

*Full Length Research Paper*

# Real estate development outside the city county of Nairobi and the escalation of urban sprawl: Could developers be avoiding zoning-related costs in the city?

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In the recent times, there has been a wave of mostly speculative developers from the city of Nairobi targeting the areas outside the city fringe and, therefore, helping to create massive urban sprawl. Although various factors would lead to urban sprawl, it should be noted too that a significant variation in the cost of development between the city and areas outside the city may create a speculative zone in suburbia where developers would maximize profits. For example, recent studies show that planning and development control in Kenya is mostly practiced inside the city, yet such planning is lacking or is ineffective outside the city fringes. This means that developers in the city bear some extra cost related to zoning and planning permission. In this paper, it is assumed that property values in the areas of the city and in the areas immediately outside the city fringe shall not vary significantly. As a result, development cost shall be the only factor taken into consideration by developers when choosing locations where to maximize profits. The t-test analysis was used to compare cost and property values between sampled areas of the city and those outside the city fringe. The analysis revealed that whereas there were very significant variations in the costs of the two development control models of the selected areas of the city and those immediately outside the city, there were, however, no significant variations in the property values in the two locations. It was then concluded that such scenario would create a zone of high profit in areas outside the city which shall induce speculative development, thus, contributing to urban sprawl.

**Key words:** Variations, cost of development, urban and fringe, same property values, urban sprawl.

## INTRODUCTION

This paper analyzes how planning in the city would create high development cost that may impel developers to opt for areas outside the city fringe where planning is either ineffective or lacking altogether. However, this scenario can only occur if the property values in areas of the city

and those outside the city do not vary significantly. In this case, the variable of property value shall be taken to be constant while the only variable factor shall be development cost. The developer shall therefore choose locations where development cost is lowest in order to

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maximize on profits since property values shall be constant. The only cost considered in this paper is cost related to obtaining development permission in order to comply with zoning regulations.

### **Theoretical foundation of the dichotomized urban-rural development paradigm in developing countries**

Most countries in the transitional economies tend to follow a two-sector development paradigm in which the urban space is clearly separated from the rural land use system. This approach tends to create a duality in land use management often manifested in the form of territorial jurisdictions and variations in land control approaches. In Kenya, for example, land use zoning and control is effectuated within the city; yet, such requirement outside the city is either lacking or ineffective (Simiyu, 2002; Ayonga and Obiero 2009a; Ayonga, 2008; Ayonga, 2012). However, there is a recent phenomenon of population movement comprising home-seekers and real estate developers who build houses for sale, those who build houses for rent and those who subdivide land for sale originating from the city and targeting the peri-urban areas of the cities in Africa (Kombe, 2005; Civil Service College, 2007; Nkwae, 2006; Mundia and Aniya, 2006; Ayonga, 2008, 2012).

The question is: can this trend of peri-urban formation be explained within the classical theories of the concentric zone and the ocean wave analog models? In the USA, Latin America, and Middle East, urban sprawl was found and currently takes the form of invasion and succession or leapfrog and this is because the urban and rural land use systems are integrated (Mubarak, 2004; Le Furgy, 2003; Violich, 1997; Ayonga, 2012).

The new trend of peri-urban formation in Kenya and other countries in transition then begs for a new theoretical dispensation that can be able to explain the observed contradiction between peri-urban formation in Africa and countries of the west, the USA, Middle East and Latin America. The relevant question at this juncture is: What actually explains peri-urban formation in Africa and in the Kenyan context in particular?

It is worth noting that the relics of colonial administration in Africa resulted in a land use administration and land use control model which is differentiated between the urban and the rural (Rondinell, 1983; Obudho, 1974; Ayonga, 2008, 2012). The resulting duality in land use management then created the urban and rural land use systems both of which had variations in land use management. On the basis of the foregoing duality, peri-urban formation in Kenya can partly be explained within the context of cost variations in the two-urban and rural models created by the dual urban-rural land administration approaches. It can be argued that developers can choose peri-urban locations because of other factors such as land availability.

However, developers in Kenya who opt for peri-urban locations have shunned areas within the city where land is also available and they also shun land located further into the interior of the rural space. This then shows that the location of the land selected by developers and not just availability is critical

### **Explaining the rural-urban duality in Kenya: Colonial Policy of racial segregation and the evolution of urban-rural land use systems in Kenya**

During colonial rule, Europeans and Asians lived in major urban areas and scheduled rural areas and Africans lived in the African rural reserves (Obudho, 1974; Okoth-Ogendo, 1991). The spatial segregation policy also saw different approaches of spatial management being applied in the racially differentiated European and African settlements. For example, controlled development based on zoning regulations was practiced in the European and Asian settlements but not in African settlements. This policy was again inadvertently continued to post-colonial era up to 1998 when the Physical Planning Act came into force (Ayonga and Obiero, 2009; Ayonga, 2012) as explained below. But why was this segregation retained in post-colonial era?

During post-colonial era, the rural areas were devoted to agriculture use and for homesteads. It was managed by the Land Control Boards with the sole purpose of promoting agriculture. The urban areas were retained as a separate land use system from that of the rural land use system to promote the growth and service center strategies. However, the urban system was still partitioned not according to race as it were during colonial, but according to income levels. The rich occupied the former European and Asian zones while the poor still occupied East lands (Syagga and Kiamba, 1992).

Whereas land in the rural areas was held as freehold land, land tenure in the urban areas was held as leasehold upon alienation (GOK, CAP 302; GOK, CAP 300; GOK, CAP 280). The rural area had a simplified survey system where hedges were sufficient as boundaries and where mutations and registered index maps sufficed as evidence of land records and boundaries. This was in contrast with urban areas which used deed plan system and land registration procedures were rigorous under the registered Titles Act (GOK, CAP 291; GOK, CAP 281; GOK, 2012).

From the foregoing, it can then be deduced that the urban and rural areas were like separate land use systems in the context of the systems theory. The urban and rural areas promoted different space use objectives, had different land registration processes, were under separate jurisdictions and had different development control models. The cost of undertaking development was also different by necessity. The question one may

ask at this juncture is: if such duality exists between the urban and rural spaces in the form of use and jurisdiction, how then does suburbia emerge?

### **The formation of a low cost-maximum profit zone that attracts the speculative developer outside the city fringe**

The requirement within the city that developers obtain development permission in order to comply to planning and zoning would result in higher development costs in the city than in areas outside the city. What then creates speculation outside the city? It is argued that over time, the urban land use system spreads towards the rural land use system. Yet the duality between the urban and rural hides the overlapping reality. The ensuing scenario is that a rational developer would shun the city in-favor of areas immediately outside the city fringe to maximize on profits.

Recent studies have corroborated the position taken in this paper that areas immediately outside Nairobi city are actually part of the city land use system although there is a boundary separating the urban and the rural space economies (Ayonga and Obiero, 2009a; 2012). Studies carried out in the UK, USA, Middle East, South East Asia Ethiopia and Tanzania also established that suburban development was part of the city land use system (Adell, 1999; Baldassare, 1986; Mubarak, 2004; Ayonga, 2008; Kombe 2005). This means that capitalists advance the profit motive in this zone by constructing urban-related development while policy still considers the zone to be part of the rural land use system promoting agriculture.

It is argued that the presence of a large number of residents in suburban Nairobi who work in the city and who earn huge incomes just like those workers residing within the city then means that large markets also exist in suburbia to enable viable investment. If this argument holds water, then it means that a developer who aims to invest in either the city or in suburbia would be indifferent between two locations unless there are other considerations. It is argued in this paper that such consideration shall result from variations in costs between the two land use systems of rural and urban

## **METHODOLOGY**

### **The choice of Eastland in Nairobi for comparisons with areas of suburbia: A justification**

During post-colonial era, a few African elites who could afford joined the European and Asian zone in West-lands of Nairobi and a new form of segregation emerged during post-colonial era that was based on income (Syagga and Kiamba, 1992). Those Africans who migrated from the rural areas simply joined their poor kinsmen in Eastlands and this led to the swelling of the already crowded low income areas in the urban. The emerging African middle class who no longer wanted to live in the congested and filthy East-lands

could not afford the preferred locations of west-lands. It is this middle income-black Africans who have moved to suburbia and reconnaissance survey also corroborated this evidence. This means that the people who create market for houses constructed in peri-urban Nairobi are the Africans originating from East Lands where most of them resided. A speculative developer could therefore either invest in East-lands or in suburbia where the customers for the intended investment could be found. The question then is; where between East-lands and Suburbia would such investor opt to put his/her money?

### **Sampling procedure**

From East lands part of Nairobi, four residential estates were randomly selected. These were Kayole, Satellite, Zimmaman and Embakasi. Although Nairobi is surrounded by three counties, only Machakos and Kajiado were purposefully selected. In the recent times, pressure for suburban development has been heaviest towards Kajiado and Machakos sides and this was the reason for the selection of the two counties. Within the two counties of Kajiado and Machakos, there are several clusters of land tenure systems which are administered by various institutions and where different development pathways are followed. It was considered that such variations in development pathways and differences in the motives guiding development control may also bring about micro variations in development cost and perhaps variations in investment opportunities. As a result, different clusters of similar land tenure systems in Kajiado and Machakos were purposefully picked for in-depth analysis and comparison.

In Kajiado the following clusters were selected for the inquiry: Ngong Town with government land, Ongata Rongai with trust land, Ngong/Ngong with freehold land and Kitengela with cooperative land tenure systems. In Machakos, Athi River was selected since it had government land, Syokimau was also selected because it had cooperative land tenure. Mulolongo town was selected because it had trust-land while Katani was also selected because it had freehold land tenure. The two counties which were selected for this study and from where clusters were picked from are considered sufficient representation of Suburbia for this analysis (Table 1).

### **Sources of data and methods of data collection**

#### ***Data related to income earning capacity and investment opportunities***

It was assumed that a developer who aims to build a house for rent in the city and in the city fringe would consider the cost of land purchase, the cost of development and the level of rent. But this developer would not vary the cost of house rent because this would be dictated by the on-going market rates as dictated by the market forces of demand and supply. The developer cannot vary the cost of land either because this is dictated by the market forces also and particularly the on-going market prices. In exceptional circumstances, the land owner may lower the land price in order to dispose such land quickly and the lucky buyer shall translate the reduced prices into increased profit once the investment is complete. In order for the house builder-to rent to maximize returns on rent, then he/she must minimize on the cost of land transaction, cost of consulting development consultants and cost of obtaining development permission. All data related to Rent Value (REVA), House Value (HOVA), and Land values (LAVA) which were used to determine the investment potential by the developers were collected from secondary sources. These sources were the district

**Table 1.** Sampling areas.

District	DIVI division	Land tenure	Sampling unit
1. Kajiado	Ngong-town-.....	▪ Governmentland(Leasehold)	Developer in each land tenure cluster: (House builder to sell, House builder to rent)
	Ngong-Ngong.....	▪ Freehold	
	Kitengela.....	▪ Cooperative/Company Land	
	Ongata Rongai.....	▪ Trustland	
4. Machakos District	Mulolongo.....	▪ Trust land	House builder to sell House builder to rent
	Syokimau.....	▪ Cooperative/company	
	Katani.....	▪ Freehold land	
	Athi River.....	▪ Government/Leasehold land	

Source: From literature review and reconnaissance survey (map).

valuation offices, the city valuation offices, the newspaper property surveys and from real estate and property consultants. The city land valuer and the district land valuers were also interviewed as key informants and their evidences were used to either corroborate or triangulate data received from secondary sources.

#### **Data related to development cost: A conceptual guide**

Developers incur various costs at different stages of the development trajectory. In order to calculate the costs, the different stages where such costs are incurred and which developer incurs such cost and the way to calculate them is conceptualized as follows. The two categories of developers would require land for investment and all of them shall incur the cost related to land acquisition and delivery (COLARD). The second cost incurred by the two developers who build houses for rent and for sell is that related to consulting the services of experts in the building industry. The last cost incurred by the two developers is that related to obtaining a development permit from the relevant authorities. The data related to development costs were obtained as explained in the section below.

#### **The cost of land registration and delivery (COLARD)(C1)**

Information relating to land delivery cost regarding government land tenure was obtained from the Commissioner of Lands, the District Lands Officer and from the Government Lands Act (GOK, CAP 280-now repealed). This category of land tenure covers Ngong town, Athi River Town and Nairobi city. Land registration and delivery relating to freehold land tenure clusters and cooperative land tenure clusters outside the city were obtained from the Land Control Boards, District Land Registrars, District Surveyors, review of the Land control Act (GOK, CAP 302) and review of the Registered Land Act (GOK, RLA Cap 300). Data on land delivery related to trust land falling within the small towns of Mulolongo and Ongata rongai were collected from the county councils of Olkejuado and Mavoko Municipal council in areas outside the city. Costs related to land delivery was given the coding of cost one (C1) in a development process.

#### **The cost of consulting development consultants (C2)**

When developers go for development permits, they are supposed to present prove that they have consulted experts in the built industry for technical advice. Some of the experts who are consulted include quantity surveyors, engineers, planners and

architects and the services provided by such experts would cost the developer some money. Data related to hiring the services of the development consultants in Nairobi was estimated through the help of the Architectural Association of Kenya. This is a professional association that incorporates all the professionals in the built industry including architects, town planners, Quantity surveyors and landscape architects.

Most consultants levy 6% of the total cost of constructing a house and such cost is often assessed and arrived at by a quantity surveyor. It was possible, therefore, to estimate the cost of all experts in the building industry. In Machakos and Kajiado, the cost of experts was estimated by interviewing developers and agents who had presented plans at the local authorities for approval. This is because developers outside the city rarely consult experts and it was not a requirement.

#### **The cost of obtaining development permits (C3)**

At the local authorities where development permits are issued, developers are expected to foot another type of cost called scrutiny and approval fees. This cost was coded as cost three in a development process (C3). The cost of obtaining development scrutiny and permits from the various local authorities was obtained from the records of the city council of Nairobi, Olkejuado county council in Kajiado and from Mavoko municipal council in Machakos. The other sources of data were from the District Physical Planning officer Machakos and Kajiado, Public Health Officer Machakos and Kajiado, District Lands Officer Machakos and Kajiado and District Works Officer, all of whom were involved in development approval process.

#### **Data analysis;**

#### **Calculating development costs**

The cost of development in each zone comprised of the cost of land registration and delivery (cost 1), the cost of hiring development consultants (cost 2) and the cost of obtaining development permission (cost 3). The total development cost (C1+C2+C3) for Nairobi was first tabulated at cluster level, for example Kayole, Zimmaman, Embakasi, then at city level and taken as the Nairobi average development cost. A similar process was carried out when calculating the cost for the areas of Kajiado and Machakos. The Nairobi average development costs were compared to those of Machakos separately using a t-test and then to those of Kajiado separately.

### **Calculating investment potential/Total revenue earning capacity in a zone**

The Nairobi rent values (REVA), Land value (LAVA) and House value (HOVA) were tabulated separately into averages and a similar process was carried out to establish the Machakos and Kajiado averages. The land values (LAVA), rent values (REVA) and house values (HOVA) were used in this study as proxy variables to represent the income earning capacity/investment capacity in a particular zone of Nairobi, Kajiado and Machakos. In order to allow uniformity in analysis, the same size of land measuring 0.045 hectares was used to compare land values in Nairobi and areas of suburbia. The house unit used to analyze house value and rent levels was also fixed as a two-bedroom house with ordinary quality finishes and sitting on the same size of land fixed at 0.045 hectares. The Nairobi average income earning capacities were compared to those of Machakos and those of Kajiado separately using a t-test.

### **The tabulation of profit: total revenue (TR) minus total cost (TC).**

If total revenue measured in terms of proxy variables of land values (LAVA), rent values (REVA) house values (HOVA) is found to be the same between areas of Nairobi and areas of the rural urban interface, then levels of profit shall have an inverse relationship to the levels of development cost. This means that the higher the cost in relation to total revenue, the lower the profit.

## **RESULTS AND DISCUSSIONS**

### **The cost of development in the Nairobi, Kajiado and Machakos development models: Evidence from the field**

This section analyzes the findings of the study

### **The cost of land delivery and registration (COLARD) in Nairobi, Kajiado and Machakos (C1)**

For the developer who is subdividing land in Nairobi in order to avail such land to the second party for investment purposes, the land owner has to seek the services of a planner to subdivide such land and such cost can be seen as the cost of planning service (COPS). Such developer has to get a land surveyor to survey the subplots at a fee hence he/she incurs the cost of survey services (COSS) and the land surveyor also prepares a deed plan which again has to be scrutinized and authenticated by the Director of surveys who also imposes some levy for the approval of such deed plan. The cost of deed plan approval (CODPA) therefore is part of the cost incurred during land delivery. Once the title deed is issued, the transfer of such land to the second party would be witnessed by a lawyer who also levies some fee and this cost was seen as the cost of legal services (COLES).

Finally, the commissioner of lands who issues a certificate of lease title to the land owner would charge a fee and this was seen as the cost of land registration

(COR). The total cost of land registration and delivery (COLARD) in Nairobi was: cost of planning services (COPS) (40,000) + cost of survey services (COSS) (Ksh.60,000 or 600 USD) + cost of legal services (COLES) (60,000) + cost of deed plan approval (CODPA) (30,000 or 300 USD) + land control board cost (LABOC) (0) +cost of registration (COR) (30,000).TC= 40,000 + 60,000 + 60,000 + 30,000 + 30,000 = KSH. 220,000 or 2200 USD. The costs of land delivery in other peri-urban clusters were as follows (Table 1.2). The unit of land used in this analysis is 0.045 Hectares both in Nairobi and the peri-urban

In order to subdivide and transfer land in the freehold land tenure cluster, the developer requires the consent to transfer land from the Land Control Boards (COLABC) and there was a cost related to this transaction. The application to subdivide such land must be accompanied by a mutation plan prepared by a land surveyor who also imposes a cost on the developer for such services (COSS). Finally, the mutations were checked by the district surveyor who also recorded such changes on the registered index map and there was a cost related to such services also (CODPA). Finally, there was a cost related to land registration (COR) incurred by the developer at the office of the District Land Registrar. The cost of land registration and delivery (COLARD) in the cooperative and freehold land tenure clusters of Machakos and Kajiado would be a function of: COLABC (cost of land control Board)+COSS (cost of survey services)+CODPA (cost of deed plan acquisition)+COR (cost of registration)=COLARD (cost of land registration and delivery).

Although the cost of land transfer in the cooperative and freehold land tenure clusters were expected to be the same, such costs were higher in the Ngong/Ngong freehold land cluster than in the Kitengela cooperative cluster. The explanation given was that in Ngong/Ngong, the land control boards 'meeting schedules' were fixed at specific dates of the year and developers had to wait for the scheduled time in order to get consent to subdivide and transfer land. However, the Ngong/Ngong land control boards had provision for 'special Land Control Board' meetings where developers could get approval for land transfer and registration at any other day of the month but at an extra cost of Ksh 5000 (USD, 50). The study established that both developers and land control board officials preferred this option because, partly, this alternative was convenient to the developer and partly, it created room for rent seeking on the part of the Land Control Board officials. The inquiry established that whereas the cost of land transaction in Ngong/Ngong was Ksh.8975 because of the extra levy of Ksh 5000 (50 USD), the cost of land registration and delivery (COLARD) for Kitengela, was only KSH. 3,975 (40 USD). Land in Ongata Rongai was administered by the Olkejuado county council (GOK, CAP 288) and to access

land in such a town, the developer had to pay Ksh 4000 (40 USD) to the Okejuado county council. The average of the four modes of land access in Kajiado was taken as the cost of land transaction (C1) in Kajiado.

In Machakos, Government land was found in Athi river town and such land was administered by the commissioner of lands and the cost of land transaction was similar to that in Ngong town (Ksh 55,805 or 558 USD) (GOK,CAP 280). Land in Mulolongo town was treated as trust land because the transactions were handled by the Mavoko Municipal council and the cost of land access and delivery was Ksh 5000. Land in Syokimau was treated as cooperative land while that of Katani land cluster was freehold land tenure. Land in Syokimau and Katani were managed by land control boards and, therefore, the cost of land transaction was the same Ksh 3975 (40 USD). The average land transaction cost from the four land tenure clusters in Machakos was taken as the cost of land transaction (C1) in Machakos district/county and this was Ksh. 17,188.75 (172 USD). After getting land for development, the developer must consult development experts as shown below.

#### ***The cost of consulting development experts (C2)***

It was established that in Nairobi, a developer must consult a town planner to establish the nature of zoning requirements and the developer incurred 50,000 for this service. The developer is also required to consult a quantity surveyor (ksh 50,000 or 500 USD), an architect (Ksh 50,000), a structural engineer (Ksh 50,000), and an electrical engineer (Ksh 10,000 or 100 USD). The total cost at this level of development (C2) was estimated to be KSH. 210,000 or 2100 USD. In Kajiado district, it was only the developers in the towns of Ongata Rongai and Ngong out of the four clusters sampled that consulted development consultants. However, the only expert who was consulted is the architect and the average cost for such service was Ksh50, 000. This was taken as the second level of development cost (C2) required to be fulfilled by developers. It was established also that just like in Kajiado County, developers in Athi River and Mulolongo town were the only ones who sought for development permits from Mavoko Municipal council. Developers in Machakos district were also found to consult the services of an architect and not any other expert and such cost was the same as that of Kajiado County (Ksh, 50,000). After obtaining a building plan, the developers had to have the plan approved by the relevant local authorities as seen below.

#### ***The cost of obtaining development permits (C3)***

The cost of obtaining development permission (C3) in

Nairobi was only Ksh 3000 or 30 USD. At the Local Authorities outside the city, such developers were required to pay various levies to the district physical planning officer (1,000 or 10 USD), the district public health officer (1,000), and the district works officer (1,000 or 10 USD) and the local authority (3,000 or 30 USD) for scrutinizing the plans and for approval and issuance of development permits respectfully. In Kajiado, the cost at level three of the development processing point (C3) is Ksh 6000 or 60 USD. It should be noted that developers in the cooperative land tenure cluster (Kitengela) and those in freehold land tenure cluster (Ngong/Ngong) did not consult development experts nor did they seek for development permits from the local authorities because there was no condition in the titles to require them to do so. Such developers were able to avoid cost two and cost three in the development process. The cost of obtaining a development permit (C3) in Mavoko Municipal council in Machakos was KSh 18,000 or 180 USD. Developers in Freehold land of Katani and those of Syokimau did not go for development permits and therefore such developers were able to avoid category two and three of the development cost.

#### ***The total cost of all the three development processes (models)***

The total development cost incurred by developers in Nairobi shall be the summation of C1, C2 and C3. The developer who invests for purposes of earning rent, and the house builder who aims to sell and make profit shall all incur the three levels of development costs (C1,C2,C3) totaling Ksh 433,000 or 4330 USD. In Kajiado side, the summation of C1+C2+C3 which again was taken as the cost of the Kajiado county development process was Ks.71, 188.75 or 712 USD. It has been correctly observed by others that the size of land or housing unit can also affect the final value. It was on the same reasoning that the unit of land analysis was based on 0.045 hectares of land while the housing unit was a two-bedroom house sitting on a 0.045 hectare of land and the house was taken to be of average finishing quality. In Machakos, the summation of average development costs in level one (C1), level two (C2) and level three (C3) was Ksh 76,188.75 or 762 USD. However, the third cost of obtaining development permission was not incurred in the freehold lands of Kitengela, Syokimau, Ngong/Ngong and Katani. The cost of the three development control models of Nairobi, Machakos and Kajiado are shown in Table 2.

#### ***Estimating the investment capacity/opportunity in two zones: Land values, house values and rent levels in Nairobi and areas outside the city***

The land values (LAVAs), House values (HOVAs) and

**Table 2.** Cost of Development in Nairobi and Peri-urban areas.

		COLARD Cost 1	CEREPAP Cost 2	CODEP Cost 3	TC Σ C1 C2 C3 DECOST	Average cost
Nairobi	Kayole	220,000	210,000	3,000	433,000	
	Zimmerman	220,000	210,000	3,000	433,000	433,000
	Satellite	220,000	210,000	3,000	433,000	(4330 USD)
	Embakasi	220,000	210,000	3,000	433,000	
	Average	220,000	210,000	3000	433,000	
Kajiado	Ngong town	55,805	50,000	6000	111,805	
	Ongata Rongai	4000	50,000	6000	60,000	71,188.75
	Kitengela	3,975	50,000	–	53,975	(712 USD)
	Ngong -Ngong	8,975	50,000	–	58,975	
	average	18,188.75	50,000	3000	71,188.75	
Machakos	Mulolongo	5000	50,000	18,000	73,000	
	Athi-River	55,805	50,000	18,000	123,805	76,188.75
	Syokimau	3975	50,000	-	53,975	(762 USD)
	Katani	3975	50,000	–	53,975	
	average	17,188.75	50,000	9000	76,188.75	

Source: Field Survey, 2006.

rent values (REVAs) for Nairobi and the areas of the peri-urban zones of Machakos and Kajiado were tabulated. Details of the land values for Nairobi, Machakos and Kajiado are shown in the Table 3. In the sections that follow, the discussions and questions which this paper endeavors to answer hinges on the following: Given the cost in Eastern Nairobi and areas of Machakos and Kajiado and further, given the income earning capacity scenarios in Nairobi, Machakos and Kajiado, where in the three zones would a profit seeking developer invest? These questions are answered in the discussions that follow (Table 3).

#### ***High land development cost in Nairobi and the option of the land speculator to maximize profit in suburbia***

The analysis carried out in this section is to compare the average land values between the city and those of the selected clusters of Kajiado and Machakos. The aim was to determine where in Nairobi, Kajiado and Machakos a land developer/speculator would be able to maximize profits. Land outside the city is not serviced first because it is considered part of the rural agricultural land promoting food security and secondly because the government of Kenya has no such policy of servicing urban land for development. Land values and development costs were compared in the city and in areas outside the city using the t-test and the findings were as follows.

The calculated t value for land values (LAVA) of Nairobi and Kajiado is 0.167. At the degree of freedom of 6 and

alpha value at 0.05, the t table value is 2.571. Clearly the calculated t value is less than the t- table value ( $0.167 < 2.571$ ) which implies that there is no significant difference of land values between the two zones. The calculated t value for land cost of Nairobi and Machakos is 1.847. At the degree of freedom of 6 and alpha value at 0.05, the t table value is 2.571. Therefore, the calculated t value is less than the t table value ( $1.847 < 2.571$ ) which implies that there is no significant difference of land values between the two zones. The implication is that the developer who considers the land values between the two locations shall not be in a position to decide where to invest. Such developer shall remain indifferent unless he/she considers other factors.

#### **The house builder to earn rent**

#### **Similar Rent earning capacity in Nairobi and suburbia and the opportunity to maximize profits in suburbia**

The Nairobi average rent levels were tabulated and compared with those of Kajiado and Machakos (Table 4). The calculated t value for rent levels between Nairobi and Kajiado was -.465. At the degree of freedom of 6 and alpha value at 0.05, the t table value is 2.571. Evidently the calculated t value is far less than the t table value ( $-.465 < 2.571$ ), which implies that there was no significant variations in rent levels between Nairobi and Kajiado in terms of rent values. The calculated t value for rent levels between Nairobi and Machakos is 1.104. At the degree of freedom of 6 and alpha value at 0.05, the t table value is

**Table 3.** Summary of land values and cost of land delivery in Nairobi and periurban clusters.

Zone	Sub-zone	Gross value of 0.045(ha)	CO1 - COLARD(Ksh)
Nairobi	Kayole	335,000	220,000
	Zimmerman	900,000	220,000
	Satellite	700,000	220,000
	Embakasi	1,500,000	220,000
	Average	858,750 (8587.5 USD)	220,000 (2200 USD)
Kajiado	Ngong town	1,000,000	55,805
	Ngong-Ngong	500,000	8,975
	Ongata-Rongai	650,000	4,000
	Kitengela	664,000	3,975
	Average	703,500 (7035 USD)	18,188.75 (182 USD)
Machakos	Mulolongo	600,000	5,000
	Athi River	525,000	55,805
	Syokimau	350,000	3,975
	Katani	100,000	3,975
	Average	393,750 (3937.5 USD)	17,188.75 (172 USD)

**Table 4.** Average rent levels, Cost of Land Delivery (DECOST), cost of erecting physical artifact and cost of obtaining development permission in Nairobi and suburbia.

		2 bedroom-rent level (REVA)	Average cost
Nairobi	Kayole	7,500	
	Zimmerman	6,000	<b>433,000</b>
	Satellite	7,250	(4330 USD)
	Embakasi	10,000	
	average	<b>7,687.50</b>	
Kajiado	Ngong town	9000	
	Ongata Rongai	7000	<b>71,188.75</b>
	Kitengela	8000	(712 USD)
	Ngong -Ngong	8,500	
	average	<b>8,125</b>	
Machakos	Mulolongo	6,500	
	Athi-River	8000	76,188.75
	Syokimau	6000	(762 USD)
	Katani	6000	
Average	<b>6625</b>		

Source: Field survey 2006.

2.571. Evidently the calculated t value is less than the t table value (1.104 < 2.571), which implies that there was no significant difference of rent levels between Eastern part of Nairobi and Machakos. From the results of the t-test, the study established that there were no significant variations in rent levels between the city clusters of East lands and the cluster areas of the rural-urban interface

(RUI) of either Kajiado or Machakos. The city county of Nairobi has a boundary that was fixed in 1963 and this has not been revised to date. Over time, some of the areas outside the city have gained the same land values as those in East-lands of Nairobi because of land pressure. If there was a variation in land values in the two locations, the developer would opt for low land value

zone to maximize on profits. However, the inquiry has established that the land values did not vary significantly in the two zones. This means that this developer shall remain indifferent between the two locations. Why then would such developer still invest in Kajiado and Machakos outside the city fringe? This question prompted a second test: Could the factor of development cost play a role in the decision making process of the developer?

The House builder to rent (HOBURE) category of developer was likely to incur costs at all the three levels of the land development process and these were taken into account when analyzing and comparing the cost averages between Nairobi and areas outside the city fringe. The average development costs in various clusters of Nairobi (ksh 433,000m or 4330 USD) were compared to those of the rural urban interface of Kajiado (ksh 71,188.75 or 712 USD) and Machakos (ksh 76,188.75 or 762 USD) by subjecting them to analysis of variance using the t-test.

The calculated t value for C1C2C3 values of Nairobi and Kajiado is 26.599. At the degree of freedom of 6 and alpha value at 0.05, the t table value is 2.571. Evidently the calculated t value is far greater than the t table value ( $26.599 > 2.571$ ) which implies that there was a high significant difference of C1C2C3 values in the two zones. The calculated t value for C1C2C3 values of Nairobi and Machakos is 21.634. At the degree of freedom of 6 and alpha value at 0.05, the t table value is 2.571. Evidently the calculated t value is far greater than the t table value ( $21.634 > 2.571$ ) which implies that there was a high significant difference of C1C2C3 values in the two zones.

The analysis carried here is in relation to East-lands Nairobi, thus, such values do not apply to the former European and Asian zones of west-lands. This implies that such developer can only maximize profits in Suburbia and not the sampled part of Nairobi. The factor of development cost could therefore tilt the indifferent position of the builder to earn rent (HOBURE) to opt for areas outside Nairobi.

### **House Developer to Sell: Is the opportunity to maximize profits in Nairobi or Suburbia?**

There were two types of developers in this category. The first category would buy land, consult experts in the building industry and obtain development permit before constructing a house for sale. Such developer shall incur the three costs: C1+C2+C3. For this developer to maximize returns, he/she has to reduce the cost of land purchase, reduce the cost of consulting experts, and reduce the cost of obtaining development permission. Such developer must also seek to maximize the market sale value of the house. However, this developer cannot vary the cost of land, nor can he/she influence the sale

value of the completed house as these are influenced by the on-going market prices and the forces of demand and supply.

The investor in this category cannot also vary the general cost of development because the building materials and other related costs are influenced by the prevailing market circumstances. But some aspect of the cost of development would vary with location and therefore this developer shall choose locations with the lowest cost if all other factors remain constant. The second developer in this category will buy a house and resale for capital gain. He shall therefore scout around for a low priced house in the two locations. A developer in the second category shall not be able to influence the sale value of the house as this shall depend on the market value and prevailing market forces. However, there is a likelihood that the developer who had spent less capital to invest in building a house may pass over this benefit to the next buyer in terms of low purchase price. This developer would likely buy the house in the location of low development cost (DECOST). Which location shall this be?

The value of two-bedroom houses sitting on a 0.045 hectare of land both in the city and outside the city were tabulated into averages (Table 5).

The Nairobi average house values (HOVA) (Table 4) and those of rural urban interface were compared by subjecting them to analysis of variance using a t-test static.

The calculated t value for 2-bedroom house values of Nairobi and Kajiado is 0.991. At the degree of freedom of 6 and alpha value at 0.05 the t table value is 2.571. Evidently the calculated t value is less than the table value of t ( $0.991 < 2.571$ ) which implies that there is no statistically significant difference in the value of two-bedroom house in the two zones. The calculated t value for 2-bedroom house in Nairobi and Machakos is 4.399. At the degree of freedom of 6 and alpha value at 0.05, the t table value is 2.571. Evidently the calculated t value is greater than tabled t value ( $4.399 > 2.571$ ) which implies that there is a significant difference in value in the two-bedroom house in the two zones.

There were significant variations in the value of the two-bedroom house in Nairobi and Machakos side where house values were lower in Machakos than in Eastland of Nairobi. It was then concluded that a developer in this category of investment would tend to be indifferent between Nairobi and Kajiado. Such developer would, however, prefer Nairobi to Machakos sides since house values were lower in Machakos. However, this category of developer would be interested in the levels of profit and not just the house values and, therefore, the decision of the developer would be based on the analysis of cost vis a vis house value in order to establish levels of profit.

The results of the t-test have already shown that there were very significant variations in development costs

**Table 5.** Levels of house values (HOVA) and development cost (DECOST) in Nairobi and areas of rural urban interface (RUI) clusters.

Zone	Sub-zones	Value of 2 bedroom house in KSH	Total cost-C1+C2+C3 (DECOST in Ksh)	Average costs (DECOST in Ksh)
Nairobi	Kayole	3,000,000	433,000	433,000
	Embakasi	3,250,000	433,000	
	Zimmerman	2,500,000	433,000	
	Satellite	2,500,000	433,000	
	Average	2,812,500 (28125 USD)	433,000 (4330 USD)	
Kajiado	Ngong town	2,500,000	111,805	71,188.75
	Ngong-Ngong	2,750,000	58,975	
	Ongata Rongai	3,000,000	60,000	
	Kitengela	1,500,000	53,975	
	Σ/4	2,437,500 (24375 USD)	71,188.75 (712 USD)	
Machakos	Mulolongo	2,000,000	73,000	76,188.75
	Athi-River	1,750,000	123,805	
	Syokimau	1,500,000	53,975	
	Katani	1,000,000	53,975	
	Σ/4	1,562,500 (15625 USD)	76,188.75 (762 USD)	

(DECOST) in the inner city clusters and those of the rural-urban interface. These findings would then tilt the position of the indifferent house builder to sell (HOBUSE) category of developer from being indecisive to that of opting for areas of the rural urban interface (RUI) clusters of Kajiado. Those who would prefer Machakos to Nairobi would consider the zone with highest returns in revenue when compared to total cost.

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Two developers who engage in the business of real estate development both inside and outside the city of Nairobi have been used to investigate the hypothesis which this study set to validate. The question asked is: where in East lands of Nairobi and areas outside the city would such investors prefer when looking for locations to invest. The first developer considered is the one who builds a house to sell for profit. This category of developer shall determine his/her profit by subtracting the cost of market land purchase price and the cost of development from the market sale value of the house he/she has constructed. House sale value (HOSAVA)-Market land purchase price (MLPP)-Development cost (DECOST).

Profit=HOSAVA-MLPP-DECOST.

The developer cannot vary the Market land purchase (LPP) nor can he/she vary the general development cost. The land owner may in very rare circumstances lower the

price of land in order to dispose it quickly. However such gesture shall still benefit the investor and not the land owner since the investor shall convert the reduced land prices to enhanced profit. However, market land purchase price is the same between Nairobi and areas outside Nairobi hence he/she can only remain indifferent between the two locations. Some aspect of development cost varies with location because of the aspect of development permission hence this developer can choose locations with lowest cost in order to maximize profits.

The developer cannot vary the price of house sale value (HOSAVA) either as this is dictated by market forces. Again, the market house sales value did not vary in the two locations and on the basis of this the developer would remain indifferent between the two locations. The levels of profit could therefore be varied on the basis of varying some aspect of development cost (DECOST) and the option open to the developer was to itinerate between the two locations and settle in the area with least development cost and these were the areas outside the city in Machakos and Kajiado.

The second analysis was carried out on the developer who seeks to build a house for purposes of earning rent. Like the first developer, this developer could not change the price of land in the two locations and in any case the price of the land was the same in the two locations meaning he/she could only be indifferent between the two locations. This developer could not vary rent in the two locations and in any case the analysis carried out showed that there were no significant variations in the rent levels in the two locations because. The developer could not

vary some aspect of development cost either but there was a variation in transaction cost in the two locations. In order for this developer to maximize on rent earnings, the option was to opt for the location with less development cost (DECOST) and this was suburbia.

The findings then can be summarized as follows: For the developer who intended to build and earn rent, the following questions were of essence (a) Is land value the same in East Lands and in areas of Suburbia? The answer is yes and therefore there was no need to change locations on this basis. (b) Is the level of rent value the same in the two locations? The answer is yes and therefore the developer would not have any profit advantage if he/she opted for any locations (c) Is the cost of development transaction the same in the two locations? The answer is yes, the general development costs would not vary as this shall be dictated by the market prices of materials. However, there is an aspect of added cost emanating from the need to obtaining development permission in order to conform to the zoning regulations. Where shall such cost be? This cost shall be in the city where zoning is undertaken and the cost would affect profit levels. Where then shall this developer invest? Since all other factors remain constant, profit shall have an inverse relationship with zoning related cost and therefore the lower it is the higher the profit. This developer shall then prefer suburbia where such cost shall be low and where he/she shall maximize profits.

The second developer who aims to build a house for sale shall make similar considerations and areas outside the city shall be the ideal location for investment, again for similar reasons as those of the first developer. It has been demonstrated in this paper that the urban and rural dualistic development approach in Kenya has resulted into two development processes, urban and rural. The development control approach in each development process and the objectives and the development requirements which such development control approaches seek to fulfill are different also. The two development processes have resulted into dual development control models therefore: The urban development control model based in Nairobi city and the rural area development control model where urban sprawl is taking place. Because of zoning in the city and other development requirements, the city development control model is more expensive (Ksh 433,000 or 4330 USD) than the rural development control models either singly or combined, Kajiado (Ksh 71188.75 or 712 USD), Machakos (Ksh. 76,188.75 or 762 USD) (combined total of Ksh 147,377.50 or 1474 USD).

It has been demonstrated in this paper, too, that the income generating capacity or investment opportunities in the East lands part of Nairobi and in areas immediately outside the city fringe are the same or they do not vary significantly. The t-test analysis using the proxy variables has shown that the rent levels, two bedroom house

values and land values in the city and areas outside the city fringe did not vary significantly. This is because over time, areas immediately outside the city fringe have been invaded by residents who work in the city and, therefore, the area immediately outside Nairobi is part of the city land use system. It has been established that the city development control model has other indirect costs related to zoning in the city. For example, the freedom to invest in profit advancing ventures such as flats and informal structures is curtailed in the city because of zoning regulations and more stringent requirements which specify the type of building materials.

Development costs in areas outside the city are low, yet investment opportunities between the sampled areas of Nairobi are the same as those of the city. It is noted in this paper that the low-cost-high returns zone in suburbia has attracted speculative developers from the city who seek to maximize profits. It is possible that other causes could drive developers outside the city other than profit making. However, if other factors are held constant, can planning in the city and lack of it outside the city drive developers to peri-urban? From the findings of analysis in this paper, it can be concluded that speculative-driven development outside the city is a factor in the emerging urban sprawl in suburban Nairobi. Such sprawl is, however, informal since development in suburbia is not subjected to planning. It should be noted also that since there is a line which divides the city and the rural, urban sprawl is occurring as a separate landscape of mixed land use marooned between the city proper and the rural proper. In order to curtail informal development outside the city, it is recommended that the two land use systems be integrated. Secondly, the two development control models should be harmonized by subjecting all developers in the city and those outside the city to the requirements of planning.

### Conflict of Interests

The authors have not declared any conflict of interests.

### REFERENCES

- Adell G (1999). Theories and Methods of the Periurban interface; a changing conceptual land scape. Draft for discussion, development Planning Unit, University of London.
- Ayonga NJ (2008). Managing Land use Conflicts at the rural urban interface. In: Van Dijk, M.P., and J. Franssen (Eds) Managing Ethiopian cities in an era of rapid urbanization. Eburon Delf Publishers, IHS, Netherlands.
- Ayonga NJ (2012a). Urban Informality and Land Use Conflicts: A focus on the peri-Urban areas of Nairobi. Germany: Lambert Academic Publishers.
- Ayonga NJ, Obiero SV (2009). Rural-Urban dualism and Ineffective Land use Control Instruments at the Rural- Urban Interface. *J. Afr. Habitat Rev.* No 3 October (2009).
- Baldassare M (1986). Trouble in paradise. The suburban transition in America. Columbia University press.

- Civil Service College of Ethiopia (2007). Center for Urban Management. Course lectures on urban Land Management.
- Huchzermeyer M (2002). "Contentious development: peri-urban studies in Sub-Saharan Africa" *Progress Dev. Stud.* 2(2):113-131.
- Kenya, the Republic of (1989). The Registered Land Act, chapter 300 of the laws of Kenya. Government Printer Nairobi
- Kenya, the Republic of (1989). The Land Control Act, chapter 302 of the laws of Kenya. Government Printer, Nairobi.
- Kenya, the Republic of (1984). The Governments Lands Act, chapter 280 of the laws of Kenya. Government Printer Nairobi.
- Kombe J (2005). Land use dynamics in periurban areas and their implications on urban growth and form; the case of Daresa-laam, Tanzania.
- LeFurgy J, Lang R (2003). *Edgeless cities. Examining the non-centered Metropolis.*
- Mubarak A (2004). Urban growth boundary policy and residential suburbanization; Riyadh, Saudi Arabia. In Choguill (ed,2004) *Habitat International. J. Stud. Human Settlements* 28(4):567-591.
- Mundia CN, Aniya M (2006). "Dynamics of land use/cover changes and degradation of Nairobi City, Kenya", *Land Degradation Dev.* 17(1):97-108.
- Nkwae B (2006) .Conceptual Framework for Modeling and analyzing periurban land problems in Sothern Africa. PhD thesis, Department of Geodesy and Geomatics Engineering, University of New Brunswick, Canada.
- Obudho R (1974). Development of urbanization in Kenya. A spatial analysis and implications for regional development strategy, PhD thesis.
- Okoth O (1991). *Tenants of the crown. Evolution of agrarian law and institutions in Kenya.*
- Rondinelli D (1983). *Secondary Cities in Developing Countries. Policies for diffusing Urbanization.* Sage Publications.
- Simiyu L (2002). Effects of urbanization on the use and control of land. A case of Ngong fringe. Unpublished M.A thesis, University of Nairobi.
- Violich F (1987) *Urban planning for Latin America. The challenge of metropolitan growth.* Gunnind Harn publishers.