# FACTORS INFLUENCING THE PRICE OF LAND IN NAKURU COUNTY

**DENNIS MATHENGE WACHIRA**

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# DECLARATION

This research project is my original work and it has not been presented for any academic award in any university or institution of higher learning.

Signature: ..... Date: .....

Dennis Mathenge Wachira

D61/79219/2015

This research project has been presented for examination with my approval as the University Supervisor.

Signature: ..... Date: .....

Dr. Josephat Lishenga

Lecturer, Department of Finance and Accounting

School of Business

University of Nairobi

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I wish to sincerely thank my supervisor Dr. Josephat Lishenga for his guidance and support towards my research project: my close circle of friends who I learnt a great deal from and my wife who challenges me to always achieve my full potential.

# DEDICATION

I dedicate this research project to all the people who value, advance and disseminate knowledge all over the world.

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| | | |
|---|---|---|
| CBK | - | Central Bank of Kenya |
| CPI | - | Consumer price index |
| GDP | - | Gross Domestic Product |
| HP | - | House Price |
| KNBS | - | Kenya National Bureau of Statistics |
| NCF | - | Net Cash Flow |
| NOI | - | Net Operating Income |
| OECD | - | Organization for Economic Cooperation and Development |
| UK | - | United Kingdom |
| USD | - | United States Dollars |

# ABSTRACT

The objective of the study was to find out the factors influencing land prices in Nakuru County. This was prompted by the recent upsurge of land prices in the country and the researcher was particularly interested in Nakuru County. The real estate sector experiences a series of booms and busts and it was therefore important to find out what is causing them. The study aimed to cover several research gaps among them; whether the variables that influence land value in mature markets like Japan are the same in Kenya, and apart from the variables covered by local studies whether other variables like speculative investment demand do influence land prices. The study adopted a descriptive study design and the target population was the land owners in the four wards of Naivasha as shown in the county government of Nakuru records. Sample was obtained using the stratified sampling method to come up with the most representative sample. The dependent variable was the land price while the independent variables were the speculative investment demand, interest rate, proximity to urban center and real GDP. Data was collected from both primary and secondary sources and analyzed using SPSS version 21.0 the model explained only 76.6% of the relationship between the independent variables and the dependent variable. ANOVA analysis showed that the probability of the value of 0.000 which was less than 0.05 which indicated that the regression relationship was highly significant in predicting how speculative investment demand, Interest rates, Proximity to urban center and Real GDP influenced the price of land in Nakuru County. The findings of the study showed that all the four independent variables had a significant positive relationship with land prices. The study was therefore similar to studies done both internationally and locally. The researcher therefore recommends that policy makers in government work on increasing the growth of GDP. Commercial banks should lower the lending interest rate so that people can access cheap loans and thus afford to buy land. Lastly, the government should endeavor to tarmac all feeder roads to increase the value of land.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

Pagourtzi, Assimakopoulos, Hatzichristos and French (2003) define real property as all rights, benefits, interests, and hindrances intrinsic in the possession of physical real estate, in which case real estate is the land jointly with all developments that are permanently attached to it and all accessories contained in it. Investors also acquire some rights when they invest in real estate, these rights are: developing, leasing, improving, controlling, exploiting, occupying, selling, and pledging. All these rights have evolved to become property rights (Brueggeman & Fisher, 2011).

The market for real estate is not the same as other financial markets in several ways. It is extremely heterogeneous because of its physical attributes and location. Traders in that market are met with illiquidity, huge transaction costs, carrying costs, taxes, and search costs that arise from real estate's heterogeneity. All these costs are frictions that point out towards a market that is not efficient compared to other financial markets (Ghysels, Plazzi, Torus & Valkanov 2012).

Real estate is an important international and local asset estimated to be about 55 percent of world assets (Bao, Glascock, Zhou and Feng, 2015). The prices of real estate have more than doubled in the past few years in Kenya and this stirs some pertinent questions on what is causing the upswing in prices. Realtors and brokers play a large part in influencing the price since they act on behalf of the buyers and sellers. The expansion in the sector for real

estate is being fueled by: a strong economy, protection of property law, an emerging middle class, a robust banking sector, urbanization, and mega infrastructure projects by the government (Omboi & Kigige, 2011).

This study will be based on several theories which include the agency theory, the hedonic model of pricing theory, efficient market hypothesis and lastly real estate property appraisal or valuation theory. Several studies have been done on real estate property in Kenya touching on various topics but none has been done on the factors influencing land prices in Nakuru County. This study therefore seeks to establish those factors and also find out if the market for real estate in Nakuru behaves like other parts of Kenya that have been targeted in previous studies or is different.

### 1.1.1 Real Estate Prices

Malpezzi and Watcher (2005) define price as the assets value which is equal to what the economic players are willing to pay for real estate property. According to (Jennergren, 2011) the income approach is highly preferred by investors as a valuation technique and is closely similar to the discounted cash flow analysis carried out on bond and equity investments by both appraisers of commercial properties and underwriters of real estate backed investments. The process of valuation starts by forecasting the income from the property which can be the projected lease payments or for hotels the anticipated occupancy multiplied by the mean cost of the room. Then, subtracting all the property level costs plus the cost of finance leaves the net operating income (NOI) or cash flow net of operating expenses. When all capital costs plus any investment capital used in the maintenance or

repair of the property and all other indirect expenses from NOI are subtracted the result is the net cash flow (NCF). Since cash is not retained for properties or a dividend policy applied NCF is equal to the cash available to investors and is similar to cash from dividends which is used in valuing equity or fixed income investments. The property value is determined when dividends are capitalized or cash flow streams (inclusive of any residual value) are discounted during a certain investment period. (Dean, 2014).

### 1.1.2 How the factors influence the price of real estate property

The hedonic model of pricing theory comes out clearly between real estate pricing and the factors that influence the prices. (Lancaster, 1966) argues that utility is not automatically created by a good but by the individual characteristics of that good. To be specific a good or item's utility is basically the sum of the individual utility of each of its characteristics. This theory has been shown to hold by (Choy, Mak and Ho, 2007) who carried out a research in Hong Kong using the hedonic price model and all the variables were found to be statistically significant. In addition , (Li, 2008) in his study finds out there are other ways to the estimation of the price of land other than location convenience in an urban modern economic perspective. Owing to progress in technology, and particularly in telecommunication sector and a land market that is growing in the intricacy of its composition, the market has produced new factors affecting land price behavior. Therefore, it's important to observe the land price behavior from new angle.

The agency theory has also been shown to hold between the real estate prices and the factors influencing the prices. This relationship arises due to there being no centralized market for exchange of real estate therefore buyers and sellers have to pay significant search costs in the form of brokerage commissions and time. The informational friction is also made worse by the heterogeneity and asymmetry of the quality of real estate, which increases the cost of quality search and contracting substantially (Chau, Wong &Yiu, 2003).

The size of the parcel is traditionally recognized as an important determinant of land value: the second determinant is location and it generally acts as a proxy of the economic and social characteristics of the neighborhood of the land parcel. Thirdly, government regulations also participate in determining the value of land (Bao, et al. 2015). It is therefore evident that land prices are influenced by many factors which differ in relevance. This empirical evidence shows that there exists a connection between the theory of real estate appraisal or valuation and the factors influencing real estate prices.

### 1.1.3 Real estate in Nakuru County

The real estate sector undergoes a cycle of booms and busts. For instance Eveready East Africa, a battery manufacturing company located in Nakuru town, closed shop owing to stiff competition from cheap imports. The company has shelved its plan to build a shopping mall on is prime land that was to be a mix use development comprising of apartments and a shopping mall. Instead it would convince shareholders to sale the land and offset a costly debt and provide free cash flows for investing in other sectors (Muhoro, 2016).

Upcoming gated community estates that are meant for middle and upper classes include the Italian luxury court five kilometers from Naivasha town. The demand for houses has also pushed up land prices especially by developers of holiday homes who have increased their activities in Navasha (Gitonga, 2014). It is therefore important to find out what these factors are and how they are influencing real estate property prices as it is a very important asset class (Bao et al, 2015).

Studies done that look at the variables that might influence property prices include (Ho & Ganesan1998) who carried out a study on the supply of land and residential housing prices; they found out that speculative demand for housing has a significant but modest impact on housing prices. This conclusion was also arrived at by (Levin & Wright 1997) who formalized the method which shows how price speculation occurs in the market for housing and provided some evidence on how the speculation is a possible determinant of housing prices in London and the rest of the UK housing markets.

In another study, (Li, 2009) find out that closeness to CBD increases the value of real estate as the transport cost is lower. The distance from the urban center where the land is located is a major independent factor where readiness to purchase a specific piece of land at a certain price level depends. Consequently, a tenant is able to bid a higher rent when economic activities depend a lot on meeting the customers as first and as frequently as possible owing to the closeness to the city center. Li (2015), in his study finds out that interest rates have a major influence on real estate developers who provide housing in the real estate market. He further argues that when interest rates increase, the real estate

developers construction costs increases thus driving up the price of real estate property. On the other hand, buyers are faced with higher cost of purchasing houses and more pressure in repaying their loans which balloons with additional interest rates. Therefore, the increase in interest rates lowers the demand for house purchase and the decline of house prices.

The overall economic activity is measured through GDP. Therefore, when there is change in real GDP, it translates into a change in real economic expansion which usually affects the real estate property market. Furthermore, there is increased business confidence brought by economic certainty as a result of an increase in real GDP. From the foregoing it is argued that demand for real estate property can be pushed up by an expansion in the economy, which leads to house prices going up and consequently the returns, ceteris paribus. In addition, the growth in real GDP means that the tenants' ability to pay increases which also causes the general rates in rent to go up, ceteris paribus. Thus, one can expect a positive relationship between changes in real GDP and returns from housing property (Clerk and Daniel, 2006).

### 1.2 Research Problem

This study aims at identifying the factors that influence real estate property prices. These factors are anchored in theory as shown in 1.1.2 From the foregoing this study will look at the following variables: speculative investment demand, proximity to urban center, interest rates and real GDP and try to establish whether there is a significant relationship between these factors and the real estate property prices in Nakuru county. Real estate has always

attracted a lot of interest in the global context and among the studies conducted internationally that try to identify the factors influencing real estate property prices include (Li and Chiang, 2012) who studied the factors behind China's real estate price appreciation in the duration 1998 to 2009 on a monthly basis. Their findings indicate that the real estate prices in China are pushed up by both institutional and economic factors. They recommend that a research be done to focus on two directions : first the impacts of land or disposable income on real estate price; second the objectives of monetary and fiscal policies on housing price by using a recently adopted econometric approach of factor- augmented vector autoregressive (FAVAR) model for analysis.

This study will try to address these gaps by looking at land prices and what influences it. Hidano and Yamamura (2004) did an analysis using a hedonic pricing model on changes in land prices in Japan which is a mature market and discovered besides other variables, lending behavior by banks and industrial investment activities was the cause for explaining the major effect on the changes in land value. In order to carry out a robust analysis they noted that it was important to access enough and reliable transaction data. Therefore, this research will try to fill the gap by gathering enough transaction data to conduct the study.

In the Kenyan context, studies done on the real estate sector include Julius (2012) who studied the determinants of residential real estate prices in Nairobi and pointed out that further research should be done to cover Kenya and also the study should extend the time horizon. Money supply as one of the factors in her model had no relationship with what determines real estate prices. Muthee (2012) who sought to explain the relationship

between economic growth and prices of real estate in Kenya suggests further research should be carried out for a longer duration and on a year to year basis.

A further research should be done on real estate sector policy on national economy. Marete (2011) on a study of what determines the prices of real estate property in Kiambu Municipality in Kenya suggests that comparative research be done between real estate property prices in the rural areas and those in the urban areas and find out if the prices are affected by the same factors. This research study aims at filling these gaps by answering the following research question: what are the factors influencing real estate property prices in Nakuru county?

### 1.3 Research Objectives

The objective of the study was to find out the factors influencing the price of land in Nakuru County. The specific objectives were to find out if Speculative investment demand, interest rates, real GDP and proximity to urban center influence land prices.

### 1.4 Value of the Study

This study will be valuable to investors in the real estate sector who will benefit immensely as they will discover what drives property prices. This information will improve their investment decisions and strategies.

Property owners will also benefit as they will be better informed on what affects the price of their properties. This information will help property owners to price their properties efficiently and thus get the optimum price.

The financial sector will also benefit, banks may find this study relevant because real estate comprises a very big chunk of their collateral, investment funds will also benefit since real estate is one of the component of their investment portfolios. Government policy makers will be better placed to make strategic decisions when they are formulating policies on real estate. Tax agents will know how to plan their tax policies based on the factors that affect real estate prices when coming up with taxes on real estate.

This study will also be valuable to other students who wish to refer to the literature review and also as a basis for further research owing to the limitations or to expand on the study.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

In this section both the theoretical and empirical review of literature was covered in the area of real estate property sector. The aim of the review was to understand the theory behind real estate and also confirm whether the theories have been proved empirically.

## 2.2 Theoretical Review

The research study was anchored on four theories that formed the basis for theoretical foundation. The theories included: agency theory, hedonic model of pricing, efficient market hypothesis and real estate property appraisal or valuation theory.

### 2.2.1 The Agency Theory

In their seminal paper Jensen and Meckling in 1976 proposed that the relationship between principals and agents in business is explained by the supposition of the agency theory. When an agent acts for, on behalf of, or as a representative for the other, identified as a principal, in a particular area of solving problems through decision making then there exists an agency relationship between them. The theory looks at how to ensure that agents (realtors and brokers) act in the best interests of the principals (home and land owners) in the real estate market. This theory is very relevant since the real estate sector is a classic example of conflict of interest between the principal who is the seller of a house or land and the agent who is the real estate broker.

In a research carried out by (Arnold, 1992) while looking at the agent - principal relationship between a home owner and a broker, the study revealed two principal-agent problems between them. The first problem was that the broker who is the agent may have an incentive to offer minimal effort in providing current market information about the search activity if the owner of the house is not keen on the brokers search activity. The second problem arose from the fact that owners of homes participate in the market infrequently and therefore they lack full information on demand and supply conditions in the housing market while brokers are seasoned participants who are better informed about the market conditions. House owners therefore rely on brokers to set up a reservation price. This information asymmetry can lead to brokers being enticed to misinterpret the market information to the detriment of the house owner. The agency theory is therefore relevant as it shows how property prices are set between agents and principles.

### 2.2.2 Hedonic Model of Pricing

Lancaster's seminal paper in 1966 was the beginning of an attempt to build a theoretical foundation for hedonic modeling. He presented a ground breaking theory of hedonic utility. In his argument he states that it is not always the case that a good creates utility by its self but instead it is the individual characteristics of a good that creates the utility. A good or item's utility to be specific is basically the sum of the individual utility of each of its characteristics. He further went on to argue that things such as goods or services can be categorized depending on the characteristics they hold. He noted that consumers while making a purchase decision refer to the group they belong to depending on the characteristics a good possesses per unit cost.

Even though Lancaster was the first to discuss hedonic utility, he didn't extend it to a pricing model. Rosen (1974) using the hedonic model of house prices approximates the implied price of every property characteristic by regressing transaction prices of properties on equivalent property characteristic. Hedonic models are best suited for markets in which a commodity can be embedded with varying amounts of each of a vector of utility-bearing attributes. This model has been widely accepted in the research for housing to investigate social ills like, ease of access to employment, neighborhood change, and racial discrimination. A property for residential use can be viewed as a package of utility producing attributes that are desired by consumers. The attributes are normally characterized by durability, spatial fixity, physical rigidity and when they are mixed differently they produce a good that is heterogeneous. The physical attributes of houses alone cannot fully explain the variations of prices since prices of houses are influenced by many intrinsic and outside factors. For instance, a change in relative price as a result of a lower transport cost due to the linkage of the suburban areas to urban areas by the introduction of a subway or highway is probably going to lead to homebuyers adjusting their combination of housing attributes to the new optimum and as well as switch their choice of residence. (Choy, *et al.*, 2007).

### 2.2.3 Efficient Market Hypothesis

Fama (1970) in his seminal paper on efficient market hypothesis (EMH) is credited as contributing a lot to modern finance. EMH is the idea that securities prices reflect all available information. He argues that in EMH competition between investors looking for supernormal profits leads to prices going to their "correct" value, therefore eliminating any

arbitrage opportunities as soon as they arise. Hence, a market is considered efficient in relation to some information if the same information cannot enable investors earn abnormal returns in comparison to the other investors. On the other hand when investors have insider information they can use it to participate in insider trading thus having the ability to earn excess positive returns.

Statman (1999) argues that market efficiency is the bone of contention among traditional finance, investment professionals and behavioral finance. In contention is the concept of "market efficiency" which he says has two meanings and one of them is that an investor cannot outperform the market systematically, while the other meaning is that the prices for securities are rational meaning that they display only "fundamental" or "utilitarian" characteristics, for example risk, but not "value expressive" or "psychological" characteristics like sentiment. Statman dismisses this second meaning.

This theory is useful in explaining investors' sentiment especially when it comes to pricing real estate property prices as shown by (Baker & Wurgler, 2006) who define investor sentiment as the inclination to speculate or as trading on a belief relating to future cash flows or risks that are not warranted by the existing facts.(Brown and Cliff, 2004) define investor sentiment as the speculators bias, described as excessive optimism or pessimism.Sentiment is investor expectations driven by irrational factors. Conventional financial markets presume that asset prices mirror existing public information and that rational investors prize assets fairly (Fama, 1979). On the contrary investors' belief about

expectations of market movement are based on sentiments, which is different from the investors' risk aversion that measures their taste for risky assets over risk-free assets.

### 2.3.4 Real Estate Property Appraisal or Valuation Theory

Baum, (1995) his seminal paper defines real estate appraisal or valuation as the procedure of valuing real estate property. The property's market value is what is usually vital. Property appraisals are required because unlike company stock, transactions in real estate do not occur frequently. In addition, there is a difference between one property to the next, an aspect that is absent in assets like corporate stock. Also, all properties are fixed in different locations which are an important part that determines their value. Due to the aforementioned nature of real estate property, appraisers who are qualified specialists are needed to advice on the value of a property. The appraiser usually presents a report on the value of the property to their client. The reports are the basis for issuing mortgage loans, for tax matters, for settling estates and divorces. The report from an appraiser sometimes is referred to by both parties to arrive at the sale price of the property.

## 2.3 Determinants of Real Estate Property Prices

### 2.3.1 Speculative Investment Demand

Ho and Ganesan, (1998) carried out a study on the supply of land and residential housing prices; they found out that speculative demand for housing has a significant but modest impact on housing prices. This conclusion was also arrived at by (Levin &s Wright 1997) who formalized the method which shows how price speculation occurs in the market for

housing and provided some evidence on how the speculation is a possible determinant of housing prices in London and the rest of the UK housing markets.

### 2.3.2 Proximity to Urban Center

Closeness to CBD increases the value of real estate as the transport cost is lower. The distance from the urban center where the land is located is a major independent factor where readiness to purchase a specific piece of land at a certain price level depends. Consequently, a tenant is able to bid a higher rent when economic activities depend a lot on meeting the customers as first and as frequently as possible owing to the closeness of the city center (Li, 2009).

### 2.3.3 Interest Rates

Li, 2015 in his study finds out that interest rates have a major influence on real estate developers who provide housing in the real estate market. He further argues that when interest rates increase, the real estate developers construction costs increases thus driving up the price of real estate property. On the other hand, buyers are faced with higher cost of purchasing houses and more pressure in repaying their loans which balloons with additional interest rates. Therefore, the increase in interest rates lowers the demand for house purchase and the decline of house prices. (Ding, 2014) finds that the loans borrowed by real estate investors are huge and they account for about 40% to 60% of the total proportion of loans in that particular year.

Further, there is a direct influence on the amount invested on real estate and the supply of real estate property as a result of the lending rate. Also a slight adjustment on the rate of interest has a significant impact on the real estate market. There will be a tendency for the government to use interest rates through fiscal policies to regulate the real estate sector. In this research interest rate is a major variable that influences the real estate property prices and therefore its effect will be investigated to check whether there is a significant effect on property prices.

### 2.3.4 Real GDP

The overall economic activity is measured through GDP. Therefore, when there is change in real GDP, it translates into a change in real economic expansion which usually affects the real estate property market. Furthermore, there is increased business confidence brought by economic certainty as a result of an increase in real GDP. From the foregoing it is argued that demand for real estate property can be pushed up by an expansion in the economy, which leads to house prices going up and consequently the returns, ceteris paribus. In addition, the growth in real GDP means that the tenants' ability to pay increases which also causes the general rates in rent to go up, ceteris paribus. Thus, one can expect a positive relationship between changes in real GDP and returns from housing property (Clerk and Daniel, 2006).

## 2.4 Empirical Review

Choy, Mak and Ho (2007) did a research from a Hong Kong perspective to approximate the prices of real estate. A model based on hedonic pricing to estimate the implicit price of

each property characteristic was employed. The data was from Quarry Bay District which was used as a case study. Other than the single mega-scale housing estate the district also comprises of many small and medium scale estates. The data series was calculated for the duration starting from July 1999 to June 2000, producing749 cross-sectional observations in total. Data was analyzed using Newey–West Heteroskedasticity Consistent Covariance and most variables were found to be statistically significant. These variables were: age, sea, garden, mass transport railway and fengshui. The Fengshui variable which is a deeply rooted traditional Chinese culture involving numbers and luck is not relevant to the Kenyan real estate context.

Li, (2009), in his study scrutinizes land prices changes in Beijing from 1993 – 2004. He uses regression analysis. The dataset is derived from the urban part of Beijing the period covered is from 1993 all the way to the first half of 2005. 5,269 in total of transactions including most of the commercial, mix use and residential land use types were used. To begin with, using box–cox transformation in regression to convert data into approximately normal distribution so that the data is more useful in statistical techniques based on the normality assumption, the box–cox model compared with the simple linear regression is a better fit of the original data. Secondly using a simple linear regression the results show that population has negative significance in all types of use other than on commercial land price where the variable in question is not shown to be statistically significant. In all categories of land use types GDP was statistically significant. Local financial revenue and wage levels are observed to be only significant in the price of industrial land.

There is a negative correlation between total investment in fixed assets and land prices in residential and mix use land types. In conclusion, the findings indicate that prices in residential land have been on a rising trajectory from 2000, signifying a robust demand for housing as a result of a thriving economy in China. In contrast, insufficiency in transactional data causes fluctuation in industrial land prices, on top of the fact that transactions in industrial land are normally linked with projects by investors from other countries where occasionally as an incentive, industrial land prices are set as a package that does not indicate prevailing market value. Furthermore, prices in commercial land exhibit a certain degree of fluctuation indicating that the nature of the real estate economy is normally volatile. In Beijing, statistical analysis points towards land prices being affected by market indicators such as investment and GDP growth. The researcher encounters a problem with lack of adequate market data on land transactions. This study is applicable to the Kenyan context as it shows a lot of similarity with the Kenyan real estate sector and the insufficiency of data on land prices is not applicable to since data is available.

Pavlov and Watcher (2010) while looking at the US real estate sector uses the version of the Longstaff and Schwartz (2001) least-squares simulation approach then applies regression analysis found out that the bank's lending sector developed new capability to present through financial innovation and deregulation aggressive products. Specifically, automated underwriting models made it possible to implement risk-based pricing, leading to the lending of mortgages that were riskier becoming prevalent in the late 1990s following the development of private label securitization of nonconforming loans. In the similar period, banks were allowed through deregulation to originate and securitize these

mortgages exclusive of having to account for the buyback requirements entrenched in these securities. In their conclusion, the availability of more funds to the borrower from banks increases the demand for more homes that ends up causing an upsurge in prices especially in a market with a fixed or inelastic supply. This study is very relevant because the automation and financial innovation is similar to what is going on with the Kenyan banking sector.

Li and Chiang, (2012) looks at the factors encouraging China's real estate price appreciation from 1998 to 2009 from month to month. They use Granger causality test, co-integration approach, vector error correction model, to investigate whether stable and long-run equilibrium relations are present between prices in housing and fundamental macro-economic variables, for instance GDP, CPI and land sale. A bilateral Granger causality is evident between HP and CPI. However, GDP does not Granger cause HP, showing personal gain (disposable income) does not draw level with national gain (GDP) in China. Co integration analysis indicates long-term equilibrium between the price of real estate (HP) and CPI or GDP, but not land sale. Between HP to GDP there is no feedback effect, indicating housing price appreciation does not translate in immediate capital gain or speculations in housing purchase. Moreover, lack of co integration relationships between land sale and HP is possibly caused by restrictive policies on land supply. The real estate price in China is pushed up by both institutional and economic factors. The institutional factors that push up real estate prices in china are not present in Kenya since the market for real estate in Kenya is free market.

Liu, Wang and Zha, (2013) look at land price changes and macroeconomic variations. They are keen on land price since it causes the most change in a house price when it fluctuates compared to the cost of the structure. In one of their observations, they note that there is empirical evidence that shows that the changes in land price and macro-economic variables move together not only during the US great recession, but also throughout the sample period that covers the years from 1975 to 2010. Through a four variable Bayesian Vector Auto regression (BVAR) model with the Sims and Zha (1998) prior. When land prices go through a positive shock they cause a persistent increase in land prices and all the other macroeconomic variables as well. They employed the model of dynamic stochastic general equilibrium (DSGE) to analyze their data and found out that a shock that drives up land prices raises firm's ability to borrow since land is major collateral in securing a loan and facilitates an expansion in production and investment.

There is specific evidence that points to co-movement between the prices for land and business investment. In their findings, macroeconomic variables and land prices are positively correlated over the business cycles. When there is a demand shock in housing that begins in the household sector it results into a force that causes land prices to fluctuate and the constant co-movements between business investments and land prices. It is also shown that firms become credit constrained. This study was done in the US where they had the requisite data. In Kenya getting data might prove to be difficult for a similar period. The study is very relevant since the macroeconomic variables are similar to those which exist in Kenya.

Marete, (2011) in her study to find out the factors affecting real estate property prices in Kiambu municipality uses a descriptive research design. She administered a questionnaire to a sample of 50 respondents through stratified random sampling from a population of 1,584 owners of property. An investigation of the data through the Statistical Package for Social Sciences (SPSS) Version 17 was utilized. The study discovered that there exists a significant relationship between real estate property prices and: location of a real estate property, purchasing power of the buyers, realtors influence on the prices, demand for real estate property. The key determinants being: location of real estate property and realtors influence on the prices. The concept of demand for real estate was not clearly defined and the study only covered a small area.

Omboi and Kigige (2011) undertook a research focusing on Meru municipality in Kenya to examine the factors that affect real estate property prices. A descriptive survey was used by giving out questionnaires. The target population composed of 15,844 real estate owners of both commercial and residential land and developed residential and commercial land within the selected five wards of Meru municipality. A total of 390 respondents were sampled using stratified sampling method then simple random sampling was applied to pick respondents in each strata. The analysis of the data showed that in Meru municipality rental incomes are crucial in influencing their prices. Of all the factors looked at income alone accounted for over 70% of the changes in real estate property prices in the municipality other factors remaining constant. The second most important factor was demand which contributed about 20% of the changes in prices. On the other hand, location of the property was found to be insignificant as well as realtors and brokers in determining

property prices in Meru municipality. The researcher only looked at four factors that influence real estate prices and two of them; location and realtors were insignificant. This calls for more research into other possible factors that influence the prices.

Karoki (2013) carried out a study whose objective was to find out the determinants of residential real estate prices in Kenya. Using a descriptive research design she adopted a multivariate regression analysis to come up with the model. Her population was the entire residential real estate properties in Kenya from a composite property index published by Hass consulting ltd on a quarterly basis from the last eight years. The data was analyzed using both descriptive and inferential statistics. Multiple regression analysis was also carried out and the results were that interest rates and money supply were the most significant variables that affect house prices. GDP and inflation were not shown to significantly affect house prices. The population survey was too general as the study purports to cover all the house prices in the whole country. There is no data on house price index that covers the entire country. The market for real estate is also not homogenous therefore it is necessary to carry out this study that focuses on a particular area.

### 2.5 Summary of Literature Review

The theory of agency explains the relationship between principals and agents in business. In real estate sector this relationship is very important as most transactions in this sector are conducted by agents on behalf of their principals. As most real estate properties are heterogeneous, the use of hedonic model of pricing is very pertinent as it estimates through regressing transaction prices of properties on equivalent property characteristic the hidden

price of each property characteristic. In the market for real estate, prices while transacting are set in a climate of confidentiality, negotiations are often shrouded in secrecy and there is no central repository from which information is readily available. This is in line with the theory of efficient market hypothesis where sellers have more information on the product than the buyer and this introduces frictions in the market due to information asymmetry. The real estate property appraisal theory proposes that due to the heterogeneous nature of real estate and lack of frequent trading, there is a need for professional appraisers who determine the value so that it can be used by several parties for various reasons.

The empirical literature review uncovers several gaps in both the international and local settings. For international studies, some variables such as fengshui in Hongkong which is a superstitious belief does not apply to the Kenyan context, another gap is lack of transactional data on land prices in china due to government restriction, also market immaturity in china for the study period. Another gap that emerges is that most studies do not delink land price from the cost of the structure which makes it difficult to explain land price and how it interacts with macro economic variables in the economy. In the local studies, the method of coming up with a sample is not clear as the stratification of the sample objects is not clearly explained variables are not clearly operationalized.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter covered the design and methodology that was employed in the research study in determining factors influencing real estate prices in Nakuru County. The scope of the study was the research design, the population to be studied, the sample size, data collection tools and the data analysis giving details of the model that was used in conducting the data analysis. Also included was the tests used to measure validity & reliability of the research instruments.

## 3.2 Research Design

Neuman (2010) defines a descriptive research as offering a significantly accurate picture, clarifying a sequence of steps or stages, locating new data and documenting a causal process. A descriptive study seek to answer 'when' 'who' 'where' 'what' and 'how' questions and its findings assist a researcher to comprehend the characteristics of a group or an individual in a given situation. A descriptive study is deemed the most suitable in gathering information on factors influencing real estate prices in Nakuru County since the variables cannot be directly observed hence the need for data collection that was then analyzed.

## 3.3 Population of the Study

Target population was composed of the entire set of individuals or objects to which a study was interested in generalizing the results and usually has observable similar characteristics

(Mugenda & Mugenda, 2003). The target population from which the study was undertaken was the real estate property owners who included people who own land, within the four wards in Naivasha sub county, Nakuru. There were 4,129 owners of plots in the four wards who were in the county government's record which include Lakeview, Viwandani, Maimahiu, and Maiella in Naivasha according to the valuation roll. (County Government of Nakuru, 2017).

### 3.4 Sample Design

Kothari (2004) defines a sample design as a clear-cut plan for finding a sample from the sampling frame. It is the formula used or method for choosing some sampling units from which inferences will be made concerning the population. A sample design is usually prepared before data collection. In this study the sample comprised of 80 respondents who were selected through the method of stratified random sampling. This sample size was adequate for parametric tests and it was also within the budget and time limits that the researcher had to work with. When members of the population are divided into homogeneous subgroups before sampling, then it is referred to as stratification. When sub populations vary within an overall population statistical surveys, it is beneficial to sample each sub population (stratum) independently. Every element in the population should only be assigned to one stratum and the strata should be mutually exclusive in addition to being collectively exhaustive. Then random or systematic sampling should be applied within each stratum. When this process is followed it improves the reliability of the sample by reducing the sampling error. The result is a weighted mean that has less variability compared to the arithmetic mean of a random sample.

### 3.5 Data Collection Method

Data was derived from both primary and secondary sources. Primary data was sourced through the use of questionnaires. The respondents in the sample filled the questionnaires provided while being assisted by research assistants where necessary. The research assistants came in where the respondents were unable to interpret the questions during any scheduled meetings; otherwise they dropped and picked the questionnaires as agreed. Both closed and open ended questions were used to obtain responses and were to cover the two independent variables, speculative investment demand and proximity to urban center. While secondary data was sourced from Kenya National Bureau of Statistics for real GDP and CBK for interest rate.

### 3.6 Validity and Reliability

Morse, Barrett, Mayan, Olson, and Spiers (2002) argue that the concepts of reliability and validity are suitable and cover all scientific paradigms. Validation is the process of investigating, checking, questioning, and theorizing in order to ensure rigor. Allen and Yen, (1979) defined reliability as the degree to which a test, questionnaire, observation or any measurement procedure produces similar results when the trials are repeated. The following tests were conducted to ensure validity and reliability: diagnostic tests, auto correlation, multi co linearity, normality, ANOVA, coefficient of determination and T – tests.

### 3.7 Data Analysis

According to (Gay, 1992) Data analysis involves organizing, explaining, and accounting for the data. The analysis major goal was to help in understanding the observed patterns,

categories and regularities. Data analysis was carried out by use of both descriptive and inferential statistics. Regression analysis was applied on the model expressing the relationship between the dependent variable and independent variables through the use of Statistical Package for Social Sciences (SPSS). Correlation was used to check the overall strength of regression model and the individual significance of the independent variables.

### 3.7.1 Empirical Model

The regression equation assumed the following form:

$Y=\alpha+\beta_1X_1+\beta_2X_2+ \beta_3X_3+\beta_4X_4+\beta_5X_5+ \varepsilon$

Where:

Y – Land price

$\alpha$ - is a constant

X1- speculative investment demand was indicated by checking off the answer to what one intended to do with the land.

X2 – Interest rates was measured using the mean lending interest rate from CBK

X3 – Proximity to urban center was measured by the distance in kilometers from the land to the major town in the area of study.

X4 – Real GDP was measured using the figures provided by KNBS.

$\beta 0, \beta_1.....\beta_n$. - Regression coefficients

$\varepsilon$ - Error term

This study was conducted for the period between 2012 – 2016.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter presents the analysis and findings of the study as indicated in the research objective and methodology. The main aim of the study was to identify the factors influencing the price of land in Nakuru County. The data was accumulated from both the primary and secondary sources. Section 4.2 presents response rate, 4.3 descriptive statistics and section 4.4 presents the inferential statistics.

## 4.2 Response Rate

The study targeted a sample of 80 land owners in Nakuru County. However, out of 80 questionnaires distributed, 67 respondents completely filled in and returned the questionnaires, contributing to 83.7% response rate. This is a reliable response rate for data analysis as Mugenda and Mugenda (2003) pointed that for generalization a response rate of 70% and over is excellent.

**Table 4.1: Response Rate**

| Response | Frequency | Percentage (%) |
|---|---|---|
| Filled in questionnaires | 67 | 83.7 |
| Un returned questionnaires | 13 | 16.3 |
| **Total** | **80** | **100** |

**Source: Research Data (2017)**

### 4.3 Demographic Information

The respondents were asked to indicate their gender, age, and marital status, level of education, sector, and ward, size of land they own and how they acquired the land.

#### 4.3.1 Gender

From the study findings, 62.7% of the respondents were male while 37.3% were female. From the study, it can be concluded that the number of men who own land in Nakuru County are more than women. Results are presented in figure 4.1.

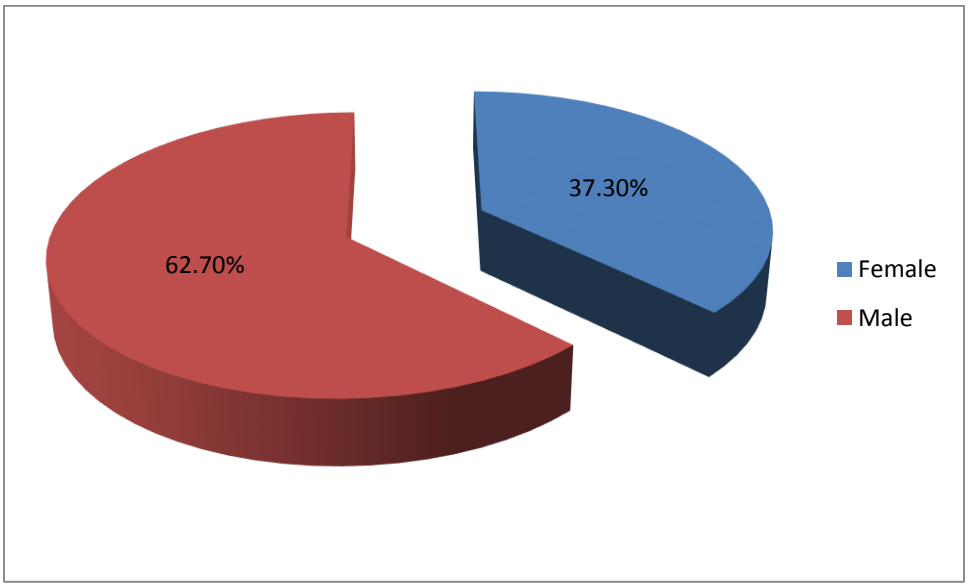


**Figure 4.1: Gender**

#### 4.3.2 Age

The study also sought to determine the respondents' distribution by age. As illustrated in figure 4.2, 52.2% were aged between 36 and 45 years followed by 31.9% of the respondents aged above 45 yearsand15.9% were aged between 26 and 35 years. As depicted by the age distribution, it is clear from this analysis that the most land owners are aged 36 and above.

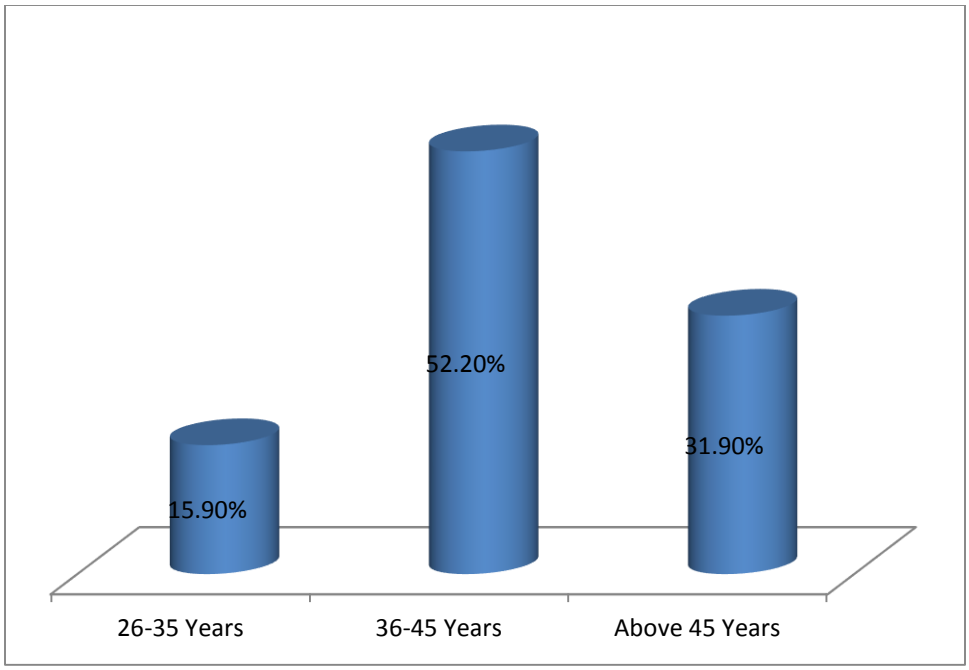


**Figure 4.2: Age**

### 4.3.3 Marital Status

The study also sought to establish the marital status of the respondents. 61.2% of the respondents indicated that they were married while 22.4% were single. Those who indicated that they were widows/widower and separated/divorced were represented by 9% and 7.5% respectively. It is clear from the findings that, most of the respondents were from stable families which are an indication of them being responsible.

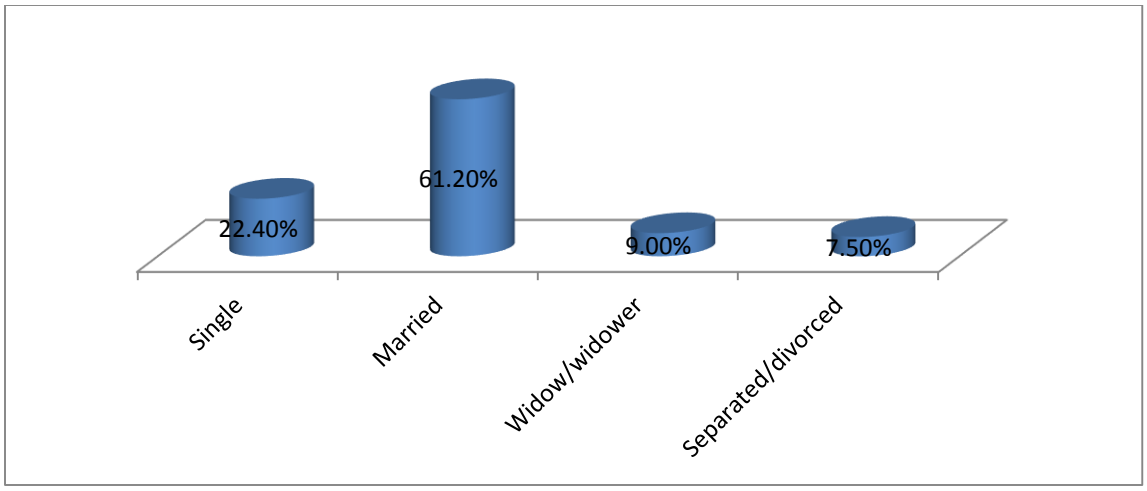


**Figure 4.3: Marital Status**

### 4.3.4 Level of Education

The study further sought to establish the respondents' level of education. From the findings, 55.2% of the respondents were College/university graduates, 28.4% of the respondents were Secondary school leaverswhile16.4% of the respondents were primary school leavers. From the study it can be deduced that majority of the respondents are College or university level graduates.

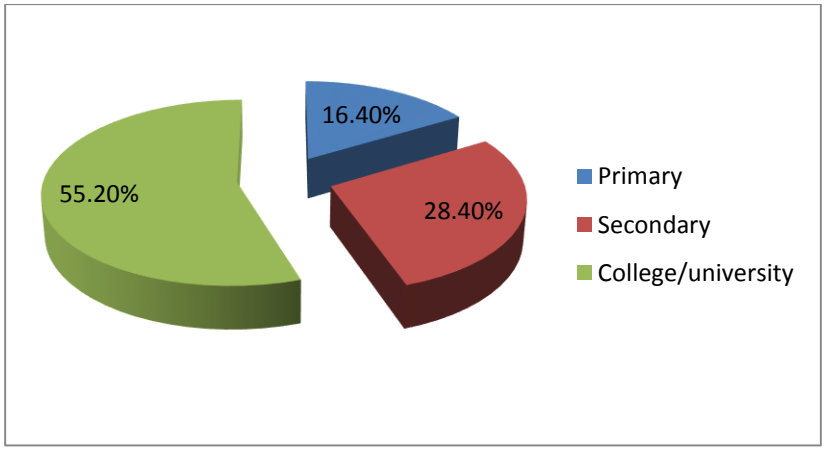


**Figure 4.3: Level of Education**

### 4.3.5 Employment Sector

The study further sought to establish the sector under which the respondents worked. From the findings, 67.2% of the respondents were in the informal sector, 32.9% of the respondents were in the formal sector.

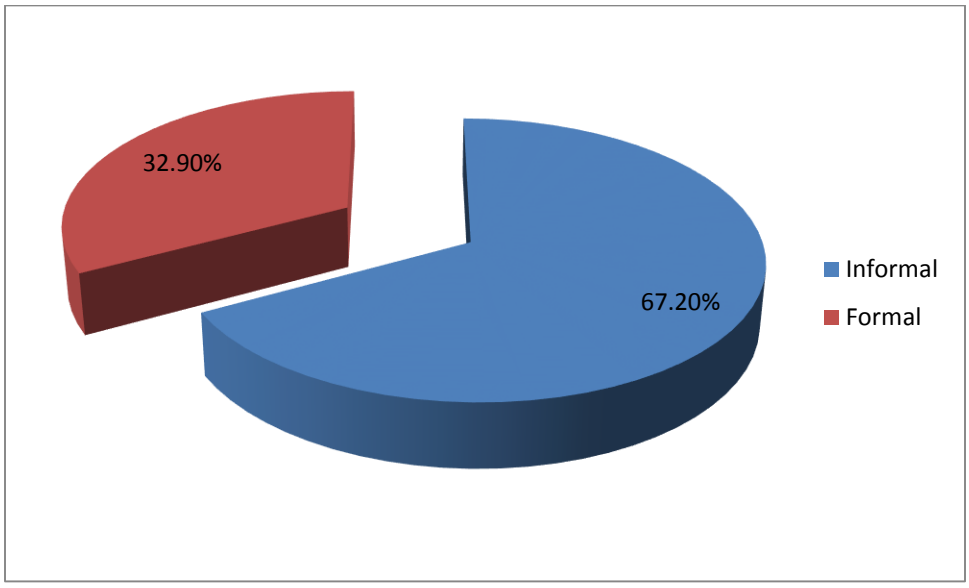


**Figure 4.54: Employment Sector**

### 4.3.6 The Ward Where Land is situated

The study further sought to establish the ward where the land is situated from the respondents. From the findings, 44.8% of the respondents land was situated in Lake view ward, 32.8% in Viwanda ward, 13.5% in Maimahiu Ward and 4.5% in Maiella Ward.

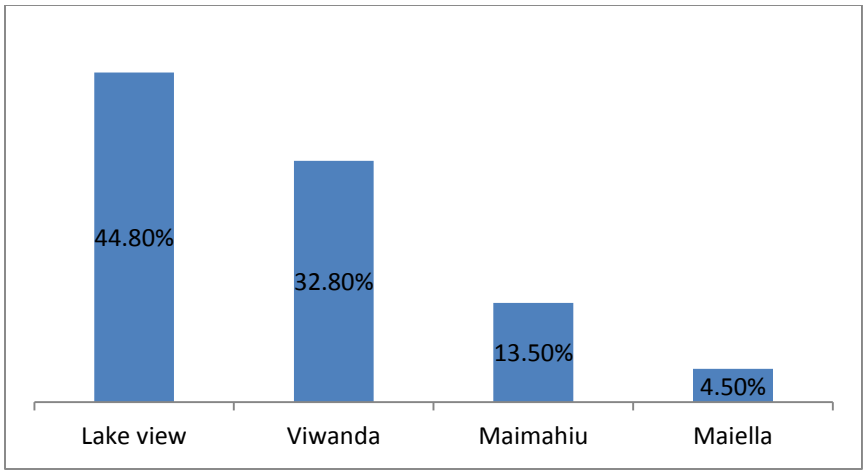


**Figure 4.5: Ward Name**

### 4.3.7 Size of land owned in the ward

The researcher also sought to establish the size of land the respondents owned in their respective Wards. The study found that majority of the respondents, 62.7% owned 1/8 of an acre, 19.4% of the respondents owned ¼ of an acre, 13.4% owned ¾ of an acre while only 4.5% owned ½ of an acre.

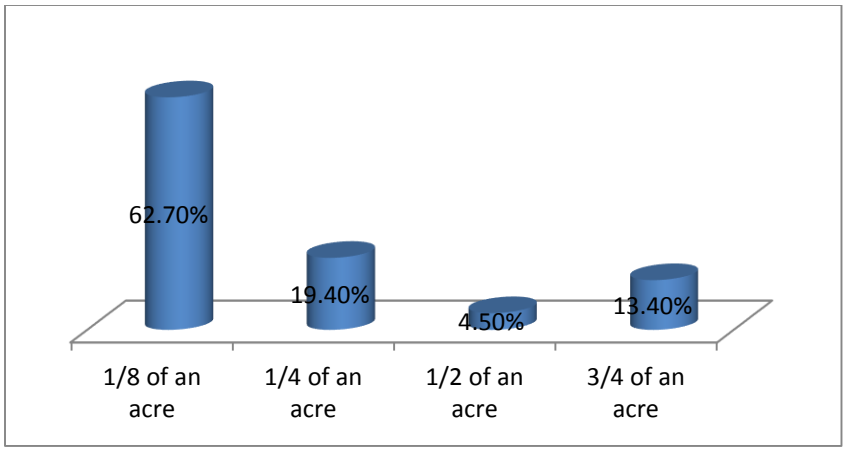


**Figure 4.76: Size of land owned in the ward**

### 4.3.8 Period when the owner acquired the land

The study further sought to establish when the respondents acquired the land. The findings show that 34.3% acquired the land more than 10 years ago, 29.9% indicated that they acquired the land between 1 and 5 years ago while 26.9% indicated between 6 and 9 years ago. Lastly those who indicated to have acquired the land less than one year ago were 9% of the entire respondents.

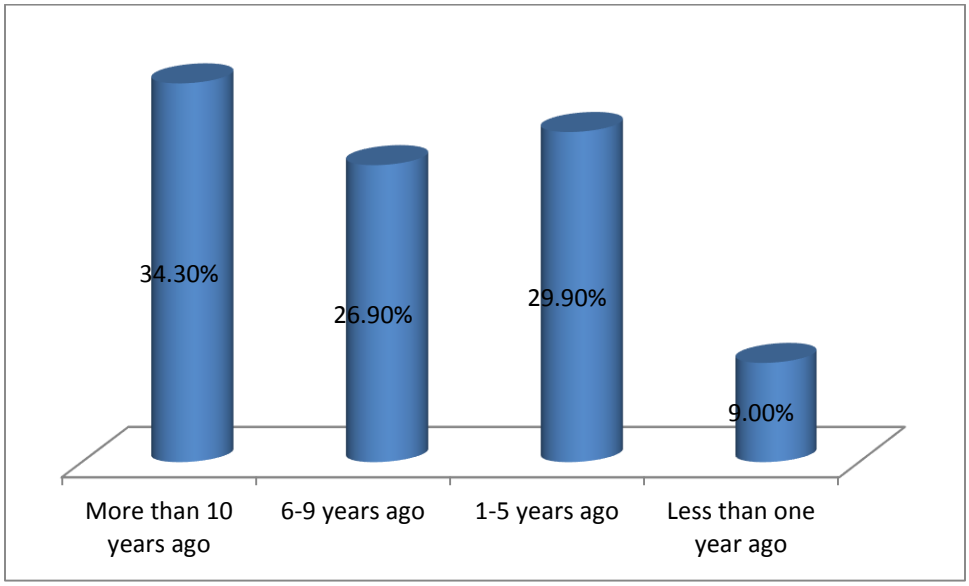


**Figure 4.8: The duration the land was acquired**

## 4.4 Descriptive Statistics

Descriptive statistics are the measures that describe the general nature of the data under study. They define the nature of response from primary data and/or secondary data. Descriptive statistics for this study were: mean and standard deviation. Graphic data analysis was performed on the speculative investment demand, Interest rates, Proximity to urban center and Real GDP. Descriptive statistics was carried out for different years as shown below.

### 4.4.1 Speculative Investment Demand

The study sought to investigate the speculative investment demand by looking at the percentage of people who indicated how they got the land, if through purchase, the price they purchased it at, how the purchase was financed and what they intend to do with the land and the current value of the land.

The study sought to establish how the land was financed. The results are illustrated in figure 4.9 below. From the results, 67.2% of the respondents indicated that they got the land through purchase, 17.9% was through inheritance while 14.9% was through exchange.

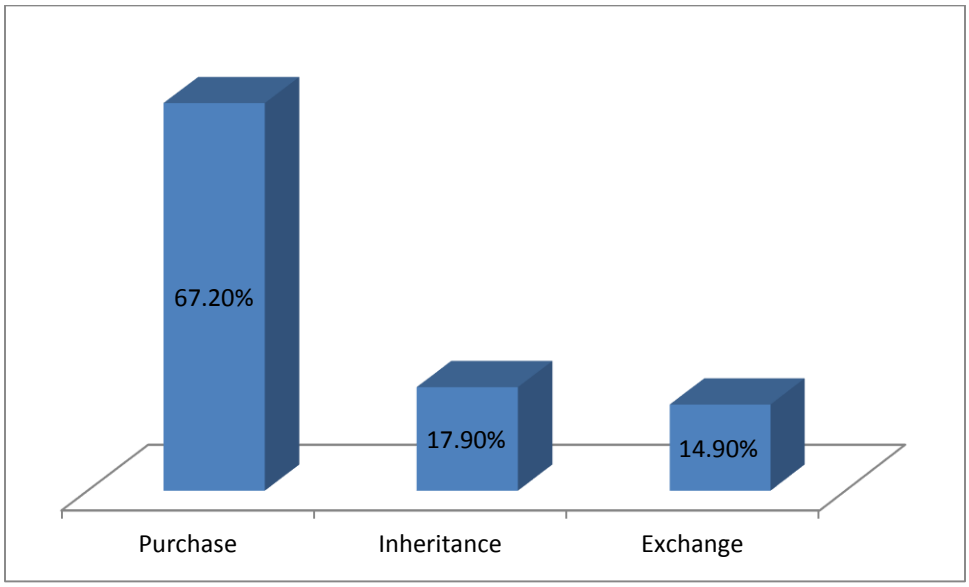


**Figure 4.7: Mode of Acquiring the Land**

#### 4.4.1.1 Price of Land

Majority of the land owners indicated that the price of their land was estimated between 501,000 and 1,000,000 as indicated by 47.9% followed by 28.4% who owned land costing between 100,000 and 250,000 and finally those who owned above 1m were 4.5%.

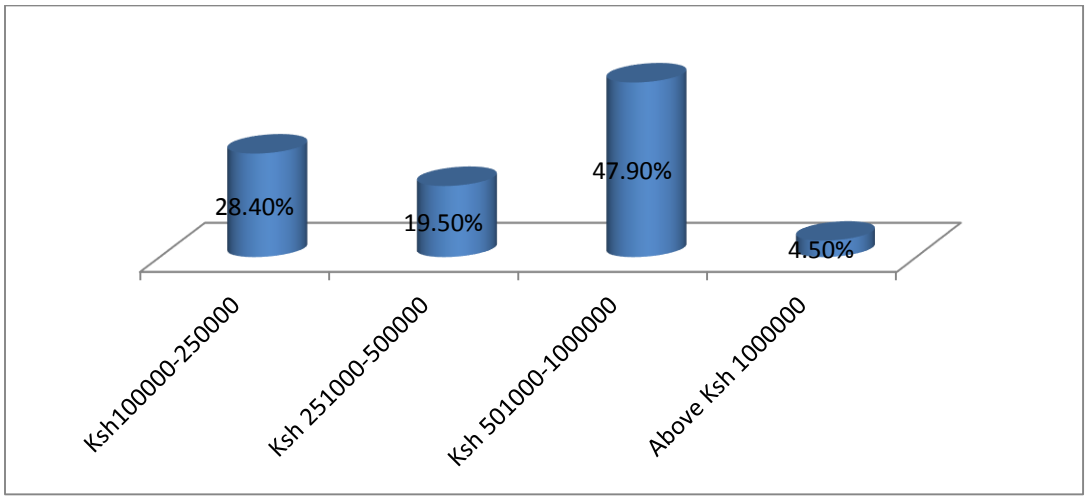


**Figure 4.10: Price of land**

#### 4.4.1.2 How the purchase was financed

On how they purchased the land, 53.7% indicated the purchase was through personal savings, 25.4% was through bank loan, 16.4% though Sacco loan while only 4.5% was through mortgage.

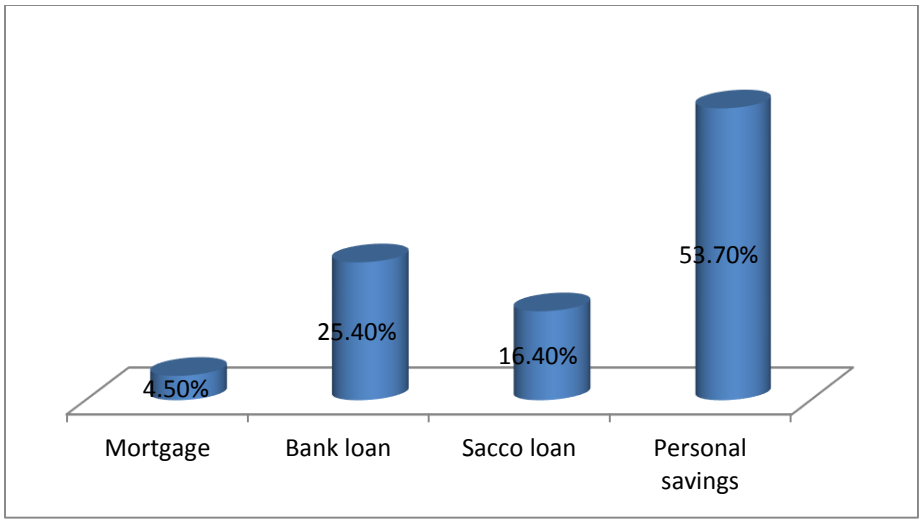


**Figure 4.11: How the purchase was financed**

#### 4.4.1.3 What you intend to do with the land

The study also sought to establish what the respondents intended to do with their land as illustrated from the results, 65.7% of the respondents indicated that they intended to develop the land, 17.9% indicated their intention was to use the land for agriculture while 16.4% indicated their intention was to sell after a certain period of time.

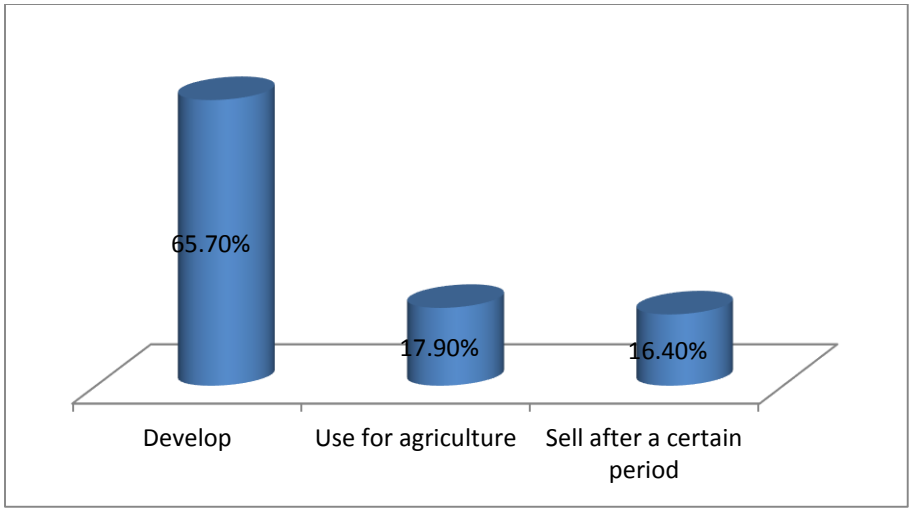


**Figure 4.12: What you intend to do with the land**

#### 4.4.1.4 Estimated Value of the Land

The study sought the current estimated value of the land. From the statistics, most of the land was being valued between Ksh500001 and Ksh 1M as indicated by 47.9% of the respondents, 25.4% said there land was valued between 1M and 3M while those who stated their land was over 3M were represented by 12.0%.

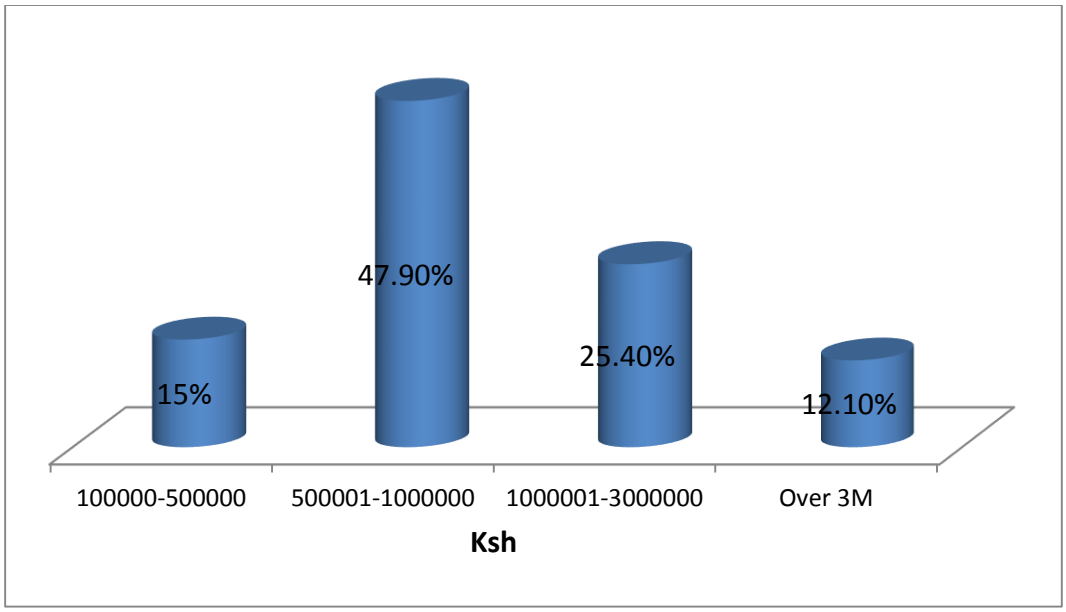


**Figure 4.8: Estimated Value of the Land**

### 4.4.2 Proximity to urban center

In this section, the study investigates the proximity of the land to the road, nature of the main road to the land, closeness to the railway line and how far it is from Naivasha town. On how far the land is from the tarmac, it was shown by 55.2% of responses that most of the land was located between 0.5 and 1km from the tarmac. 23.9% indicated that their land was 1.5 km and above from the tarmac and 11.9% indicated less than 500 m from the tarmac.

#### 4.4.2.1 Distance from the land to the road

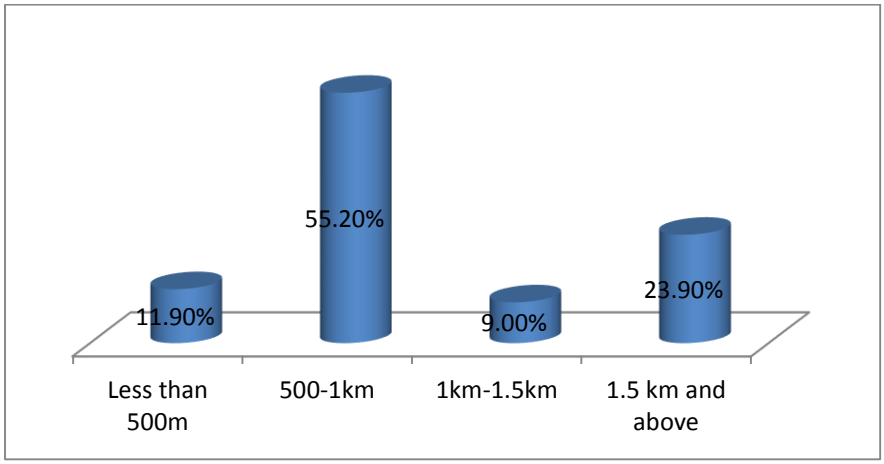


**Figure 4.14: Distance from the tarmac to your land**

#### 4.4.2.2 What is the nature of the main road to your Land

The respondents were asked to indicate the nature of the road to their land, as illustrated in figure 4.15 below, 49.3% of the respondents indicated that they had all weather road to their land and 31% indicated dusty road. The rest of the respondents 19.4% indicated that they had tarmac road to their land.

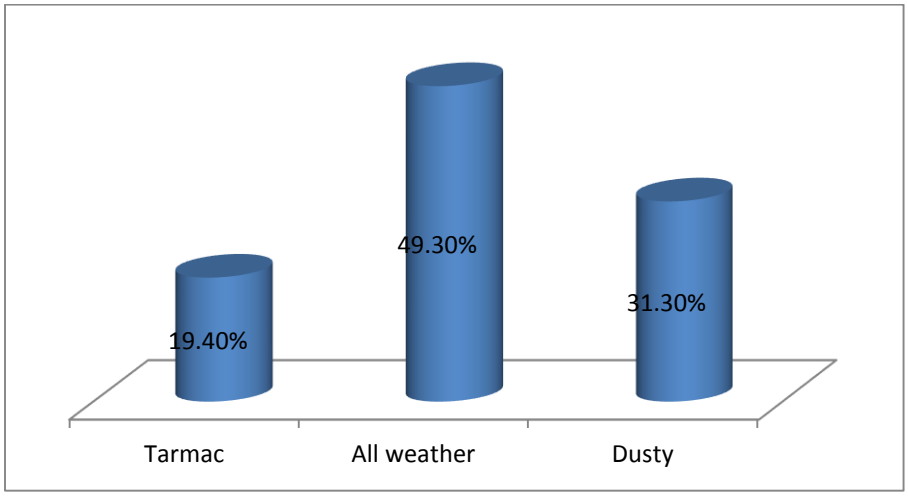


**Figure 4.15: The nature of the main road to your land**

#### 4.4.2.3 How near is the railway line to your land

On how near the railway line was to the land, majority of the respondents represented by 44.8% indicated that they were 1.5km and above from the railway line, 32.8% indicated they were between 500m -1.5 km from the railway line, and lastly 9% were less than 500m from the railway line.

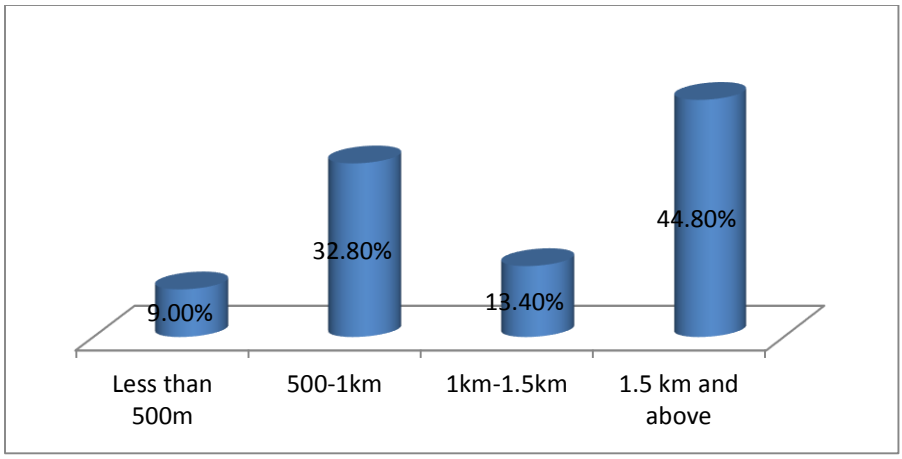


**Figure 4.9: Nearness of the railway line to your land**

#### 4.4.2.4 Nearness of Naivasha town from your land

The study further sought to establish how near the land is from Naivasha town. The results show that most of the land was between 500m and 1.5km as illustrated by 50.7%, 35.9% indicated between 1.6km and 5km while 13.5% showed their land was over 5km from Naivasha town.

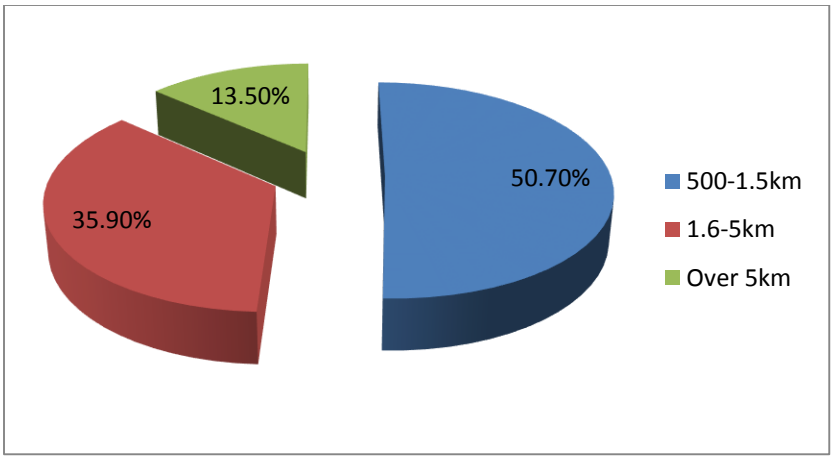


**Figure 4.10: Nearness of Naivasha town from your land**

### 4.4.3 Real GDP

The table shows the Real GDP as measured using the figures provided by KNBS. The results show that, the Kenya's Gross domestic product has been steadily growing from 2012 to 2016.This shows that the sectors such as: agriculture, mining and quarrying, manufacturing, electricity and water supply, construction industry, wholesale and retail trade, accommodation and food services, transport and storage information, and communication which are the key determinants of the real GDP have been recording growth over the period.

**Table 4.2: Real GDP (KSh Million)**

| | **Year** | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|---|
| Quarter | 1 | 1,035,113 | 1,142,221 | 1,300,095 | 1,506,384 | 1,626,767 |
| | 2 | 1,050,755 | 1,168,578 | 1,323,824 | 1,536,585 | 1,811,965 |
| | 3 | 1,065,056 | 1,205,069 | 1,366,620 | 1,580,496 | 1,853,017 |
| | 4 | 1,119,436 | 1,241,846 | 1,426,641 | 1,653,299 | 1,883,949 |
| | Average | 1,067,590 | 1,189,429 | 1,354,295 | 1,569,191 | 1,793,925 |

### 4.4.4 Lending Interest Rate

The study sought to establish central banks' lending rates from 2012 to 2016. From the statistics obtained from the CBK, CBK lending rates have been steady over the last three years except in 2012 when it stood at 19.65%. The year 2015 recorded the lowest lending rates. However, going by the quarters, CBK issued the lowest lending rates to her customers in the last quarter of 2016 which were 13.86, 13.73, 13.67 and 13.66 in the months of September, October, November and December. From these statistics, the study can deduce that since the capping of interest rates charged by commercial banks to their customers, the CBK on her part has been able to offer favorable rates to the commercial banks hence creating a favorable business environment for other people to get loans from commercial banks at favorable interest rates.

**Table 4.3: Lending Interest Rate from CBK in %**

| | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|
| Jan | 19.54 | 18.13 | 17.03 | 15.93 | 18 |
| Feb | 20.28 | 17.84 | 17.06 | 15.47 | 17.91 |
| Mar | 20.34 | 17.73 | 16.91 | 15.46 | 17.87 |
| Apr | 20.22 | 17.87 | 16.7 | 15.4 | 18.04 |
| May | 20.12 | 17.45 | 16.97 | 15.26 | 18.22 |
| Jun | 20.3 | 16.97 | 16.36 | 16.06 | 18.18 |
| Jul | 20.15 | 17.02 | 16.91 | 15.75 | 18.1 |
| Aug | 20.13 | 16.96 | 16.26 | 15.68 | 17.66 |
| Sep | 19.73 | 16.86 | 16.04 | 16.82 | 13.86 |
| Oct | 19.04 | 17 | 16 | 16.58 | 13.73 |
| Nov | 17.78 | 16.89 | 15.94 | 17.16 | 13.67 |
| Dec | 18.15 | 16.99 | 15.99 | 18.3 | 13.66 |
| **Average Lending Rate per year** | **19.65** | **17.31** | **16.51** | **16.16** | **16.58** |

### 4.5 Correlation Analysis

Pearson's correlations analysis was conducted at 95% confidence interval. The table below indicates the correlation matrix between the independent variables (speculative investment demand, interest rates, proximity to urban center and Real GDP) and estimated price of the land in Naivasha, Nakuru County.

**Table 4.4: Correlation Matrix**

| | | **Estimated land price** | **Speculative demand** | **Interest rates** | **Proximity to urban center** | **Real GDP** |
|---|---|---|---|---|---|---|
| Estimated land price | r | 1 | | | | |
| | Sig | | | | | |
| Speculative investment demand | r | .481 | 1 | | | |
| | Sig | .003 | | | | |
| Interest rates | r | .501 | .379 | 1 | | |
| | Sig | .002 | .022 | | | |
| Proximity to urban center | r | .626 | .595 | .494 | 1 | |
| | Sig | .003 | .000 | .002 | | |
| Real GDP | r | .610 | .162 | .206 | .458 | 1 |
| | Sig | .008 | .004 | .007 | .005 | |

According to the table, there is a positive relationship between the variables (Speculative investment demand, interest rates, Proximity to urban center, and Real GDP) and estimated land price in Naivasha, Nakuru County of magnitude 0.481, 0.501, 0.626 and 0.610 respectively. The positive relationship indicates that there is a significant correlation between the four variables and estimated land price. Proximity to land showed the strongest correlation on estimated land price followed by Real GDP then interest rates while speculate investment showed the lowest correlation on estimated land price.

### 4.6 Regression Analysis

Having carried out the descriptive statistics the study employed inferential statistics so as to draw conclusions and recommendations.

#### 4.6.1 Cross tabulation of Land price against estimated current price

The study conducted a cross tabulation of the price of land at the time of acquisition and the estimated value at the moment.

**Table 4.5: Cross tabulation of Price of land at the time of acquisition versus estimated value of the land**

| Price of land at the time of acquisition x Ksh 1000 | **Estimated valued of the land x Ksh10000** | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 45 | 50 | 60 | 70 | 75 | 80 | 85 | 90 | 100 | 120 | 150 | 200 | 500 | |
| 100.00 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| 150.00 | 0 | 3 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **8** |
| 200.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **3** |
| 250.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | **5** |
| 300.00 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | **6** |
| 350.00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 450.00 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| 500.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | **3** |
| 650.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **2** |
| 850.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | **4** |
| 1000.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | **6** |
| 3000.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | **3** |
| **Total** | **3** | **5** | **3** | **2** | **2** | **3** | **3** | **2** | **7** | **7** | **4** | **3** | **3** | **47** |

From the findings in table 4.4, the results indicate that all the parcels of land that were acquired at Ksh 100,000 have an estimated price of Ksh 450,000. In overall, all the land owned by the respondents has increased in value since the time of acquisition. Most of the land had increased by over 400% in value with those acquired at only Ksh 500,000 now estimated at Ksh 5,000,000. It is very clear that land is a very prime property in Naivasha and sharply appreciates in value. This could be explained by the fact that, most of the land was roughly less than 2km from the road or railway line hence the ease of access. The total response (47) was however less than the response which was 67. This could be as a result of some respondents not giving both the price of the land at the time of acquisition and the current price estimate.

### 4.6.2 Model Summary

A multiple regression analysis was done to test the correlation among predictor variables. The research utilized statistical package for social sciences (SPSS V 21.0) to code, enter and calculate the estimations of the multiple regressions.

**Table 4.6: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.872 | 0.766 | 0.751 | 0.573 |

**Source: Researcher (2017)**

Coefficient of determination discloses the degree to which changes in the dependent variable can be reflected by the adjustment in the independent variables or the rate of variation in the dependent variable (price of land) that is determined by the speculative

investment demand, interest rates, proximity to urban center and Real GDP. The four independent variables that were studied, explain only 76.6% on the relationship between the independent variables and the price of land represented by the $R^2$.

### 4.6.3 Summary of ANOVA Results

**Table 4.7: Summary of ANOVA Results**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 430.361 | 4 | 86.072 | 137.193 | 0.000 |
| | Residual | 140.533 | 62 | 0.627 | | |
| | Total | 570.894 | 66 | | | |

**Source: Research Data (2017)**

a. Predictors: (Constant), Speculative investment demand, Interest rates, Real GDP and Proximity to urban center

b. Dependent Variable: estimated land price

From the ANOVA statistics in table 4.6 above, the probability value of 0.000 which is less than 0.05 indicates that the regression relationship was highly significant in predicting how speculative investment demand, Interest rates, Proximity to urban center and Real GDP influenced the price of land in Nakuru County. That is, there is a significant relationship between land price in Nakuru County and the independent variables (speculative investment demand, Interest rates, Proximity to urban center and Real GDP).

### 4.6.4 Model Coefficients

**Table 4.8: Regression Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| 1 | (Constant) | 4.781 | 1.423 | | 5.468 | .0000 |
| | Speculative investment demand | 0.863 | 0.112 | 0.642 | 7.705 | .0000 |
| | Interest rates | 0.683 | 0.161 | 0.483 | 4.242 | .00017 |
| | Real GDP | 0.771 | 0.171 | 0.574 | 4.509 | .0000 |
| | Proximity to urban center | 0.896 | 0.231 | 0.159 | 3.879 | 0.000 |
| Dependent variable: Estimated land prices | | | | | | |

**Source: Research Data (2017)**

From the regression results, multiple regressions were obtained as follows;

$Y = 4.781 + 0.863X1 + 0.683X2 + 0.771X3 + 0.896X4$

Where; X1 = Speculative investment demand, X2 = Interest rates, X3 = Real GDP and X4 = Proximity to urban center and Y= Estimated land prices

According to the model, all the variables were significant as their significance value was less than 0.05. Speculative investment demand, Interest rates, Real GDP and Proximity to urban center had a positive relationship with land prices. From the model, taking all factors (Speculative investment demand, Interest rates, Real GDP and Proximity to urban center) constant at zero, land prices in Nakuru County was 4.781.

The regression results also shows that speculative investment demand had positive and significant relationship with land prices ($\beta_1$ =0.863, P= 0.000).

The study also found that interest rates had positive and significant relationship with land prices ($\beta_2$ =0.683, P=0.000).

The study also found that Real GDP had positive and significant relationship with land prices ($\beta_3$ = 0.771, P=.039).

The study further found that Proximity to urban center had positive and significant relationship land prices ($\beta_2$ =0.896, P=0.000). This infers that Proximity to urban center contributed most to the land prices followed by Speculative investment demand then Real GDP while Interest rates had the least significant effect on the land prices.

### 4.7 Discussion of Findings

The findings of this study where the four variables (Speculative investment demand, Interest rates, Real GDP and Proximity to urban center) have a significant positive relationship with the independent variable are similar to studies done both internationally and locally. Li, (2009) found out that GDP growth strongly affects land prices which are similar to the results of this study. Li and Chang, (2012) in their study also find that real estate prices are affected by both institutional and economic factors and from this conclusion the economic factors include GDP growth and interest rates which agrees with what the researcher has found out. Marete (2011) in her study found out that location of real estate had a significant positive relationship with the price of real estate property. In this study it has also been proven that proximity to urban center has a similar effect.

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents the summary of the findings from chapter four, and it also gives the discussions, conclusions and recommendations of the study based on the objectives of the study. The objective of this study was to find out the factors influencing the price of land in Nakuru County.

## 5.2 Summary of Findings

The objective of the study was to find out the factors influencing the price of land in Nakuru county. The study found that all the land owned by the respondents increased in value since the time of acquisition. Most of the land had increased by over 400% in value. The regression relationship was highly significant in predicting how speculative investment demand, Interest rates, Proximity to urban center and Real GDP influenced the price of land in Nakuru County. The four independent variables that were studied, explained only 76.6% on the relationship between the independent variables and the price of land represented by the $R^2$. That is, there was a significant positive relationship between land price in Nakuru County and the independent variables (speculative investment demand, Interest rates, Proximity to urban center and Real GDP). According to the model, all the variables were significant as their significance value was less than 0.05. From the model, taking all factors (Speculative investment demand, Interest rates, Real GDP and Proximity to urban center) constant at zero, land prices in Nakuru County was 4.781.

### 5.3 Conclusion of the Study and Policy Recommendation

From the findings of this study it is clearly evident that land price in Nakuru county is influenced by all the dependent variables which include: speculative investment demand, Interest rates, Real GDP and Proximity to urban center. Land price has been steadily increasing over the period of study and this is explained by the positive relationship with speculative investment demand which had a correlation of 0.481, interest rates with a correlation of 0.481, proximity to urban center 0.626 and finally real GDP with 0.610. The objectives of the study were therefore met.

It is recommended that policy makers in government look for ways of increasing the growth of GDP so that majority of people can afford to buy land. The lending interest rate should also be reduced further so that people can get loans that are cheaper and thus afford to buy land. Dusty and murram roads should have tarmac to improve transportation and also the value of the land.

### 5.4 Limitations of the study

The researcher was faced with several limitations which are pertinent to this study. The time for carrying out the study was not adequate therefore the sample was small hence introducing sampling error. The answers given in the questionnaires are solely based on the honesty of the respondents. The researcher also faced a financial challenge and therefore wasn't able to carry out a larger sampling size that would have minimized the sampling error.

### 5.5 Suggestions for Further Research

This study investigated the factors influencing the price of land in Nakuru County. The researcher suggests that similar studies be conducted on other factors apart from the four that are likely to determine the price of land in the county. Studies should also be done to determine factors influencing the price of land in other counties in Kenya so that a generalization can be made on the factors influencing the price of land in Kenya.

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# APPENDICES

## APPENDIX I: QUESTIONNAIRE

**Introduction**

The objective of this research is to establish the factors that influence real estate property prices in Nakuru County in Kenya. Please answer the questions in this questionnaire by inserting "X" in the boxes provided or by filling out the spaces provided as briefly as possible.

**SECTION A: PERSONAL INFORMATION**

Please tick (√) the option that corresponds to your answer in each of the following:

1. Gender

(a) Female ( ) (b) Male ( )

2. What is your age?

(a) Below 25 ( ) (b) 26 – 35 ( )

(c) 36 -45 ( ) (d) Above 45 ( )

3. Marital status

(a) Single ( ) (b) Married ( )

(c) Widow/widower ( ) (d) Separated/Divorced ( )

4. What is your highest level of education?

(a) Non-formal ( ) (b) Primary ( )

(c) Secondary ( ) (d) College/University ( )

5. Do you work in formal or informal sector?.....

6. In which ward of Naivasha Sub County do you live?

(a) Lakeview ( ) (b) Viwanda ( )

(f) Mai mahiu( ) (g) Maiella ( )

7. What size of land do you own within the ward?

(a) 1/8 of an acre ( ) (b) ¼ of an acre ( )

(c) ½ of an acre ( ) (d) ¾ of an acre ( )

(e) 1 acre ( ) (f) Others (specify)……

8. When did you acquire the land?

(a) More than 10 years ago ( ) (b) (6-9) years ago ( )

(c) (1-5) years ago ( ) (d) Less than one year ago ( )

**SECTION B: SPECULATIVE INVESTMENT DEMAND**

9. How did you acquire the land?

(a) Through purchase ( ) (b) Through inheritance ( )

(c) Through exchange ( ) (d) Others (specify)…….

10. If (in 9 above) was through purchase, what was the price? Please state.

Ksh……..

11. How did you finance the purchase?

(a) Mortgage ( ) (b) Bank Loan ( )

(c) Sacco Loan ( ) (d) Personal savings ( )

(e) Others (specify)…….

12. What do you intend to do with the land?

(a) Develop ( ) (b) Use for agriculture ( )

(c) Sell after a certain period ( ) (d) Others (specify)…….

13. In Your own estimate, what is the value of your piece of land today?

Ksh……..

**SECTION C: PROXIMITY TO URBAN CENTER**

18. How far from the tarmac is your land?

(a) Less than 500m ( ) (b) 500m – 1 Km ( )

( ) 1 Km – 1.5 Km ( ) (d) 1.5 km and above ( )

19. What is the nature of the main road to your land?

(a) Tarmac ( ) (b) All weather ( )

(c) Dusty ( )

20. How near is a railway line to your land?

(a) Less than 500m ( ) (b) 500m – 1 Km ( )

(c) 1 Km – 1.5 Km ( ) (d) 1.5 km and above ( )

21. How far is Naivasha town from your land?.....

***THANK YOU FOR YOUR CO-OPERATION.***

## APPENDIX II: GDP IN MILLIONS

| Year | Quarter | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| 2012 | 1,035,113 | 1,050,755 | 1,065,056 | 1,119,436 | 1,067,590 |
| 2013 | 1,142,221 | 1,168,578 | 1,205,069 | 1,241,846 | 1,189,429 |
| 2014 | 1,300,095 | 1,323,824 | 1,366,620 | 1,426,641 | 1,354,295 |
| 2015 | 1,506,384 | 1,536,585 | 1,580,496 | 1,653,299 | 1,569,191 |
| 2016 | 1,626,767 | 1,811,965 | 1,853,017 | 1,883,949 | 1,793,925 |