THE IMPACT OF TRANSPORTATION INFRASTRUCTURE
UPGRADING ON PATTERNS OF LAND USE: A CASE
STUDY OF THE EASTERN BYPASS

BY

NJOKA DAVID FRANCIS

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SCHOOL OF BUILT ENVIRONMENT

COLLEGE OF ARCHITECTURE AND ENGINEERING

UNIVERSITY OF NAIROBI
DECLARATION

I, Njoka David Francis, do hereby declare that this research project is my original work and has not been presented for a degree in any other university

Signed: ……………………… Date: ………………………………………

Njoka F.D

(Candidate)

This Research project has been submitted for examination with my approval as the University Supervisor.

Signed: ……………………… Date: ………………………………………

Dennis Mbugua

(Supervisor)
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Firstly, I would like to give thanks to the Almighty God for enabling me to get this far and to pursue this course

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DEDICATION

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Abbreviations

GOK ......................................................... Government of Kenya
RoK .......................................................... Republic of Kenya
GEB .......................................................... Greater Eastern Bypass
KURA ...................................................... Kenya Urban Roads Authority
KERRA ..................................................... Kenya Rural Roads Authority
KENHA ................................................. Kenya National Highways Authority
ABSTRACT

Land use planning is one of the key tools of land management in Kenya. It has been used as a means of controlling developments for the achievement of sustainability, economy and compatibility of land uses. Albeit the fact that the trade-off between using land use planning to set the pace for development and it being reactive to emerging land use patterns has not been clearly defined, the Kenyan case has inadvertently been inclined towards a reactive nature.

The Eastern Bypass is one of three bypasses that are under construction by the Government of Kenya with the help of China, who have been a recent consistent development partner to the country. The bypass has opened up various peripheral regions to the city of Nairobi thus prompting developments in these areas due to ease in accessibility and availability of new lands for development.

Keeping in mind land use planning being more reactive than proactive, the necessary infrastructural framework for the utilization of these new lands is tentatively not well laid. Rapid changes in land uses are imminent in the areas opened up by the new road. Competing land uses operating within the market forces of supply and demand result in the achievement of the highest and best use for the land. Prior use are phased out brutally.
CHAPTER 1

1.0 INTRODUCTION

Kenya is a developing country that is experiencing rapid growth in its social economic systems. As any other developing third world country its economic growth can greatly be attributed to an increase in population especially in its urban areas. Movement of people from rural to urban areas is inherent in such a setting. According to Mwangi (2014), in less developed countries, 60% of the country’s population resides in urban areas. As at the year 2005, studies illustrated that only 20% of Kenya’s population resided in urban areas (Patrick and Rosemary, 2006). As per the 2009 population census, Kenya’s urban population stood at 12.5 million, which is approximately 32% of Kenya’s population. On another note, the population of Nairobi has increased from 2.09 million in 1999 to 3.14 million in 2009 (RoK, 2011). This is an increase of over 50%. The rapid increase in the population of urban areas through rural urban migration triggers expansion of urban centres such as towns and cities.

The growth of a city requires a city plan. In Nairobi, the capital city of Kenya, has had a great challenge in the form of uncontrolled development and a general disregard for planning regulations (RoK, 2009). Urban sprawl has made it difficult to control what is developed where. A good city plan is the general system of arterial streets and transportation lines by which the different sections of the existing and future city will be connected with each other and with centres of population outside the city limits (Lewis, 2006). A city in most cases owes its genesis, expansion and prosperity to the facilities it has for internal communication, easy access to sources of supply of raw materials and access to market for manufactured product. The development of transportation infrastructure is crucial in the sustenance and growth of a city (Lewis, 2006).

The expansion of cities prompts upgrading of transportation lines to cater for the flux of the volume of raw materials and manufactured product that has to be moved. A city’s growth in most cases consequentially results to the growth of other centres.
around it. Continued expansion results to the merger of these small centres with the larger city. The result is a metropolis (Rodwin, 1960).

A metropolitan centre with numerous sub-centres looks to decongest the traffic that passes through it from one small centre to another through the construction of by-passes. The size of metropolitan areas and the distance from the city centre have always been related with travel demand. Inadvertently, the growth of cities has a direct positive bearing on the travel demand (Lewis, 2006).

Higher earning citizens enjoy living in the high class homes such as maisonettes, bungalows and well serviced apartments. Such structures are increasingly being located in the more peripheral areas of the city. The decentralized settlements that seek to evade the congestion of the city whilst enjoying the unpolluted air of the country-side have been key in the emergence and development of dormitory towns. Dormitory towns are urban centres that develop on the periphery of a larger urban centre as home areas for numerous workers of the larger centre (Kariuki, 2011). These towns require more products for their rising populations leading to increased shipping in of manufactured product. Subsequently, the volume of goods in transit passing through the city’s CBD rises. In a bid to decongest the city’s roads, by-passes have been constructed so that the goods in transit move from one dormitory town to another without passing through the city (Rodwin, 1960).

In the pursuit of improving the lives of its citizens, the Government of Kenya (GOK) has a commitment to develop of infrastructure and specifically, the road network (RoK, 2008). This has been achieved through the construction of by-passes. The by-passes are intended to channel traffic away from the city centre. The Greater Eastern Bypass (GEB) which is currently in its final stages of construction is one of the milestones that will enable the government to reach its goal. The GEB is approximately 77 kilometres long and is located within Machakos, Nairobi and Kiambu Counties (KURA, 2013). The section of the road connecting Mombasa road to the Nairobi-Thika Super Highway is approximately 35 kilometres long. The Northern Bypass connects the Nairobi-Thika Super Highway to Ruaka area and will eventually connect to Nairobi - Nakuru Highway. The Southern Bypass connects Mombasa Road to Nairobi - Nakuru Highway. The roads are constructed such that
interchanges between the bypasses and other roads have intelligent designs (fly overs) to ease traffic congestion on the roads (KURA, 2013).

1.1 PROBLEM STATEMENT
Kenya’s capital city is experiencing rapid growth. This is consistent with the expected trend in developing countries which have rapid urban growth. The growth is accompanied by increases in the population of the urban centres. Nairobi’s population has increased by approximately 50% between 1999 and 2009 (RoK, 2011). The population growth can be attributed to high rates of rural urban migration as the urban life promises jobs and opportunities if income. Higher population inherently results in an increased demand for housing. The higher demand for housing relative to its supply has resulted in poorly planned property developments.

Planning sets out infrastructural guidelines. The GEB which was planned for decades before its actual construction was demarcated by the GOK. It cut through a prevalently remote area. As brought out by Hartgen and Kim (1998), when a new road is developed people and firms re-locate to exploit the accessibility benefits created. The influx of migrants to the area is bound to put strain on the existing infrastructure. This is in terms of waste disposal systems, water supply, provision for energy and in general social facilities.

Jason (2001) carried out a study on the impact of highways on property values in Arizona. He pointed that the improvement of a transportation line may improve accessibility to a particular area thus increasing the premium that commercial, industrial and residential users are willing to pay to purchase or rent the property. According to a study by Spawn and Hartgen (1997) in North Carolina, there is evidence that new highways may have negative impacts on land values. The above studies are just but a few of numerous studies on impacts of highways on land values and land uses.

In this study, the researcher concentrates on the impacts of infrastructural development with keen interest to bypasses as opposed to mainstream highways, on land use value and land use change. There is supposedly a direct relationship between the emergence of the GEB and the land use changes in the area bordering it. This
study also seeks to bring out the relationship between the construction of the bypass and the changes in land use values of the area surrounding it. The study seeks to establish the implications of the construction of the Eastern Bypass (Ruiru to Embakasi) on land use changes and land use values along the road with special reference to Ruai area.

1.2 STUDY OBJECTIVES
(i) To document the existent land use types in the country.
(ii) To identify the key land uses along the Eastern Bypass.
(iii) To establish the land use changes along the Eastern Bypass.
(iv) To make appropriate recommendations

1.3 RESEARCH QUESTIONS
(i) What are the existent land use types in the country?
(ii) What are the key land uses along the Eastern Bypass?
(iii) What are the land use changes along the Eastern Bypass?
(iv) What are the appropriate measures that can be taken to streamline land uses in the study area?

1.4 RESEARCH HYPOTHESIS
Road construction and upgrading has a direct effect on the land use values. Transportation infrastructure upgrading impacts heavily on land use changes.

1.5 SIGNIFICANCE OF THE STUDY
This study seeks to bring out the expected “evils” of improvements in transportation infrastructure. The study in bringing some of the key issues to light shall also attempt to come up with solutions to existent problems and also circumvent expected future challenges. As stated earlier development of new roads prompts relocation of people and firms in a bid to exploit the accessibility benefits created, which consequently puts pressure on the existing infrastructure.
1.6 ORGANISATION OF THE STUDY

The first chapter is an introduction to the study. It consists of the general overview of the study: introduction, problem statement, objectives of the study, the research questions and the research methodology.

The second chapter is the literature review. The published data relating to construction of roads (in particular, bypasses), the factors affecting the real estate market, housing in Nairobi area and its periphery and how the construction of major roads impacts on the real estate market patterns.

The third chapter is on the research methodology. The data to be retrieved from the various collection techniques, the problems expected to be encountered in the collection and an overview of the techniques to be used in the acquisition of the data required for the study.

The fourth chapter is data analysis and presentation. The outcome of the fieldwork is in this chapter. The data collected in the field such as description of the study area. Presentation in form of tables, photographs.

The fifth chapter is a conclusion that shows the findings of the study, recommendations and areas of further study.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction
This chapter is an overview of the relevant literature as postulated by various authors and researchers. It explains the impacts of road upgrading with special reference to land values and land use changes.

The chapter shall assess the land tenure system in Kenya, the use value of land, its physical attributes, real property development, the correlation between accessibility and value, and the impact of road upgrading to real property.

2.1 Land
Land has been defined over time by various writers in different ways. The definition of land cannot be comprehensively compounded into one statement. Land is viewed in different ways by different people. For instance, land as a factor of production, land as space, as a form of wealth among others (Kariuki, 2011)

In Kenya, where the constitution is the primary source of law governing the land, Article 260 of the Constitution of Kenya 2010 states that;

“land includes: the surface of the earth and the subsurface rock, any body of water on or under the surface, marine waters in the territorial sea and exclusive economic zone, natural resources completely contained on or under the surface and the air space above the surface” (RoK, 2010).

Additionally, various Acts of Parliament give various definitions of land. According to the physical planning Act (Cap 286) includes any land covered with water, and any buildings or other things attached to land, and any interest or right of easement in, to or over land.

For the purpose of this study, land includes the physical solum, any permanent structures erected on it, the geo-space below and the aero-space above (Kariuki, 2011). This definition brings out the aspects of land stated in the constitution without contradiction and also gels with the study with respect to land utilization.
2.1.1 Land Tenure Systems in Kenya

Land ownership systems in Kenya have evolved from the pre-colonial period when land was communally owned under customary law. Every member of community or the society was considered to enjoy equal access to land belonging to such a community. For this reason such communally owned land was not regarded as a commodity capable of being adopted by any individual so that they could individually claim some exclusive rights. Additionally no member of the community was in a position to dispose of such land by way of sale (Machogu, 2011).

With the advent of colonialism, the customary law was overshadowed by the English property law. Registration of land was based on the various statutes of the British protectorate. It was believed that the system was going to provide a less flawed system of land administration. This was not the case. The system has been found to have a structure of land distribution characterized by large holdings of high potential land under few hands and highly degraded and fragmented small holdings by majority of the population on the other hand (Machogu, 2011).

According to the National Land Policy, land tenure refers to the terms and conditions under which rights to land and land based resources are acquired, retained, used, disposed off or transmitted (RoK, 2009). It also states that since independence, Kenya has had two land tenure systems namely customary and statutory tenure systems.

The statutory land tenure system has operated under various statutes such as: The Government Land Act (Cap 280), The Registration of Titles Act (Cap 281), The Land Titles Act (Cap 282), the Registered Land Act (Cap 300) and the Sectional Properties Act No. 21 of 1987. The statutes above relating to land (with the exception of the Sectional Properties Act) have now been consolidated and repealed in the Land Registration Act No.3 of 2012.
2.1.2 Interests in Land

This refers to the quality of rights that different tenure systems confer on individuals, groups of individuals and other entities. The principle rights ownership are the rights to use, right to dispose off, right to exclude others from enjoying the land and right to transfer part, or as a whole to an individual or organization. The scope of these rights to land differs from one tenure system to another.

Freehold interest which confers the largest quality of land rights as it has absolute interest in perpetuity provides for unlimited compulsory regulations power, planned rights of use, abuse but limited to compulsory acquisition provided under the Land Acquisition Act (RoK, 1968).

The leasehold interest is the right to use land for a defined period of time in exchange for the performance of certain obligations as payment of ground rents. It has restricted rights and when the term expires, the land rights revert back to the original owner. This tenure system is also subject to police power, planning regulations and compulsory acquisition.

Customary interest confers land rights to members of a community and every member of that community has the right to use such land as long as he undertakes his obligations to that community.

2.1.3 Land as a Factor of Production

Land is one of the four major factors of production. The other factors include capital, entrepreneurship and labour. According to Alfred Marshall (1987), a factor of production is a productive resource used to manufacture a given produce. Land is viewed as a primary attribute in all industries, ranging from agriculture, food processing, tourism, catering, et al. The main characteristics of land as a factor of production include:

- Free gift of nature: Land is a gift of nature and cannot be produced or destroyed. Land is not an outcome of human labour. However, ownership of the piece of land can be conveyed from one owner to another.
Fixity in supply: The supply of land as a whole in an economy is fixed and inelastic. It is said that land has no supply price. That is, price of land prevailing in the market cannot affect its supply.

Land is immobile: Land cannot be shifted from where it is situated to another region. Therefore land lacks mobility in the geographical sense. However ownership or value can be transferred from one person to another.

Land is a primary factor of production. All industries require land in order to operate. For instance, manufacturing industries get their raw materials from land. Additionally, the agricultural sector uses land for cultivation.

Land is a passive factor of production. This is because land cannot produce anything by itself. For instance, maize cannot automatically grow on a piece of land.

97.8% of land in Kenya is not covered by water bodies. Out of that, only 20% of the land can be classified as medium to high potential agricultural land and the rest of the land is mainly arid or semi-arid. Forests, woodlands, natural reserves and game parks account for 10% of the land area (RoK, 2009). This fact proves that the fertile land is scarce and the increasing population has in the recent past affected land reserved for special purpose such as the case of the Mau complex.

2.1.4 Legal and Institutional Framework Governing Land Use in Kenya
In Kenya, two institutions are charged with the responsibility of controlling and monitoring land uses. They include the Ministry of Lands and the National Land Commission. The Ministry is in charge of operations whereas the commission’s duty is oversight. The various legislations include: The Land Act No. 6 of 2012, The Land Registration Act No. 3 of 2012, The Urban Areas and Cities Act No 13. of 2011,and The Physical planning Act (Cap 286). The Physical Planning Act provides for the formulation of National, Regional and Local physical planning guidelines, policies and strategies. It further provides for the preparation of regional and local physical development plans. The Urban Areas and Cities Act provides for board of cities or boards of municipalities, depending on the state of an urban centre. The board is charged with the responsibility of controlling land use, land sub-division, land development and zoning by both public and private sectors.
2.2 Land use value
Land use refers to man’s activities directly related to land or human use of land (Kariuki, 2011). It can also be defined as the accommodation in terms of all man’s activities on land and the way which land may be basically used for agricultural purposes, forestry, and range land.

In the contemporary literature, the use value of a commodity is thought of as the direct utility that one receives from its consumption. The use value of a commodity depends on the needs and wants of the people who consume it. Use value may be defined as the value of a property for a specific use or to a specific user, reflecting the extent to which the property contributes to the utility or profitability of an enterprise. In the context of land, it is not simply the physical site attributes, such as its proximity to commuter zone, that contribute to the use value, but also the ability of the land to help satisfy the needs of the land user (Burkhardt et. al, 1998). Understanding land use value

2.3 Determinants of land value
According to economic theory, land values are determined by the market forces of supply and demand. Additionally however, there are other factors that influence land values such as population growth, development controls, social factors, physical attributes, speculation purposes and accessibility.

2.3.1 Development controls
These are government regulations that govern the use of land. They include; zoning laws, building codes, rent controls and others. Planning regulations can push up the price of land if they constrain the supply of land and thus impact on the elasticity of the housing supply or agricultural land. (Kariuki, 2011) argues that if certain land use were permitted in some places and prohibited in others, in so far as this differed from the existing pattern of land use, there would be an increase in some land values and decrease in other land values.

(Jason, 2001) asserts that planning system cannot push up prices of land or housing other than in certain conditions. He explains that housing prices are largely determined by demand because the sale of the new houses makes up a small part of
the market. In contrast it has been argued by (King’oriah, 1987) and (Obala, 1990) that, planning keeps conflicting land uses apart through devices such as zoning and density control. These devices would likely subject land to its highest and best use, thus leading to high level aggregate land values than would exist in the free market. Development controls on use of land, according to them have the effect of shifting land uses.

This study acknowledges that no uses in land can operate in a vacuum, and planning itself cannot single-handedly affect the value of land upwards. Other factors come into play. However, it is inherent planning in separating land uses through zoning will prompt the attainment of the highest and best use for land.

2.3.2 Accessibility

Accessibility includes both pecuniary and time cost, associated with getting to work, visiting relatives, friends, shopping and other activities. Sites located near the town centres are more accessible than those that are far. Sites located next to main transport routes have an advantage over sites located far off (Kariuki, 2011).

Values of land tend to shift to those areas that have gained accessibility and away from those that have suffered in this respect with traffic congestion in many older urban areas; uses and values tend to be transferred from them to sub urban areas more easily reached. Where means of communication is good, spread of values is likely to be more uniform than where communication is poor (Thorncroft, 1974).

(Mbugua, 2000) observes that if a new road or railway line opens up in an area, the land values will have an upward trend particularly for industrial and commercial use. Similarly, where there exists good water supply, drainage, electricity and other facilities, the rents commanded by residential properties tend to increase as compared to those where the services are absent.

The study therefore gathers that access has a direct bearing on land values, with areas next to transport routes having an advantage over those farther away. Additionally proper access prompts commercial use increase. Areas that have uniformly poor communication tend to have a uniform spread of land values.
2.3.3 Social Factors

These include population growth or population decline, changes in family sizes, typical ages and attitudes towards law and order, prestige and education levels. (United Nations, 1973) reports that, urban areas experienced an increase in land values during the 1950s due to influx of migrants from rural areas to urban areas. The movement of population from one region to another causes pressure on land which results to changes in land values and intensity of land use.

Alonso’s rent-bid concept implies that with an increase in urban income, the demand for land would increase and the prices will subsequently appreciate because the supply of land remains fixed. (Onyango, 1988) argues that population increase cause increase in land values in both rural and urban areas. Population however may also affect the prices of land negatively especially in cases of overcrowding.

The study acknowledges that influx in population may prompt prices to shoot up but may however have a negative impact in cases of overcrowding. Increase in disposable income of residents may also increase their purchasing power and willingness to pay to enjoy particular uses of land.

2.3.4 Physical attributes and Infrastructure

Some of the physical attributes of land include soil fertility, climate, location and topography. Physical infrastructure attributes of land include: convenience to shopping, availability of water, sewers, school, and parks, utilities and public transportation.

Syagga (1994) asserts that different soils are suitable for different agricultural purposes. Sandy soil is easy to work on, but does not hold enough water for plant growth. Thus the prices of land with sandy soil and loamy soil as far as agriculture is concerned will be different. For this matter loamy soil will fetch higher prices compared to sandy soil.

Nkonge et al (1995), notes that the quality of soil affects the strength of the foundation of the building therefore is a determinant of construction costs. Areas with
clay soils are unsuitable for construction and thus these sites may attract low values as compared to land whose soil is composed of gravel.

The topography is important not only to the development of the land, but also to the desirability of the land. Fairly sloping areas may be more desirable as they allow for proper natural drainage. Extreme topographical problems may in fact preclude any development. Looking at topography with relation to agriculture, gently sloping to level land may be well suited for farming (Syagga, 1994).

Von Thunen and Ricardo theories argue that land near a market is of higher value compared to land away from the market. This concept applies in that land near social amenities (the market) such as schools and hospitals have higher values. The quality of schools in a certain area may place a neighborhood puts it in a competitive advantage or disadvantage relative to another neighbourhood (Jason, 2001). The same applies to quality of services available such as of health care, fire-fighting services, police and municipal recreational facilities.

Mbugua (2000) argues that where part of a high class residential suburb is neighboured by a slum, the said section of the suburb commands lower rents than other parts of the same estate since slums are associated with crime and degradation of the environment. For instance, the rents in part of Lavington estate neighbouring Kawangware are lower compared to those in other parts of the estate.

2.3.5 Land speculation

Speculators hoard large trucks of urban land unproductively at relatively low costs to themselves (Kreibich, 2000). Speculation is largely by high income people including senior civil servants. This creates artificial scarcity in land supply causing escalation in prices so that land is not easily accessible to the low income groups. Land speculation can drive land prices beyond the productive value of the land, causing a bubble in the land and property market, where the prices of land and property are unreasonably very high (Kreibich, 2000).
2.4 Investment in Real Estate

The real estate market is one of the most dynamic and sophisticated markets in the world. The sector forms a major part of any economy both by its sheer size and by its extensive influence on other various sectors of the economy. It is also an important investment vehicle for both individual and institutional investors as an investment good, while also bringing the output of development and construction industry (Jason, 2001).

2.4.1 The Real Estate Market

There are various actors in the property market. Firstly, the government through the ministry, which caters for physical planning and other aspects such as valuation and survey of properties for developmental purposes; the property professionals such as developers, architects, surveyors, estate agents and valuers; investors who set up properties for the purpose of accruing income; lending institutions such as banks which lend to property developers; land owners with or without interests in developing on their properties (Murigu, 2005).

According to Mbugua (2000) the various stakeholders involved in the industry operate in the market with the influence of a couple of factors. They include: credit conditions, interest rates, inflation, economic growth and income levels, type and location of property.

a) Type of property and its location. Economic forces relate to the idea that land has value because of its productivity. Virtually all land has some use and subsequently some desirability. Due to this desirability land has value. The desirability of one site differs from another and thus there is a difference in value between the different sites.

b) The state of the economy dictates heavily the levels of income of citizens in it. Economic influences therefore relate to consumers’ ability to purchase real estate and use it. Regardless the propensity one has to purchase a specific parcel or development, the desire cannot materialise without the purchasing power.
c) Interest rates and the availability of credit. The availability of debt money has an influence on real estate. When credit is plentiful, loans are easy to obtain. Since the quantity supply of money in the economy can sustain that being demanded the interest rates are lower. This availability of money promotes activity in the real estate market. When credit is scarce, loanees have to pay a premium to acquire funds and thus interest rates are higher. There is a state of illiquidity in the economy has numerous negative effects such as the interest rate a builder must pay on borrowed funds during the construction period.

2.4.2 Types of Investments in Real Estate

In Kenya real estate investment is one of the prime investment options that is sought. It demands the attention of both the public and the private investors. According to Murigu (2005) there are four main types of investment in real estate. These are:

a) Commercial Real Estate

Commercial real estate is that which is income generating. It is inclusive of offices, shopping stalls and sales bazaars. Offices and stalls are usually leased out to tenants upon the discretion of the manager or owner of the property (Murigu, 2005). Commercial property leases usually exceed 5 years with the intention of avoiding controlled tenancies. Landlords avoid controlled tenancies due to the various restrictions placed on them regarding such tenancies in the Landlord and Tenant (Shops, Hotels and Catering Establishments) Act (Cap 301). Under Section 2(1) of the Act, a controlled tenancy means an establishment:

(a) Which has not been reduced into writing; or

(b) Which has been reduced into writing and which;

(i) is for a period not exceeding five years; or

(ii) contains provision for termination, otherwise than for breach of covenant, within five years from the commencement thereof; or

(iii) relates to premises of a class specified by the Minister by notice in the Gazette with reference to rent paid or to rateable value entered in a valuation roll under the Valuation for Rating Act.
In Nairobi, high concentrations of commercial real estate can be located in the Central Business District, along Waiyaki Way, Kiambu Road and Ngong’ Road (Murigu, 2005).

Commercial real estate gives the highest return on investment. Land rents charged for commercial properties by the central government in Kenya are higher than any other use (Syagga, 1994). These land rents are charged on the basis of the value in use of the property in question.

b) **Residential Real Estate**

Residential properties are of a wide variety such as apartments, bungalows, maisonettes and villas. Residents may either be lessees or home owners. Home ownership in Kenya is difficult because of a few factors such as expensive building materials, the escalating land prices and the high rates imposed on mortgagees (Murigu, 2005).

The residential uses in the country can be broken down into two: (i) single dwelling residential use and (ii) multi-dwelling residential use. Single dwelling units are mostly for home owners who wish to settle down (Mbugua, 2000). Construction of single dwelling units is a real investment option in the country considering more and more people are accruing a reasonable disposable income and can afford homes by paying through mortgages.

On the other hand, multi-dwelling units are a perpetual source of income for the investor. Residential property is more commonly let out due to this fact (Mbugua, 2000). There are legislations that govern the leasing of residential properties. They include The Rent Restriction Act (Cap 296) and the Distress for rent Act (Cap 293).

c) **Industrial Real Estate**

Investment in industry is divided into the service industry and heavy industry. The service industry is inclusive of insurance, banking and hotels. In Nairobi service industry is prominent in the Central Business District, Westlands and along Thika Road (Murigu, 2005). On the other hand the heavy industry characterized by high voltage manufacturing is located in the export processing zones. The industrial area
stretching from Factory Street to Mombasa Road, along enterprise road can be pointed out as having the highest concentration of industrial real estate (heavy industry). Industrial real estate is an income generating investment. *Godowns* including both warehouses and manufacturing plants are structures that can give return on investment. However, manufacturing plants require special skills to operate and manage. Setting up storage units and warehouses is more reasonable and profitable for a property investor looking to acquire industrial real estate.

The location of any industry is determined by various factors. According to Von Thunen’s rent theory, these factors include: accessibility to the market; quality, cost and availability of transport; communication; labour supply and the government’s regional policy.

d) **Agricultural Real Estate**

Agriculture is an important sector in Kenya’s economy. It is often stated that agriculture is the “backbone” of Kenya’s economy. Agricultural production has been on the decline due to the conversion of agricultural lands to commercial properties (Museleku, 2012). An example is the vast coffee estates of Ruiru area that are being more and more converted to multi-residential units. Transactions on any agricultural land are to be conducted in accordance with the Land Control Act (Cap 302). The Act provides for a Land Control Board whose purpose is to have oversight on controlled transactions. The board has the power to approve or disprove of any transaction listed as a controlled transaction under the Act.

This section brings out the various investment options available for real estate investor in Kenya.

### 2.5 Real Property Value Appreciation

Lexicon defines appreciation as the increase of a property value due to the changes in market conditions. (Jason, 2001) argues that most real estate investors purchase income properties for cash flow and capital appreciation. It is thus vital for real estate investors to have a good understanding of the factors that cause real estate property to appreciate in value. This will assist them make more profitable decisions.
2.6 Factors Influencing Real Property Value Appreciation

There are various reasons that lead to property appreciation. The seasoned real estate property investor will look for a combination of factors that will result in high appreciation growth (Jason, 2001). The factors that influence real estate appreciation are:

a) **Inflation**

Knakal (2009) argues that, real estate value increases when the inflation rate rises. Inflation is caused by an increase in the amount of money in circulation. The value of money declines when the supply of money increases and this results in increased retail prices.

b) **Location and access**

According to (Jason, 2001) location, condition and security are relevant value determinants. Location is in relevant to the proximity to major public centres and social amenities. Security of lives and property is very essential to prospective investors. For that reason, real property located in crime prone areas experiences minimal value appreciation. The condition of the property should be considered in value estimation. A property in a deteriorating state will definitely have reduction in value while the well maintained properties appreciate in value. (Jason, 2001) adds that infrastructure plays a major role in value appreciation of a property and locations that suffer from value depreciation. (Jason, 2001) argues that location is by far the most important factor. Location is non-controllable and it does not affect most factors. Conveniences from the main routes, traffic flow, visibility and crime rates, are all attributes affiliated to location.

c) **Market forces of supply and demand**

Supply and demand can cause the value of real estate to either go up or down. According to analysis in Real Estate Investment Software, oversupply causes the real estate values to fall while low supply lead to price appreciation of the properties. Demand for real estate varies greatly in different areas and is affected by a number of factors namely; availability of jobs, availability of land, level of interest rates,
proximity to amenities, population changes, infrastructure improvements, property
tax rates and crime level in an area.

2.6.1 Accessibility and Land Prices

Accessibility in general terms is the ease to which one can move to and from
destinations of importance from a single origin. The ability of transportation networks
to make land more desirable is a result of connections formed with surrounding
parcels and activities. Greater accessibility can have a positive impact on the
desirability of an area and this may be reflected through higher land values (Kariuki,
2011).

For residential use, a house location must allow one to visit friends, travel to work
and conduct other activities of day to day life. For commercial or industrial
properties, access to customers and suppliers, as well as specialized facilities such as
railways and airports is important. Accessibility therefore is defined by good roads,
railways and highway networks accessing different areas. According to Boarnet
(2002) development of several tolled highway corridors in Orange County created an
accessibility premium reflected through house prices and employment growth
patterns.

Past evidence asserts that new highways change he geographical pattern of
accessibility and developments. However, this is challenged by the studies conducted
between 1950 and 1970s which showed large land price changes associated with road
improvements during and after construction. Between 1980 and 1990, results were
typically smaller and statistically insignificant (Forkenbrock, 1990).

Other highway critics have also argued that constructing new roads or expansion of
the existing ones to improve accessibility or relieve traffic congestion is a futile
exercise. They have stated that improved roads spur additional travel or divert trips
from parallel routes, quickly returning a facility to its original congested condition
thus resulting to a status quo (Forkenbrock, 1990).
A study conducted in the U. S. A, metropolitan areas over a 15 year time period concluded that areas investing heavily in road capacity fared no better in easing traffic congestion than areas that did not (U.S. Department of Transportation, 1988). They also stated that this resulted to stagnant development of land prices.

2.6.2 The Anatomy of Induced Demand

Demand is one of the land value determinants. High demand is believed to occur where accessibility is improved. Unlike research done in the past decades, modern writers have come up with a positive look towards highway expansion. Road improvements are thought to have distinct short and long term impacts (Cervero and Ewing, 2001). In the short run, increased capacity prompts behavioural shifts; some formerly suppressed trips are now made and motorists able to switch routes in time of travel to exploit available capacity. Downs refers to this trip as convergence. For example, those who previously commuted on the shoulders of the peak might start filling freeway slots that are vacant in the heart of the peak.

In the long term, structural changes can be expected. Notably, people and firms locate to exploit the accessibility benefits created when freeways are upgraded. The consequences would be various uses; petrol stations, fast food restaurants, warehouse would cluster or align themselves around interchanges, along road frontage and along connecting arterials (Hartgen and Kim 1998).

2.7 Legal and Institutional Framework on Road and Highway Construction in Kenya

The Kenyan infrastructural sector with regard to roads operates under three major parastatals. These are: the Kenya National Highways Authority (KeNHA), Kenya Urban Roads Authority (KURA) and Kenya Rural Roads Authority (KeRRA).

KeNHA is established by Section 3 of the Kenya Roads Act of 2007. It has ten regions each headed by a Regional Manager. The Regional Manager reports functionally to the General Manager on maintenance and administratively to the Director General. The mandate of the Kenya National Highways Authority is to manage, develop, rehabilitate and maintain national trunk roads (KeNHA, 2013).
KURA and KeRRA are established by Sections 9 and 6 of the Kenya Roads Act respectively. Their mandate is to manage, develop, rehabilitate and maintain localised roads. As their names suggest, KeRRA caters for roads in rural areas whereas KURA caters for roads in urban areas. According to Section 10 (1) of the Act, the Urban Roads Authority shall have the responsibility for the management, development, rehabilitation and maintenance of all public roads in the cities and municipalities in Kenya except where those roads are national roads.

This study on the Eastern Bypass falls under the jurisdiction of the Kenya Urban Roads Authority since the bypass is not a trunk road and it falls within a predominantly urban setting.

2.7.1 The Hierarchy of Roads in Kenya

Planners need to ensure that the correct hierarchy of roads is provided for when planning a settlement or neighbourhood. The importance of setting out the hierarchy includes: ensuring activities incompatible with traffic flow to be restricted on designated roads, reduction of number of intersections to reduce the risk of accidents and to concentrate traffic movement to a few selected corridors.

Table 2.1: Road Classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type</th>
<th>Reserve in metres</th>
</tr>
</thead>
<tbody>
<tr>
<td>International trunk roads</td>
<td>A</td>
<td>60</td>
</tr>
<tr>
<td>National trunk roads</td>
<td>B</td>
<td>40-60</td>
</tr>
<tr>
<td>Primary roads</td>
<td>C</td>
<td>25-30</td>
</tr>
<tr>
<td>Secondary road</td>
<td>D</td>
<td>20</td>
</tr>
<tr>
<td>Minor roads &amp; SPR</td>
<td>E</td>
<td>18</td>
</tr>
</tbody>
</table>

Source: KENHA, 2013

2.7.2 Impact of Highways on Economic Activities

Highway improvements and the consequent user benefits can create conditions conducive to increased commercial activity in the area of the project. Transportation investments can stimulate business growth via expansion of existing businesses or attraction of new businesses in the corridor, reduction of costs in moving goods and materials and increased inter-regional traffic (Jason, 2001). Highway development
may also deter other types of economic activity such as resorts and other leisure activities relying on remote locations (Perera, 1990)

The impacts can be both positive and negative. Direct impacts include use of facility by vehicles, but also employment and taxes generated by on-site construction and operation of the improvement. Indirect impacts include off-site activities associated with production of immediate goods and services used for construction and operation of the transport improvement. Induced impacts are the multiplier effects of the direct and indirect impacts (Perera, 1990).

Caution should be exercised in attributing regional and community gains in employment and income to highway development, as net gains must be viewed in light of inter-regional changes, the costs and benefits of alternatives to highways and the conditions that would likely exist in the absence of the highway improvement (Gamble, et al, 1978)

2.7.3 Effects of Highway Improvements on Real Property Values

There have been numerous studies on the effects of transportation improvements on real estate values. Most studies analyse the effects of highway expansions or original construction on residential sale prices, with the goal of establishing the economic impact of the highway construction. Huang (1994) found that virtually every major land use study came to the conclusion that transportation improvements positively affect the value of nearby land.

In a study of median housing prices and monthly rents in the San Francisco Bay area, (Kockleman, 1997) showed a strong positive association between accessibility and land prices, evidently, homeowners and renters do value improvements to the transport network, whether their perception of travel benefits is direct or indirect. Mikelbank (2001) suggested that home prices rise in response to improvement of transportation networks that occur along shortest-path routes connecting individual homes to the region’s central business district or the local shopping centre; in general, however, prices fell as a response to nearby transportation-related construction. In congested urban settings with reasonably vibrant economies, real estate developers
scramble to acquire and develop properties with good regional road way access. Parcels well served by roads can yield handsome profits (Jason, 2001). Voith further states that, developers are well aware of roadway projects stated for construction under general regional transportation improvement programs and position themselves to take advantage of planned public improvements.

Besides the opening of improvements of new lanes, actual operating conditions are also thought to influence the scale of land use changes resulting to high values. Higher speeds provide confirmation, demonstrating first hand that there are advantages to owning or leasing properties along a particular stretch of road. The combination of past year road investments and recent trends in operating speeds are thought to influence the amount of development added within a buffer zone of a freeway.

2.8 Impacts of Highway Development on land values

One of the principal ways in which user benefits get transferred to non-users is through the real estate market. A transportation improvement may improve accessibility to a particular area, increasing the premium commercial, industrial and residential users are willing to pay for the property (Jason, 2001). In this scenario, land values within the region of improved accessibility would appreciate significantly. Buyers of land at those locations would be, in effect, purchasing accessibility benefits; the future savings in travel time and operating costs being effectively discounted to their present value and transferred to the sellers of the land (Gamble, et al,1978). This observation would be expected to hold true for the industrial firm benefiting from reduced shipping costs as well as for individuals experiencing lower commuting costs.

If transportation improvements enhance the desirability of locations within the impact area, demand for land at those locations would be stimulated. Given a fixed supply of land, increased demand would lead to escalation of land rents, resulting in higher land values. (Perera, 1990) All other things being equal, one would expect the greatest appreciation in property values at sites that benefited most from this accessibility. Interchange areas, because they represent the focal point of accessibility to major
highways, would likely be the most desirable locations for many types of development. Therefore, these sites might be expected to experience the greatest increase in appreciation.

Uniform conditions however virtually never apply to multiple locations. The value of a given parcel of land is a function of many variables, the most important of which are the uses to which adjoining or nearby tracks of land are put. Other factors that influence the land values besides accessibility are land use controls, topography, drainage, regional growth or decline, availability of capital funds and supply and demand relationships in the local real estate markets (Forkenbrock, 1990). These factors make isolating the influence of the highway a difficult task, particularly with respect to the net gains to a society as a whole as a result of land value appreciation around highways.

While an aggregation of the estimated increases in land values of all parcels within the impact area would yield an overall measure of the value of an improvement to the community (Perera, 1990), there still remains the difficulty of determining the effect on the impact area and the degree to which benefits from one community are transferred to another. Studies seem to indicate that accessibility influences the value of urban land over wide areas surrounding the highways, and is not only influential at interchange sites or in areas closely adjacent to the right of way (Gamble, et al, 1978).

Not all highway studies show increase in land values. There has been increasing interest in secondary impacts resulting from highway improvements (Spawn, et al, 1997). There is a growing realization that, under certain conditions or in some locations, there are negative impacts from highways on land values. A less desirable effect on property values is created by adverse highway influences which may affect certain locations and types of land uses. Improvements that result in externalities such as degradation of water quality or increased safety hazards can effectively decrease property values (Jason, 2001).

Studies that compare the increase or decline in property values along highways to the value of similar properties in control areas are measuring the net effect from the highway. Most research focusing on the detrimental effects of highways on property
values have been limited to adverse impacts on residential land uses. Highway noise is generally considered the most important of such adverse effects (Palmquist, 1980), but the influence of air pollution and the safety hazards of increased traffic are also cited as potential drawbacks of highway development. Many researchers have identified significant negative impacts; however, most acknowledge that there may be both positive and negative impacts working together. For example, properties located very close to major highways may be positively influenced by accessibility improvements, but at the same time adversely affected by highway-generated noise and air pollutants (Gamble, et al, 1978).
2.9 Conceptual Framework

Infrastructural Development

- Forms of infrastructural developments
  - Electrical installation
  - Sewerage system
  - Garbage collection and disposal
  - Wireless networks installations
  - Piped water supply
  - Transportation

Transportation Infrastructure

Land Uses

Types of land uses in Kenya
- Agricultural
- Commercial
- Residential (single user)
- Residential (multi-user)
- Industrial

Bypasses

New land use predominant in study area:
- Commercial properties (retail outlets)
- Residential (multi-tenant) - aesthetic apartments
- Residential (single-dwelling) - gated communities

Changes in the real estate market
- Land use changes
- Land value changes

Cultural framework

Social factors

Political factors

Legal and institutional framework
CHAPTER THREE

Research Methodology

3.1 Introduction
The following chapter introduces information on the study area so as to bring out the
general overview of the area. The chapter also brings out different data collection
methods and analysis as discussed by various intellectuals and their relationship with
this research work, and the problems encountered in the process of collecting data.
The chapter unveils how actually the research was done and how these methods were
used and the reasons behind their usage in data.

3.2 The Study Area
This study focuses on Ruai area which is located approximately 27 kilometres away
from Nairobi, Central Business District. It is located centrally along the Eastern
bypass as it is situated at the junction of the bypass and Kangundo Road. Ruai area is
classified under zone 18B of Nairobi. It is marked primarily as a residential area. Ruai
is located to the North East of Nairobi City Centre.

Ruai town is located in the former Nairobi Province, now Nairobi County and is a
part of Ruai ward in Kasarani Constituency. The Ward has an approximate area of 98
square kilometres. The area covered by the study is approximately 14 square
kilometres (see attached map). The population of Ruai ward is approximately 36,000
(field survey, 2014).

It is one of the relatively new, rapidly growing residential areas in Nairobi. Ruai
harbours the middle class and lower class members of the working population in
Nairobi. The area is less favourable for the higher class of citizens as it has a large
treatment plant of liquid wastes. The treatment plant results in uncomfortable
environment marred by air pollution.

Ruai is 1° South of the Equator and 38° East of the Greenwich. Ruai area is fairly flat.
The area like most of Nairobi experiences cool climatic conditions. Climate partly
depends on altitude. The altitude of Ruai is approximately 1500 meters (above sea
level). Nairobi experiences dual seasons of rainfall per annum.
Long rains are experienced from March to May whilst short rains are experienced from October through to December. Temperatures in the area vary from 16.5°C to 25.2°C.

**Plate 3.1 Map showing the extent of the Greater Eastern Bypass and the location of Ruai**

**Map 1: Location of Ruai along the Eastern Bypass**

**Source: Map by Google**
Plate 3.2 Map showing the extent of Ruai Area

Map 2: Area covered by Ruai
Source: Maps by Google

3.2.1 Services
The area is serviced with communication network by Airtel-Kenya, Orange-Kenya, Safaricom and Yu, and enjoys improved security owing its close proximity to Ruai police station. Shopping centres include supermarkets such as Quickmart.

Plate 3.3 A supermarket in Ruai town

Source: Field Survey 2014
The residents of Ruai and the surrounding areas have a privileged of having many places of worship. There is the Cornerstone Christian Foundation Church, St Joseph Catholic Church, Deliverance Church Ruai, P.C.E.A Canaan Church, which all serve the Christian residents and people from the surrounding areas. It has various schools offering both primary school and secondary school education such as Josna Primary and Ruai Primary School. There is a noticeable absence of recreation facilities such as a playing field or a park.

The Eastern Bypass is one of three bypasses that are under construction by the Government of Kenya with the help of China. The proposed Greater Eastern Bypass (GEB) is one of the milestones that will enable the government to reach its vision 2030 goals. The proposed GEB is approximately 77 kilometres long and is located within Machakos, Nairobi and Kiambu Counties; starting at Lukenya area along Mombasa Road and stretching to Garissa Road at Kilimambogo. The section of the road connecting Mombasa road to the Nairobi-Thika Super Highway is approximately 35 kilometres long.

**Plate 3.4 The Greater Eastern Bypass**

![Image of the Greater Eastern Bypass](source: Field Survey 2014)
3.3 Research and Research design

The following section describes the procedures and methodology that was followed in conducting the study. It addresses data collection, the sampling methods and procedures, the statistical parameters and data analysis techniques. The research design is the conceptual structure within which the research is done. In this section, the researcher aims to accomplish the task of idea conceptualization systematically, facilitating data collection and data analysis in order to arrive at a solid conclusion and recommendations.

3.4 Data Collection

The study seeks to describe an existing phenomenon by quantitatively assessing various values over a defined period and subsequently assessing the perceptions and attitudes of individuals. For this study based in Ruai, the assessment of the land values and land use shall require observation of three chosen parameters. They include: prices of land (that has changed hands) in the last 7 years, the number of transactions in land (per annum) within the last 7 years, and the number of land use changes (per annum) over the last seven years. The quantitative data shall be collected from the valuation departments of the County Council of Nairobi and the Ministry of Lands, Housing and Urban Development.

3.5 Primary Data

The primary data for the study shall be acquired through:

i) Observations and Visual Inspections

A reconnaissance study was carried out by the researcher in a bid to familiarize himself with the area. The exercise allowed the researcher to acquire a general outlook of the study area which substantially contributed in the choice of the problem statement. The units of observation that were used include the new and upcoming residential developments (their number and nature), agricultural parcels (whether cultivated or not) within close proximity to the road.
ii) Taking Photographs
Upon multiple visits to the property, photographs were taken to supplement observations made in the process. The photographs captured the actual situation on the ground. The researcher shall be keen to identify the new developments in the study area.

iii) Questionnaires
The research required some input regarding some qualitative aspects of the stakeholders concerned. These could be adequately captured by the administration of questionnaires by the researcher. Questionnaires were administered to the sample residents and property developers and represented a supplementary source of data. The researcher for this study shall prepare 3 questionnaires. The first to the residents of Ruai to assess what they feel about the development of the road; the second to property professionals operating around the study area so as to get a professional opinion on the same; and the other to the county council of Nairobi so as to acquire intricate data on land values, basic details of the study area and the land use changes observed.

iv) Oral Interviews
Face to face interviews with key informants were conducted. Interviews are considered effective as they allow for clarification to be sought where the response given may not be clear to the researcher. Key informers include: the Chief Valuer, Ministry of Lands, a director at KURA. The Valuer shall aid the researcher in attaining property values in the study area and their changes over time. The director at KURA should be in pole position to enlighten the researcher on the value of the construction of the GEB. The researcher managed to get a hold of Engineer Michael Njonge of KURA. The researcher could not get an interview with the Chief Valuer but was redirected to Senior Valuer B.M. Nzau.

3.6 Sampling Methods and Procedures
a) Population
Population is a large group of people, animals or objects with individual characteristics which a researcher intends to make certain inferences after exhaustive quantification and analysis of such characteristics. A population is a group of individuals under study that shares common characteristics (King’oriah, 2004).
The population in this study shall include the residents within Ruai Area especially along the Eastern Bypass.

b) Sample
Since the researcher cannot be at all places at once and consider all the varied opinions of each member of the population, he has to work with a sample representing the general population. The nature of the study required these members of the sample be: estate valuers, physical planners, property developers and the land owners on the ground.

Sampling can be probabilistic or non-probabilistic. Probabilistic sampling comprises of simple random sampling, stratified random sampling and cluster sampling. The non-probabilistic sampling (also known as purposive sampling) is comprised of quota sampling and opportunity sampling. (Museleku, 2012)

For this study the researcher embarked on simple random sampling.

3.7 Secondary data
Related literature can be reviewed to provide data and information. The researcher has been able to review published and unpublished papers, articles, books and journals relating to land use value with relation to road infrastructure. The data was sourced from libraries, government departments and the internet.

3.8 Data Analysis and Presentation
The data collected from the study was analysed using descriptive statistics and presented using photographs, maps, charts, simple tables and graphs. This has been influenced by the quantitative and qualitative nature of the study. Basically the key objective is to determine the effect of the construction of the Eastern bypass on land values with special reference to Ruai area with the aim of establishing recommendations on appropriate land use management framework.

3.9 Problems and Challenges Encountered During the Study
A major problem encountered by the researcher was getting the relevant respondents to disclose the requisite information. Some respondents were reluctant to answer specific questions especially where they thought the questions were testing their
competence. Some respondents declined to fill in questionnaires, and those who did after a great deal of persuasion gave answers that were too general. Additionally, the response rate was low, set at 72 percent. This reduced the sample thus affecting data analysis. However, a response rate of above 70 percent is deemed a good response (Mugenda, 1999). This substantiates the findings of the study. Another challenge encountered was the limited time period. With a stringent time schedule; having to meet so many deadlines created a lot of pressure on the researcher. This was compounded by the limited funding available. Travelling to the various interview respondents’ offices and to administer questionnaires in Ruai area was a major toll on the budget.
CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction
The research herein was an endeavour to investigate land use changes and land value changes as a result of highway upgrading. The Eastern bypass with reference to Ruai was chosen as a case study to represent other areas affected by the bypasses. The findings from this study form the basis of the following analysis and presentation. Simple descriptive statistics such as tables, pie-charts, graphs and photographs have been used to display, describe and present the findings of the research through classification of the raw data into some purposeful and usable categories. Qualitative data has presented as narratives have been used to supplement the quantitative data.

4.2 The Researcher distributed 40 Questionnaires and conducted 3 interviews. The response was as follows

Table 4.1 Response rate

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Total Number Issued</th>
<th>Response</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Valuer</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Director KURA</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Valuers, Planners and Property developers</td>
<td>15</td>
<td>12</td>
<td>80</td>
</tr>
<tr>
<td>Land Owners</td>
<td>25</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td>County Council of Nairobi (County Clerk)</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>TOTAL</td>
<td>43</td>
<td>31</td>
<td>72</td>
</tr>
</tbody>
</table>
The response rate was low, set at 72 per cent. This reduced the sample thus affecting data analysis. However, a response rate of above 70 per cent is deemed a good response (Mugenda, 1999). This substantiates the findings of the study.

4.3 The prevalent land uses along the Eastern bypass in 2007 before the commencement of its construction

4.3.1 The prevalence of the various land uses along the Eastern Bypass before commencement of its construction

Table 4.2 Responses by Residents

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Residents</th>
<th>Professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Agricultural</td>
<td>10</td>
<td>62.5</td>
</tr>
<tr>
<td>Residential (single user)</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>Residential (multi-user)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industrial (warehouses)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial (retail outlets)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100</td>
</tr>
</tbody>
</table>

From the data collected it is evident that majority of the sampled residents (62.5%) believe that there were mainly agricultural uses to the land in the area. Additionally, a considerable proportion (37.5%) believes that single dwelling residential units were more prevalent. No resident was of a contrary opinion from those two lines of thought.
It is also evident from the data that majority of the sampled professionals (75%) believe that there were mainly agricultural uses to the land in the area. Additionally, a considerable proportion (25%) believes that single dwelling residential units were more prevalent. No professional was of a contrary opinion from those two ideologies.

There is an insignificant difference between the opinions of the professionals and those of the residents according to the study as they both strongly believe that agricultural uses were more prevalent before commencement of construction of the GEB.

Table 4.3 Total responses on the most prevalent land use 7 years ago

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural</td>
<td>19</td>
<td>70.5</td>
</tr>
<tr>
<td>Residential (single user)</td>
<td>9</td>
<td>29.5</td>
</tr>
<tr>
<td>Residential (multi-user)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Industrial (warehouses)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial (retail outlets)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>
The research revealed that in the study area agricultural land uses were more prevalent both from the professionals’ perspective and the residents’ view. This was established with a combined 70.5% of the notion that there were more agricultural activities. A distant second was the group of the opinion that single dwelling uses were more prevalent at 29.5%.

From the study, none of the sampled respondents had a belief in the prevalence of any other land use in the area before the commencement of the construction of the Eastern bypass.

The heavy existence of the two land uses may be attributed to the physical attributes of the land. Firstly the soil factors, with most soils being clay and some loamy, agricultural land use would prevail. And since the farms need to be worked on, few dwelling houses are expected to exist. Additionally, clayey soils are unsuitable for construction, especially of multi-storey buildings.
It can also be argued that before the construction of the road, there was limited access to parcels in the area thus they were unsuitable for most commercial uses, industrial uses and multi-tenancy residential units. Therefore most parcels were held by proprietors at the lowest possible use value, which is agricultural use.

Plate 4.1 Maize farm in Ruai area 50 metres off the Eastern Bypass

Source: Field Survey 2014
4.4 The land use changes along the Eastern Bypass

4.4.1 The prevalence of conversion from agricultural land uses over the last 7 years

Table 4.4 Responses on the prevalence of conversion from agricultural land use

<table>
<thead>
<tr>
<th>Response</th>
<th>Residents</th>
<th></th>
<th></th>
<th>Professionals</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>None</td>
<td>2</td>
<td>12.50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>5</td>
<td>31.25</td>
<td>1</td>
<td>8.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exponential</td>
<td>9</td>
<td>56.25</td>
<td>11</td>
<td>92.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100</td>
<td>12</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the data collected it is evident that majority of the sampled residents (56.25%) believe that the rate of conversion of property from agricultural uses to alternative use is very high. A considerable proportion (31.25%) believes the rate of conversions is moderate whereas 12.5% are of the opinion that there is no trend of conversions from agricultural land uses.

On the other hand majority of the sampled professionals (92.7%) believe that the rate of conversion of property from agricultural uses to alternative use is very high. A considerable proportion (8.3%) believes the rate of conversions is moderate whereas none of the professionals is of a contrary opinion.

There is a marked difference between the opinions of the professionals and those of the residents according to the study on the prevalence of the conversions. This can probably be attributed to the fact that the professionals have a better chance of knowing of the changes as they are involved in the transactions. Additionally, transactions in land are usually privy to the parties involved in transacting. Therefore, unless land owners declare publicly of their transactions in land (which is highly unlikely), persons who are not involved in the conversion or conveyance will have little knowledge of the same.
Table 4.5 Combined professionals’ and residents’ responses on the prevalence of conversion from agricultural land use

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2</td>
<td>7.14</td>
</tr>
<tr>
<td>Moderate</td>
<td>6</td>
<td>21.43</td>
</tr>
<tr>
<td>Exponential</td>
<td>20</td>
<td>71.43</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey 2014

Various long standing inhabitants with considerable sizes of parcels of land have experienced new neighbours who are constructing heavily on their parcels. Respondents with the belief that there has been an increase in conversion from agricultural uses argued that the influx in population had an impact on this from the responses received by the researcher. Owners of considerably large parcels have opted to subdivide and sell them.

4.4.2 The influx of residential uses

Table 4.6 Responses on the influx of residential uses in the area in the last 7 years

<table>
<thead>
<tr>
<th>Response</th>
<th>Residents</th>
<th></th>
<th>Professionals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>None</td>
<td>3</td>
<td>18.75</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>6</td>
<td>37.50</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td>Exponential</td>
<td>7</td>
<td>43.75</td>
<td>8</td>
<td>66.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>100</strong></td>
<td><strong>12</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
From the data collected it is evident that majority of the sampled residents (43.7%) believe that the rate of increase of residential uses is very high. A considerable proportion (37.5%) believes the rate is moderate whereas 18.75% are of the opinion that there is no trend of conversions to residential land uses. On the other hand majority of the sampled professionals (66.7%) believe that the rate of conversion of property to residential uses is very high. A considerable proportion (33.3%) believes the rate of conversions is moderate whereas none of the professionals is of a contrary opinion.

Unlike the professionals, not all the residents believed that there is a trend of conversion to residential land uses. Out of the 16 residents only 13 were of the opinion that there has been a trend of conversion to residential land uses.

Again in this case the professionals who are actually involved in the transactions in land in the area are in a better position to tell the emerging trends as opposed to some residents who may not even be aware of the gradual or even drastic changes in their environs. On the other hand professionals who have carried out numerous activities with regards to conversions in the area may have a biased opinion depending on which conversions they have majorly encountered in the discharge of their duties.

4.4.3 Reasons for conversion to residential uses

<table>
<thead>
<tr>
<th>Response</th>
<th>Residents</th>
<th></th>
<th>Professionals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Security of the area</td>
<td>1</td>
<td>7.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Proximity to the CBD</td>
<td>3</td>
<td>23.1</td>
<td>2</td>
<td>16.7</td>
</tr>
<tr>
<td>The land price</td>
<td>2</td>
<td>15.4</td>
<td>2</td>
<td>16.7</td>
</tr>
<tr>
<td>The construction of the Bypass</td>
<td>5</td>
<td>38.5</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>15.4</td>
<td>1</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>100</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>
Chart 4.2 Graphical representation of reasons for conversion to residential uses

Source: Field Survey 2014

4.4.4 The change of land prices

Table 4.8 Residents’ responses on the increase in land prices in the area over the last 7 years

<table>
<thead>
<tr>
<th>Response</th>
<th>Residents</th>
<th></th>
<th>Professionals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Little or No increase</td>
<td>1</td>
<td>6.25</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Moderate increase</td>
<td>5</td>
<td>31.25</td>
<td>2</td>
<td>16.7</td>
</tr>
<tr>
<td>Exponential increase</td>
<td>10</td>
<td>62.50</td>
<td>10</td>
<td>83.3</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>
From the study, most of the sampled residents (62.5%) believe that there has been an exponential increase in land prices. 31.25% believe there has been a moderate increase in land prices and 6.25% believe there has been no increase in land prices over the specified period.

From the study, most of the sampled professionals (83.3%) believe that there has been an exponential increase in land prices. 16.7% believes the increase in land prices has been a moderate whereas none believe there has been no increase in land prices over the specified period.

Table 4.9 Combined responses on the increase in land prices in the area over the last 7 years

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little increase</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>Moderate increase</td>
<td>7</td>
<td>25.0</td>
</tr>
<tr>
<td>Exponential increase</td>
<td>20</td>
<td>71.4</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

Chart 4.3 Graphical representation of opinions on changes in land prices

Source: Field Survey 2014
Table 4.10 Average prices of land in the area of interest

<table>
<thead>
<tr>
<th>Year</th>
<th>1/8 acre</th>
<th>1/4 acre</th>
<th>1 acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>500</td>
<td>900</td>
<td>3,000</td>
</tr>
<tr>
<td>2009</td>
<td>800</td>
<td>1,450</td>
<td>4,500</td>
</tr>
<tr>
<td>2011</td>
<td>1,400</td>
<td>2,600</td>
<td>8,000</td>
</tr>
<tr>
<td>2013</td>
<td>2,100</td>
<td>3,900</td>
<td>12,000</td>
</tr>
</tbody>
</table>

The above data was collected from the Ministry of Lands, Housing and Urban Development Headquarters, Ardhi House, located along 1st Ngong Avenue in Nairobi’s Upper Hill area. The director of physical planning directed the researcher to the valuation department to acquire the requisite data.
The land prices in the area, from the valuation records, have been escalating at a tremendous rate. This area is no exception as other parts of Nairobi bordering the CBD have been experiencing similar trends. Parcels in Kileleshwa, from the valuation records have been experiencing in excess of 10 million increases in land price per acre over the last 4 years. The areas have recently been under renovation and expansion, with link roads being heavily invested upon.

From the literature review, land prices may be determined by accessibility. Values of land tend to shift to those areas that have gain accessibility associated with getting to work, visiting relatives, friends, shopping and other activities and away from those that have suffered in this respect with traffic congestion in many older urban areas. Land value and price can also be affected by changes in population. With perceived increase in access people will move into the area. The demand for residential housing
in the area increases subsequently. With the supply for housing being slower in producing additional units than the increasing demand, the price of residential units increases. This subsequently increases the value of residential parcels.

Land speculation is a prevalent trend in the Kenyan land market. It is reported that projects such as Konza City have sparked quick purchase and hoarding of parcels by numerous persons. From the literature review, this creates artificial scarcity in land supply causing escalation in prices so that land prices are driven beyond the productive value of the land.
4.5 The Present Day Key Land Uses along the Eastern Bypass

4.5.1 Commercial Properties

From the literature review, if a new road or railway line opens up in an area, the land values will have an upward trend particularly for industrial and commercial use.

i) Entertainment spots

Plate 4.2 New restaurants, along the Bypass

Located approximately 900 metres off Thika Road along the Eastern Bypass is this Bar and Grill restaurant under construction. When completed, it shall be one of over forty similar developments occupying a five kilometre stretch of the Eastern bypass from the Nairobi-Thika Super Highway eastwards.

These have collected in clusters along the bypass.
ii) Retail outlets
Mostly supermarkets and hardware stores

Plate 4.3 Easy mart and Tumaini Supermarkets

![Easy mart and Tumaini Supermarkets](image)

Source: Field Survey 2014

With influx of population in the area, several retail outlets in the form of supermarkets have opened to cater for the house hold needs of the residents of the area.

Plate 4.4 Hard-ware stores

![Hardware stores](image)

Source: Field Survey 2014

Hardware stores have formed clusters along the bypass. They provide raw materials for all the new developments and those that are upcoming along the GEB.
4.5.2 Residential Properties

Plate 4.5 An apartment block

Gezi Apartments is located 2 kilometres south of Ruai in Utawala area along the bypass. It is recently completed and currently has no inhabitants.

Source: Field Survey 2014

The area is predominantly occupied by single dwelling units. Recently, various multi-tenancy residential buildings have been set up.

At the time of the study, numerous apartment buildings were under construction. All multi-tenancy units especially near the road have just recently been constructed. The trend of increasing multi-tenancy residential units was more prevalent in south of Ruai along the bypass.

Single dwelling units on the other hand are more prevalent to the north of Ruai along the bypass. Several gated communities are under construction. A parcel approximately 5 acres in size located about 3 kilometres from the Eastern bypass interchange with Kangundo road is under development for a gated community.
In Plate 4.6 is an example of a newly constructed single-dwelling unit North of Ruai along the GEB.

Source: Field Survey 2014

The researcher observed two gated communities recently completed with one having residents already starting to settle in named Ladera Abbie Homes. The other, named Wysteria had both 3 and 4 bedroomed bungalows. Access to these settlements is limited and they both employ 24 hour surveillance. From the study, the researcher came to find out that they were both serviced by boreholes for water supply and septic tanks. Most of the other single dwelling units visited by the researcher exhibited similar properties which is unsavoury for an area harbouring Nairobi’s sewage and water treatment main facility.

The single dwelling units located north of Ruai are seemingly encroaching into the agriculture based Ruai regions. Most land owners in Ruai area along the bypass are adopting a kitchen garden format of farming, whilst letting out the rest of the property.
4.5.3 Special Properties

Petrol stations

Plate 4.7 Quick Check Service station

Source: Field Survey 2014

The petrol station is one among several new stations that have come up along the Eastern Bypass. Others include Shell and Total Petrol stations. With the amount of traffic along this route, from the researcher’s observation, these stations over a 13 kilometre stretch are sufficient to cater to motorists plying the route.
CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter seeks to bring out a clear outline of the study. In this chapter, there shall be a summary of the study, conclusions made from the findings of the study and recommendations based on the findings of the study. The chapter also includes areas of further study that the researcher has identified.

5.2 Summary of findings
From the study, the researcher came up with the following findings.
Before the commencement of the construction of the GEB, the most prevalent land use in the study area was agricultural. Majority if the residents of Ruai area and the property experts operating in the area were of this opinion.
Additionally, the study revealed that there has been an increased conversion of land use from agriculture. Most of the respondents believed that there was an exponential increase in conversion from agricultural uses. Of those who believed there was an increasing number of conversions, a majority believed that the most prevalent use to be converted to was residential. Professionals further added that multi-tenancy residential uses were more common in conversions.
Another observation made in the study was that the respondents were of the opinion that land prices in the study area have increased with most of them of the notion that the increase in land prices was exponential. The researcher also deduced that there was a direct relationship between the belief that conversions from agricultural uses were prevalent and the opinion of increase in land prices.
From the study various uses were established in the area of study. Multi-tenancy residential buildings are predominantly coming up in the area. Single dwelling units are mostly in form of gated communities. Other single dwelling units are accompanied by kitchen gardens as the inhabitants of the area are still pegged on the previously predominant practice of farming in the area.
5.3 Conclusions

The Construction of the Eastern Bypass has resulted in increased land use values in Ruai area. Several parcels have been converted from agricultural use to residential uses. This trend is harboured by the edaphic factors of the area. The area predominantly has black cotton clayey soils which hinder construction of high rise buildings.

The influx in population of the area can be attested by the increase in size of public passenger transport. The terminals have expanded to cater for the increased number of vehicles. The increase in population has translated to an increase in demand for housing. Developers in the area are currently working on increasing the supply. On the other hand land prices for residential purposes are shooting up due to the increased demand.

The agricultural sector in Ruai has suffered a big blow. Parcels are increasingly being converted from agricultural uses. With Ruai being a source of food crop, though not a large one, the food stores in the country are diminishing. A major problem for country is famine in arid areas especially during seasons of drought. Such conversions are aggravating the condition of a “sore wound”.

Another thing is that the levels of infrastructure such as piped water supply, solid waste management and sewerage systems are not sufficient to cater for the increasing population. New developers in the area are parting with huge amounts of cash to ensure installation of such services. Distribution of electricity however, is commendable. Generally, increasing the available infrastructure stock would require even more funding.

The farmers in the area have subdivided their parcels. Fragmentation into smaller parcels that are un-cultivatable is prevalent. Fragmentation in most cases, from the Kenyan chapter, is a resultant feature of succession of land. However the bypass took up some sections of land of various farmers.
5.4 Recommendations

Institutional reforms that would change the management and direction of public infrastructure investment should be re-organised. Additionally, agencies authorized to choose and finance investments that promote regional well-being should be advised to target more investment to central city and urban centres and less to the surrounding suburban areas. This would help alleviate the strain placed on the infrastructural facilities available in these peripheral areas.

Taking a keen note of the traditional uses of Ruai area, it is important to observe agricultural demand for land. Maize production has declined but vegetable production is important due to perishability of the crops. Vegetables have been seen to thrive in greenhouses. The researcher identified a few structures such as these that moderate conditions of growth of crops and confine them to a limited area. Active campaigns to adopt this form of farming in the area can help preserve its culture of agro-production as it embraces changes of conversion to other land uses.

5.5 Areas of Further Study

1. A study of the effect of bypass construction to the development of dormitory towns

2. An investigation of the role played by transportation infrastructure in the development of Nairobi into a metropolitan.

3. An investigation into the effect of convergence of infrastructural lines on emerging land uses.
BIBLIOGRAPHY


Forkenbrock, David (1990): *Putting Transportation and Economic Development into Perspective*, the Public Policy Centre, the University of Iowa.


Huang W. (1994): *The Effects of Transportation Infrastructure on Nearby Property Values: A review of the Literature*; Institute of Urban and Regional Development; Berkeley, California


Lloyd Rodwin (1960): The Future Metropolis, Tamiment Institute and Daedalus


Thorncroft (1965): Principles of estate Management, Estates Gazette Ltd

APPENDIX A:

QUESTIONNAIRE FOR THE COUNTY COUNCIL OF NAIROBI: CLERK

The following Questionnaire is strictly for academic work. It is submitted by Njoka David Francis, from the University of Nairobi who is undertaking a research for Bachelor of Real Estate on the impact of road upgrading with the Eastern Bypass with respect to Ruai area as the case study. Your cooperation is highly appreciated.

1. What is the population of Ruai Area?

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

2. What has been the periodic change of the rates charged to properties in Ruai area particularly along the Eastern Bypass (say from 2006)?

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

3. What types of land uses are predominant along the Eastern Bypass (special reference to Ruai)?

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
4. What has been the most prevalent land use that land has been converted to within this period?

5. What is the number of transaction on land on an annual basis in the area over the last 7 years

Documents Request: Ruai Land Use Plan

ALL INFORMATION HEREIN IS TREATED WITH CONFIDENTIALITY.

THANK YOU FOR YOUR PARTICIPATION.
APPENDIX B:

QUESTIONNAIRE FOR PROPERTY PROFESSIONALS OPERATING ALONG THE EASTERN BYPASS

The following Questionnaire is strictly for academic work. It is submitted by Njoka David Francis, from the University of Nairobi who is undertaking a research for Bachelor of Real Estate on the impact of road upgrading with the Eastern Bypass with respect to Ruai area as the case study. Your cooperation is highly appreciated

1. What is your occupation?

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

2. What is the name of your company?

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

3. For how long have you worked on properties along the Eastern Bypass? ........

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

4. As at 7 years ago, what was the most prevalent land use in the area?
<table>
<thead>
<tr>
<th></th>
<th>Land Use Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Agricultural</td>
</tr>
<tr>
<td>b</td>
<td>Residential (single user)</td>
</tr>
<tr>
<td>c</td>
<td>Residential (multi-user)</td>
</tr>
<tr>
<td>d</td>
<td>Industrial (warehouses)</td>
</tr>
<tr>
<td>e</td>
<td>Commercial (retail outlets)</td>
</tr>
</tbody>
</table>

5. In your experience, has there been a decrease in agricultural land uses over the last 7 years?
   a) No                   (   )
   b) Yes (moderate)       (   )
   c) Yes (exponential)    (   )

6. In your experience what has been the rate of increase of the price of land over the last 7 years?
   a) Low                  (   )
   b) Moderate             (   )
   c) Exponential          (   )
7. In your opinion, has the population of the area increased over the last 7 years?

a) No ( )

b) Yes (moderate) ( )

c) Yes (exponential) ( )

8. Has there been an increase in residential land uses over the last 7 years?

a) No ( )

b) Yes (moderate) ( )

c) Yes (exponential) ( )

9. If yes for question (8) above, what would you say are the reasons

a) Security of the area ( )

b) Proximity to the CBD ( )

c) The land price ( )

d) The construction of the Bypass ( )

e) Other ( )

Give this other reasons

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
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........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
ALL INFORMATION HEREIN IS TREATED WITH CONFIDENTIALITY.

THANK YOU FOR YOUR PARTICIPATION.
APPENDIX C:

QUESTIONNAIRE FOR THE RESIDENTS OF RUAI AREA, ALONG THE EASTERN BYPASS

The following Questionnaire is strictly for academic work. It is submitted by Njoka David Francis, from the University of Nairobi who is undertaking a research for Bachelor of Real Estate on the impact of road upgrading (the Eastern Bypass) with respect to Ruai area as the case study. Your cooperation is highly appreciated

1. What is your occupation?
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2. Are you the owner of the property or a tenant?
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3. For how long have you lived in the property?
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4. If respondent has been a tenant for less than 7 years, what prompted their move into the neighbourhood? (tick in any entry and as many as you see fit)
a) Security of the area ( )
b) Proximity to the CBD ( )
c) The land price ( )
d) The construction of the Bypass ( )
e) Other ( )
Give this other reasons
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5. If you (the respondent) have been a tenant for more than 7 years, were you affected by the process of land acquisition by the government for the construction of the road? If so, how?

6. At the time of your commencement of residency, what is the most prevalent land use in the area?
   a) Agricultural
   b) Residential (single user)
   c) Residential (multi-user)
   d) Industrial (warehouses)
   e) Commercial (retail outlets)
   f) Other

7. Do you think there has been a decrease in agricultural land uses over the last 7 years?
   a) No
   b) Yes (moderate)
   c) Yes (exponential)

8. Do you think that the price of land has increased over the last 7 years?
   a) No
   b) Yes (moderate)
   c) Yes (exponential)
9. Do you think the population of the area has increased over the last 7 years?
   a) No (   )
   b) Yes (moderate) (   )
   c) Yes (exponential) (   )

10. Has there been an increase in residential land uses over the last 7 years?
    a) No (   )
    b) Yes (moderate) (   )
    c) Yes (exponential) (   )

Notes

ALL INFORMATION HEREIN IS TREATED WITH CONFIDENTIALITY.

THANK YOU FOR YOUR PARTICIPATION.