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A PARADIGM SHIFT IN URBAN ECONOMIC THEORIES: THE RE-EXAMINATION OF RESIDENTIAL LAND AND HOUSING VALUES DETERMINANTS IN AFRICAN CITIES.

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ABSTRACT

The past urban economic studies have shown that land and housing values are largely determined by location factors such as distance from Central Business District (CBD), ignoring the non-location factors like time of land purchase, zoning policy, housing quality and neighbourhood infrastructures. Therefore, this paper examined the relative importance of location and non-location factors in the determination of willingness to pay for sustainable land and housing values, by posting Onitsha, an African city as a case study. Eight hundred and fifty residential housing units were selected and questionnaire administered to the landlords through multi-stage sampling technique. The regression analysis results showed that non-location factors, especially, time of land purchase ($R^2 = 0.478$, $p < 0.05$) and number of rooms ($R^2 = 0.325$, $p < 0.05$) were more important determinants of land and housing values than the location factors. Also, Land and housing values increased with distance from the CBD because of the effects of non-location factors. Therefore, the paper suggested the need to include non- location factors in the revision of the urban economic theories for better understanding of residential land and housing values determinants in support of sustainable development.

Keywords: Land, Housing, Values, Determinants, Sustainability

INTRODUCTION

Land has been incorporated in economic theories in various ways as explained by Klaus et al (2006). Originally, land used by agriculture was the main motivation for economic treatment of land. This is gradually extended with various other land use categories. Today, residential land use, among the various competing urban land uses, is the largest consumer of land in urban areas. That's why the residential land use is usually the focus of urban research and this paper inclusive as confirmed in works of Burgess (1924), Mabogunje (1962), Sada (1968), Frishman (1977) Olaore (1991) Onakerhoroye (1984), Olayiwola et al (2006). Land is the base that anchors the other determinants of real income. It is the main source of wealth especially in developing countries and whoever lacked it practically had nothing. This is because land is an asset that includes anything on the ground, above the ground and under the ground, down to the centre of the Earth (www.businessdictionary.com). Also, land is a major component of the production of housing, which everyone needs and equally essential as production facilities, which we all depend on for our livelihood. On the other hand, housing has been defined in various forms by social scientists in urban studies. According to Harvey (1972), housing is fixed in geographic space, it changes hands infrequently, it is a commodity which we cannot do without, it is a form of stored wealth which is subject to speculative activities in the market, it has various forms of value for the user and above all, it is the point from which the user relates to every other aspect of the urban scene. Other recent definitions have generally argued that housing includes the physical building (whether residential, commercial, industrial, etc) as well as the totality of the environment and the neighbourhood amenities within which the building situates (Eke, 2004; Agbola, 2005). The various explanations of land and housing have implications for the values attached to them. Therefore in economic sense, land is a natural or physical platform upon which a house is built for owner occupation, for sale or for rent at agreed prices or costs

Land value is the cost per plot of land. Also, as explained by Lewis (1979), it is the price offered by a purchaser who is aware of price being paid for and asked for other plots or pieces of land in the vicinity at a time when the availability of land is known widely. On the other hand, housing value is the estimated cost of a building in order to determine its selling price. There is significant relationship between land and housing which Grimes and Aitken (2007) confirmed that their values are relevant to developers in deciding the willingness to invest or develop. From this vantage of expressional relationship between land and housing, it is of utmost importance to gain understanding of the determinants of their values. A growing phenomenon in most African cities (Nigerian cities inclusive) is the high cost of urban land and housing, which eventually gets transmitted into intensive housing development and overcrowding. Urban economic theories or studies have shown that the consumer's decision to pay for land or a house is mainly a function of location factors, which has been seriously contested for ignoring non- location factors. For instance, the bid rent theory argued that land or housing values increase with distance near the Central Business District (CBD) while the hedonic price theory contested that land or housing value is determined by its structural, neighbourhood and location attributes. This contention calls for a paradigm shift in examining or explaining these determinants.

The paradigm shift or change is to ensure sustainability in the land and housing values determinants, which has been dominantly based on location factors such as distances from CBD and major roads, and hence the need for re-examination. Sustainability, according to Bromley (2008), is the process of maintaining change in a balanced fashion, in which the exploitation of resources, direction of investments, the orientation of technological development and institutional change are

all in harmony and enhance both current and future potential to meet human needs. The change in this case is to show that the willingness of persons to pay for the land or house are not only determined by location factors but also by non location factors like the time of land purchase, housing and environmental attributes as well as the government zoning policy. Moreover, studies have shown that technological development has a decaying effect on the distance variable in determining land or housing values whereby preferences are more on the structural and environmental attributes (Ilechukwu and Salau, 2012). This is a clear manifestation of the need for change in order to ensure sustainability in land and housing values determinants.

Despite the useful contributions made in past studies, the contention is that the significance importance accorded to CBD and major roads in determining the land and housing values is limited and not sustainable because non location factors are also important as well as the fact that CBD could not be the only place to live or work. Therefore, for sustainable development, this paper examined the relative importance of location and non- location factors in the determination of land and housing values, as well as the extent to which land and housing values were determined by non location factors, using Onitsha city in Nigeria as a case study. Arising from this investigation, the paper argued the need for a paradigm shift in urban economic theories by the re-examination of the determinants of land and housing values for a sustainable development.

THEORETICAL AND EMPIRICAL ISSUES OF LAND AND HOUSING VALUES DETERMINANTS

The two major urban economic theories upon which empirical studies have been conducted to explain the determinants of land and housing values are the Bid's rent theory and Hedonic price theory. The bid's rent theory says that land or housing values increase with distance near the Central Business District (CBD) while the hedonic price theory explains that land or housing value is determined by its structural, neighbourhood and location attributes.

In order to isolate factors attributable to the households' willingness to pay for access to CBD, Alonso (1964) employed the concept of bid rent, which formalizes the trade – off between accessibility and land costs. In developing the bid rent function, each activity or land use has a family of bid rent curves which shows what a given activity is prepared to pay at each site. The activities with steeper bid rent curves capture the central locations because they are prepared to pay more for central sites. This means that households are willing to pay more for land closer to the CBD. The extensions of the bid rent model by addition of housing were later produced by Muth (1969) and Mills (1972). They established that house price, land rents, building height and population density decline with distance from the CBD. There are several empirical studies in support of the location factor or distance variable as important determinants of land and housing values. The studies are confirmed by the early and recent works of Alonso (1964), Yeasts (1965) , Brodsky (1970), Kain and Quigley (1970), Ball (1973), Wilkinson (1974), Smith (1976), Ball and Kirwan (1977), Li and Brown (1980), Asabere (1981), Butler (1982), Dziauddin et al (2013), Emoh et al (2013) and Larsen et al (2014).

Supporting the influence of accessibility or distance factor, Asabere (1981) examined the determinants of land values in an African city and concluded that a clear understanding of the determinants of land values in Accra, Ghana, must precede the formulation and implementation of all land related policies. The model or hypothesis of his study states that the value of any given lot is determined by the following variables : location in terms of distance to the CBD, distance to the sea, and the presence of major or class – A roads, governmental zoning, culturally rooted determinants like land tenure (who owns or sells

land), ethnic clustering (homogeneity), and the type of interest attached to land (freehold or leasehold), time of sale, the size of the lot and whether the lot has site services or not. Asabere's (1981) findings reveal that land values decrease away from the CBD but increase away from the sea because of erosion, corrosion, noise pollution and other reasons. Also, the distance to road variable shows that land values are higher close to class A roads, while governmental zoning regulations restrict the form of development to be undertaken by any zone by imposing constraints upon its use, height and minimum environmental standards and these have potential impacts on land values.

In their own studies, Dziauddin et al (2013) examined the effect of Light Rail Transit (LRT) system on house price in Malaysia using GIS and network analysis technique. They discovered that properties close to the LRT stations were valued higher than properties situated further away. They remarked that the effect of LRT on properties values is in line with the bid rent function theory, irrespective of the structural attributes of the housing and environmental condition. Also, Emoh et al (2013) considered access to major roads as more important when they prioritized residential land values determinants in Onitsha, Nigeria. Their findings include accessibility, neighbourhood quality, land title, zoning regulations, transportation, improvement tax, view of amenities, in that order, as the determinants. In addition, Larsen et al (2014), using regression analysis examined effects of surface street externalities on residential property price in U.S.A and concluded that street traffic affect various property types differently. They discovered that single-family homes contiguous to an arterial street were sold at a discount while multi-unit properties contiguous to an arterial street were sold at a premium. These studies, however, are somehow biased and not sustainable in according the distance variables or location factors more importance than they really deserve, while the effects of non- location variables are neglected.

In support of the non- location factors, the hedonic price theory was first suggested by Court (1939), developed by Griliches (1971) and used by Rosen (1974). The theory sees price as a measure of values attached to land and housing in the urban housing market. Rosen (1974) used the concept to analyse the supply and demand of the characteristics which differentiate products in competitive markets. When the theory is applied to housing as a multi-dimensional good, housing is differentiated into a bundle of attributes that vary in both quantity and quality. The classical hedonic price theory shows that there is a relationship between housing prices and the attributes. The housing attributes can be classified into three categories; structural attributes (such as number of rooms, building age, roof cover and plumbing fixtures, etc.) denoted by S , neighbourhood attributes (such as school quality, road quality and availability of electricity, water and other vital public services) denoted by N, and location attributes covering access to economic, social and political facilities(such as distance to CBD, shopping centres, parks and other recreational facilities) denoted by L. This relationship is expressed as $P = f(S, N, L)$. Where, P is the hedonic or implicit price function of any of the attributes. The implicit price of a particular attribute can be found by differentiating the implicit price function with respect to that attribute, when all other attributes are held constant.

Some studies in examining the land and housing values determinants have gone beyond location factors to include non-location determinants. Megbolugbe's (1983) study of urban housing market in Jos in Nigeria, observed structural and neighbourhood attributes as major determinants of housing values. Arimah (1990) observed that Megbolugbe's (1983) study neglected location attributes in his estimate of housing values and concluded that the implicit price of housing values are determined by the structural, neighbourhood and location attributes in his analyses of urban housing market in Ibadan, Nigeria. He found that the variables, number of rooms occupied (structural attributes), road or presence of school

(neighbourhood attributes) and distance to CBD (location attributes) are the important determinants of rental values in both the indigenous and modern parts of the city. Olaore (1991) studied 'the values of land and rentage of shelter in Nigerian's urban areas', with a case study of Kaduna. He attempted to determine the factors responsible for the growing disaffection and public outcry against soaring urban land values and the rental values of housing. With regard to residential land value, the important factors were age of a neighbourhood district, infrastructural index, residential accessibility index and distance from the CBD. On the rental value of shelter, the infrastructural index, distance from the CBD, and residential accessibility were factors considered important. Furthermore, Olayiwola et al (2006) used the principal component technique to analyse spatial variation in residential land value determinants in Lagos. They identified accessibility, rent, transport improvement, quality of neighbourhood, infrastructural facilities and government regulation with particular reference to zoning as determinants of residential land value.

Some empirical works in U.K have shown that, the impact of the planning system is of course a powerful determinant of land values, which does not always take into account the natural tendencies of market forces which underpin the theoretical models. For instance, deliberate shortage in land supply or accessibility brings about increase in land values. In his report to the Scottish Government, Evans (2002) argues that planning regulations can push up the price of land if they constrain its supply, thus impacting on the elasticity of the housing supply. Also, Cheshire and Sheppard (2000) still maintain that planning system or regulations often result in price differentials in land and housing development. They recognized many factors which impact on the price of an individual plot of land and house. For instance, they stated that it has long been recognized that housing is a composite good. The price that is paid for a house reflects various characteristics of the house – its floor area, the facilities it enjoys, its age and design. A house, however, is not only composed of characteristics relating to its structure but also of the characteristics determined by its location such as the quality of local public goods like schools, hospitals and amenities in the immediate neighbourhood, which the location provides access to.

In U.S, some studies have shown that fundamentals such as lending interest rates and psychological factors like behavioral expectations are useful in the explanations of variations in land and housing values. Mayer and Sinai (2007) in explaining variations in house prices in U S, found that interest rates are the most important determinants of variations in housing values and lending market efficiency also is capitalized into house prices, with higher prices associated with lower origination costs and greater use of subprime mortgage. Case and Shiller (2004) showed that the expectation of future price appreciation by the households is psychological. They observed that recent buyers in Los Angels expected much higher long term price appreciation than households in Milwaukee, where house prices were flat in the 1980s. In a subsequent survey, Smith and Smith (2006) concluded that run-up in prices was not fully justified by fundamentals but that pricing inefficiencies are due to high transaction costs that limit arbitrage opportunities for rational investors.

Recent studies have also shown support for consideration of non- location factors as important determinants of land and housing values. Liew and Haron (2013) examined factors influencing the rise of house prices in Malaysia using correlation analysis and discovered that economic factors like the construction costs, population growth, long term profit of housing, growth of GDP and decline in supply of new housing have the most influence on house prices. Corroborating this study, Ong (2013) observed that population growth and government policy are important influencing factors in the explanation of the relationship between macroeconomic variables and the price of housing in Malaysia, using multiple regression analysis.

Aliyu et al (2012) examined violent ethno-religious conflicts on residential property values in Nigeria using regression analysis and concluded that conflict prone areas have lower rental values due to decrease in demand and vice-versa. Also Ilechukwu and Salau (2012) studied location and non- location factors in the determination of residential land values in Nigeria, using stepwise regression for data analysis. They observed that non location factors, particularly time of land purchase, were the most significant determinants of residential land values than the distance variable in Onitsha. Also in Nigeria, Kemiki et al (2014) examined the impact of factory noise and dust on rental values of residential settlements by using hedonic pricing model. The findings showed that dust and noise have negative effect on residential rental values. Furthermore, using hedonic price model of stepwise regression, Adegoke (2014) observed that structural attribute and security are the most important factors influencing rental values when he examined the factors influencing rental values of residential property in Nigeria. Again, the inherent values of particular physical infrastructure in house rental values in Nigeria were investigated by Famuyiwa and Babawale (2014) using hedonic model. They observed that power supply, good road condition, street lighting, pedestrian pavements, good drainage systems, neighbourhood security and public waste removal services have a positive effect on residential rental values. In addition, Oduwole and Eze (2013) investigated the dynamic factors that influence the rental values of residential apartment in Nigeria. Using stepwise hedonic regression, they noted that access road, number of rooms, number of bathroom, plot size, electricity, proximity to CBD, the presence of schools and crime rate are the determinants of the rental values for residential apartment. Supporting these findings, Oloke et al (2013) also observed that proximity to the highway, number and size of bedrooms, conveniences, good roads, drainages and security are important factors affecting residential values in Nigeria. All these studies have shown that structural, locational and neighbourhood characteristics are all relevant for a sustainable price or values of land and housing; and not the dominant emphasis on location attributes as in the past studies.

The sustainability of these determinants will depend on the extent of willingness to pay, which means the need to change from the traditional urban economic theories approach to a comprehensive view of the peoples' ability to pay now and sustain such payment in future. The need for the sustainability is because of the questionable assumptions of these theories, especially the bid rent theory. The bid rent theory begins with some basic assumptions: that all parcels of land are uniform apart from their relative distances from one another; that transport is a direct function of the linear distances between places; that CBD is the only single center for all the employment opportunities; that people are rational in their market transactions. Based on these assumptions, the argument proceeds as follows. For all types of land use, the most central sites will be the most attractive. As a result, competition for central sites will be intense, and the prices offered for them will be higher than those for less central sites. Different types of land users will place different financial evaluations on the utility of centrality, depending on their particular schedule of expected income and expenditure (i.e budget). For example, given two distinct households – high and low income, when their bid rent curves are plotted, an important relationship is exposed. Those with higher incomes will have steeper bid rent curves and so end up nearer the city centre, while the lowest income groups will end up on the periphery. However, this argument is contested by what we have seen about the suburbanization of both the high and middle income groups due to increase in residential plot size, floor space, number and size of rooms and other space related housing attributes with distance from CBD, which is facilitated by improved transportation technology.

This argument means that distance/location factors should not be given undue recognition but that the non- location factors should also be included in the theory formulation in order to allow different households to have wide choice of willingness to pay and hence making the land and housing values sustainable. It is against this background that the study re-examined the determinants of land and housing values to include both location and non- location factors for sustainability.

THE STUDY AREA AND RESEARCH METHODOLOGY

Onitsha is the study area and it is located in Anambra State in the south eastern part of Nigeria. The State is bounded on the east, west, north and south by Enugu, Delta, Enugu and Imo States respectively (Figure 1). In the state, Onitsha is bounded in the east, north and south by Idemili, Oyi and Ogbaru Local Government Areas respectively and by the River Niger in the west (Figure 2). The town of Onitsha or Onitsha metropolis comprises mainly the Onitsha North and South Local Government Areas, with the Inland Town and Fegge as the Headquarters respectively. Onitsha metropolis covers the town itself and a long narrow area of low-lying land generally situated between the Niger River and the Owerri road extending southwards. Onitsha metropolis consists of 11 layouts, namely Fegge, Odoakpu, Okpoko, Woliwo, Otu, Inland town, Awada, Omoba, American Quarter, G.R.A. and newly established Nkisi Layouts ("33") (Figure 3).

Despite the conflicting and often contradicting estimates of the population of Onitsha, the population size has increased from 13,000 people in 1857 to 160,000 before the civil war, 256,447 people in 1991 and 261,604 in the 2006 census (NPC, 2006). However, due to high annual growth rate of 6.43%, World Urbanization Prospects (2018) estimated population of Onitsha to be 1,303,000 people.

The existing land use pattern in Onitsha is well defined. The commercial heart (or the CBD) is located in Otu around the main market in the triangle between the Niger River, Old Market-road and New Market road. This busy commercial hub (CBD) and mixed use area is surrounded by the high density residential areas of Odoakpu and Fegge and low/medium density residential area of American Quarters. The low densities residential areas of G.R.A. and Trans Nkisi ("33") are found in the north while in the east are the medium density residential areas of Omogba, Woliwo and Inland Town. Most large scale and new industrial development is concentrated around the Niger Bridge Head and the more accessible new roads (Expressway) between Niger Bridge, Iweka Roundabout and Owerri Road. Secondary commercial centers are located along Iweka Road (Ochanja market), at Iweka Roundabout (New Relief Market), and at the specialized Bridge Head Market dealing mainly in building materials and pharmaceutical drugs. Other areas in Onitsha metropolis are the medium density residential area of Awada located in Obosi to the east and the high density residential area of Okpoko in Ogbaru Local Government Area, to the south of Onitsha.

According to the Onitsha Master Plan (1978), the existing housing stock comprises a total of about 24,500 dwellings within the town plus a further 6,500 or so in the unauthorized development at Okpoko. However, the estimated total housing units in 1978 Onitsha Master Plan was updated for the study with additional 11,500 housing units recorded in the 1991 National population census due to later development of new layouts of Omogba, Awada (both in early 1980s) and Trans Nkisi ("33") in late 1980s (NPC, 1991).

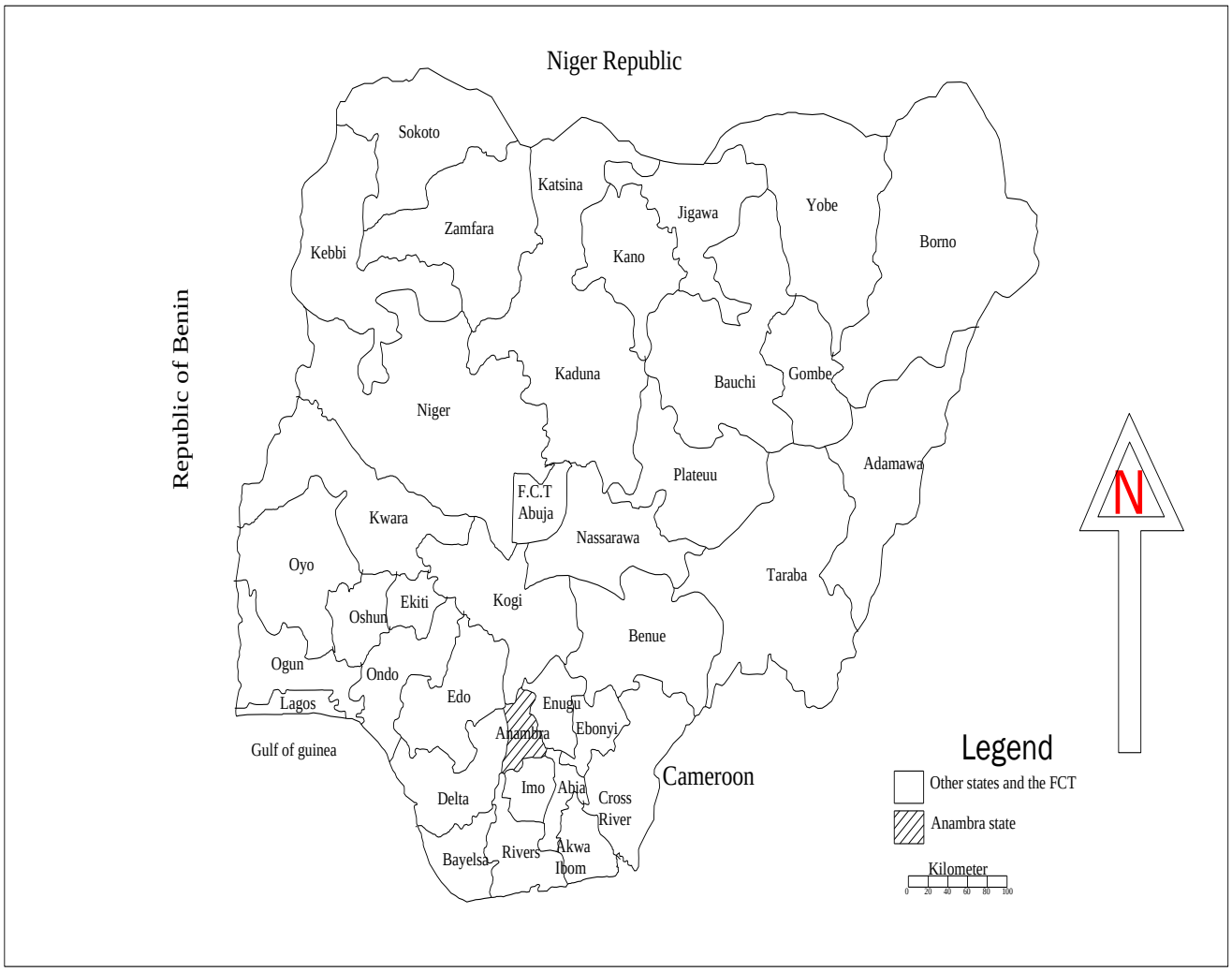

Fig 1.Nigeria Showing Anambra State (Federal Survey, 2011)

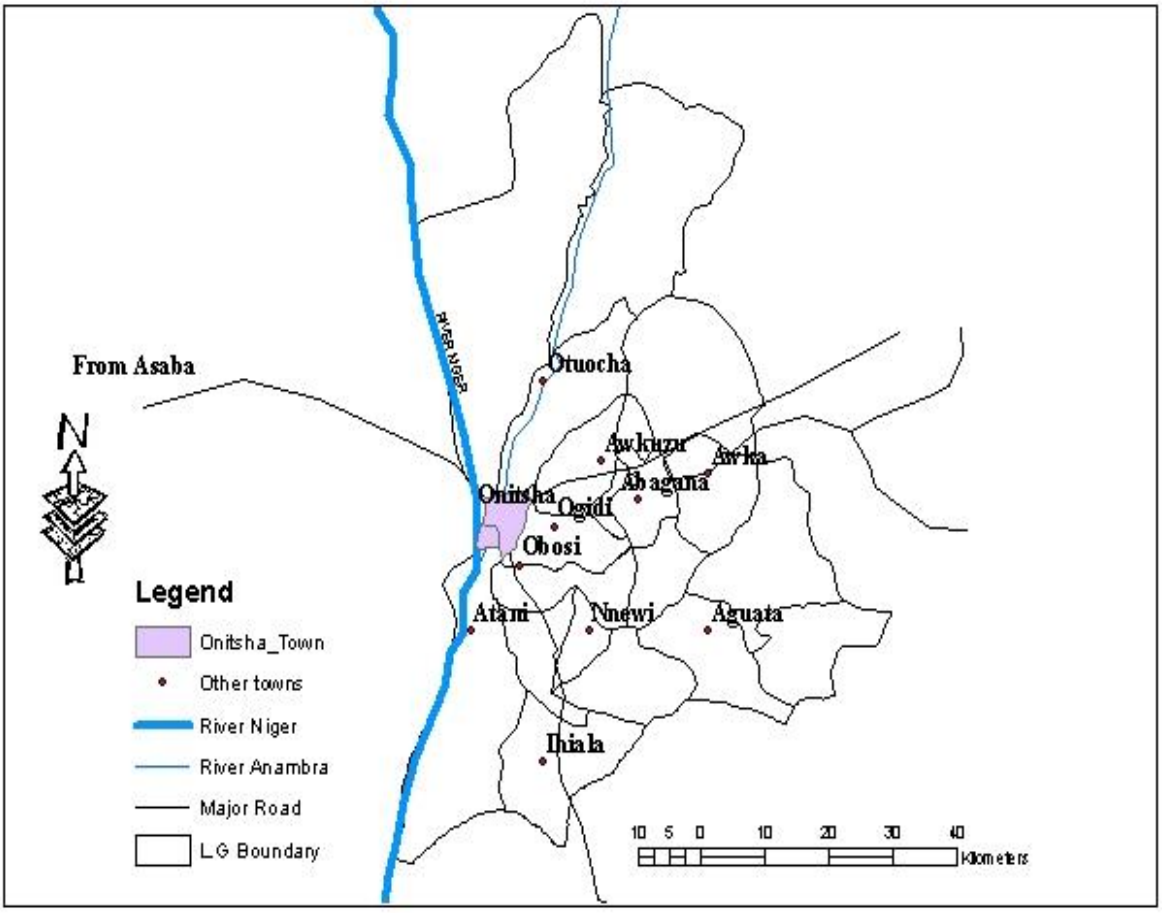

Fig.2. Anambra state showing Onitsha and major towns (Federal Survey, 2011)

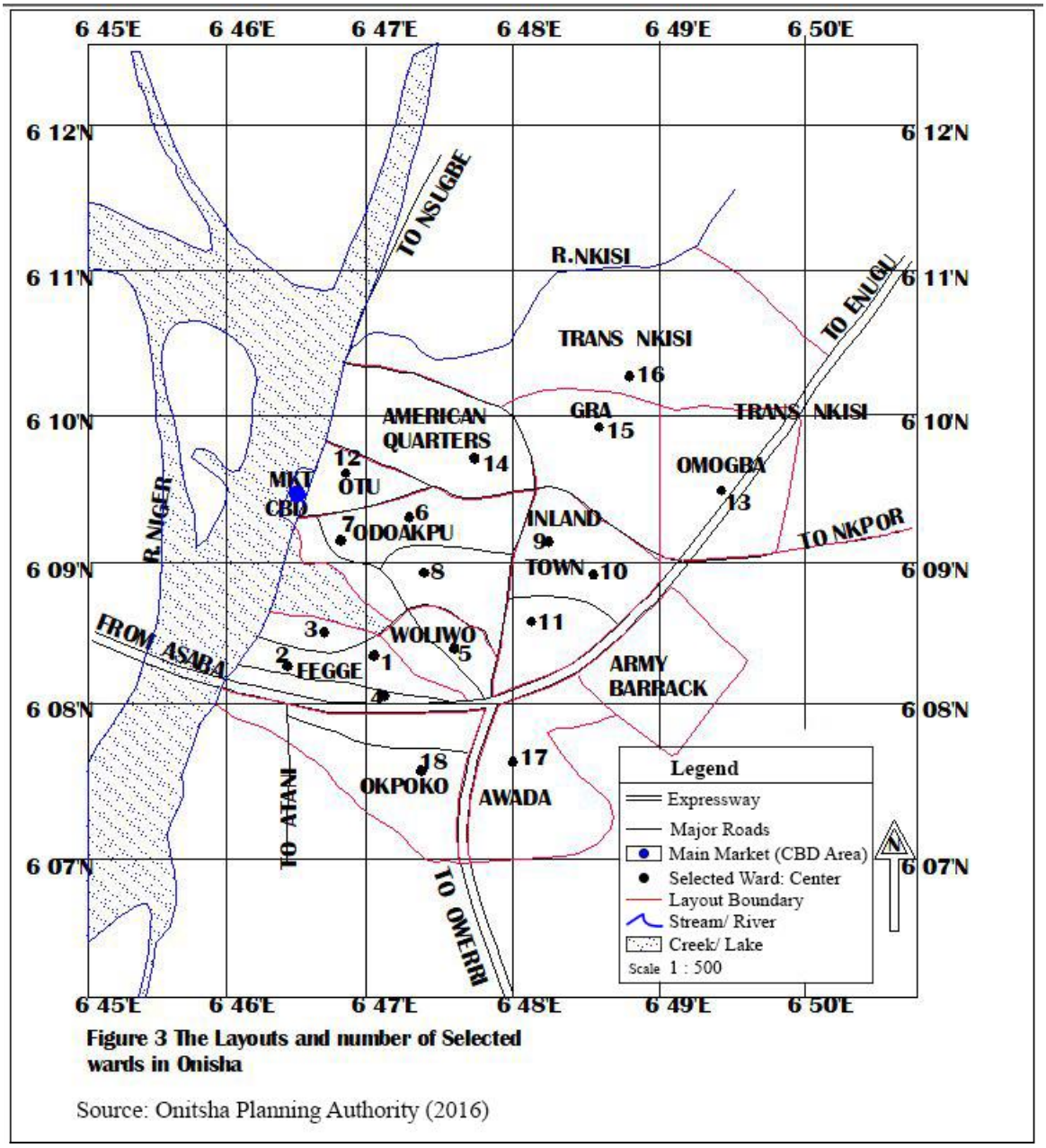

Figure 3 The Layouts and number of Selected wards in Onisha

Source: Onitsha Planning Authority (2016)

Also, additional 4,760 housing units were developed in these new layouts as at 2006 population and housing census as a result of their further expansion and growth rate (NPC, 2006). Therefore, the total housing stock in Onitsha Metropolis for the study as at 2016 is 47,260 (31,000 + 11,500 + 4,760)

Table 1 shows the distribution of this stock among the layouts in Onitsha metropolis. There are some characteristics of these dwelling units that have implications for land and housing values in the town. For instance, there is a high incidence of sharing between more than one family, and occupancy rates are generally high. Overcrowding and lack of proper services and amenities represent the most acute problems with the general physical condition of the buildings giving a little cause for concern.

The study adopted a survey design drawing on urban microeconomic perspectives such as bid rent and hedonic price theories. Using multi stage sampling technique, the 11 layouts of the study area were first identified and classified into high, medium and low density residential zones. Major wards in each of these layouts were selected in the second stage by simple random sampling while in the third stage streets were selected in the chosen wards based on their grades. In the final stage, every third housing unit was then systematically selected in each of the streets for questionnaire administration. A structured questionnaire was administered on landlords (or balloted in case of multiple landlords) of 850 residential housing units or their representatives. Table 2 shows the sampling procedure and sample size distribution.

Data collected include the socio-economic characteristics of the land and house owners, land, housing and neighbourhood data. Land and housing data pertained to how land was acquired, land size and cost, time of land purchase, housing type, size and number of rooms, date of development, housing construction materials, housing facilities such as water supply, solid waste disposal system, types of bathrooms, toilets, kitchens. Information was also sought on the condition of the houses such as the state of walls, floors and roofs, in order to determine their quality. Data were collected on housing cost and rent for bungalow, block of flats and duplexes. Neighbourhood data include age, condition of road, community facilities (for example number of primary schools, number of health facilities, number of security organizations) as well as types of pollution and crime, and reasons for locating in the neighbourhood, and the distances of land and houses from the CBD and major roads. These distances were determined using the street or layout map of Onitsha, obtained from the local planning authority. With this, direct measurement of linear distances of houses in each selected street and ward, to the CBD and the identified major roads, were obtained.

The data collected for this study were analyzed using descriptive technique (frequency, mean, standard deviation) and inferential using regression analysis.

Table1. Residential housing stock per layout

S/N	Layouts	Housing units
1	Fegge	10,750
2	Woliwo	2,000
3	Odoakpu	8,000
4	Inland Town	5,400
5	Otu	2,550
6	Omogba	3,452
7	American Quarters	2,050
8	G.R.A	1,500
9	Trans Nkisi (“33”)	3,380
10	Awada	2,928
11	Okpoko	5,250
	TOTAL	47,260

Source: Onitsha Master Plan (1978), NPC (1991, 2006) and Town Planning Authority (2016)

Table 2.Sampling procedure and sample size distribution

Density class	Layouts	Selected Wards	Selected Streets	Total Questionnaire	Retrieved Questionnaire
High density	Fegge	4	21	215	208
	Odoakpu	3	15	160	154
	Woliwo	1	3	40	21
	Okpoko	1	3	105	32
Medium Density	Omogba	1	4	50	50
	Awada	1	2	30	29
	Inland Town	3	12	108	69
	Otu	1	4	51	50
Low density	American Quarters	1	3	41	35
	G.R.A	1	3	30	30
	Trans Nkisi	1	3	20	20
TOTAL		18	72	850	758

Source: Author's Field Work, 2016

DATA ANALYSIS AND FINDINGS

Summary descriptive analysis of the socio-economic characteristics, land, housing and neighbourhood data collected are presented in Table 3 and later subjected to regression analysis. This is to examine the relative importance of location and non- location factors in the determination of the willingness to pay for the land and housing values as well as the extent to which land and housing values were determined by the non- location factors.

The variables consist of quantitative and qualitative or dummy data. The quantitative data are land and housing values. Others are distances from the CBD and major roads, plot size, room size, number of rooms, time of land purchase, date of development, age of layout, income per month, number of primary schools, number of health facilities and number of security organizations. The qualitative or dummy variables include place of origin, density type, house type, kitchen type, bathroom type, toilet type, housing wall and roof conditions and road condition.

The survey shows that the average value of land per plot is 12.42 million naira and the housing value is 18.24 million naira. The average distance of houses from the CBD and major roads are 2.4 km and 102 m respectively. The average area of a plot of land and a room is respectively 594.84 m^2 and 13.32m^2 while there are average of eight (8) rooms in a building. The time of land purchase and date of development is approximately the same on the average of 25 years, which implies that land is developed as soon as purchased. The average age of the layouts is 75 years and the income per month of the land and home owners is above 70,000 naira with 79% of them being non- natives. There are average of 2 primary schools, 1 health facility and 2 security groups in each layout.

The density distribution shows that 51% of the lands and houses are in high density zone, 37% in medium density and 12% in low density. The dominant building types are the blocks of flats (44%), out of which 59% of them have separate or private kitchens, 47% have tub with shower bathroom and nearly all have water closet type of toilet. Less than 4% of the houses have crack walls and leaking roofs. About 67% of roads in each of the layout are paved or tarred.

Using regression analysis, the distance (location factors) and the non - distance (non- location factors) variables were examined in relation to land and housing values to confirm the most important determinants of variations in these values. The results of this analysis for land and housing values are presented in Tables 4 and 5. The results of the regression analysis presented in Table 4 show that the F – value of 109.893 for land values is highly significant at 0.05 level and the R^2 statistics of 0.612 means that the eleven variables collectively account for 61.2% of variations in land values and that the R^2 values obtained are not chance occurrences. The R^2 change shows that the most important variable is time of land purchase (TLP), which accounts for 47.8% of the spatial variations in the land values. The TLP coefficient indicates that land value has a negative relationship with the period when land is purchased. The time value of money shows that land purchased more than 25 years ago is valued lower than the one bought less than 15 years ago.

This is followed by age of layout (AOL), road condition (ROC) and number of security groups (NSG) which respectively contribute 6.3%, 2.5% and 1.5% to the explanation of the variations in land values.

Table 3. Definitions and Summary Statistics of Variables in the Analysis

Variables	Definition	Mean	Standard deviation
Land value, LV	Cost per plot of land (in million naira)	12.42	7.889
Housing value, HV	Cost per building type (in million naira)	18.24	10.920
Distance of houses from CBD, dCBD (in km)		2.4	1.622
Distance of houses/land from Major Roads, dMR (in km)		102	63.726
Plot size, PLS , Area of a plot of land (m^2)		594.84	496.191
Room size, RMS, Area of a room in building (m^2)		13.32	6.962
Number of rooms, NRM, Number of rooms in building		7.56	3.980
Time of land purchase, TLP	Period of time of land purchase(years)	25.71	15.922
Date of development, DOD	Period of housing development (years)	25.38	15.523
Age of Layout, AOL	Age of layout (years)	75.73	46.685
Income per month, INC	Amount of money earned per month	71134.56	59966.653
Place of Origin, POO	= 1 if respondent is none native*	0.79	0.406
Density of zone type	= 1 if location in low density zone, LDZ*	0.12	0.322
	= 1 if location in medium density zone, MDZ*	0.37	0.484
	= 1 if location in high density zone, HDZ*	0.51	0.500
House type, HOT	= 1 if Blocks of flats*	0.44	0.496
Kitchen type, KIT	= 1 if kitchen is separate*	0.59	0.492
Bathroom type, BAT	= 1 if bathroom is tub with shower*	0.47	0.499
Toilet type, TOT	= 1 if toilet is water closet*	0.99	0.081
Housing wall condition, HWC	= 1 if wall is not cracked*	0.94	0.239
Housing roof condition, HRC	= 1 if roof is not leaking*	0.97	0.172
Road condition, ROC	= 1 if road is tarred*	0.67	0.469
Number of primary school, NPS	Number of primary schools	2.55	1.580
Number of health facilities, NHF	Number of health facilities	1.39	0.630
Number of security groups, NSG	Number of security groups	2.21	1.430

*0 otherwise

Table 4. Regression analysis (location and non- location variables): Land values

Step	Variables	Multiple R	R^2	R^2 change	Regression coefficient	t – value	Sign. level
1	TLP	0.692	0.478	0.478	- 0.360	- 5.642	0.001
2	AOL	0.736	0.541	0.063	- 0.213	- 6.215	0.001
3	ROC	0.754	0.566	0.025	0.163	5.342	0.001
4	NSG	0.767	0.581	0.015	0.234	6.023	0.001
5	HOT	0.770	0.590	0.009	0.092	3.801	0.001
6	INC	0.774	0.596	0.006	0.086	2.936	0.003
7	KIT	0.778	0.602	0.006	0.171	3.678	0.001
8	dCBD	0.782	0.607	0.005	0.073	3.176	0.001
9	BAT	0.783	0.609	0.002	0.086	3.129	0.002
10	LDZ	0.785	0.612	0.003	0.084	2.451	0.002
11	DOD	0.787	0.614	0.002	- 0.145	- 2.250	0.025

$R^2 = 0.612$, F – value = 109.893 probability of F <, = 0.05

Table 5. Regression analysis (location and non- location variables): Housing values

Step	Variables	Multiple R	R^2	R^2 change	Regression coefficient	t – value	Sign. level
1	NRM	0.571	0.325	0.325	0.343	10.106	0.001
2	AOL	0.658	0.431	0.106	- 0.136	- 4.117	0.001
3	INC	0.684	0.465	0.034	0.176	5.551	0.001
4	MDZ	0.710	0.502	0.037	0.228	6.838	0.001
5	NPS	0.722	0.518	0.016	0.132	3.704	0.001
6	BAT	0.731	0.530	0.012	0.131	3.804	0.001
7	ROC	0.737	0.540	0.007	0.070	2.430	0.015
8	dCBD	0.740	0.543	0.003	0.061	2.465	0.014
9	NSG	0.743	0.546	0.003	0.113	3.014	0.003
10	LDZ	0.740	0.550	0.004	0.130	3.058	0.002
11	TLP	0.748	0.552	0.002	- 0.074	- 2.288	0.020

$R^2 = 0.551$, F – value = 85.617 probability of F <, = 0.05

The AOL variable accounts for 6.3% of the variations in land values and its coefficient shows that a unit increase in the age of layout would result in a 0.213 decrease in the land values. This means that land values are high in younger or new layouts.

Furthermore, the ROC variable accounts for 2.5% of variation in land values and the coefficient means that a unit increase in number of paved roads would lead to a 0.163 increase in land values. This means that land values are high for lands along the tarred roads. In addition, land values are affected by the level of security as it accounts for 1.5% of the variations. The NSG coefficient means that an increase in the number of security groups would result in a 0.234 increase in land values. In other words land values increase with number of security groups in the layouts.

The other seven variables are not too significant and important because they contribute less than 1% of the variations in land values. The HOT variable has no meaningful explanation despite the positive relationship with land values. The INC coefficient shows that increase in the amount of money earned per month would result in a 0.086 increase in land values. This implies that only the high income earners can afford to pay for higher land values. The KIT and BAT variables have no meaningful explanation to the variation in land values despite their positive association. Distance from the CBD (dCBD) was the only location factor entered, which accounts for only 0.5% of variation in land values. The dCBD coefficient means that a unit increase in the distance of houses from the CBD would result in a 0.073 increase in land values. This means that land values increase with distance from the CBD contrary to the past studies.

From this analysis, the only significant variables entered were the non- location factors, with the TLP contributing more to the variations in land values. Therefore, the conclusion is that the willingness to pay for the value of land will also depend on the non- location factors, especially time of land purchase and neighbourhood qualities and not the distance variables only if such payment is to be sustainable. Hence, the non- location factors are more important determinants of land values than the location factors.

For the housing values, the results of the regression analysis are presented in Table 5. The overall performance of the analysis is significant as indicated by R^2 value of 0.551 and F – value of 85.617, which means that 55.1% of variations in housing values are accounted for by the eleven variables entered and the R^2 values could not have occurred by chance.

Out of the eleven variables, the most important variable as shown by R^2 change is the number of rooms (NRM). This variable accounts for 32.5% of the variations in housing values. The NRM coefficient shows that a unit increase in number of rooms in a house would result in a 0.343 increase in housing values. This is expected because houses, especially blocks of flats, with more rooms are costlier.

The second most important variable is age of layout (AOL), which accounts for 10.6% of the variations in housing values. The AOL coefficient shows that a unit increase in the age of a layout would result in a 0.136 decrease in housing values. This implies that housing values are high if the layouts are new.

The next most important variable after the second step is income per month (INC) and this account for 3.4% of the variations. The INC coefficient indicates that a unit increase in the amount of money earned per month would bring about a 0.176 increase in housing values. This mean that high cost buildings are only provided or afforded by the higher income earners.

Location in medium density zone (MDZ) is the fourth most important variable and it accounts for 3.7% of the variations in housing values. The sign coefficient of MDZ shows that housing value has a positive association with density type. This means that housing values are high if the houses are located in medium density zone. Number of primary schools (NPS) and bathroom type (BAT) respectively account for 1.6% and 1.2% of variations in housing values. The NPS coefficient shows that housing value has a positive association with number of primary schools, which implies that housing values are high in neighbourhoods with more primary schools. Also, the coefficient of BAT indicates that housing value has a positive relationship with type of bathroom in a house. This means that housing values are high in houses with tub and shower bathroom facilities.

From the seventh to eleventh step, the variables account for less than 1% of variations and are considered not too important in the explanation of the variations in housing values. Among these variables is the distance from CBD (dCBD), which is a location factor and accounts for only 0.3% of variation. Again, the dCBD coefficient means that a unit increase in the distance of houses from the CBD would result in a 0.061 increase in housing values. This further confirmed that housing values increase with distance from the CBD contrary to the past studies. The ROC, NSG and TLP coefficients show that housing value has a positive relationship with condition of roads, number of security groups but negative association with time of land purchase. Housing values are high for houses located along tarred roads and in neighbourhoods with more security groups.

The regression results reveal that the determinants of the variations in housing values are number of rooms (housing attribute), age of layout (time attribute), income per month (socio – economic attribute) location in medium density zone (policy attribute), number of primary schools (neighbourhood attribute), bathroom type (housing attribute) and road condition (neighbourhood attribute). All these are non- location factors. Therefore, the willingness to pay or rent a house will also depend on the non- location factors, especially housing/structural attributes like number of rooms and age of neighbourhood and not the distance variables only if such payment is to be sustainable. Hence, the non- location factors are more important determinants of housing values than the location factors.

CONCLUSION AND RECOMMENDATION

This paper has analysized the location and non -location factors influencing land and housing values in Onitsha city. This has been done with respect to the different residential neighbourhoods during which reasons for the observed views were established. The use of the regression analysis made it possible to establish the relative importance of the location and non-location factors in the explanation of the spatial variations in land and housing values as well as the extent to which land and housing values were determined by non location factors. Non-location factors including time of land purchase, housing quality and neighbourhood infrastructures significantly determined variations in land and housing values with distance from the CBD in Onitsha. The implication is that non-location factors should be recognized as important determinants of willingness of persons to pay for urban land and housing in Nigeria. Moreover, the land and housing values were observed to increase with distance from the CBD contrary to the past studies, meaning that for values to be sustainable the attributes of the environment within which the land is located as well as the characteristics of the housing should also be considered.

Therefore for sustainable development and the willingness to pay, the assumptions of the urban economic theories, especially the bid rent theory need to be re-examined. The bid rent theory is based on the works of Alonso (1964) which explains that land values are determined by the distance from the CBD. That is, land values would decrease with distance from the CBD. However, the findings revealed that the distance variable is not the most important determinant of land values in the study area. Specifically, time of land purchase is considered as the most important determinant of the variations in land values and as such time variable should have been considered in the assumptions of the theory. In addition, the assumptions that all employment opportunities are provided only at one centre, all land surrounding the centre is identical and all households have identical utility functions and income levels are not realistic and sustainable in contemporary development. For instance, the assumption concerning the location of all employment opportunities at the centre (in this case, Onitsha Main Market), probably cannot be true in the study area. This is because of the other competing market centers such as Ochanja market, New Relief market, Head Bridge market and other commercial centers in the area that can make people to have preferences in the willingness to pay. Thus, there are other choices where to trade and not necessarily the Main Market. This also affects the choice of where to live or buy land and house. In other words, the values of land and housing are influenced by these other commercial centers. Moreover, land is not identical in both physical and economic senses as claimed by the bid rent theory. This is because, in the study area, zoning policy makes the networks of streets and roads in some areas better while the structural or neighbourhood characteristics make some areas more or less protected. For these reasons, land values would vary, not because of distance from the CBD alone.

The hedonic price theory has been used by some scholars (Rosen, 1974; Megbolugbe, 1983; Arimah, 1990; Cheshire et al, 1998), to explain variations in housing values based on the structural, neighbourhood and location attributes of the housing stock. Though the findings of this study indicate that structural and neighbourhood attributes are the most important determinants, the credibility of the theory is the inclusion of location factors for sustainability or willingness to pay. This is because the theory centred on the principle that the price/value of a commodity is determined by the utility that various attributes (including location factors) of the particular product bears. This paper is in support of inclusion of both location and non- location factors for sustainability and willingness to pay. Hence, the willingness to pay for the attributes determines the value or price of the property. However, it is pertinent to note that even with the current modern day complexities of cities where several CBDs are found like in Onitsha, the variations in property value still revolve around the nearest CBD that exerts influence on properties.

It is then recommended that the bid rent theory should incorporate not only location factors but more importantly non location factors to ensure willingness to pay and sustainability. These modifications in the urban economic theories would provide a clearer understanding of the variations in the land and housing values of residential housing for a sustainable development. Therefore, the urban economic theories such as the bid rent theory, need to be revised to represent conditions in contemporary urban areas better, especially in African cities. This generalization is made by the fact that there are obvious similarities in the pattern and characteristics of urbanization in African cities as manifested in the growing disaffection against increasing urban land and housing values in most cities that require a sustainable approach to the determinants of these values.

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