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Land Value Dynamics in Khana Local Government Area of Rivers State, Nigeria

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Abstract:
Urban centers as against rural centers are area of pronounced heterogeneous activities and features. They represent mass attempt at making proper and effective use of the space and resource around them. Urban planners attempt to understand the underlying process human activities in space. The heterogeneity of urban areas creates dynamic system of interactions which are necessary to maintain the functional linkages that characterize urban centers. These functional activities need accessibility and special locations in order to exist. This study examined the spatial distribution of land values in twenty communities in Khana Local Government Area of Rivers State, Nigeria. It attempts to uncover the locational factors which impact on the value of land in the study area. Primary and secondary data formed the sources of data for this work. The primary data were collected by the researcher through the use of structured questionnaire. The study adopted the stratified simple random sampling technique. The secondary data came from published literature collected from relevant agencies in the study area. The results of this analysis revealed that though there is variation in the spatial distribution of land values among the different communities in the study area, there is however no statistically significant relationship between land value and the distance of a plot of land from the CBD. The land market in Khana Local Government Area conforms to Hoyt model, which states competition on the Best use of site is resolved on "ability to pay". Thus as cities grow in wedges (sectors) that areas of highest rent tend to be alongside line of communication.

Keywords: Land-value, land-use, land-rent, Best use, CBD

1. Introduction

The term "land" suggests different things to different people depending upon their outlook and their interest on land (Barlower 1987). Land is the sum total of the natural and manmade resource over which the position of the earth surface gives control. It is the platform of all human activities-economic, social, spiritual or recreational. The entire land use area of a country can be broadly divided in urban and rural lands. Within an urban area, a rational pattern of land use evolves as an urban area consists of a great variety of inter-dependent activities and the choice of location of any activity is normally decided by assessing the relative advantages of various locations for the performance of such activity.

Land occupies a significant place in a nation's socio-economic well-being. As a nation grows in size and rural areas become urban centers and urban centers become large metropolitan areas, there is always an increased competition as well as demand for land, for different purposes. Increased demand for land produces a corresponding increase in land value.

Land values are central to understanding property prices and assessments. Land values may also be used to determine the costs of urban agglomeration, the optimal level of public good provision, and even the optimal size of a city. (Crowley, 1967, (Crowley, 1967, David and Gabriel, 2013)

This work is on land value dynamics in Khana Local Government Area of Rivers State. It X-rays the spatial pattern of land values in the various communities in the study area with a view to examining the factors accounting for variation in land value in the different communities in the study area.

2. Study Location

Khana Local Government Area (LGA) situates at 4.78° North and latitude, 7.01° East longitude. Khana is one of the LGAs that make up the Ogoni Kingdom in Rivers State, Nigeria. The LGA houses the Ken-Saro-Wiwa Polytechnic, Rivers State and a host of other multi-national oil and gas industries. The area has over time witnessed unprecedented growth occasioned by rapid influx of people and firms into the area leading to high demand for land space. Increased pressure on land space has also triggered land commercialization with attendant increase in land value in the study area.

The study covers the twenty (20) communities in Khana Local Government Area of Rivers State (see figure 1). The communities under focus are: Bori Luawii, Gwara, Betem, Kaani, Ugure, Kor, Beeri, Taabaa, Kpong, Sogho, Bean, Pue, Winyaakara, Okwale, Luubaara, Zaakpon, Buah, Teenama, Sii.
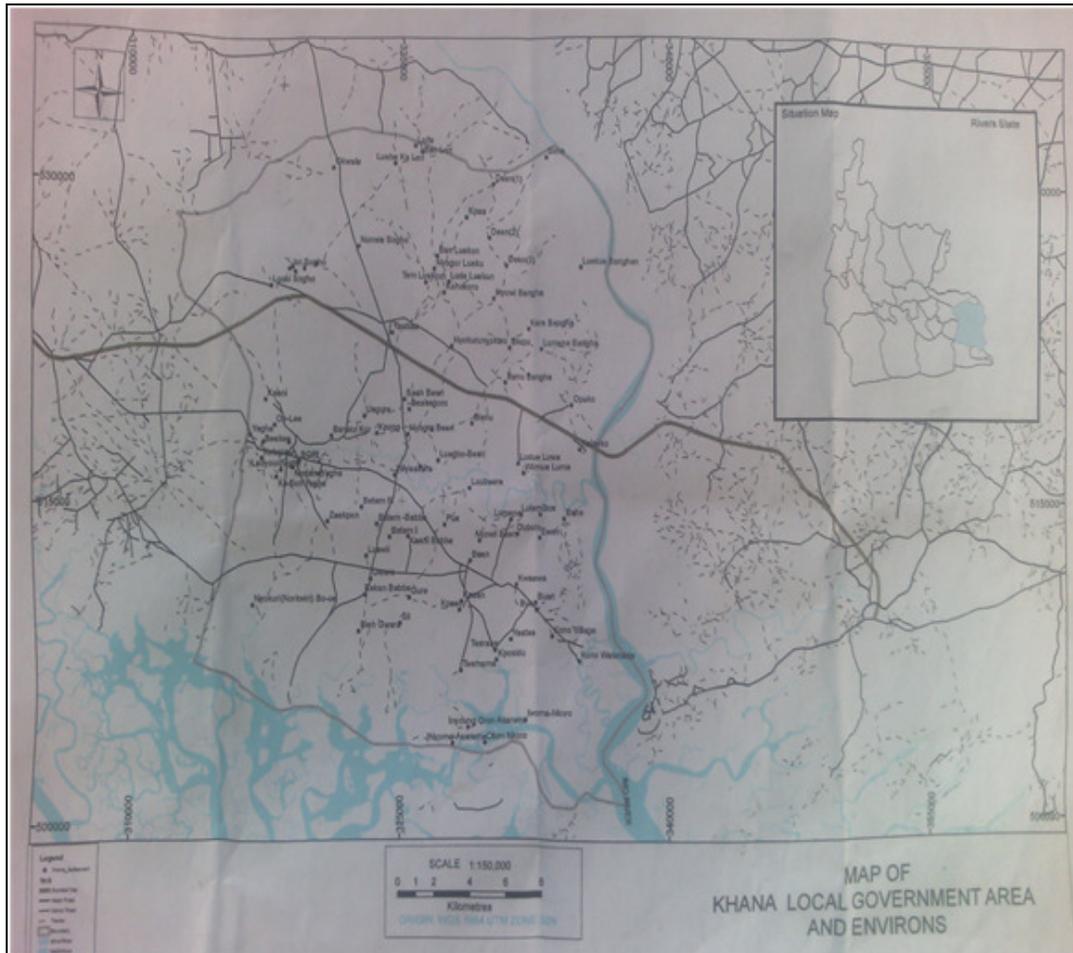
Figure 1: Khana Local Government Area Administrative
Source: Rivers State Ministry of Urban Development

3. Theoretical Framework/ Literature Review

The historical perspective of land use started in the 18th century and has its origin in David Ricardo's agricultural rent which is still the most present day theory. Ricardo (1817) pointed out that the most fertile land is first put into use, and that less favored land is put to use as the demand for agricultural production increases. He also opined that land which is nearer the market bears lower's transport cost on the production than more distant land, and that this advantage also accrues to the land in form of rent as a result of completion among the farmers. However, Ricardo devoted his attention primarily to fertility differentials.

Von Thunen (1863) developed the theory of location differential more fully. Von Thunen argued that the various land uses around the market place bid for the use of site and that land is assigned to the highest bidder in each case. According to him, the rent which each crop can bid at each location will be the savings in transportation of its products which that site affords in contrasts to a more distant site. The most distant land in cultivation yields no saving in transportation, and consequently there will be no rent at that location.

Von Thunen's economic rent was controlled by distance from the market and transport cost. He later came up with a concentric circles showing how economic rent decline with increasing distance from the market. Unlike Ricardo and Von Thunen, whose attention was on agricultural rent, Alfred Marshall (1914) was concerned with the value of urban land. He emphasized the importance of location within the city, and defines "situation value" as the sum of the money value iSf the situation advantage of site.

On the other hand, much of the theories of urban land use and urban land value is based on the work of Hurd. Hurd (1903). In his book "Principles of city land values" Hurd (op citn) proceeded to outline a theory for urban land which closely resembles that of Von

Thunen for agriculture. He argued that land at the city centre earns more rent than those at the periphery and concluded that since value depends on economic rent, and rent on location, and location on convenience, and convenience on nearness, we may eliminate the intermediate step and say that value depends on nearness. Hurd (op cit) does not, however, consider the size of the site, and to bypasses the problem of residential land, he said "the basis of residence value is social and not economic even though the land goes to the highest builder".

Alonso's (1964) view did not defer from those of Hurds. In his book 'The economics of urban land" He contended that pattern of land use is determined by land values, which in turn are related to transportation costs. He concluded by saying that "as various potential users bid for land, the landlord sells or rent to the highest builder for land, such that the pattern of land use and land values become mutually determined". Hartshorn (1992), also in his book "interpreting the city" agreed with Alonso's postulation but added that since activities which need to minimize transport costs cluster around the city centre, the accessibility increases the value of urban land.

In his own view, Barlowe (1978) argued that "the highest and best use of any particular site is often subject to change like the concept of use capacity; he said "it can shift with changes in the quality of land resources, technology and changes in demand, and those due to zoning ordinances". Barlowe (1978) pointed out that under most circumstances, a certain amount of shifting also can be expected to take place in land values in response to the bidding and counter bidding that goes on between various operators.

Duaen S. (1966) tends to agree with Barlowe when he observed that land values exhibit a tremendous amount of various within the city. He argued that the major factor accounting for the variation is "Location" and "accessibility". According to him land value is highest in areas of much accessibility in areas that are less accessible.

The supply of urban land in the words of is relatively fixed. Elsewhere, it is patently obvious that land has also frequently been at the centre of struggles over its use and control. Rent, seen as the price for the use of land is the only means through which bidder in the land market can resolve the issue of use. Intra-Urban activities and functions are determined by two factors of accessibility and location seen in this way, land use become the product of urban economic system, hence different locations in an urban centre commands different utility and different levels of economic rent.

Some attempt has been made to rationalize the use of land from classical period to date. Burgess in (1924) attempted to identify areas within Chicago based upon the outward expansion of the city and the socioeconomic groupings of its inhabitants arrived at a model in which land uses arranged in five concentric zones. Zone one, the central Business Districts (CBD) which houses the major shops and offices and serve as the centre of commerce. Burgess argued that land values were highest in the city centre and decline rapidly out wards to give a zoning of urban functions and land use

The sector model postulated by Hoyt (1992) was based on the argument that urban growth is a process hinged on sectors rather than on concentric zones as theorized by Burgess. His interest was on residential structure and rental value. This study was based 142 cities in U.S.A. Hoyt made the same assumptions as Burgess, but added that competition on the Best use of site is resolved on "ability to pay' he opined that as cities grow in wedges (sectors) that areas of highest rent tend to be alongside line of communication

Ullman/Harris (1945) set out to produce a more realistic model than those of Burgess and Hoyt but ended with one that is more complex. They reasoned that Burgess and Hoyt's model of land use were too simple to explain the reality of intra-urban land use patterns. They argued that city growth does not take place from one centre but form other subsidiary area. Such subsidiary centered according to them display functional specialization. Ullman/Haris (op cit) multi-nuclei model was developed as a response to the need to maximize accessibility to a centre, to keep certain types of land use apart and for difference in land value

The bid rent theory was first developed in an agricultural context. One of the first theoreticians of bid rent effects was David Ricardo (1817). According to whom the rent on the most productive land is based on its advantage over the least productive, the competition among farmers ensuring that the full advantages go to the landlords in the form of rent. The /Bid-Rent Model is the urban equivalent of von Thunen's "rural land use model", in that both are based on locational rent the main assumption is that in a free market, the highest bidder will obtain the maximum profit from the site and so can pay the highest rent.

Competition for land is keenest in the city The most expensive or prime site in most cities are the Central Business District (CBD) mainly because of it accessibility and the shortage of space here shops conduct their business using a relatively small amount of ground floor, and due to their high rate of sales and turnover they can bid a high price for the land.   The most valuable site within the Central Business District (CBD) is known as the Peak Land Value, Intersection. (PL VI).

Difficulties in measuring land values have led researchers, as well as assessors, to employ a variety of approaches to land value measurement for example, Quigley, kok, Monkokken (2010) examined land values in New York using   land prices on various characteristics, and observed that, among other results that land prices decline in lot size with distance from the city center. Nichols et al. (2013) used the data to construct time series for commercial and residential land prices using market transactions across 23 metropolitan areas. In New York, Combes, Duranton, and Gobillon (2012) used land transaction from France to estimate the costs of urban agglomeration in the context of a monocentric city model.

David and Gabriel (2013) using a cross-sectional analyses of land values across the United States using transaction data concluded that the strongest predictor of value per acre is lot size, followed by location, and then time. Davis and Heathcote (2007) and Davis and Palumbo (2008) constructed land price indices for a large number of metro areas across the United States using a residual approach. In this approach, land values are inferred from observed housing prices by subtracting imputed structure values, and attributing the residual to land.

 Case (2007) used a similar approach to assess the combined value of land in residential and non-residential uses. He notes that the residual method can easily produce negative values for land.

The present study adopts the land-price approach of measuring land value.

4. Materials and Methods

The data used in this study were obtained from primary and secondary sources. The primary source includes all Direct Information generated in the field by the researchers through the use of questionnaires and personal interviews. The secondary data used in this study came from published literatures in urban economics, land use planning, academic journals and maps. The questionnaires were both structured and unstructured, designed in simple terms to ensure easy comprehension. Distance was measured as the shortest distance ('As Crow flies') from each community to the nearest CBD in kilometers.

   The stratified simple random sampling technique was use in the selection of the respondents. The entire study area was stratified into 20 different communities.   Selection made in each stratum was done using a simple random technique via the use of random numbers. To achieve a sample that is representative of the population, care was taken to ensure that every community had a fair representation. The population of each community was considered. Due to time and cost inherent in total census, a sample fraction of 0.1 percent was taken across board. Consequently, one-hundred and fifty-three (153) respondents mainly heads of households from the study area serve as our sample size.

In order to test hypotheses of this study for rejection or non-rejection, the linear regression analytical technique as contained in SPSS computer programme was used. The student t-test was used to test for level of significant at 95% Apha level.

The linear regression analysis helps us to determine if there is any significant relationship between our dependent variable and independent variable. The model is given as;

$Y = a + b_1 x_1$……Equation (1)

Where:

Y= dependent variable (land value)

b_1= coefficient

x_1= independent variable

a= constant

The t-test of level of significant is given as

$$r = \frac{\sqrt{n-2}}{\sqrt{1-r^2}}$$ --------------Equ (2)

Where:

      r = regression coefficient

      n = sample size

      t = student t-test

      While degree of freedom (d/f) = n-2

Where:

n= number of sample size.

5. Results and Discussion

Basically, the value of urban land is a reflection of competition for site between different land uses operating under the forces of demand and supply. If within an urban area, there are two different plot of land of the same size but one of the plots has a higher market price then the other, the differences may be due to differences in their locational characteristics. This difference in the market price of two plots of land will show itself in their land values.

In the long-run therefore, the value of urban land will be graded in accordance to the different locational characteristics of the different sites. In the words of Alonso (1964) "The outcome of the competitive market process is that, urban land values will display a regular zonation. This zonation does not usually follow a negative decline with increasing distance from the city center."

Assuming that all men are rational and respond to economic forces, potential uses of a given plot of land will estimate the net gain derivable from a particular site compare to the net gain of occupying an alternative site such that the more utility which a site offer the potential buyer, the higher he is willing to pay leading to an overall increase in the value of the land.

Since different site have different characteristics, these differences will manifest in the difference in land value, leading also to difference in the level of patronage between and among different lands within an urban space.

Table 1 shows the prices of land per plot (50ft by 100ft) in different communities in Khana Local Government Area

Community	Land value (in Million Naira)
Bori	2
Luawiii	0.4
Gwara	0.15
Betem	0.5
Kaani	1
Boue	1
Kor	0.9
Beeri	0.5
Taabaa	0.6

Kpong	0.35
Sogho	0.4
Bean	0.8
Pue	0.5
Wiiyaakara	1.2
Okwale	0.5
Luubaara	0.5
Zaakpon	0.5
Buah	0.2
Teenama	0.25
Sii	0.7

Table 1: Land Value of Communities in Khana Local Government Area
Source: Field Work (2016)

In Khana LGA, the use to which land is put in a reflection of the existing land rents and values leading to a higher competition between and amongst different land users for space. Over time this competitive allocation process in land market results in the overall adjustment, so that each site (land) is occupied by activities which can pay the highest rent.

A keen look at the table 1 above reveals a hierarchical zonation of land values in different location (communities) in the study area.

The area with the highest values of 2million Naira is Bori main town (i.e. the area covering back of police station, polytechnic road, and the timber road, hospital road, yeghe area). This is the zone of Pick Land Value (PLV) in the study area and is often dominated by commercial use and falls within the zone often described as the Central Business District (CBD).

The next zone of higher land value after Bori is Wiiyaakara. This area has a land value of 1.2 million naira per plot. Others are Boue and Kaani with land values of 1 million naira each. For Kor, it is N900,000, Bean is N800,000, Sii, N700,000 respectively. Fig.2 is a map of Khana area showing land values.
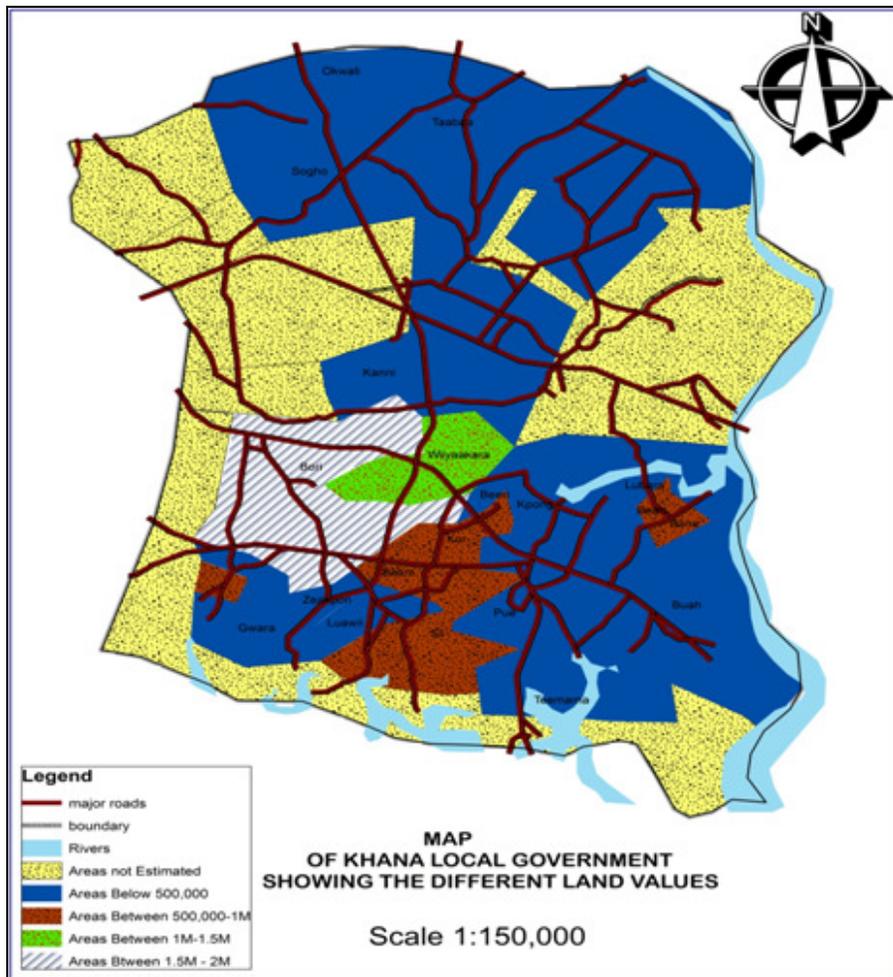
Figure 2: Schema showing the distribution of Land-Values in Communities of Khana
LGA in Rivers State, Nigeria
Source: Authors Analysis (table 1)

The reason for the observed variation in land value in the study area may be due to distance of the plot to the CBD. Using the data from our fieldwork (shown in appendix 1) we sought to x-ray if there is any statistically significant relationship between land value and the distance of the plot to the CBD. Our hypothesis stated is of this form:

H_0: Land value does not decline with distance from the CBD.

H_1: Land value does decline with distance from the CBD.

The result of the analysis gave a regression coefficient R of 0.59 and a correlation determination of 29%. This means that 29% of variation in land value is explained by our independent variables (distance from the CBD) while the remaining 71% are explained by other factors not included in our model.

The value of our T-calculated is -2.71 as against our T-critical value of 0.014. (see table 2)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.023	.161		6.366	.000
	Distance from CBD (km)	-.057	.021	-.540	-2.719	.014
a. Dependent Variable: Land value (in Million Naira)						

Table 2: Summary Result (Coefficients a)
Source: computer print-out from Data Analysis.

Arising from the above since the calculated t-value (-2.17) is less than the t-critical value (0.014) will accept our null hypothesis while concluding that there is no significant relationship between land value and distance from the CBD in communities of Khana Local Government Area.

The result of the analysis produced a model equation of this form:

$Y= 1.02-0.057x_1$…………………Equation (3)

Where:

 Y= Land value

a= Constant

b= Correlation coefficient

X_1= Distance from CBD

6. Conclusion/Recommendation

One of the intriguing aspects of rapid urbanization in Khana LGA is the tempo at which people move into the area. This unprecedented influx of people and firm has led to a corresponding increase in land values in the area

More so, the changes in the socio-political life of Khana LGA, has continued to act as a pull attracting more population especially from the rural communities. All these have implication on the demand for land -both for accommodation space and for the provision of infrastructure -with attendant increase in land value in the area. The result of this work reveals that though there may be a relationship between land value and the distance of the plot from the CBD, this relationship is not statistically significant in our study area.

The land market in Khana Local Government Area conforms to Hoyt model, which states competition on the Best use of site is resolved on "ability to pay. Thus as cities grow in wedges (sectors) that areas of highest rent tend to be alongside line of communication

Given the above scenario therefore, the study advocates for deliberate effort by government to embark on a well thought out sub-urbanization scheme aimed at dispersing the overcrowded population of the city. This will reduce rural-urban mass movement and lower the demand placed on land in the study area

Again, the management of Ken Saro-Wiwa Polytechnic should as a matter of urgency embark on massive construction of hostel accommodation for its staff and students. This will lower the pressure on available accommodation space in the area hence reduce the demand for more land.

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