential location selection where population concentration causes the provision of facilities such as; prayer places, schools, recreation facilities e.t.c. Special accessibility means that with pattern of land use that is formed by public accessibility, there is clustering or a group of stores and activity.

Each of the various land use types or classes or sub-groupings make a city exist in co-operation with all other members of the urban family. Like every approximate ecological pattern, the condition of cooperation among land uses is accompanied by the condition of location, competition and survival (Edwards, 1969). As an urban area grows, the position of greater
accessibility and complimentarity tend to grow both literally and vertically and usually divide into cluster of complimentary activities (Lean and Goodall, 1977).

It will therefore be expected that land values will fall with increasing distance away from the position of greatest accessibility and complimentarity thereby reflecting the disadvantages of these positions with respect to complimentarity (Richardson, 1971). In such cases, there is interdependence of like uses and the advantages of the complimentarity result in the chastening of these activities which can benefit from grouping.

**2.7.2. Dynamic changes**
Factors that cause dynamic changes include real income and technology development. New building techniques, which retain the raising building cost lead to a rise in the level of development. Movement out of city centre increase the level of measurement of land surface that can be used. Increasing need for some land causes rise in prices which can be balanced by availability of site or allocation in big amount. Land prices in the sub-centre will increase like in the city centre when the people move to suburb. (see figure 2.1 below)

**Figure 2.1**

![Changes in Land Price Gradient](source: Urban Land Economics (Harvey, 1996; 206)]

**2.7.3. Geographical features**
Any particular urban area however has its own geography. There are hills or mountains, streams and gullies, prevailing winds, districts with poor drainage sub-surface conditions that will support high-rise buildings in one area but not in another, scenic lakes or woodlands, large stretches of
flat land and sometimes significant political boundaries. Relief determines transport routes thus affecting the location of most economic activities. Relief features influence the position of complimentarity since accessibility and complimentarity are closely linked.

2.7.4. Legal requirements
The type of land policies pursued is a pervasive influence on the structure of land ownership and on the extent of private-property rights in land. There is also support policies directed towards certain types of land use. The fundamental reasons of government intervention in land use are that individual and societal utility do not always coincide. The type of land use or land management that is optional for the individual or company is not necessarily optimal for the general (Mather, 1986). The legal requirements affect land uses through the process of zoning and restrictions. Governments have planning regulations which they enforce through local authorities. The regulations, according to Lean and Goodall, may go so far as to prohibit what would appear to be the highest and best use of site from an economic point of view. The legal regulations are necessary in achieving an orderly development forum in urban areas.

2.7.5. Climatic conditions
The most important element in climate in land use distribution is the wind direction. This is particularly significant in industrial cities where industrial smoke will be avoided by locating residential areas on the windward or opposite side. The rich will try to locate far away from industrial centers whereas those who cannot afford to move away will settle in the “black-belt” created by industrial smoke carried by the prevailing winds. Sometimes there also microclimate differences; for example accessibility to fog which affect the location of an airport.

2.7.6. Geological conditions
Geological conditions have a bearing on the pattern and intensity of land use. The subsoil conditions will determine the type and amount of foundations necessary for any particular building. This will affect construction costs and therefore those areas with deep sandy soils will require large amounts of money for large multistorey buildings, otherwise the extent of the building and number of storeys is limited. Land may take different land uses such as residential, commercial, industrial, agricultural and recreational purposes.
CHAPTER THREE

BACKGROUND TO STUDY AREA AND METHODOLOGY

3.1. Preamble
Kitengela is part of the Athi-Kaputiei Plains and its unique proximity to Nairobi provides an insight into a highly complex and dynamic landscape. There is competition for alternative land uses such as livestock rearing, conservation of wildlife, small-scale rain-fed agriculture, large-scale irrigated horticulture, quarrying, industrial, residential and commercial development. The area provides lessons on the challenges that can be experienced in other pastoral rangelands especially of East Africa due to the intensifying and diversifying land uses by pastoral and agro-pastoral families. The area is known to support a substantial wildlife population especially in the rainy season when animals move southwards from Nairobi National Park. The area has also been known to be at the centre of a vast wildlife-rich ecosystem in which enormous herds of large wild mammals were free to roam alongside herds of livestock owned by the locally dominant Maasai tribe. Development has however drastically reduced the extent of the ecosystem and this has led to reduction in the numbers of large mammals it can support. Partitioning and fencing off of this pastoral and rich wildlife area has also reduced its accessibility to livestock and wildlife.

3.1.1. Historical background information
For centuries, the indigenous communities living on the plains of the Kajiado—mainly of Maasai origin—have learned the art of coexisting with the wild. The expansive grasslands provided pasture for their livestock and were also an ideal home for wildlife. The people of Kitengela struggled to adapt when urbanisation began creeping in from the outskirts of Nairobi in the early 1980s. Kitengela is known to be the first group ranch to be subdivided into private land parcels in 1986. This resulted to land sales which at the same time led to a decline of the average size of holdings from 255 acres to 154 acres. Privatization of land triggered land fragmentation and introduced new competing and conflicting land uses. Such land uses include the cultivation of maize and beans, as well as fencing of land and urban encroachment.

Land subdivision and ownership came hand in hand with urbanisation. Following the demarcations, perimeter fences on the firms were erected by the new legal land owners hence blocking the migratory paths of wildlife. These were the migratory paths connecting the wild animals’ wet-season range south of Kitengela with their dry-season range in Nairobi National
Park and used by Wildbeasts, lions and other animals to go south into Tanzania's Serengeti plains. Erection of these fences led to human wildlife conflict, an issue that was a very rare in the past.

In early 2003, scientists in Nairobi initiated a scheme they hoped will help restore the peace. Researchers at the International Livestock Research Institute (ILRI) developed a mapping software that in combination with other data collected on the ground would show where the fences had been erected. Mapping of the fences was to enable the researchers see where such fences blocked the wildlife migratory routes and then pass the information on to a land-leasing scheme that had been launched three years earlier. Herders are paid to forego fencing or developing their land under this scheme, and so allow the wildlife to migrate. The scheme is run by Friends of Nairobi National Park, a conservation lobby group, with support from the World Wildlife Foundation (WWF) and other stakeholders. Participants of the programme call it reto-a-reto, which in the maasai language means, "I help you, you help me".

In 2004, the reto-a-reto team which also included a number of community members developed maps of the fences and land uses in Kitengela. This included land uses such as water points, wildlife migration routes, open grazing areas for livestock and wildlife, and areas of possible future land use conflict. The team managed to map 6471 fenced plots in the first and second Kitengela triangles. Dispersal and abundance of the mapped fences helped galvanize community members and the local authority to renew their efforts in planning for land use.

In August 2006, the Department of Physical Planning in the Ministry of Lands and Housing in consultations with the community, Kenya Wildlife Service (KWS) and Olkejuado County Council unveiled a proposed Master Plan for Kitengela proposing zoning of areas critical for livestock and wildlife. The proposed plan also defined limits to urban expansion and the extent of sub-division of land. The plan drew information from data and maps produced by the Reto-o-Reto community-research team. Adoption of the Master Plan was to facilitate local and international fund raising efforts to enable the lease programme to be further expanded, extending the benefits from this innovative approach to wildlife conservation to more land owners.
Land subdivisions and land sales are also believed to have encouraged the spread of unplanned urban settlements in Kitengela with a high concentration being observed along the Athi-river-Namanga road. Frequent droughts have also accelerated land conversion in the recent years forcing pastoralists to sell their land hence severely impacting their pastoral livelihoods and security.

3.2. Geographical background

3.2.1. Location of the study area
Kitengela area covers approximately 390 km² (GOK, 2001) within Isinya district in Kajiado county and is part of a larger rangeland ecosystem called the Athi-Kaputiei plains (a 2,456 km² ecosystem). The township is situated about 38 km South of Nairobi, on the tarmac road from Athi-river to Namanga. The location of the town is on longitude 36° 55’ East and latitude 01° 19’ South at an altitude of approximately 1624 metres above sea level.

Near Kitengela town is the Maasai Ostrich Park, a tourist destination, 7 km off the Nairobi - Namanga road. Kitengela is close to Athi-river town in Machakos County in the former Eastern Province. The western part of the township comprises the Athi-river G.K Prison, Kitengela district hospital and the district officer offices.

3.2.2. Soils and Topography
The area is covered by basement rock soils arising from different cycles of erosion. The soils are red brown sand soils which are generally of low fertility. Topographically, the area is located in the Athi-Kapiti plains, an area of open rolling land with some few dry riverbeds.

3.3. Climate
The area has a bimodal rainfall pattern with short rains falling between October and December while the long rains falling between March and May. The coolest period is between the month of June and August while the hottest are from October to April. The annual rainfall average is about 1,000 mms. The temperature of the area is influenced by altitude and season; the highest temperature of about 30°C is recorded during the dry season. Specific climatic details of the township presented in this study are as below;
Fig. 3.1. Map Kenya showing the 47 counties

Fig. 3.2-Kajiado County Administrative Boundaries

Source: [http://www.google.co.ke/imgres](http://www.google.co.ke/imgres), accessed April 4th, 2013

Fig 3.3. Aerial view of Kitengela town

Source: [http://www.google.earth.co.ke](http://www.google.earth.co.ke), accessed April 4th, 2013
(a) Temperature
There has been no specific recording for Kitengela Township temperatures in the past. However, temperature details for the entire area have been recorded at Kenyatta meteorological station. This information was found appropriate since the area has the same climatic conditions to Kitengela town. The records indicate that the coldest month is August when the minimum temperature is 12.1 deg centigrade. The hottest month is January when the maximum temperature is 28.3 deg centigrade.

_Chart 3.1- Variation of temperature as recorded at Kenyatta Meteorological department, (2012)._  

![Temperature Chart]

_Source: Kenya Meteorological Department_

(b) Precipitation
_Chart 3.2- Precipitation as recorded at Kenyatta meteorological station, (2012)_

![Precipitation Chart]

_Source: Kenya Meteorological Department_
Chart 3.2 above indicates two rainy seasons: long rains in April and May and short rains in December. Mean monthly precipitation is lowest at January recording as low as 0mm.

(c). **Humidity**

Chart 3.3 below indicates the lowest humidity is in the months of January and February and the highest in December.

*Chart 3.3- Humidity as recorded at Kenyatta meteorological station, (2011)*

![Humidity Chart](image)

*Source: Kenya Meteorological Department*

3.4. **Institutions and industries**

Kitengela is perhaps the fastest expanding cosmopolitan town in Kenya with analysts expressing optimism that it could overtake some of the key towns in the near future. The accelerated growth of Kitengela is based on its strategic location and supported by mushrooming of major investments which include agriculture, manufacturing, housing and banking. Experts have concluded that the setting up of the cyber city near the town and the improved road and railway linkages are among the major drivers of the fast expansion of Kitengela town. Kitengela hosts a large array of government institutions which include; schools (see table 3.1), Athi-river GK prison, Kitengela district hospital, Kitengela slaughter house, Kitengela police station, chiefs camp, administration police camp and the district officers offices. The town is however lacking in many industries and only boasts of a few light industries save for Kitengela steel makers.
(i) Schools
Isinya district has several boarding and day schools as indicated on table 3.1 below.

<table>
<thead>
<tr>
<th>Level of schools</th>
<th>Number of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public primary schools</td>
</tr>
<tr>
<td>2</td>
<td>Private primary schools</td>
</tr>
<tr>
<td>3</td>
<td>Public secondary schools</td>
</tr>
<tr>
<td>4</td>
<td>Private secondary schools</td>
</tr>
</tbody>
</table>

*Source: Education office, Isinya District, march 2013*

(ii). Kitengela water supply
The area does not have adequate surface water for livestock, human consumption or irrigation largely depending on underground water reserves. Alternative sources of water for livestock and domestic use are subsurface resources such as dams, water pals, and shallow wells. Water table is low in the area. The rocks are generally porous and allow water to percolate to great depths into the ground. Boreholes are drilled for a depth of about 90 meters. The township depends on piped water from the Export Processing Zone (EPZ) in Athi-river. The water is of good quality and is well distributed in the township. There are no future plans by the council to have its own water supply for the township.

(iii) Sewerage system
Kitengela township has no laid sewerage system. The council together with the Kenya Urban Roads Authority (KURA) have provided water drainways along the major roads only. There is however a proposed sewer plan for the township which the council has not been able to finance. The locals use septic tanks for their sewer which they later empty by use of hired exhausters.

3.5. Population projections
The area was inhabited by semi-nomadic pastoralist Maasai and land was communally owned. This lifestyle has however undergone changes due to ongoing land adjudication and subdivision leading to individual land tenure system. Population growth and urbanization have been processes occurring alongside the land tenure changes. The area’s proximity to Nairobi and Athi River towns has also attracted high immigration thus exposing the area to high population growth estimated to be 4.51% annual growth rate, which is significantly above the national growth rate.
of 2.56% (World Factbook – 2005). The 1999 population census counted 17,347 residents of Kitengela, up from 6,548 in 1989 (GOK, 2001). More than two-thirds of the population is concentrated in the Kitengela shopping centre and other smaller shopping centres (Nkedianye, 2004). The population of Kitengela has been enumerated in the national census of 1989, 1999, and 2009. The population figures are as shown in the table below.

Table 3.2 – Population growth in Kitengela

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>6,548</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>17,347</td>
<td>165</td>
</tr>
<tr>
<td>2009</td>
<td>58,167</td>
<td>235</td>
</tr>
</tbody>
</table>


From the above table, the human population within the Kitengela area has more than tripled in the last 10 years, from 17,347 in 1999 to 58,167 in 1999. The high population growth rate experienced in this area has been attributed mainly to in-migration, due to Kitengela’s proximity to Nairobi and increasing urban development occurring in the proximity of the town. The immigrants are mainly from the Kikuyu and Kamba communities. A spatial plan for Nairobi Metropolitan Region of Kenya initiated by the Ministry of Nairobi Metropolitan Development (MoNMD) projects the population of Kitengela as part of the Southern Metro to be 223,925 and provides an integrated guide for spatial, economic, social and infrastructure development.

Figure 3.4. Occupational Structure and Land Use Distribution for Kitengela, 2030

Source: Development of a Spatial Planning Concept for Nairobi Metropolitan Region, ministry of Nairobi Metropolitan Development, document 2010063/UPD
3.6. Economic base
The major land uses within the township include; commercial land use, residential land use and industrial land use. All these land uses can then be related to their impact on the hinterland.

(i). Agricultural land use.
Pastoralism has historically formed the central element of the Maasai production system living in the Kitengela area adjacent to Nairobi National Park. While the local community (Maasai) still focus on livestock production, they have been diversifying into cropping (mostly maize, beans and potatoes for subsistence). Some of the new landowners are interested (and more experienced than the Maasai) in growing crops. Others appear to be land speculators. There is also a small amount of commercial production of horticultural products for export occurring but not within the township.

(ii). Commercial land use.
The town centre comprises of shops, hotels, bars and restaurants, lodges etc. There are a number of wholesale shops such as Acacia, Eastmatt, Naivas and Satellite supermarket and retail shops which are all privately owned. There is also a number of petrol stations in the township which include Paws, Eupen, Kobil, Tosha, Gates and Eucos petrol station. In most of the residential areas, there are small market stalls and shops providing the essential goods. Financial services are also present within the town. The town has many banks which is a sign of an active economy and they include; Equity bank, National bank, Kenya Commercial bank, Consolidated bank, Bank of Africa, Family Bank, Standard Chartered bank and Co-operative bank.

(iii). Industrial activities
There are no heavy industries within the town centre save for Kitengela steel makers which is located along Athi-river-Namanga road. Most of the industries within the town are service industries which can be functionally classified into: smithing and carpentry workshops, slaughter house, poshomills and garages. The area around the township is very suitable for growing flowers, cement production is predominantly carried in Athi-river and this has led to some of the industries being developed in kitengela. The expansion of these industrial activities has led to growth of employment opportunities and income for the people.
(iv). Transportation.
There is one main trunk road within the township, Athi-river-Namanga road. This road is tar surfaced. The township also has inter-town transportation linking all residential and institutional areas from the centre of the town. The major inter town roads are Prison road, Balozi road, Deliverance road, Old Kajiado road, and the road from sokoni to Kyang’ombe. There are also access roads linking the single plots with the inter-town roads. The inter-town roads are mainly murram surfaced. The access roads are earth surfaced and some of them are too narrow and nearly impassable during the rainy season. These roads render the town it’s dusty nature during the dry season and it’s muddy nature during the wet season.

(v). Employment and income
The township locals enjoy employment from both the public and private sector. While livestock production is still the dominant form of production, subsistence crop cultivation has become a central part of livelihood strategies, along with off-farm income from wage labour and business investments. EPZ also acts as a major source of employment to the locals. The available government institutions such as the hospital, prison, and police camps also create employment to the people. The other sources of employment in the town include the light industries, the commercial centre and the transport sector especially the matatu bus operations as well as petrol stations. The labour force in these sectors is mostly casual.

3.7. Housing
Like many of the urban centres in Kenya, the township experiences shortage of housing of all categories. The financial inability of the local authority to provide housing has been matched by the rapid growth of substandard housing such as Kyang’ombe, Noomcopier, and Kwa Saitoti. The council has not developed any estates to cater for the rising population in the area. This has led to thriving of planned housing schemes which have been privately financed such as; Milimani estate, Newvalley, Warma, Redwood, and Capital Hill estates. The government has also provided housing quarters for its staff such as the Kitengela hospital quarters, Athi-river G.K prison quarters and Kitengela police station quarters.
RESEARCH METHODOLOGY

3.8. Introduction
To research is to carry out a diligent inquiry or a critical examination of a given phenomena. It implies exhaustive study, investigation or experimentation following some legal sequence (Mugenda & Mugenda, 1999). It involves a critical analysis of existing conclusions or theories with regard to newly discovered facts. This research study seeks to analyse the factors affecting land values in Kitengela town and find out the degree of influence of each variable. According to Mugenda & Mugenda (1999), the purpose of research is to enable explanation of phenomena. Such explanation involves accurate observation and measurement of a given phenomena. In order to explain a phenomena, one should be able to describe it, predict its occurrence and observe factors that cause its occurrence with certainty and accuracy. This backs the efforts of the researcher to have studied previous works in his literature search.

Studies are conducted to test theoretical concepts in real situations in order to develop generalizable applications. The researcher was therefore required to conduct a field study to collect the relevant information by enquiring directly from the relevant stakeholders. In this case, the field study for this research is Kitengela town. Eisenhardt (1989) says that case studies are:

Particularly well suited to new research areas or research areas for which existing theory seems inadequate. This type of work is highly complementary to incrementing theory building from normal science research. The former is useful in early stages of research on a topic or when a fresh perspective is needed, while the latter is useful in later stages or knowledge (pg. 548-549).

A case study is an in-depth investigation of an individual, group, institution or phenomenon (Mugenda and Mugenda, 1999). Mugenda further explain that the purpose of a case study is to determine factors and relationships among the factors that have resulted in the behaviour under study. Case studies are useful in providing answers to “why” and “how” questions and this role can be used for descriptive, explanatory or exploratory research. According to Yin (1994) the case study design must have five components; the research questions (s), its propositions, its unit(s) of analysis, a determination of the data linked to the propositions and criteria to interprete
the findings. Yin concluded that operationally defining the unit of analysis assists with replication and efforts at case comparison. This therefore dictated the research method to be used. The selection of a research design was based on the nature of the research problem or issue being addressed, the researchers personal experience and the audience for the study. Research design can either be qualitative, quantitative or mixed research.

3.9. Research design
A research design is the logic that links the data to be collected and the conclusion to be drawn to the initial questions of a study; it ensures coherence (Kumar, 2005). Research design deals with a logical problem and not a logistical problem (Yin, 1989). According to Mugenda & Mugenda (1999), qualitative research includes designs, techniques and measures that do not produce discrete numerical data. In qualitative study research design should be a reflexive process operating through every stage of a project (Hammersley & Atkinson, 1995). It involves the activities of collecting and analysing data, developing theory, elaborating the research questions, identifying and dealing with validity threats usually going more or less simultaneously, each influencing all of the others. This does not mean that every type of empirical research has implicit if not an explicit research design.

Quantitative research includes designs, techniques and measures that produce discreet numerical or quantifiable data (Mugenda & Mugenda, 1999). Quantitative research method attempts to maximise objectivity, replicability and generalizability of findings, and are typically interested in prediction. Integral to this approach is the expectation that a researcher will set aside his or her experiences, perceptions and biases to ensure objectivity in the study and the conclusion that are drawn (Lincoln & Guba, 1985). They further explain that quantitative methods are also frequently characterized as assuming that there is a single “truth” that exist, independent of human perception. The quantitative approach is more appropriate to determine the extent of a problem while the qualitative is more appropriate when the research wants to explore the nature of a problem (Kumar, 2005).

Mixed research is an approach to inquiry that combines or associates both qualitative and quantitative forms. It includes philosophical assumptions, use of quantitative and qualitative
approaches and the mixing of both approaches in a study. Thus it is more than simply collecting and analysing both kinds of data; it also involves the use of both approaches intendem so that the overall strength of a study is greater than either qualitative or quantitative research (Reswell & Plano, 2007).

3.9.1. Strategies of inquiry
The researcher not only selects a quantitative, qualitative or mixed methods study to conduct the research but also decides on the type of study within the three choices. Strategies of inquiry provided specific direction for procedures in the research design. Some people called them approaches to inquiry (Craswell, 2007) and others research Methodologies (Merteus, 1998).

Quantitative strategies include true experiments and less rigorous experiments called quasi-experiments and correlational studies (Campbell & Stanley, 1963) and specific single-subject experiments (Cooper, Hedgas & Valentive, 2009). This research focused on two strategies of inquiry; survey and experimental research.

1. Survey research provided a quantitative or numeric description of trends, attitudes or opinions of population by studying a sample of that population. It included cross-section and longitudinal study using questionnaires or structured interview for data collection, with the intent of generalizing from a sample to a population (Babbie, 1990).

2. Experimental research sought to determine if a specific treatment influenced an outcome. An experiment involves manipulation of independent variables to determine their effect on a dependent variable where the independent variables are the treatments in a true experiment (Mugenda & Mugenda, 1999).

Qualitative research involves design, techniques and measures that do not produce discrete numerical data. The researcher used three methods to collect qualitative data;

1. Direct observation where the required behaviour was observed in a particular setting.
2. Participant observation where data was collected by an observer regularly and by a full time participant in the activities being observed.
3. Interview method- a face to face interaction between the researcher and subjects (Mugenda & Mugenda 1999)

3.9.2. Criteria for selecting a research design
Given the possibility of qualitative, quantitative or mixed methods approaches, what factors affect a choice of one approach over another for the design of a proposal? Added to the strategy and methods would be the research problem (Morse, 2010). According to him certain types of research problem call for specific approaches. For example, if a problem calls for (a) the identification of factors that influence an outcome, (b) the utility of an interaction, or (c) understanding the best predictors of outcomes, then a quantitative approach is best.

On the other hand a concept merits for qualitative approach if the phenomena needs to be understood because little research has been done on it or when the researcher does not know the important variable to examine. This approach is also needed when the topic is new or has never been addressed with a certain sample or group of people and existing theories do not apply with the particular sample or group under study (Morse, 2010)

The study adopted the experimental research design as it is the only method of research that could truly test hypothesis concerning cause and effect relationships. This design also represents the most valid approach to educational problems, both practical and theoretical and to the advancement of education as a science” (Gay, 1992 pg.298). the researcher used conventional multiple regression analysis method to analyse all the factors influencing land values and the influence of every factor in Kitengela town.

3.9.3. Population
Population refers to the aggregate number of objects or events, not necessarily people which vary in respect of some variable of interest (King’oriah, 2004). According to Marczyk (2005), population is all individuals of interest to the researcher. In this research study, the population consisted of landlords, tenants, land owners and land officers such as land planners and land valuers. The researcher was unable to study the entire population and this necessitated the need for sampling.
3.9.4. Sampling
Clarke, (2004) defines a sample as any subset of a population. Sampling is the process of selecting a few (sample) from a bigger group (the sampling population) to become the basis of estimating or predicting the prevalence of an unknown piece of information, situation or an outcome regarding the bigger group (Kumar, 2005). It was important to decide on the sample or the segment of the population to be investigated. This was done through a sample survey to obtain the information about a certain population (Clarke, 2004). It was also convenient to distinguish between the target population, study population and sampling unit during the sampling process. Clarke (2004) defines each of them as follows:

1. Target population- is the population about which we want information.
2. Study population- is the population about which we can obtain information.
3. A sampling unit- is a potential member of the sample

The most convenient way of choosing the sample was to draw up a list of sampling units and chose the sample from the list by use of random samples. Influences drawn from the data collected from the sample were deemed to be attributable to the whole working population (Clarke, 2004).

3.9.5. Sampling frame.
Sapsford and Jupp (1996) defines a sampling frame as whatever is being used to identify the elements in each sampling unit and could be anything at all provided that it represents the total population. The sampling frame in this research consisted of landlords, different buyers of land and properties and also tenants.

3.9.5.1. Sampling technique and sample size.
The sample size should enable the research reasonable precise generalization with confidence (sekaran, 2003). Precision refers to how close the researchers estimate is to the true population characteristics. Confidence denotes how certain the researcher is that his/her estimates will really hold true for the population which according to Mugenda and Mugenda (1999.pg. 42), there isn’t a minimum or maximum sample size. Confidence limits provide the limits to a confidence
interval in which the researcher may be confident, at a given level, the true parameters lie (Lucey, 2002).

Once the sample size has been identified, it is of paramount importance to establish a sampling technique for the study. The researcher used both systematic sampling method, random and stratified sampling method to conduct his study. Stratified sampling method involved making the use of known characteristics of the parent population as a singly guide in selection (King’oriah, 2004). Random sampling involved a technique where a sample was chosen so that every member of the population was equally likely to be a member of the sample, independently of which other members of the population were chosen (Clarke, 2004). Systematic sampling method involved the technique where every K\textsuperscript{th} case in the population frame was selected for inclusion in the sample (Mugenda and Mugenda, 1999).

3.9.6. Data collection instruments

Sources of information were classified into two broad categories;

Primary sources
A primary source is a direct description of any occurrence by an individual who actually observed or witnessed the occurrence (Mugenda and Mugenda, 1999). Primary data was collected by use of questionnaires and interviews.

(i). Questionnaires.
Questionnaires are commonly used to obtain important information about the population (Mugenda & Mugenda, 1999). According to her, each item in the questionnaire is developed to address a specific objective, research question or hypothesis of study. The researcher must also know how information obtained from each questionnaire item will be analyzed.

Questionnaires were administered to landlords and tenants of both commercial, and residential properties. The questionnaires consisted of open-ended questions and closed questions including Yes-No and multiple response items. The questionnaires helped the researcher get information on the rents which the tenants pay and also information on the prices of agricultural parcels within
and in the hinterland of the town. The researcher also attempted to get general suggestions on main factors that affect land value within the town.

(ii). Interviews.
An interview is an oral administration of a questionnaire or an interview schedule. The researcher must establish a friendly relationship with the responders for him/her to obtain accurate information (Mugenda & Mugenda, 1999). The researcher conducted interviews with estate agents located in the township, land valuers, landlords, township local authority officers, County education officer and tenants. With input from these interviews and the literature search, questionnaires were developed to enable the researcher get adequate information on the factors affecting land value in Kitengela town.

Secondary data.
This included any publication written by an author who was not a direct observer or participant in the events described in this research. The literature review done by the researcher in chapter two was the main source of secondary data and its outcome was the subject to the entire chapter. Secondary data was obtained from books, theses and dissertations, references quoted in books, annual reports and government documents.

3.9.7. Data processing and analysis.
Data analysis is a process of cleaning, coding, transforming and modelling data and analysing it. It is from the results of such analysis that researchers are able to make sense of the data. The raw data realized in the research was systematically organized, analysed and presented through qualitative description of the data, tabular, pictorial and chart presentations of the information. Both qualitative and quantitative evidence was examined, categorised, tabulated and tested to address the initial propositions of the study. Key among the methods of data analysis used is the multiple regression analysis.

3.9.8. Conventional multiple regression analysis
According to King’oriah (1987), there are situations where only one variable is not enough to explain all the variation in the dependent variable. This method of regression analysis allows the
use of known value of two or more variables to estimate the unknown value of one and
independent variable. In the general case the method which is applicable in the multi-variate case is

\[ y = a + b_1 x_1 + b_2 x_2 + \ldots + b_k x_k; \]

in the situation where \( x_k \) are independent variables, and \( b_k \) are the changes in the dependent
variable \( y \) with respect to each of the \( x_k \) independent variables.

The idea behind the use of multiple regression analysis is that once the values of the independent
variable are known, they can be used together with the constants to determine the value of
dependent variable \( y \). The complete equation can determine the contribution of each independent
variable. This ability is essential in determining the effects of the size of plot on its market value.
Scott and white (1977) says that the use of multiple regression analysis in property value is
mainly in estimating the relationship between selected property characteristics and property
value. It measures the simultaneous influence of a number of independent variables (or factors)
on one dependent variable (property variable).

Multiple factors such as; location of property, communication networks, size of plots can be
“regressed” upon the dependent variable (property value) to provide an explanation of factors
affecting value. If the estimated relationship is statistically significant, it can be used as a
predictor of the expected sales price (or value).” The regression equation is of the following
form:

\[ P = b_1 c_1 + \ldots + b_n c_n + b_n + 1 \ldots + b_m x_k \] (4)

Where
\[ P = \text{sales price per acre (or value)} \]
\[ b_i = \text{regression coefficients} \]
\[ c_i = \text{land class value} \]
\[ x_i = \text{other independent variable} \]
Conventional multiple regression analysis is used in valuation because it offers a commonly used statistical approach for selecting the critical value indicators for a specific property type within a pre-determined location. This method also assigns relative weights to each of the value indicators. Therefore in consideration of the advantages of this method of analysis, this study attempts to use it for its purpose of analysing the influence of the factors influencing land values in Kitengela township and give the relative weight of each factors on land values. The main items of multiple regression analysis are:

1. **The regression coefficient (b).**
   The regression coefficient records the rate of change of the dependent variable with the changing values of the independent variable (King’oriah, 1987)

2. **Measures of goodness of fit.**
   The goodness of fit measures provide information about the power of the regression model to predict required values. These are relative measures, which provide information about the percent of total variance in the dependent variable that is explained by the estimated regression model. These include:

   **Coefficient of multiple determination, \( R^2 \)**
   This is the proportion of variance accounted for by a number of predictors in the independent variables. \( R^2 \) is most often seen as a number between 0 and 1.0, often used to describe how well a regression line fits a given set of data. \( R^2 \) near 1.0 indicates that a regression line fits the data well, while an \( R^2 \) closer to 0 indicates the regression does not fit the data very well. The coefficient of determination is the proportion, or the probability of the variation between \( x \) and \( y \) which is explained by the changes in the independent variable \( x \). Therefore, the coefficient of determination “\( R^2 \)” is calculated using the following technique.

   **Regression (explained) sum of squares**
   **Total sum of squares**
The adjusted coefficient of multiple determination, $R^2$

The adjusted $R^2$ corrects for the degree of freedom lost as more independent variables are added to the regression equation. The results is that as a new independent variable is added to the equation the value of $R^2$ does not necessarily increase, in fact, it can decrease if the new variable does not reduce the sum of squared residuals sufficiently to offset the degree of freedom. The equation with the largest $R^2$ yields the least residual variance, and is therefore the best to be used in predicting $y$ (dependable variable).

3. Absolute measures of goodness of fit of the regression equation

(i) The F test

It is concerned with the ratio of two estimates of variance in random samples from normal distributions. If both samples are drawn from normal distribution with the same variance then the ratio of the two estimates follows the F distribution (Clarke, 2004). The F distribution depends on the degrees of freedom for the numerator and for the denominator and is a continuous random variable that ranges from zero to infinity, and cannot take a negative value.

The standard error of estimate

It allows the calculation of a likely range of error if the results are for prediction of prices. The standard error of estimate is scaled in the same units as the dependent variable and is the standard deviation of the residuals. This measure provides information on the size of the residual or errors generated by the regression model. The properties of the measure are such that the regression equation which has the smallest standard error of the estimate also has the highest $R^2$.

3.9.9. Reporting.

The results and findings of the case study will be done in prose. Maps and digital photographs will be used to illustrate clear picture of the study. Conclusions will be drawn from the findings and appropriate recommendations made.
CHAPTER FOUR

DATA ANALYSIS

4.1. Introduction.
This chapter focuses on the analysis of the economic activities in Kitengela township and leads to determination of the forces giving rise to the prevailing market prices of commercial, industrial and residential. Land values are clearly reflected by going prices (market prices of parcels of land). Alternatively, if rents are properly raised to reflect market rents, they can also be a manifest of land values. To any investor, knowledge of the market is very important because this form the basis on which decisions are made.

Data for property sales was obtained from various property agents in the town and also from land transactions recorded at the ministry of lands in Kajiado. Rental figures were obtained from either tenants or landlords. In some cases however, it was very difficult to get rental figures or sale prices for sale of properties because of the reluctance of the concerned people to disclose the amount of rent they pay or receive or due to lack of accurate records of land transactions in the ministry of lands, Kajiado district. Transfers in the land market are not complete because it is believed that those which are unrecorded are quite many. The values given are also doubtful because human nature is that they deviate from recording the actual price to evade tax obligatons.

4.1.2. Nature of the data required
For the purposes of this study, data relating to land has been categorised and treated under three sections; commercial, residential and industrial data. In the case of commercial land data, information on the date of transaction, parcel number, plot area, sale price and sale price per unit area of land was obtained. For the let properties, the rental income data obtained for commercial premises was; name of street, particulars of property, size of property and rental income per month. Residential housing market data has been categorised and treated as below;

a. Estates name and the type of services offered
b. Accommodation offered in each sub market
c. Characteristics of the neighborhood to each subject premise
d. Average rent paid in each premise  
e. Approximate distance of the estate from the main road and town centre.

4.1.3. Sampling  
The study covered the three major urban land uses namely; residential use, commercial use, and industrial use. To cover the whole study area, the researcher devised a sampling method that would cover the whole region without necessarily distorting the information. The study was aimed to cover the whole of Kitengela township, but this was hardly possible due to time shortage vis-a-vis the area of the town. As a result, this study covered the township within a radius of two kilometers from Athi-river Namanga road (herein referred as the Main road). A sampling method that would represent the whole study area was however inevitable.

For commercial properties, the researcher used systematic sampling method to analyse the rent which the tenants pay. The researcher chose to interview every sixth shop. This was done for the shops along Athi-river-Namanga road and the main feeder roads such as Sokoni road, Prison road, Balozi road, Deliverance road and Old Kajiado road. By using this method, a total of twenty shops and offices were analysed.

As for residential properties, the researcher used the stratified method of sampling. All estates of the population were grouped according to their location; North Western part (NW) of Kitengela, North Eastern (NE), South Eastern (SE) and the South Western (SW) part of the township. More than fifteen estates were identified and for each category, two estates were chosen by random sample method and questionnaires administered. For each location, the researcher conducted an interview with the tenant for at least one estate chosen through random sampling. It should be noted that government houses were left out for the reason that they charge economic rent instead of market rent. Economic rent cannot be a clear manifest of value.

As for the industrial properties, the researcher found out that they were not very many within the specified study area. Random sampling method was used to administer questionnaires. Prices of land parcels within the study area were also obtained on the basis of years. The researcher chose the years ranging from 2007 to 2013 as the years of study and the transactions which took place
at that period were recorded. The researcher had to make sure that he covered the four broad categories of location for the township.

4.1.4. Response to questionnaires
These were administered to tenants, caretakers, and available landlords for both commercial and residential properties. All the questionnaires were hand delivered and the researcher ensured that the questionnaires were accompanied by a cover letter to ensure the respondents that the information would be utilised for research purposes only and confidentiality would be ensured. The questionnaires were administered as shown below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Questionnaires issued</th>
<th>Questionnaires received</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial properties</td>
<td>30</td>
<td>24</td>
<td>80.0</td>
</tr>
<tr>
<td>Residential properties</td>
<td>20</td>
<td>14</td>
<td>70.0</td>
</tr>
</tbody>
</table>

*Source: field survey, March 2013*

4.2. Expected land value gradient
Organization of land depends on relationship among major physical components and the natural features. This can also be determined by politics, economics as well as technology. They determine settlement patterns, proximity to market which affect the value of property and availability of transport. According to Von Thunen, the values of land fall from the center to the periphery. Von Thunen considered the relationship among: Distance of farms from the market, prices received by farmers for their products and land rent. Sullivan (1990) used bid rent functions to discuss the land use patterns in the central business district. He pointed out that the bid-rent functions shows how much the typical firm is willing to pay per acre for different sites in the city.

A close view of Kitengela township within Kajiado district can also explain abit of this theory. Within the township and its neighborhood, land use determines the land value. The use of land is determined by zoning regulations. However, the township has not been zoned hence land use within the township has not followed a specific order from the central business district to the hinterland. It is noticed that the location of a given land use has an influence on the value of land.
This is evidenced by the fact that commercial properties within the township are mainly located along the main Athi-river Namanga road due to the high incomes and prevailing purchasing power potential.

Land value is the present value of a stream of income expected from land. This is the periodic rental income receivable from land and landed property. Land values in Kitengela township are expected to increase gently towards the Northern part of the town. For example, taking residential plots of the same size, it is noted that a quarter acre plot in the Northern part of the township is selling at Kshs 4,000,000 while on the Southern part it is selling at Kshs 2,500,000. Residential properties also fetch a higher income on the Western and North western part of the town than the eastern part of the town. This can be attributed to location of many facilities in the western side of the township than the eastern part of the township such as Kitengela district hospital and the provincial administration offices e.g D.Os office and the chiefs camp. Together with the provincial administration offices, the location of the Athi-river G.K prison on the Western part of the township is also perceived to provide security to the area residents. It is also possible to note that industrial land value gradient is steeper in the Northern part than the Southern part due to location of the Export Processing Zone and the cement industries in the Northern part.

Figure 4.0.1 Comparison of land value gradients in Kitengela township towards North and South.

source: Fieldwork, 2013
Land values are also expected to decline from the town center towards the hinterland. The situation can be evidenced by the complex economic activities and development within the Central Business District (CBD). The effective demand for properties is high within the CBD and this makes land values to shoot up due to their competition for scarce land. This is expected to reduce as one moves away from the town center as other forces come into play such as accessibility and provision of services such as water and security. Central land is occupied by the activity with the most gain from proximity.

*Figure 4.0.2 Shows the housing price function for a city.*

4.3. Analysis and evaluation of findings.

4.3.1. Residential properties.
The researcher used rental figures which were readily available from the tenants and the caretakers to get the variations in land values for the residential properties. Kitengela township has various estates for residential purposes. In this section the researcher grouped the residential estates according to their location. The residential housing market has been further divided into bedsitters, one bed roomed houses, two bed roomed houses and three bed roomed houses.
Tables 4.0.1. Rent per month paid in different housing categories for the period between 2007-2013.

a) Bedsitter

<table>
<thead>
<tr>
<th>Estate name</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newvalley</td>
<td>5,000</td>
<td>5,500</td>
<td>5,500</td>
<td>6,000</td>
<td>6,000</td>
<td>6,500</td>
<td>6,500</td>
</tr>
<tr>
<td>Chohi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kipepeo</td>
<td></td>
<td></td>
<td>4,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,500</td>
<td>6,000</td>
</tr>
<tr>
<td>Gohaps</td>
<td></td>
<td>4,000</td>
<td>4,500</td>
<td>5,000</td>
<td>5,500</td>
<td>6,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Kitengela Academy</td>
<td>4,000</td>
<td>4,000</td>
<td>5,000</td>
<td>5,000</td>
<td>6,000</td>
<td>6,000</td>
<td>6,500</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

b) One–Bedroomed house

<table>
<thead>
<tr>
<th>Estate name</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newvalley</td>
<td>9,000</td>
<td>10,000</td>
<td>10,000</td>
<td>11,000</td>
<td>11,500</td>
<td>12,000</td>
<td>12,500</td>
</tr>
<tr>
<td>Chohi</td>
<td>7,000</td>
<td>7,500</td>
<td>7,500</td>
<td>7,500</td>
<td>8,000</td>
<td>8,500</td>
<td>9,500</td>
</tr>
<tr>
<td>Kipepeo</td>
<td></td>
<td>8,000</td>
<td>8,500</td>
<td>8,500</td>
<td>9,000</td>
<td>9,000</td>
<td></td>
</tr>
<tr>
<td>Gohaps</td>
<td></td>
<td>6,800</td>
<td>6,800</td>
<td>7,800</td>
<td>7,800</td>
<td>8,800</td>
<td>9,800</td>
</tr>
<tr>
<td>Kitengela Academy</td>
<td>6,000</td>
<td>6,000</td>
<td>6,500</td>
<td>6,500</td>
<td>7,000</td>
<td>7,500</td>
<td>7,500</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013
c) Two–Bedroomed house

<table>
<thead>
<tr>
<th>Estate name</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newvalley</td>
<td>13,000</td>
<td>13,000</td>
<td>14,000</td>
<td>14,500</td>
<td>14,500</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Chohi</td>
<td>9,000</td>
<td>10,000</td>
<td>10,000</td>
<td>11,500</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
</tr>
<tr>
<td>Kipepeo</td>
<td></td>
<td>14,000</td>
<td>14,500</td>
<td>14,500</td>
<td>15,000</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>Gohaps</td>
<td>9,000</td>
<td>9,000</td>
<td>9,500</td>
<td>10,000</td>
<td>10,500</td>
<td>11,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Kitengela Academy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

Analysis of the findings in residential land values.

The above variation in rents of different estates were found to be caused by various factors which include: Location, availability of social amenities, neighbourhood and infrastructural facilities. The relationship between residential rents and distance from Kitengela town centre was found to be weak. Comparatively, rents for various middle and high income residential estates do not vary much in relation to distance from the main road. A good example is that of a two bedroom unit in Newvalley estate which is approximately half a kilometer from the town centre attracting a monthly rent of Kshs. 15,000 while a similar property within the town centre fetches the same amount. The main reason was found to be that middle and high income residents have their own private means of transport to the main road. However, low income residential rent vary greatly in relation to distance from the town centre. A bedsitter in Noomcopirr located approximately 1
Kilometer from the main road attracts a monthly rent of Kshs. 1,200 while a similar bedsitter within the town centre attracts an average of Kshs. 6000.

The slight variation of residential rents within the township is as a result of provision of infrastructural facilities and social amenities. Most of the properties attracting very low rents were found to lack water and electricity. Tenants have to move to other estates to look for water. Tenants were found to use oil lamps and charcoal. Residential properties fetching high rents were found to be served with water and electricity. This is also attributed to good road networks and street lighting which provides a sense of security. Newvalley estate, a middle and high income residential estate, located near the main road fetches relatively high income than Chohi estate located approximately 1 Kilometer from the town centre. Low income residential estates were found to have very narrow earth roads while high income residential areas are served by good roads that are repaired from time to time. Estates having services such as DSTV services also fetch a higher rent than estates that do not have.

Neighbourhood plays a very crucial role in determining rent hence the value of a given property. The high income groups tend to allienate themselves in the quiet posh residential areas where there is minimal disturbance. Low income groups are associated with such nuisance and dirt. Estates near industrial area are mostly affected by smoke, dust and noise pollution. As a result, middle and high income groups tend to be discouraged from occupying houses near the industrial area. This is evidenced by location of Kyang’ombe, Kwa Saitoti and Noomcopirr substandard housing in the Northern part of Kitengela where most industries such as the Export Processing Zone and cement manufacturing industries are located.

Table 4.02. Percentage rate of change in rental levels in the various housing categories.

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly rent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average monthly rent</td>
<td>4,500</td>
<td>4,500</td>
<td>4,750</td>
<td>5,250</td>
<td>5,625</td>
<td>6,000</td>
<td>6,250</td>
</tr>
<tr>
<td>Change in rentals</td>
<td>0</td>
<td>250</td>
<td>500</td>
<td>375</td>
<td>375</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Percentage change (%)</td>
<td>0</td>
<td>6</td>
<td>11</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013
f) One–Bedroomed house

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly rent</td>
<td>7,300</td>
<td>7,600</td>
<td>7,800</td>
<td>8,300</td>
<td>8,600</td>
<td>9,200</td>
<td>9,700</td>
</tr>
<tr>
<td>Change in rentals</td>
<td>300</td>
<td>200</td>
<td>500</td>
<td>300</td>
<td>600</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Percentage change (%)</td>
<td>4.1</td>
<td>2.6</td>
<td>6.4</td>
<td>3.6</td>
<td>6.9</td>
<td>5.4</td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

---

g) Two–Bedroomed house

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly rent</td>
<td>10,300</td>
<td>10,700</td>
<td>11,900</td>
<td>12,600</td>
<td>13,000</td>
<td>13,400</td>
<td>13,400</td>
</tr>
<tr>
<td>Change in rentals</td>
<td>400</td>
<td>1,200</td>
<td>700</td>
<td>400</td>
<td>400</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Percentage change (%)</td>
<td>4</td>
<td>11</td>
<td>5.8</td>
<td>3.1</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

---

h) Three–Bedroomed house

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly rent</td>
<td>18,000</td>
<td>20,000</td>
<td>20,000</td>
<td>21,000</td>
<td>21,000</td>
<td>22,000</td>
<td>22,000</td>
</tr>
<tr>
<td>Change in rentals</td>
<td>2,000</td>
<td>0</td>
<td>1,000</td>
<td>0</td>
<td>1,000</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Percentage change (%)</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>4.7</td>
<td>4.7</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

There are also sales for residential plots done in the town by estate agents over the previous years and such information has been used to study the trend in land values within the area. The sales are as shown in the table below.
Table 4.3. Plot values at different estates.

<table>
<thead>
<tr>
<th>Name of estate</th>
<th>Size of plot</th>
<th>Price of plot</th>
<th>Year of sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milimani</td>
<td>0.2372</td>
<td>600,000</td>
<td>2009</td>
</tr>
<tr>
<td>Airview estate</td>
<td>0.101</td>
<td>400,000</td>
<td>2010</td>
</tr>
<tr>
<td>CBD</td>
<td>0.125</td>
<td>4,950,000</td>
<td>2011</td>
</tr>
<tr>
<td>Newvalley</td>
<td>0.2891</td>
<td>5,700,000</td>
<td>2012</td>
</tr>
<tr>
<td>Newvalley</td>
<td>0.25</td>
<td>5,500,000</td>
<td>2013</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

From the above tables, it is noted that rents for the various rental levels have been on the rise. 86% of the questionnaire respondents and the persons interviewed attributed such rise to the rising population within the township hence demand for housing. 10% of the respondents attributed the increase to provision of services such as water, security, and improved infrastructure. The remainder (4%) said that such rise was as a result of increased cost of living hence the landlords were justified to increase the rent to their properties.

This rise in population is attributed to the movement of people to the area after the 2007 post election violence which was considered a safe area. It is also argued that land acquisition within Kitengela township is easy and more secure compared to other areas such as Mavoko. Economic activities within the township have also been on the rise due to the construction of Athi-river-Namanga road, location of Export processing Zone and the cement manufacturing industries. Such economic activities give people high purchasing power which leads to effective demand for properties hence the upward movement of land values due to competition for the scarce land.

4.3.2. Commercial properties.
As for this category of land use, the data obtained was rentals paid by the tenants per month for the use of the premises. Prices of land parcels within the study area were also obtained to compare the trend of land values and rents over the period between 2007 and 2013. The
commercial activities within the study area included shops, offices, hotels and restaurants, and banks. The data collected is as shown below;

Table 4.0.4. Land transaction between 2007 and 2013

<table>
<thead>
<tr>
<th>Date</th>
<th>Parcel No</th>
<th>Location</th>
<th>Area (acres)</th>
<th>Total sale</th>
<th>Price</th>
<th>Price per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>21/8/2007</td>
<td>Kjd/Kap N/7627</td>
<td>Kap/North</td>
<td>0.2372</td>
<td>600,000</td>
<td>2,529,510</td>
<td></td>
</tr>
<tr>
<td>12/7/2008</td>
<td>Kjd/Kap N/ 11933</td>
<td>Kap/North</td>
<td>0.1236</td>
<td>400,000</td>
<td>3,236,245</td>
<td></td>
</tr>
<tr>
<td>14/1/2009</td>
<td>Kjd/Kit/30655</td>
<td>Kjd/Kit</td>
<td>0.0791</td>
<td>625,000</td>
<td>7,901,390</td>
<td></td>
</tr>
<tr>
<td>17/11/2009</td>
<td>Kjd/Kit/30656</td>
<td>Kjd/Kit</td>
<td>0.0791</td>
<td>625,000</td>
<td>7,901,390</td>
<td></td>
</tr>
<tr>
<td>13/7/2010</td>
<td>Kjd/ Kap N/ 25632</td>
<td>Kap/North</td>
<td>0.1112</td>
<td>1,100,000</td>
<td>9,892,086</td>
<td></td>
</tr>
<tr>
<td>27/7/2011</td>
<td>Kap/North/17141</td>
<td>Kitengela</td>
<td>0.045</td>
<td>1,000,000</td>
<td>22,000,000</td>
<td></td>
</tr>
<tr>
<td>23/8/2011</td>
<td>Kap/North/40107</td>
<td>Kitengela</td>
<td>0.5</td>
<td>5,000,000</td>
<td>10,000,000</td>
<td></td>
</tr>
<tr>
<td>22/11/2012</td>
<td>Kap/North/10557</td>
<td>Kitengela</td>
<td>0.080</td>
<td>2,200,000</td>
<td>27,500,000</td>
<td></td>
</tr>
<tr>
<td>13/6/2012</td>
<td>Kjd/Kit/27122</td>
<td>Kitengela</td>
<td>0.09</td>
<td>1,400,000</td>
<td>15,600,000</td>
<td></td>
</tr>
<tr>
<td>25/3/2013</td>
<td>Kjd/Kit/35595</td>
<td>Kitengela</td>
<td>0.0435</td>
<td>1,000,000</td>
<td>23,000,000</td>
<td></td>
</tr>
<tr>
<td>18/3/2013</td>
<td>Kap/North/22367</td>
<td>Kap/North</td>
<td>0.09</td>
<td>4,400,000</td>
<td>48,000,000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Lands office, Kajiado lands registry, 2013

From the above table, it is noticed that land prices for properties have changed gradually over the years. 86% of the questionnaire respondents attributed the rise to increased demand for land. The remaining 14% attributed such rise to increased provision of infrastructure and services in the past years.

Table 4.0.5. Rates of change in land prices between 2007 and 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Average price per acre (Kshs)</th>
<th>Change in price per acre (Kshs)</th>
<th>Percentage change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>3,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>4,500,000</td>
<td>1,500,000</td>
<td>50</td>
</tr>
<tr>
<td>2009</td>
<td>8,000,000</td>
<td>3,500,000</td>
<td>78</td>
</tr>
<tr>
<td>2010</td>
<td>10,000,000</td>
<td>2,000,000</td>
<td>25</td>
</tr>
<tr>
<td>2011</td>
<td>16,000,000</td>
<td>6,000,000</td>
<td>60</td>
</tr>
<tr>
<td>2012</td>
<td>22,000,000</td>
<td>4,000,000</td>
<td>25</td>
</tr>
<tr>
<td>2013</td>
<td>35,500,000</td>
<td>13,500,000</td>
<td>61</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013
The researcher also collected data on the rents paid by the different tenants per month for the use of the commercial properties. The data was collected based on different locations guided by different streets within the township. The streets include, Athi-river-Namanga road as the main commercial street, Sokoni road, Prison road, Balozi road, Deliverance road and Old Kajiado road.

**Table 4.0.6. Rent paid per month at different locations.**

<table>
<thead>
<tr>
<th>Street</th>
<th>Plot size</th>
<th>Rent per month in 2007</th>
<th>Rent paid per month in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namanga road</td>
<td>15 X 20</td>
<td>15,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Sokoni road</td>
<td>12 X 15</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Deliverance road</td>
<td>12 X 15</td>
<td>4,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Prison road</td>
<td>12 X 15</td>
<td>4,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Balozi road</td>
<td>12 X 15</td>
<td>3,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Old Kajiado road</td>
<td>12 X 15</td>
<td>5,000</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

Rents paid range from Ksh 20 to Kshs 85 per square foot per month. Athi-river-Namanga is the main commercial street and rents for commercial properties on this street are higher than in the other streets generally. Rents for commercial properties vary depending on the location of the street and the distance from the town centre.

**Table 4.0.7. Relationship between plot sizes, plot location and prices for residential plots.**

<table>
<thead>
<tr>
<th>Location of plots</th>
<th>Size of plots</th>
<th>Price per plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noomcopirr</td>
<td>50 X 100</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Milimani</td>
<td>50 X 100</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Newvalley</td>
<td>100 X 100</td>
<td>2,500,000</td>
</tr>
<tr>
<td>EPZ</td>
<td>100 X 100</td>
<td>4,000,000</td>
</tr>
<tr>
<td>CBD</td>
<td>50 X 100</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Kyang’ombe</td>
<td>50 X 100</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Pinto</td>
<td>100 X 100</td>
<td>2,800,000</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

From the data above in table 4.7 and 4.8, it is clear that commercial properties command higher prices than residential properties. Altogether, location is seen as a common influence of residential and commercial land prices although the plot size has a major influence on the land price since plot size is directly proportional to plot price.
Analysis of factors contributing to variations in commercial land values.
The researcher attributed various factors to the variations in land values for this particular land use category. Many tenants cited accessibility in this category as influencing their decision on whether to pay higher rents or lower and also the type of business to be done. Commercial properties located at strategic positions where they could tap a lot of customers were found to command higher rents than properties located at back streets. Namanga road which is the main road in the township has properties that command the highest rents as compared to Bakery road which is a back street. Location of the property is also directly attributed to the variations in land values in this category of land use.

Properties of the same type, same same street and being used for a similar purpose were seen to attract different amount of rent. One shop in Namanga Road was seen to attract a rent of Kshs 26,000 while another shop in the same street was seen to attract rent of Kshs 24,000 despite the fact that they were on the same street. The property attracting higher rent was situated at a road junction where it was accessible from various directions while the one attracting a lower rent was situated on a straight road only accessible from two directions.

The amount of rent the tenants are willing to pay is also highly determined by proximity of properties in relation to other properties. Shops and offices and restaurants near institutions such as banks were seen to attract higher rents than other properties. Tenants in such properties cited availability of customers who come to the banks as the main cause, as to why they are willing to pay higher rents than in other properties. Businessmen with their businesses away from the main road of the town were willing to pay higher rents than they were paying for their plots if only such plots were only available. All the factors attributed to variations in land values of this category of land use were related to availability of customers. Commercial properties away from the town centre were found to command relatively low rents than those at the prime points of the town centre.

4.3.3. Industrial properties.
Within Kitengela township, there are no heavy industries save for Kitengela Steel Makers Ltd and Kitengela slaughter house which are located along Athi-river-Namanga road. Industries
within the town are basically small scale service industries such as Carpentry, garage, workshop e.t.c. Most industrial activities are located at Athi-river and within Export Processing Zone at the Northern part of Kitengela. Rental data for this kind of land use was difficult to get because of the reluctance of the owners of these properties or tenants to give such information. There were no recent sales for this kind of properties and so the property values were difficult to get.

For the small industries found such as carpentry and garages, the space occupied is acquired mainly through letting. The researcher found out that most of this space is undeveloped residential or commercial properties waiting to be developed. A conclusion for industrial land use would be deficient because no enough data was obtained to analyse industrial land use and land values. In addition, save for Steel Makers Limited and the Kitengela Slaughter house, most of the industrial activities are carried out on undeveloped commercial or residential plots which is not a true representation of industrial land use.

From the foregoing analysis, it can be noted that land values are on the increase and will continue to be on the rise. From the data collected, it is also noticed that the greatest rate of change in land value is experienced in the commercial land use type followed by residential land use. In this regard it may be said in conclusion that different factors cause variations in land values within the township. The following factors have been found to affect land values in Kitengela town. Each of the factors is analysed and quantified so as to be used in the multiple regression analysis (MRA). A sample of eight properties was used to quantify the factors affecting land values.

4.3.4. Factors affecting land values.

1. Demand for a particular land use.
Demand is the amount and type of real estate desired for purchase or rent in a given market at a given period of time. The higher the demand for a particular land use the greater the land values. Within the study area, the researcher found out that commercial land use commands a higher land value because of the associated demand while residential land use comes second. Tables 4.0.5 and table 4.0.6 shows that commercial properties attract more value as compared to residential properties.
2. Accessibility

Accessibility makes properties more desirable and hence increases their values and evaluates the net economic cost of moving persons and goods between one place and another describing how conveniently land uses are located in relation to each other and how easy it is to reach them with the transport network. This is evident within Kitengela township as properties, especially commercial properties, tend to follow the road network available. Properties situated in accessible areas have higher rents evidenced by the fact that plots within the CBD which is highly accessible attract higher prices than plots at the hinter land. For example, an eighth of an acre plot within the CBD costs approximately Kshs 10,000,000 while a similar plot in size approximately 2 kilometers from the CBD cost Kshs 4,000,000.

The relationship between accessibility and residential areas was found not to be strong. As earlier discussed, accessibility was found to affect the low income earners since the middle and high income earners have personal means of transport thus locate far from from town centre. For purposes of MRA measurements from the main street to the subject plot were taken for sampled properties within the township and distance recorded in meters.

3. Location

Location can simply be defined as a place where something is or could be located. A property’s location impacts its desirability and includes many things such as how the property sits in relation to a property, the size and shape, its grade and the soil composition. A relative importance of each location should be measured against the proximity to the Central Business District. As shown below, plots of land within the CBD command high values than plots far from the CBD. For purposes of MRA, the distance to the CBD was measured in metres for each property.

Table 4.0.8. Rental-location relationship

<table>
<thead>
<tr>
<th>Property</th>
<th>Location (distance from CBD)</th>
<th>Rent paid per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shop A</td>
<td>0</td>
<td>25,000</td>
</tr>
<tr>
<td>Shop B</td>
<td>20m</td>
<td>20,000</td>
</tr>
<tr>
<td>Shop C</td>
<td>50m</td>
<td>15,000</td>
</tr>
<tr>
<td>Shop D</td>
<td>80m</td>
<td>12,000</td>
</tr>
<tr>
<td>Shop E</td>
<td>100m</td>
<td>6,000</td>
</tr>
<tr>
<td>Shop F</td>
<td>120m</td>
<td>5,000</td>
</tr>
<tr>
<td>Shop G</td>
<td>150</td>
<td>4,000</td>
</tr>
</tbody>
</table>

*Source: Fieldwork, 2013*
4. **Parcel size**

The location of a property does not by itself make it absolutely desirable. With location as a key factor, other considerations such as the size of the area of property are made. Large plots sell at a lower unit price than small plots particularly in commercial properties. However, very small plots may not allow proper economic utilization of the plots because no economic development can be carried out. This affects such plots by depreciating their value. The researcher sampled properties and analysed them in terms of their size given in metres.

5. **Provision of services.**

Provision of services add the market value of land. This is as a result of increased demand for areas served with schools, electricity, internet services and good communication network such as roads than areas that do not have these services. A site which has the above basic services comprise an area with high land values. For example, Newvalley Estate which is provided with electricity, water and DSTV services fetch higher rent than Chohi estate which is not provided with DSTV services. Other estates such as Kyang’ombe, Kwa Saitoti and Noomcopirr low income estates attract rent as low as Kshs 800 due to lack of services compared to high income residential estates such as Newvalley and chohi which are provided with such services and fetch rents as high as Kshs 6,000 for a single roomed unit.

6. **Site improvements.**

Improvements increase the value of land directly. The increase in value is dependent on the type and intensity of the improvement so provided. Improvements are capital intensive and the cost of improvement is included to the value of unimproved site for the owner to recoup the cost incurred when he is selling the plot. For example, a 0.1236 acre piece of land developed with a block of flat within the central business district goes for Kshs 67,000,000 while a vacant plot of similar size in the same location can sell at Kshs 15,000,000. This shows that improvements affects the actual market price of a property.

7. **Security.**

A greater sense of security result to an increase in the average value of properties. The fear of being the victim of any kind of violence has been recognized as a significant social problem. The
researcher found out that demand for houses which were deemed secure was very high and that such estates attracted higher rents than estates that were less secure. Security is seen in terms of provision of street lighting, nearness to a police or chief camp, easy access due to provision of good road networks and also the quality of neighborhood. Out of the questionnaires administered, 70% of the respondents cited security as a determinant of their choice of estate to reside or location of their business. This is also reflected in the rents paid as estates which are regarded more secure attract higher rents than low secure estates. Residential neighborhoods can either be regarded as safe of unsafe. For purposes of MRA, safe neighborhoods account for 2 while unsafe neighborhoods will account for 1.

8. **Quality of the neighbourhood**

Residential property is a multidimensional commodity, characterised by durability and structural inflexibility, as well as spatial fixity. Each residential unit has a unique bundle of attributes that cumulatively determine the neighbourhood quality of a certain location. The relationship between house prices and locational factors is the result of unobservable variation in the location across properties coupled with the heterogeneity of the market. For instance, better-quality properties could reflect the quality of the location that in turn induces more good-quality property to be developed in that location. For purposes of MRA, neighbourhoods were classified according to different categories and quantified as shown below:

1. Excellent neighbourhood quality – 3
2. Good neighbourhood quality – 2
3. Poor neighbourhood quality – 1

9. **Government policies**

Government policies on land use can affect property values in a variety of ways either positively or negatively. The positive effect of a land-use regulation on property values can occur when land-use regulations protect, enhance, or create amenities or services that benefit property owners. Licensing and property taxes raise funds that can be used to finance public services and utilities. Regulations also have negative effect if they constrain land owners from actions that would increase their land valus. The government regulates land uses through institutions which
set up policies which regulate land use. The government does this through the central bank by decreasing or increasing interest rates on borrowed funds which affect the effective demand and thus land values. Regulations such as density controls, plot ratio and zoning regulations affect the nature of land use hence the land values. For the purposes of MRA, a value of 1 was ascertained where government and institutional regulations are observed while where they are not observed, a value of 0 was ascertained.

10. Speculation
Speculation is the practice of engaging in risky financial transactions in an attempt to profit from short or medium term fluctuations in the market value of a tradable good rather than attempting to profit from the underlying financial attributes embodied in the instrument. Kitengela area experiences speculation evidence by the sprawl of the township, high rents and poor public services. Land owners in the area subdivide their farms into plots and then sell them at higher prices than if sold whole. Kitengela town is viewed as one of the fastest growing satellite cities due to its proximity to Nairobi which has attracted a high number of immigrants to the area. However, this has not been dealt with since the researcher could not quantify speculation for inclusion in the multiple regression analysis.

11. Land tenure.
Land tenure is the set of rules that determines how land is used, possessed, leveraged, sold, or in other ways disposed of within societies. These rules may be established by the state or by custom, and rights may accrue to individuals, families, communities, or organizations. Land tenure system gives security, ownership rights and obligation pertaining actions to be committed or omitted from the property. Tenure security rather than just property rights is the linchpin to economic development. Freehold interests command higher values than leasehold interests since they have no time limit for expiry. Most of the properties in Kitengela are freehold in nature and were awarded a value of 1 while the leasehold properties were awarded a value of 0 for the purporses of MRA analysis.
4.3.5. Multiple Regression Analysis

As earlier indicated, Multiple Regression Analysis will be used to analyse the influence of the factors determining land values in Kitengela township and give their relative weight on the land values. After thorough observation, interviews and physical inspection of properties, information on value of the property, demand of the particular property, parcel size, location, land tenure, accessibility, land use policies, security and neighbourhood quality was recorded. Topography and sewage disposal was found not have major influence on land value since the areas topography is generally uniform and the area is not provided with sewerage services.

The above variables were utilized inclusively so that all the factors were experimented on. The factors were reduced into measurable terms and only eight (8) out of the eleven (11) factors are being analysed since three of the observed variables were assimilated into other variables. For the purposes of this analysis, eight commercial properties were examined all located within the township for uniformity on their uses. Value of the land is the dependent variable while the other factors are the independent variables.

Table 4.0.9. Multiple Regression Analysis table

<table>
<thead>
<tr>
<th>Characteristics (variables)</th>
<th>Sample commercial plots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Y Value of land, Kshs '000</td>
<td>10,000</td>
</tr>
<tr>
<td>X1 Demand(p/acre),Kshs'000</td>
<td>80,000</td>
</tr>
<tr>
<td>X2 Parcel size</td>
<td>0.125</td>
</tr>
<tr>
<td>X3 Location(From CBD)</td>
<td>9</td>
</tr>
<tr>
<td>X4 Land tenure</td>
<td>1</td>
</tr>
<tr>
<td>X5 Accessibility (In Metres )</td>
<td>9</td>
</tr>
<tr>
<td>X6 Land use policies</td>
<td>1</td>
</tr>
<tr>
<td>X7 Security</td>
<td>2</td>
</tr>
<tr>
<td>X8 Neighbourhood qualities</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Fieldwork, 2013

The Multiple Regression Analysis as per the computer printout was done in two steps to compare the different results and come up with the factors influencing land value in order of their influence in Kitengela town. Each output was analysed following two steps as given below:

1. Correlation analysis for all independent variables against the dependent value (value of land)
2. Conventional multiple regression
1. Correlation Analysis

The correlation printout obtained for the independent variables against the dependent variable (see appendix 1) indicated that three variables were positively correlated with the dependent variable and the rest were negatively correlated. From the table below, it can also be noted that the level of correlation for the dependent variables with the independent variables is very high.

Table 4.1. coefficients of correlation between the dependent and independent variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand for land</td>
<td>0.820</td>
</tr>
<tr>
<td>Parcel size</td>
<td>-0.661</td>
</tr>
<tr>
<td>Accessibility</td>
<td>-0.960</td>
</tr>
<tr>
<td>Location</td>
<td>-0.898</td>
</tr>
<tr>
<td>Security</td>
<td>0.854</td>
</tr>
<tr>
<td>Neighbourhood quality</td>
<td>0.820</td>
</tr>
</tbody>
</table>


The strongest relationship between the dependent variable and the independent variable is between accessibility to the main road at -0.960. This indicates that buyers for commercial properties first consider the accessibility factor of the property in relation to the main road. In otherwords, the nearer the property is to the main road, the higher the value. The other factor that is considered next is the location factor whose coefficient is -0.898. This is in regard to the desirability of plots in relation to the CBD where the value of land decreases as one moves away from the CBD. Variable X4 (land tenure) and variable X6 (land use policies) were removed after computation as they were seen to be insignificant in relation with the dependent variable Y.

High levels of collinearity was also found to exist between the variables themselves. The highest level of collinearity was found to exist between accessibility of property and location from the CBD at 0.979 and the lowest between parcel size and neighbourhood quality at -0.725. This shows that the independent variables heavily depend on each other to influence the dependent variable Y.
2. Conventional multiple regression

The remaining explained independent variables were also regressed to determine the most critical indicators for the property value. Variables X1 (demand for land) and X7 (security) were not included in the equation after computation since they were also found to be insignificant in terms of the variable Y. The results obtained for the remaining independent variables after conventional multiple regression analysis were as follows:

*Table 4.1.1. Multiple Regression analysis results*

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.997</td>
<td>.995</td>
<td>.985</td>
<td>146.891</td>
<td>98.647</td>
<td>0.010</td>
</tr>
</tbody>
</table>

*Predictors: (Constant), Accessibility, Parcel size, Neighbourhood qualities, Location from the CBD*

*Source: Fieldwork, 2013.*

A multiple R of 0.997 indicates that the independent variables accounts for 99.7% variation of the dependent variable. The knowledge and identification of the independent variables X allows for the computation of the dependent variable which in this case is 0.997 Y. The probability of obtaining 0.997 is certain with the knowledge of the independent variables X. Beta weights were obtained to determine the levels of significance of the independent variables and the results were as below:

*Table 4.1.2. Beta weights for the independent variables*

<table>
<thead>
<tr>
<th>Model</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parcel size</td>
<td>.033</td>
<td>.434</td>
</tr>
<tr>
<td></td>
<td>Location from the CBD</td>
<td>.974</td>
<td>3.890</td>
</tr>
<tr>
<td></td>
<td>Neighbourhood qualities</td>
<td>-.455</td>
<td>-3.390</td>
</tr>
<tr>
<td></td>
<td>Accessibility (In meters)</td>
<td>-2.360</td>
<td>-8.651</td>
</tr>
</tbody>
</table>

*Source: Fieldwork, 2013.*

From the results of multiple regression shown in the table above, it can be concluded that the listed factors have influence on the land values and that they are linearly related to the value of the property. Accessibility is noted as the major factor influencing the value of land followed by neighbourhood qualities and the least influencing factor is parcel size with a beta weight of 0.033.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS.

5.1. Conclusion.
From the data analysis in chapter four, it may be said in conclusion that different factors cause variations in land values. It's also evident that land values have been changing over the study period positively. The analysis also indicates that different properties are influenced by different factors which also vary in their degree of influence. Residential properties are highly influenced by factors such as location and the quality of neighbourhood which is not the case in commercial properties which are highly influenced by accessibility. This is in relation to customers and their ease of reaching a given shop, restaurant or office. The analysis also shows that land values for both commercial and residential land fall from the township centre towards the periphery. This supports Von Thunen's concentric zone model that the values of land fall from the centre to the periphery.

The analysis however disapproves Von Thunen's argument that similar land uses will be found at equal distances from the market centre arranged in concentric zones. In Kitengela, different land uses are found in 'pockets' distributed all over the township and do not take any definite format. This can be said is as a result of lack of zoning regulations for the township. Land use pattern in the township can be said to adopt the Ullman's Multiple Nuclear Theory of urban growth where different land uses are distributed all over the township.

From the correlation analysis, it's also revealed that the different factors have different degree of influence on land value. Accessibility is the main factor with the highest level of relationship with the dependent variable Y. The beta weights for each factor also indicate that the different factors have different levels of significance in influencing the dependent variable. From the analysis of beta weights, it can also be concluded that accessibility is the main determinant of variation in land values in Kitengela township. This findings therefore nullifies the study objective which stated that increase in land values is as a result of changes in population in the area.
5.2. Recommendations.

In light of the above findings and conclusions, the following recommendations are suggested.

1. **Expansion of infrastructure and social amenities.**

The research has shown that there is lack of enough and well distributed amenities and social infrastructure. Apart from the main Namanga road which is tar surfaced, the other feeder roads within the township are earth surfaced. This renders them dusty during the dry season and impassible during the rainy season. The township also depends on water supplied from the Export Processing Zone which is not well distributed to all parts of the township and which the council authority has very little say on its distribution.

Provision of social amenities such as schools, hospitals and internet facilities are also not uniformly distributed. Most of this facilities are provided along the main road and in pockets which are not well distributed within the area. There is no laid sewerage system and for rain water. The locals use septic tanks for their sewer which they later empty by use of hired exhausters which has proved to be too costly for the area residents. There is however a proposed sewer plan for the township which the council has not been able to finance.

As a result of this, the researcher recommends that the council encourages a policy aimed at uniform growth. Infrastructure is important for the services it provides. Infrastructure provides services that support economic growth by increasing the productivity of labors and capital thereby reducing the costs of production and raising profitability, production, income and employment. Provision of good transport network and social amenities in the hinterland will also open up other areas far from the main road. This will reduce the effective demand of land within the CBD while increasing demand of land in the hinterland since such areas become accessible too. The local authority can also partner with the private sector to in provision of infrastructure and amenities.

while the private sector may be responsible for the financing, construction and maintenance of social infrastructure, and some non-core services, the local authority would still provide the core
services to the community especially for the low income groups, such as schools and providing clinical services to patients. The policies should require that privately financed option demonstrate superior value for money to the government and community compared to conventional, publicly funded approaches to infrastructure provision. The local authority can start negotiations with the manufacturing companies within the area to finance some of the projects as part of their social responsibility to the locals.

2. **Comprehensive land use planning.**

Land use planning is highly recommended as it will determine the community goals and aspirations in terms of community development. The outcome of comprehensive planning will be a comprehensive plan which will inform related policies in terms of transportation, utilities, pattern of land use, recreation and housing. The larger area supports a substantial wildlife population, particularly in the rainy season when animals disperse southwards from Nairobi National Park hence zoning of areas is critical to determine areas for livestock and wildlife and define limits to urban expansion and the extent of sub-division of land. This is ensured through strengthening, empowering and charging the municipal or county councils with the responsibility of policing of land use regulations.

3. **Provision of cheap housing.**

Housing is a major concern for all people as the wellbeing of a country is reflected in its people enjoying a certain standard of living. Residential and neighbourhood satisfaction is an important indicator of housing and condition. The research has shown emergence of substandard housing in Kitengela such as Noomcoppir and Kyangombe. This is as a result of influx of people due to the location of the cement manufacturing industries in Athi-river and the Export Processing Zone on the Northern part of Kitengela. Most of the employees are casual workers who cannot afford to pay the high rents demanded by the landlords of the various estates in Kitengela. The researcher also found out that the council has not provided any housing units. It is therefore recommended that the council provides low cost housing to accommodate the low income residents and prevent further emergence of substandard housing.
5.3. Areas of further study.

1. Most the industrial activities take place on the Northern part of the town. This include the cement manufacturing industries and the location of the Athi-river Export Processing Zone. It’s of paramount importance to study the impact this has to Kitengela town in terms of economic development.

2. Kitengela area supports a substantial wildlife population, particularly in the rainy season when animals disperse southwards from Nairobi National Park. In the recent past, there has been cases of human wildlife conflict hence it is of great importance to study the impact that Kitengela has on the wildlife and suggest ways to settle the human wildlife conflict.

3. A study to analyse the environmental impact that Athi-river Export Processing Zone and the cement manufacturing industries has on the town.

5.4. Limitations to the study

1. Among the questionnaires distributed, some were returned blank, not fully filled while others were misplaced by the respondents. The principle reason for lack of response could be lack of interest in research oriented studies by the respondents.

2. There was very short time for undertaking an exhaustive field study and the researcher had no enough funds to fully establish some issues.

3. Bureaucracies in government institutions limited access to information. The researcher could not get enough information from the ministry of lands, Kajiado lands office due to the conservative nature of the land officers and their unwillingness to assist in the areas of interest.
Works Cited


APPENDIX 1

SPSS correlation tables

<table>
<thead>
<tr>
<th></th>
<th>Value of the land</th>
<th>Demand for land</th>
<th>Parcel size</th>
<th>Accessibility (metres)</th>
<th>Location from the CBD</th>
<th>Security</th>
<th>Neighbourhood qualities</th>
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<td>.000</td>
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|                      | Demand for land   |                |             |                        |                       |          |                        |
| Correlation          | .820              | -951           | -836        | -802                   | .801                 | .759     |                        |
| Sig. (2-tailed)      | .024              | .001           | .019        | .030                   | .030                 | .048     |                        |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

|                      | Parcel size       |                |             |                        |                       |          |                        |
| Correlation          | -.661             | -.951          | 1           | .745                   | .752                 | -.799    | -.725                  |
| Sig. (2-tailed)      | .106              | .001           | .055        | .051                   | .051                 | .031     | .065                   |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

|                      | Accessibility in meters | | | | | | |
| Correlation          | -960               | -836           | .745        | 1                      | .979                 | -.915    | -.926                  |
| Sig. (2-tailed)      | .001               | .019           | .055        | .000                   | .004                 | .003     |                        |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

|                      | Location from the CBD | | | | | | |
| Correlation          | -898               | -802           | .752        | .979                   | 1                    | -.916    | -.909                  |
| Sig. (2-tailed)      | .006               | .030           | .051        | .000                   | .004                 | .005     |                        |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

|                      | Security           |                |             |                        |                       |          |                        |
| Correlation          | .854               | .801           | -.799       | -.915                  | -.916                | 1        | .837                   |
| Sig. (2-tailed)      | .014               | .030           | .031        | .004                   | .004                 | .019     |                        |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

|                      | Neighbourhood qualities | | | | | | |
| Correlation          | .820               | .759           | -.725       | -.926                  | -.909               | .837     | 1                      |
| Sig. (2-tailed)      | .024               | .048           | .065        | .003                   | .005                | .019     |                        |
| N                    | 7                 | 7              | 7           | 7                      | 7                    | 7        |                        |

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Model Summary

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a. Predictors: (Constant), Accessibility in meters, Parcel size, Neighbourhood qualities, Location from the CBD

ANOVA

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a. Predictors: (Constant), Accessibility in meters, Parcel size, Neighbourhood qualities, Location from the CBD
b. Dependent Variable: Value of the land
Appendix 2

Questionnaire formulation

Declaration: This questionnaire is meant for academic purpose only and the information will remain confidential.

Respondent

Instruction:-(Tick as appropriate)

Residential Rental Survey Questionnaire.

1. Name of estate ..............................................................................................................
2. Name of Tenant;.........................................................................................................Phone No;..............................................................................................................Signature;........................................................................................................
3. What is the approximate distance of the estate from the main road?........................
4. (a) What is the approximate distance of the estate from the town centre?...................
   (b) Would you wish to own a plot near the main road? Yes ( ) No ( )
   (c) If yes to (b) explain why .................................................................................................................................
5. How is the intensity of land use for plots near the main road compared to other plots a few kilometers away?
   Very high ( )
   High ( )
   No deference ( )
6. Do you have any of the following services offered in your premises?
   a. Water.(If Yes Specify the source) ..............................................................................
   b. Electricity..............................................................................................................
   c. Drainages............................................................................................................
      If yes to (c) specify. Mains ( ), Septic ( )
   d. Security.............................................................................................................
   e. Internet..............................................................................................................
   f. DSTV/ZUKU.......................................................................................................
   g. Any other (specify)............................................................................................

   (a) What services do you enjoy from the local authority?
   ...............................................................................................................................
   (b) In your opinion, are the services provided adequate? Yes ( ), No ( )
   (c) if no, do you think this has affected the respective land value? Yes ( ), No ( )
   (d) How important are the services not provided to your plots?
7. What is your opinion about the location of the plot? Ideal ( ), Not ideal ( )
(Give reasons for your answer)

If the location is not ideal, which location would you prefer and why?

8. Has topography affected the choice of estate. Yes ( ), No. ( ). If yes, please explain how the topography has influenced your choice.

9. What kind of facilities does the neighborhood have?
(a) Schools ..............................................................
(b) Hospitals ............................................................... 
(c) Type of housing ..................................................
(d) Any other (specify) ..............................................

10. What is the accommodation for the estate?
specify whether it is:
(i) Bedsitter:
(ii) One bedroom house-self contained
(iii) Two bedroom house-self contained
(iv) Three bedroom house-self contained
(v) Any other (specify) ..............................................

For how long have you been a tenant in this estate? ..........................................................

11. How much rent have you been paying over the following years for each type?
Indicate

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12. In your opinion, what has been the reason for the increase or decrease of rent over the years?

..........................................................................................................................................................
Commercial Rental Survey Questionnaire

Declaration: This questionnaire is meant for academic purpose only and the information will remain confidential.

RESPONDENT

Instruction: (Tick as appropriate)

1. Name of respondent; .......................................................................................................................... Phone No; .......................................................................................................................... Signature;

2. Name the location of your business by street ..............................................................................

3. Name the type of business you engage in. Specify if;
   a. Shop
   b. Hotels and restaurants
   c. Offices
   d. Others (specify)

4. What is the approximate distance of the business from the main road? .................................

5. (a) What is the approximate distance of the business from the town centre? .........................
    (d) Would you wish to own a plot near the main road? Yes ( ) No ( )
    (e) If yes to (b) explain why ........................................................................................................

6. How is the intensity of land use for plots near the main road compared to other plots a few kilometers away?
   Very high ( )
   High ( )
   No defference ( )

7. Do you have any of the following services offered in your premises?
   h. Water. (If Yes Specify the source) ..............................................................................................
   i. Electricity......................................................................................................................................
   j. Drainages......................................................................................................................................
      If yes to (c) specify. Mains ( ), Septic ( )
   k. Security.......................................................................................................................................
   l. Internet...........................................................................................................................................
   m. DSTV/ZUKU...............................................................................................................................
   n. Any other (specify)
      .........................................................................................................................................................

8. (a) What services do you enjoy from the local authority?
     .......................................................................................................................................................
(b) In your opinion, are the services provided adequate? Yes ( ), No ( )
(c) if no, do you think this has affected the respective land value? Yes ( ), No ( )
(d) How important are the services not provided to your plots?
...........................................................................................................................................................What is your opinion about the location of the plot? Ideal ( ), Not ideal ( )
(Give reasons for your answer)
...........................................................................................................................................................
(a) Do Local Authorities actions (e.g Licensing and taxation) interfere with your business? Yes ( ), No. ( ).
(b) if Yes, explain how.
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Appendix 3

Field interview schedule.
Declaration: This field interview schedule is meant for academic purpose only and the information will remain confidential.

Topic of Study: An analysis of factors influencing changes in land values.
A case study of Kitengela town

PART A
GEOGRAPHICAL INFORMATION
Location

Respondent; Lands officer.
Name;.................................................................Department.......................................................
Phone.No;..........................................................Signature;.......................................................

1. What's the location of Kitengela town?
   District;..................................................Province..........................................................
   Longitude; (.........................), Latitude; (.....................), Altitude; (.........................)
2. Distance from Nairobi;..............................Coverage (sq.km);.............................................
3. Administrative function (Please specify)..........................................................................
   ................................................................................
   ................................................................................
4. What's the general slope of the town from North to South?...........................................
5. What is the geology and soil conditions of Kitengela town?...........................................
   ...............................................................................................................................

Land transaction between 2003 and 2012

<table>
<thead>
<tr>
<th>Date</th>
<th>Parcel No</th>
<th>Location</th>
<th>Area (acres)</th>
<th>Total sale price (Kshs)</th>
<th>Price per rent area (acres)</th>
</tr>
</thead>
<tbody>
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</table>

(Obtain location plan for Kitengela town)
Climate

Respondent; Meteorological Officer
Name: .......................................................... Department: ..........................................................
Phone. No: .......................................................... Signature: ..........................................................

1. Is there any recording for Kitengelea town temperatures/precipitation? If Yes, specify.

Temperature.

<table>
<thead>
<tr>
<th>Period</th>
<th>Mean Maximum (Deg.C)</th>
<th>Mean Minimum (Deg.C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td></td>
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<td>October</td>
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<td>November</td>
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<tr>
<td>December</td>
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<td>YEAR</td>
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Precipitation.

<table>
<thead>
<tr>
<th>Period</th>
<th>Mean Precipitation</th>
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<tbody>
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<td>January</td>
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<td>December</td>
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<td>YEAR</td>
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2. Are there specific wind records for Kitengela. If yes, specify.

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PART B

INSTITUTIONS AND INDUSTRIES
1. What kind of institutions are available?
   Schools / Hospital
   Administrative institutions e.g, prison, provincial administration e.t.c
   Water supply / existing sewage system
   Hostels / Slaughter house.
   Any other (specify)

   Schools
   Respondent; District education officer.
   Name; ............................................................ Phone no; ...................................................
   Signature; .........................................................................................................................

<table>
<thead>
<tr>
<th>Name of school</th>
<th>Type of school (D/B)</th>
<th>Number of pupils approx</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
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   Hospital
   Respondent; health officer.
   Name; ............................................................ Phone no; ...................................................
   Signature; .........................................................................................................................
   If hospital specify; location, no of staff houses if any, no of beds and the average no of patients.
   .............................................................................................................................................
   .............................................................................................................................................

   Water supply/sewage system
   Respondent; town council officer
   Name; ............................................................ Phone no; ...................................................
   Signature; .........................................................................................................................

   1. Is there a water supply plan for the town? .................................................................
   If yes specify;
   (a). Source of water; ...........................................................................................................
(b). Distribution of water in the town

(c). Daily consumption (m$^3$)

(d). Any proposed extension projects to water supply

2. Is there a sewer system plan for the town?
   If yes specify;
   (a). Year of construction
   (b). Areas covered in the town

<table>
<thead>
<tr>
<th>Area</th>
<th>Diameter</th>
<th>Approximate length (km)</th>
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<tbody>
<tr>
<td>1</td>
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</table>

(c). Any proposed extension projects to water supply

(d). What's the state of sanitary condition in the unsewered areas

Other institutions (specify)
PART C

HOUSING.

Respondent: town council officer
Name:............................................................Phone no:............................................................
Signature:....................................................................................................................................

1. What are the major land uses in Kitengela town
   Agricultural land use
   Commercial land use
   Residential land use
   Industrial land use
   Recreational land use
   Any other (specify).............................................................................................................

2. What type of housing is available?
   Town council estate (specify i.e; name of estate, type of estate e.g high/medium/low class estate)
   ................................................................................................................................................
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   Substandard housing (specify)
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   Planned housing schemes (list the areas with planned housing)
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   Government housing quarters (specify; Location and name of the housing scheme, financing and management of the scheme)
   ................................................................................................................................................
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   Individual housing estate estate (specify; Name location and use of the estate)
   ................................................................................................................................................
   ................................................................................................................................................
   ................................................................................................................................................
Appendix 4: Site photos

Commercial land use Properties

![Commercial land use Properties 1](image1)
![Commercial land use Properties 2](image2)

Residential Land Use Properties

![Residential Land Use Properties 1](image3)
![Residential Land Use Properties 2](image4)
Industrial land use Properties

Namanga road (main road)  Feeder road

DO/Chiefs office  Kitengela Health Centre  Athi-river G.K Prison.