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Rural-Urban 'Divide' and the Formation of 'Sporadic Appended Urban Sprawl' in Kenyan Cities:

A Conceptual and Methodological Explanation

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Abstract

Three propositions are advanced to explain the peculiar 'sporadic and appended sprawl' currently emerging at the rural-urban interface of the Kenyan cities. First, if policies treat the rural and urban spaces as separate cocoons, the zone-specific development control models emerge and the unregulated rural model become cheaper. Secondly, if the value of properties in the city and in the areas outside them shall not vary significantly, speculative investment will ensue outside the city, thus forming sprawl. Thirdly, the sprawl cannot be regulated by the two cocoon-specific development control models and this makes it sporadic. To verify the three assertions, a comparative analysis was carried out. Nairobi average land values (LAVA), house values (HOVA) and rent values (REVA) were compared with those of the bordering counties of Machakos and Kajiado. The average cost of undertaking development, both in the city and in suburbia, were also subjected to analysis of variance. The inquiry found that whereas there were no significant variations in LAVA, HOVA and REVA values (TR) in Nairobi and suburbia, variations in development costs (TC) were significant. It was concluded that variations in cost led to speculative investment in the less costly suburbia. To prevent the 'sporadic appended sprawl', the rural-urban 'divide' must be harmonized.

Keywords: Cocoons, Divide, Kenyan cities, Rural-Urban, SpoApurban sprawl.

INTRODUCTION

The colonial government created the urban and rural spaces in Kenya and the status quo was retained during post-colonial rule. The two space cocoons are separated by marked boundaries ,with both promoting different development objectives as well as being placed under different institutional jurisdictions. Due to variations in management, the two enclaves tend to evolve separate land-use regulations, and therefore different planning instruments are applied. In this context, sprawl 'jumps' the divide which separates the two zones thus taking place in the rural jurisdiction, yet the force that creates such sprawl emanates from the urban zone (Ayonga, 2008; Ayonga and Obiero, 2009). This paper provides a conceptual and methodological framework to explain how the policy-led rural-urban 'divide' creates the pattern of 'sporadic appended' sprawl. It is also argued that the emerging sprawl cannot be regulated using the urban and rural specific planning instruments. As a result, the Kenyan sprawl is sporadic and can be viewed as a third sector marooned between the two-sector urban and rural realms.

THEORY

The 'Peculiar' Urban Sprawl in Kenya Requires an Alternative Theoretical Exposition

Boyce (1971), uses the ocean wave analogy to argue that sprawl evolves through activities which, like the ocean waves, originate from the inner city. In Boyce's contention, urban sprawl is brought about by turbulence in the inner city, which pushes people towards the city fringe, the same way turbulence in the ocean pushes waves and pebbles to the edge of the ocean. Turbulence in the city triggering sprawl can be viewed in the context of congestion, blight and crime (Boyce, 1971; Adell, 1999). Urban sprawl in the cities of North America and Europe is explained within the context of the ocean wave theory. Supposing there was a cliff at the edge of the ocean which prevents the pebbles from moving any further, how would

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one explain sprawl that may occur beyond the cliff? Sprawl beyond the cliff would have 'jumped' the 'divide', thus occurring in another jurisdiction. The forces which trigger such sprawl cannot be similar to those discussed in the context of the ocean wave analogy theory.

In Kenya, for example, the colonial government had introduced policies which created towns and rural areas. They also introduced different land-use management styles in the two space realms. For this reason, both the urban and rural areas in the white settlements were subjected to planning and put under the same jurisdiction, while African zones were excluded from planning. In the absence of any barrier, the urban and rural relationship within the white zones could be viewed as a continuum. However, the lack of planning in the former African urban and rural settlements had created a dichotomy. During the post-colonial era, the clear demarcations between the urban and rural areas in the form of separate jurisdictions could also be viewed as a dichotomy, and Boyce's explanation of sprawl cannot suffice in this context. The relevant question then is; what factors can explain urban sprawl beyond the city rural dichotomy threshold? This explanation is provided in the section that follows.

The Occurrence of SpoApurban Sprawl

In order to understand the dynamics and formation of sporadic appended urban sprawl in Kenya, Ayonga (2012, 2013, 2015), provides the following postulates. That in the context of the two-sector rural-urban 'divide', there would emerge rural and urban-specific development pathways, aimed at achieving different space-specific objectives. As a result, different zone-specific land-use development control models and land transaction costs evolve. Due to zoning-related costs in the city, and the lack thereof in areas outside them, the urban development control and land transaction models become more expensive than those of the rural. It is also argued that with time, land, house and rent values in areas immediately inside and outside the two space realms become at par. The implication is that the areas immediately outside the city fringe tend to present a minimum costs-maximum profit (MINIMAX) opportunity to the developer.

The MINIMAX factor in areas outside the city then tend to attract the land and real estate speculative developers whose aim is to maximize profits. As a result, the zone of the rural-urban interface becomes a beehive of investment activities. The pattern of development which emerges in suburbia is viewed as sporadic and appended urban sprawl due to the following reasons. When urban sprawl occurs in the context of dichotomous jurisdictions, urban authorities cannot regulate 'urban-like' activities outside the city for lack of jurisdiction. Again, even if urban authorities had such jurisdictions, the urban specific development control instruments cannot be effective in the mixed land-use zone. Again, the rural authorities cannot regulate the emerging mixed zone for lack of appropriate instruments, mandate and capacity. The emerging zone of sprawl then remains unregulated and appended between the urban and rural zones, both of which have specific character and patterns. In the two sector development paradigm, the mixed zone then emerges as a third sector, without a specific jurisdiction and without clear instruments to regulate it, thus qualifying the use of the term 'sporadic and appended urban sprawl'; SpoApurban.

RESEARCH METHODS

To test the postulate that property values shall be at par in the two locations, this inquiry tabulated the average land values (LAVA), house values (HOVA), and rent values (REVA) from the sampled areas immediately outside the city fringe and in areas within the city for comparison purposes. To calculate profits, developers must subtract development costs (TC) from the total revenues (TR). These revenues are those that accrue from the land sales, collection of rent and from the sale of houses. The average development costs were also tabulated from the sampled zones of the city and those from areas immediately outside the city fringe.

For example, for the land speculator to calculate their profit, they must first find out the cost of land acquisition or purchase and the cost of land transaction (TC). If the land speculator (LASPE), for example, buys one acre of land to subdivide into eight subplots for sale, he/she will first try to find out how much it shall cost him/her to acquire the one acre in Nairobi and in areas outside the city (LPP/C). The total cost (TC) of acquiring the land shall consist of the actual land purchase price (LPP) and the land

transaction cost (LTC). To find out the total revenue, the land speculator shall calculate the amount of money accruing from selling the eight pieces of sub-plots (TR). The land speculator shall then calculate the profit by subtracting the total cost (TC) from the total revenue (TR) (TR-TC). However, land purchase price (LPP) and land sales prices (LSP/C) are both dictated by the existing market forces and, therefore, the land speculator cannot change them. Hence, profit for the land speculator can only be determined by the land transaction costs which shall vary in the two zones because of zoning-related costs in the city. In testing this hypothesis, the first task would be to find out whether land purchase and sales prices (LPP and LSP) in the urban and in the areas outside vary significantly or not.

For developers who were engaged in real estate investment, this inquiry assumed that they would also subtract costs from the revenues accruing from renting and from the sale of houses. The inquiry began by tabulating and correlating the average rent values (REVA) and house values (HOVA) for the sampled areas of Nairobi and those outside the city. In Nairobi, these values were first tabulated at cluster levels of Zimmerman, Kayole, Umoja and Satellite. The average of the four clusters were aggregated to form the Nairobi average property returns. A similar process was repeated to determine the Machakos and Kajiado average property values. For uniformity, house and rent values were pegged on land size measuring 0.045 hectares, and the house value was pegged on a two-bedroom house constructed with ordinary quality finishes. Again, just like land values, developers had no control over HOVA and REVA prices as well as certain types of development costs, such as the prices of building materials and labor, which are dictated by the market forces of demand and supply. The only cost which could vary was the zoning-related costs because planning took place in the urban areas, but was excluded in the rural zone.

On the basis of the foregoing, it was hypothesized that there were no significant variations in the house and rent values in the two zones. As a result, investors remained indifferent between the urban areas and areas immediately outside the city, until they be persuaded to relocate to suburbia when the factor of development cost is taken into account. To find out the validity of this hypothesis, the Nairobi average income earning capacities were compared to those of Machakos and Kajiado separately using a t-test. Secondly, the Nairobi land and housing development costs were compared with those of suburbia using a t-test. To calculate the cost, certain variables were used to guide the tabulation of development costs. These were: land registration and delivery cost (cost 1), the cost of hiring development consultants (cost 2), and the cost of obtaining development permission (cost 3). Using the above guidelines, the average costs were calculated at cluster levels, both in Nairobi and areas of suburbia. The cluster level costs were then aggregated and tabulated as Nairobi, Kajiado and Machakos average development costs.

RESULTS AND DISCUSSION

The land speculator prefers the low-cost suburbia to maximize profits

This section presents the findings of the hypothesis that 'there are no significant variations in the average land values in Nairobi and the bordering zones of Machakos and Kajiado county' and that 'there shall be significant variations in the cost of land transactions in the city and areas outside the city'. The average land purchase/cost prices (LPP/C) and the land transaction costs (LTC) for the two zones are shown in **Table 1**.

Using the t-test, the inquiry found out that there were no significant variations in land purchase/cost prices in the selected clusters of Eastlands, Nairobi and the areas outside the city fringe (Ayonga, 2013, 2015 for detailed analysis of the t-test). On the basis of land values alone, the land speculator could not carry out profitable business in either Nairobi or areas of suburbia and therefore remained indifferent. This finding then rules out the 'cheap land' hypothesis as a factor in land speculation outside the city fringe as argued by others (Simiyu, 2002). However, the t-test established that there were significant variations in the cost of land delivery (COLARD) in the two zones. On this basis, the land speculator tended to prefer suburbia where they could maximize on profits, resulting in the formation of sprawl.

One would pose, 'why was the urban land transaction model more expensive than the rural'? Due to policy-

TABLE 1: Land values and cost of land delivery in Nairobi and peri-urban clusters

Zone	Sub-zones	Gross value of land (LAVA) 0.045 (ha)	Development cost: 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**	**220,000**
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**	**18,188.75**
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**	**17,188.75**

Source: Fieldwork 2006

led zoning in the city, developers were required to seek development permits and they were also expected to pay levies at various points. To acquire development permits, developers were required to seek the services of certain development consultants who had to be paid. In the rural areas, planning was either lacking or ineffective, implying that developers could evade zoning-related costs. Secondly, land tenure in urban areas was mainly leasehold while that in the rural areas was freehold. Development pathways in the freehold tenure were found to be cheaper than those in leasehold (**Table 1**). For this reason, land speculations were rampant in areas of freehold land such as Kitengela, Katani and Ngong-Ngong, than in areas of government and trust land found in Ngong town, Athi River, Ongata Rongai and Mulolongo. The third factor which made this category of developers seek locations in suburbia was the availability of large chunks of land which were not available in the city. Locations closer to the city fringe was the fourth factor since land speculation business was not viable in zones further into the rural areas due to low value.

House builders to rent and sale preferred suburbia because of MINIMAX factor

This section presents the findings of the t-test on the hypothesis that 'rent values do not vary significantly in areas of the city and those outside'. In this context, the Nairobi REVA were compared with those of Kajiado and those of Machakos separately using a t-test. Rent values (REVA) and development costs in the clusters of Nairobi, Kajiado and Machakos were tabulated (**Table 2**).

The analysis established that there were no significant variations in the rent levels in Nairobi and those of Kajiado and Machakos (see Ayonga (2015)). For this reason, developers in the category of house builders to rent had no reason to shun their current locations. This paper advanced a second hypothesis that 'the cost of undertaking development shall vary in Nairobi, Kajiado and Machakos thereby tilting the position of the undecided house builder to rent (HOBURE). For this reason, the average development costs in various clusters of Nairobi (Ksh 433,000 or 4330 USD) were

TABLE 2: Levels of rent values in Nairobi and suburbia

Zone	Sub-zones	2-bedroom rent level (REVA)	Average cost
Nairobi	Kayole Zimmerman Satellite Embakasi	7,500 6,000 7,250 10,000	**433,000 (4330 USD)**
Average		**7,687.50**	
Kajiado	Ngong town Ongata-Rongai Kitengela Ngong-Ngong	9,000 7,000 8,000 8,500	**71,188.75 (712 USD)**
Average		**8,125**	
Machakos	Mulolongo Athi River Machakos Syokimau Katani	6,500 8,000 6,000 6,000 6,000	**76,188.75 (762 USD)**
Average		**6,625**	

Source: Fieldwork 2006

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) separately (**Table 2**).

The study established that there were significant variations in the development costs between the two zones of Nairobi and Machakos and between Nairobi and Kajiado. The low development cost and the subsequent creation of MINIMAX conditions in suburbia was the factor which then persuaded the undecided investor in housing for rent (HOBURE) to prefer suburbia (See Ayonga (2013, 2015), for details of the t-test analysis). The same process was repeated to find out the decision-making process of the house builders to sell (HOBUSE). Akin to the foregoing, the first test was to determine the validity of the assertion that 'there were no significant variations in the value of the two-bedroom houses in Nairobi and areas of suburbia'. The study found out that house values were significantly lower in Machakos compared to those in Nairobi. However, there were no significant variations in house values in Nairobi and in the areas of Kajiado (**Table 3**).

On the basis of the foregoing, a developer who aims to build a house to sell (HOBUSE) would tend to be indifferent between Nairobi and Kajiado. Such a developer would, however, prefer Nairobi to Machakos since house values were lower in Machakos. However, a prudent developer should consider the cost of construction before making a final decision. The analysis of variance established that the Nairobi development costs were significantly higher than those of Kajiado and Machakos. Due to the foregoing, developers who were in the business of constructing houses for sale would invest in the clusters outside the city where costs were low. The formation of suburbia in the context of the rural urban duality can then be explained within the context of the rural urban 'divide'.

TABLE 3: Levels of house values in Nairobi and suburbia

Zone	Sub-zones	Value of 2-bedroom house (DECOST in Ksh)	Total cost C1+C2+C3 (DECOST in Ksh)	Average cost (DECOST in Ksh)
Nairobi	Kayole Embakasi Zimmerman Satellite	3,000,000 3,2500,000 2,500,000 2,500,000	433,000 433,000 433,000 433,000	**433,000**
Average		**2,812,500 (28125 USD)**	**433,000 (4330 USD)**	
Kajiado	Ngong town Ngong-Ngong Ongata-Rongai Kitengela	2,500,000 2,750,000 3,000,000 1,500,000	111,805 58,975 60,000 53,975	**71,188.75**
Σ/4		**2,437,500 (24375 USD)**	**71,188.75 (712 USD)**	
Machakos	Mulolongo Athi River Syokimau Katani	2,000,000 1,750,000 1,500,000 1,000,000	73,000 123,805 53,975 53,975	**76,188.75**
Σ/4		**1,562,500 (15625 USD)**	**76,188.75 (762 USD)**	

Source: Fieldwork 2006

CONCLUSION AND RECOMMENDATIONS

This inquiry aimed to explain how urban sprawl takes place in the context of the rural-urban duality. It has been demonstrated in this paper that the unique sprawl in the cities of Kenya is first and foremost precipitated by the policy-led city rural dichotomy. The dichotomy creates two space cocoons which have different objectives, separate jurisdictions, different development pathways and different development control models and instruments. Over time, the zoning-led urban development control model becomes more expensive than the rural. However, land and property values at the point of contact between the two zones remain at par. These conditions created the MINIMAX factor in suburbia which attracted the speculative investment that then caused sprawl.

The areas of sprawl could not be regulated by the city authorities due to lack of jurisdiction and in any case, the city-specific land-use development control model was not useful in the mixed zone. Again, rural authorities could also not regulate this pattern of sprawl because the rural-specific instruments were inappropriate in the mixed zone. Due to the 'divide', the zone of sprawl occurred as a separate landscape, marooned between the city and the rural proper. The emerging peculiar pattern of sprawl was then viewed as 'sporadic and appended' (SPOAPURBAN) (**Figure 1**).

The emerging area of sprawl is, however, undesirable because it lacks infrastructure and poses a danger to food security. Policy makers should endeavour to harmonize the rural-urban 'divide' by subjecting the two space cocoons to planning.

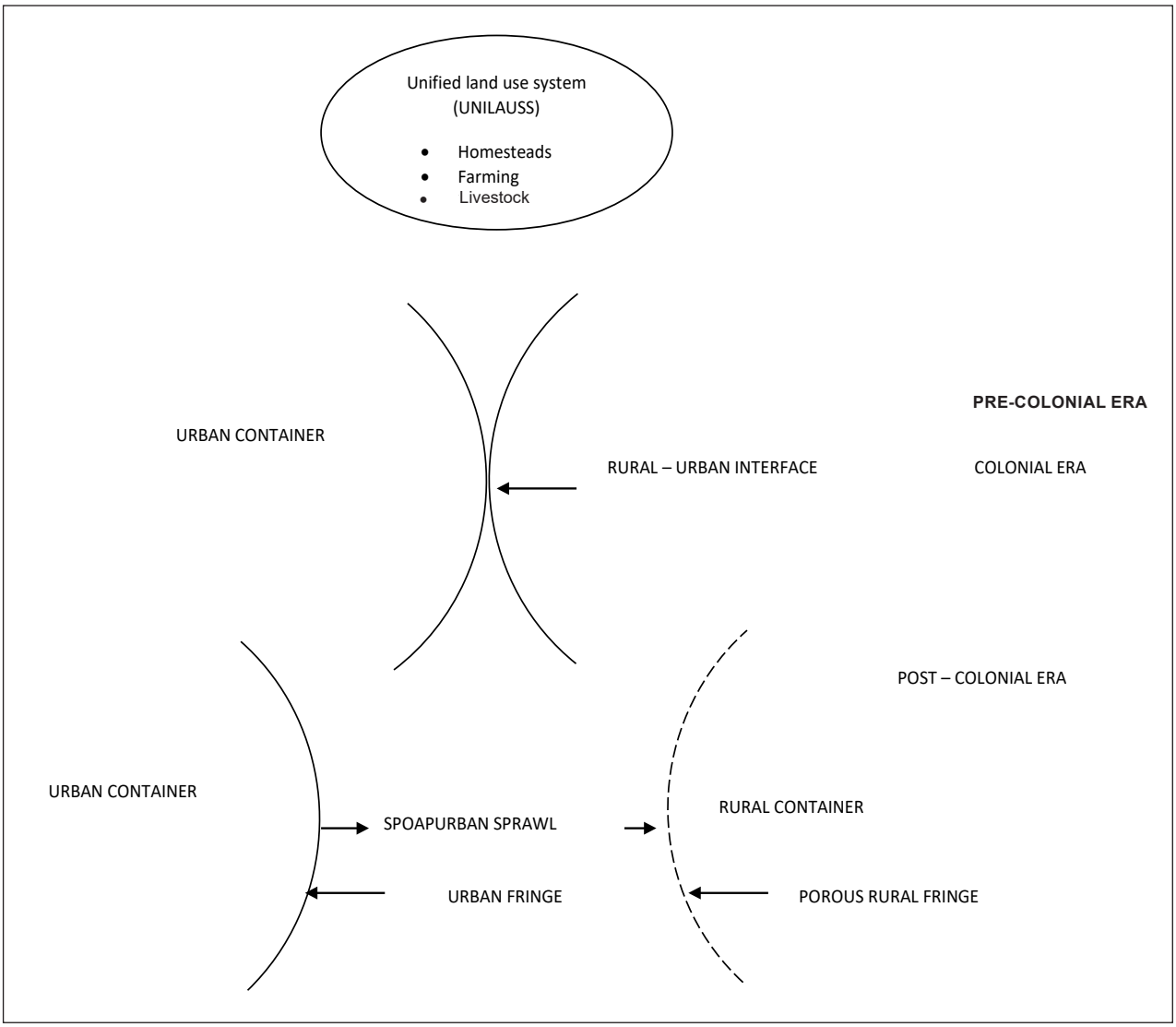

FIGURE 1
Land-use at the rural urban interface of Kenya and the formation of SpoApurban sprawl
Source: Fieldwork 2006

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