

Assessing the Impact of Low Density Residential Housing Conversion: Case of GRA Phase I and II Port Harcourt

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Abstract - Human phenomenon is one of the forces that influences the circumstances under which land use are being shaped all over the world. The overwhelming increase in residential housing conversion in GRA phase 1 and 2 has obstructed the land use plan for the area which is predominately low density residential land use. The aim of the study is to assess the impact of low density residential housing conversion to other factors such as residential rent, housing shortage, crime rate, traffic congestion and environmental degradation. Data for the study was gather through administration of questionnaire to 100 respondents in which 86 questionnaires was proper filled. A random sample technique was adopted to the two residential neighbourhoods. The data was analyzed using descriptive, inferential statistic and multiple Regression through the aid of Statistical Package for Social Sciences (SPSS). The finding showed the low density house are converted for economic benefit and their effect include increase in residential rent, housing shortage, traffic congestion among others.

Keywords - Housing conversion, Traffic congestion, Housing shortage Residential rent

I. INTRODUCTION

Human phenomenon is one of the forces that influences the circumstances under which land use are being shaped all over the world. Residential housing conversion has depleted owners clamor for housing conversion because of high return on investment accruing to it, which they observes stimulates economic development in Nigeria and reduces housing stock (Agukoronye and Nwankwo , 2002). Hence residential housing is of less economic advantage compared to the other land, this affect the rate of investment on residential land use by the land owner.

The planner's sees residential housing conversion as an obstruction to the land use pattern of the urban centers. Several study demonstrated the consequences of housing conversion in Nigerian cities manifest in dislocation and displacement of households (Agukoronye and Nwankwo, 2002). Nwachukwu and Ukpabi (2009), observed that conversion of residential buildings to commercial uses lead to population increase in the area and other environmental issues in the area. Gbadamosi, (2002) also considered residential housing conversion to be influenced by various human land use activities such as; Population growth and physical expansion and growth of space for human needs.

In Port Harcourt and most Nigerian cities the demand for commercial space/activities has been on increase on daily basis which have led to residential housing conversion yet the demand is still intense. Ukpabi, (2005) also regarded housing conversion as an "aberration". This is because of the physical, environmental and social dislocations that it tends to cause on the urban areas. The influence of human (developers, Land owners, Individuals, etc) on land, changes the physical appearance of the city and enhance the city, improve the standard of living, spring up growth etc. Ayotamuno et al (2010), examine the land use change in 1986 and 2005 in Government Residential Area (GRA) Phase. It was observed that there are significant land use changes of 394, 2, 7 and 2 in 1986 against 232, 214, 33 and 10 in 2005 for residential, commercial, institutional and other respectively. This study assess the impact of low density housing in GRA phase 1 & 2 whether there is a strong relationship between housing conversion and other variable such as residential rent, housing shortage, traffic congestion, crime rate and environmental degradation being an underlying determinant.

II. PROBLEM STATEMENT

The rate of low density housing conversion is one of the major problem facing major cities in Nigeria, especially Port Harcourt. In recent years, land use conversion by property developers from its originally approved plan and planning scheme for the area has become a major problem in most urban residential layout. Ideally, proper land utilization and management the land use ought to be guided against any form of haphazard development that does not conform to the planning scheme for the area. However, most researchers have attributed these phenomena to shortage of housing stock, increase in house rent and inadequate housing supply etc.

The Government Reserved Area (G.R.A), Port Harcourt was earmarked for Low density residential housing. From observations, there are overwhelming increases in other land use in the area. The developers convert their residential houses to other land use that are of more economic profit to them. Hence, the research to know the potential and adverse effect this problem creates on the neighborhood and occupants such as traffic congestion crime rate housing shortage among others.

III. STUDY AREA

The study area which is Diobu GRA Phases 1 and 2 is part of the Port-Harcourt City Local Government Area (PHALGA) and Obio-Akpor Local Government Area. Diobu GRA is bordered by D-line and Diobu to the south, Rumueme to the West, Rumuola to the north and Elekahia to the east. It is located about 5.6 km (3.5 miles) southwest of Port Harcourt's. The geographical coordinates of the neighborhood lies on latitude 4°45'40"N, 4°53'40"N and longitude 6°45'40", 7°0'20"E (figure 1).

It was a high and middle class resident which has changed to mixed use due to economic change. Port-Harcourt features a tropical wet climate with lengthy and heavy rainy seasons and short dry seasons. Port-Harcourt highest precipitation occurs during September with an average of 367mm of rain. December on average is the driest month of the year with an average of 20mm. Temperatures throughout the year in the city are relatively constant, showing little variation throughout the course of the year. Average temperatures are typically between 25°C - 28°C in the city.

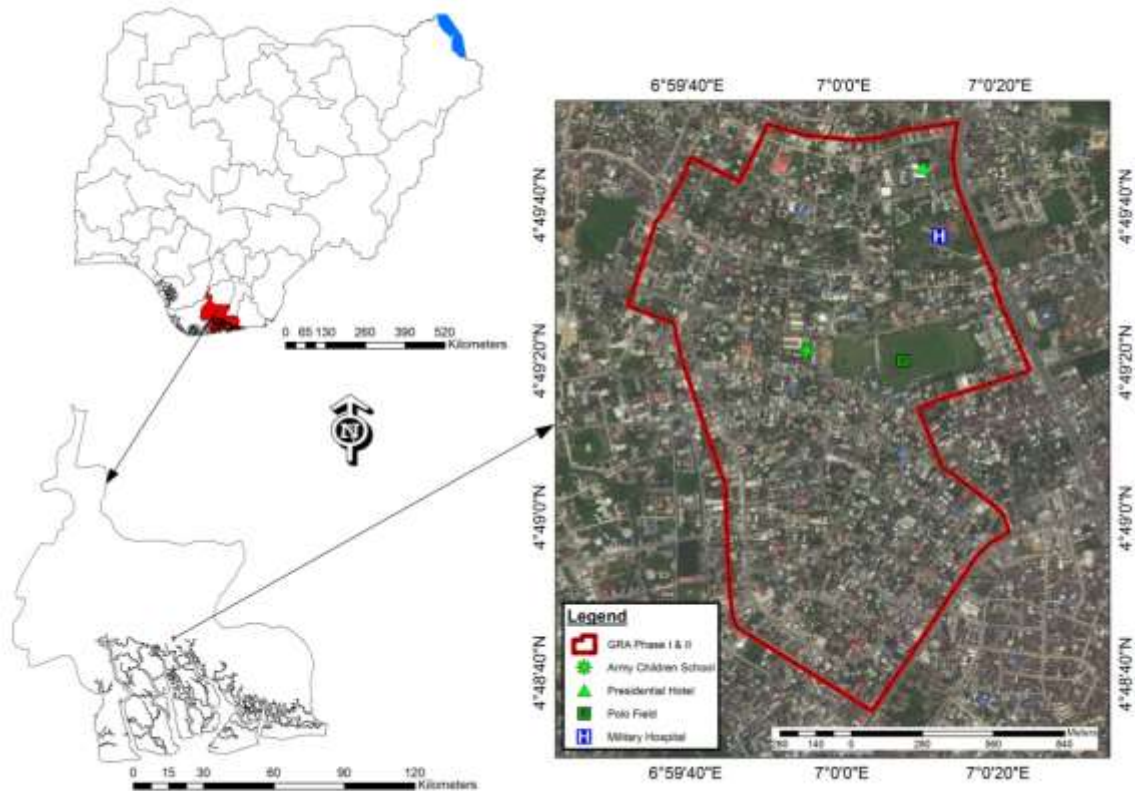


Figure 1: Map Showing (a) Nigeria (b) Rivers State (c) GRA Phase 1&2

IV. METHODOLOGY

The research design will be adopted is quantitative research instrument which would yield better understanding on the subject matter. However, from the neighborhood perception the research will adopt a passive observational research design (Cook and Campbell, 1976). A reconnaissance survey was conducted in the study area to ascertain housing conversion is dominant. The area includes, Evo road, Woji, Birabi, Omereluand Road One. National Population Census (1991), the neighborhood of GRA Phase 1 & 2 (Oromezimgbu Layout) Port Harcourt as of 1991 was 6591. The population of the study area will be projected to 2017 using Linear Exponential Equation as shown below.

$$P_n = P_o (1+r)^n \dots\dots\dots (1)$$

Where:

- P_n = population at the future date
- P_o = population at the initial date
- 1 = Constant
- r = Rate of growth = 8.7%
- n = Interval of number of years

Therefore, the projected population for 2017 is 57, 666.

A closed ended questionnaire was drawn and 100 questionnaires were randomly distributed in these observed areas.

Variables in the Study

The dependent variable (Y) of the study is the Residential Housing conversion, while the independent variables (X) are:

- X_1 =Resident rent
- X_2 =Residential Housing shortage

X₃=Traffic Congestion
 X₄=Crime rate
 X₅=Environmental Degradation

The above variables were quantified through the application of a check-list and table for assessment of impact of low density residential housing conversion.

The Multiple Regression Model

In the study, Multiple Regression Model is used for the purpose of establishing the relationship between the dependent variable and independent variables. The model produces estimators of the standard error and the coefficient of multiple determinations. The purpose of the multiple regression as applied in this study is to establish numerical relationship between housing conversion and other factors such as housing shortage, crime rate traffic congestion etc. The dependent variable (Y) is associated with, or is a function of the independent variables (X_n). Mathematically, this is written as:

$$Y = f(X_1, X_2, X_3, X_4, \dots, X_n) \dots\dots\dots (2)$$

Where:

Y = the dependent variable
 f = function of n independent variables.

For ease of calculation, a linear form is assumed, thus:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \epsilon \dots\dots\dots (3)$$

Where:

Y = Dependent variable,
 X₁ and X₂ = Independent variables.

The above equation refers to fixed constants for a given population (i.e. α , β_1 and β_2). The term α is the intercept parameter of the regression relation. The constant β measures the net change in the conditional mean that occur per unit change in X₁ when the other independent variable (i.e. X₂) is held constant. β_2 also relates to X₂ in the same manner. The random error term ϵ represents the deviation of each value of the independent variables (X₁ and X₂). Sample data were used to estimate the population parameter. Besides, we have used only sample data in the study. Based on the above analysis, the estimated multiple linear regression model with m independent Variables is used:

$$\hat{Y} = a + b_1 X_1 + b_2 X_2 + \dots + b_n X_n + e_i \dots\dots\dots (4)$$

Where:

a, b₁, b₂ and b_n are point estimates of the unknown population parameters
 α , β_1 , β_2 and β_n respectively
 \hat{Y} is the estimated value of the conditional mean μ .

V. RESULT

Socioeconomics Characteristics of Residents

Table 1 shows summarize the personal and household characteristics of residents in our sample for the GRA Phase 1, 2, and 3. The samples are relatively homogeneous in terms of residential socioeconomics characteristics. The result shows that both genders were considered. 62.8% were male, 37.2% were female. From the 86 questionnaires administered, this shows that the male responded more than female.

Table 1: Socioeconomics Characteristics of Residents

S/No.	Characteristics	Frequency	Percentage
1.	<u>Genders</u>		
	Male	32	37.2
	Female	54	62.8
2.	<u>Marital Status</u>		
	Single	35	40.7
	Married	45	52.3
	Widow	5	5.8
	Widower	1	1.2
3.	<u>Age Category</u>		
	21 – 30 years	2	2.3
	31 – 40 years	20	23.3
	41 – 50 years	29	33.7
	51 – 60 years	20	23.3
	61 – Above	25	17.4
4.	<u>Occupation Status</u>		
	Public Servant	28	32.6
	Civil Servant	35	40.7
	Trading	5	5.8
	Unemployed	1	1.2
	Self Employed	17	19.8

5. <u>Income Level (₦)</u>		
Less than 100,000	12	14.0
100,001 – 200,000	29	33.7
200,001 – 300,000	25	29.1
300,001 - above	20	23.3
6. <u>Number of Person Per Household</u>		
2 – 3 Persons	48	55.8
5 – 6 Persons	30	34.9
7 – Above	8	9.3
7. <u>Length of Stay</u>		
Less than one year	2	2.3
1 – 5	20	23.3
6 – 10	26	30.2
11 – Above	38	44.2

The table above indicates that 52% of the 86 respondents were married, while 40.7% and 5.8% were singles and widows respectively and 1.2% widower. Greater percentage of the respondents interviewed was married. However, the study reveals that the larger percentage of the study population falls within the age bracket of 31-40years representing 33.7%, followed by age group between 41- 50years representing 23.3%, 21- 30years representing 23.3%, also 51- 60years represent 17.4% and 61 years and above represent 2.3%. This shows that matured people were more interviewed.

The result above shows that 35persons representing 40.7% of the respondents were Civil servants while 28, 5, and 1 persons were 32.6%, 19.8%, 5.8% and 1.2% indicating public servant, Self-employed, Trader and Unemployed respectively. The table above indicates that 12 persons representing 33% of the respondents earn less than 100,00 naira monthly, while 29 persons accounting for 33.7%, 25 persons accounting for 29.1% earns 100,001 – 200,000, 200,001 – 300,000 respectively on monthly basis and 20 persons earn 300,000 and above monthly. This means majority of the respondents interviewed has more than 200,000 as their monthly income which can sustain themselves and household.

The result above indicates that majority of the respondents interviewed have lived in the neighbourhood from 11 years and above representing 44.2%, between 6-10 years representing 30.2%, between 1-5 years representing 23.3% and less than a year represent 2.3% respectively of respondent’s length of stay in the neighbourhood. Table 2 reveals that 55.8% of the respondents have 2-4 persons in their household, 34.8% falls between 5-6 persons per household and 9.3% falls between 7 persons and above. This shows that the study area has few number of persons living in a household.

Type of Land use Conversion

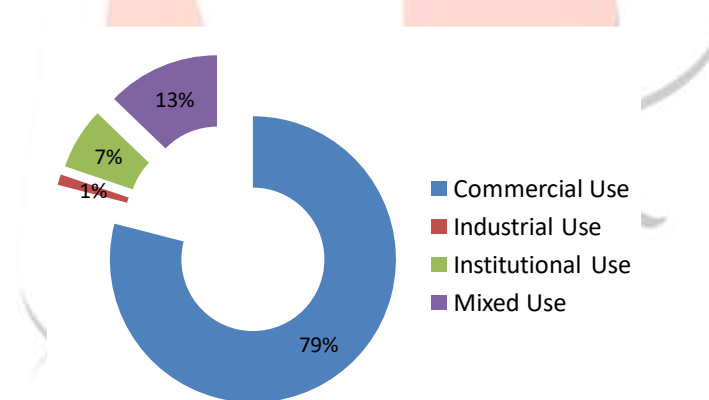


Figure 2: Type of Land use Conversion

Figure 2 reveals the opinion of the respondents on the land use that residential buildings were converted into. 79% of the respondents were of the view that residential buildings were converted into commercial uses, 13%, 7.0% and 1% were of the view that they were converted into mixed use, Institutional use and Industrial use respectively.

Factors Responsible for Housing Conversion

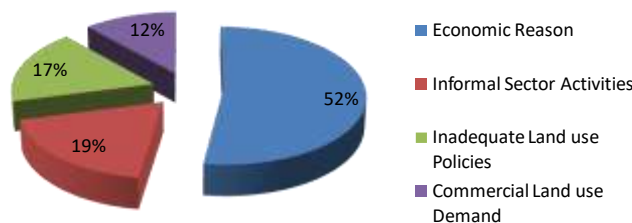


Figure 3: Factors Responsible for Housing Conversion

The Figure 3 above shows that majority of the respondents which is 52% are of the opinion that residential houses are been converted for economic reasons, 19% said they are converted due to urbanization (increase in informal sector activities), 17% of

the respondents said is as a result of inadequate land use policies and 12% are of the view that it is as a result of increase in demand for commercial housing.

Analysis of Results

Hypothesis Testing

Correlation and multiple regression analyses was conducted to examine the relationship between Residential housing conversion and residential rent, crime rate, residential housing shortage, environmental degradation, traffic congestion are predictors. Table... below summarizes the descriptive statistics and analysis results. As can be seen each of the Residential Rent, crime rate, residential housing shortage, environmental degradation and traffic congestion is positively and significantly correlated with the housing conversion.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.262 ^a	.069	.032	.86482

a. Predictors: (Constant), Residential Rent, Crime rate, Residential Housing Shortage, Environmental Degradation in Housing Conversion, Traffic Congestion in Housing Conversion.

b. Dependent Variable: Housing Conversion

Table 3: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	6.945	5	1.389	1.857	.106 ^b
Residual	94.237	126	.748		
Total	101.182	131			

a. Dependent Variable: Housing Conversion

b. Predictors: (Constant), Residential Rent, Crime rate, Residential Housing Shortage, Environmental Degradation in Housing Conversion, Traffic Congestion in Housing Conversion

Table 4: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.936	.582		3.324	.001	.783	3.088
1 Environmental Degradation	-.252	.137	-.427	-1.835	.069	-.524	.020
Traffic Congestion	.162	.409	.233	.397	.692	-.646	.971
Crime rate	-.257	.373	-.196	-.690	.491	-.994	.480
Residential Housing Shortage	.097	.120	.105	.804	.423	-.141	.335
Residential Rent	.588	.672	.593	.874	.384	-.743	1.918

a. Dependent Variable: Housing Conversion

The multiple regression model with all five predictors produced $R^2 = .069$, $F(5, 126) = 1.857$, $p < .106$. As indicated, the Residential Rent, Crime rate, Residential Housing Shortage, Environmental Degradation, and Traffic Congestion had significant positive regression weights. Therefore, we would reject this H_0 : and accept H_1 : decide to use the model, since it accounts for significantly more variance in the housing conversion variable than would be expected

VI. DISCUSSION

Low Density Residential Land use Conversion

It is observed that low density residential housing in the neighbourhood was converted into commercial, institutional and mix use. These have significant impact to the housing stock within the neighbourhood. The result in figure 2 affirmed that 79% of the respondent were of the view that residential building were converted into commercial use, 13% is of the view that it is converted to mix use, 7% said institutional and 1% are of the view that the place is been converted to other land use

Cause of Residential Housing Conversion

There is several cause of residential land use conversion as discovered in the study.

- i. **Economic Reason:** Many develop and landlord convert their residential house into commercial and other land use in order to generate more income and value of the land. Figure 3 indicates that 52% of the respondents are of the view that developer converts residential housing into other land uses for economic benefit.
- ii. **Informal Sector Activities:** Due to challenges associated to urbanization such as increase in population, unemployment etc, 19% of the respondent affirmed to the fact that the rate of low density housing conversion is due informal sector activities.
- iii. **Inadequate Land Use Policies:** Based on the result in figure 3, 17% of the respondent agreed on this factor. The failure on the part of government agencies responsible for monitoring and implementation of land use policies. These land use policies are made to guide various development processes in the neighbourhoods. This has led to haphazard development, alternation in residential land use there by depleting the neighbourhoods.
- iv. **Commercial Land use demand:** Referring to figure 3, 12% of the respondents consider increase in commercial land use as one of the factor for residential housing conversion. This is because of the competitive nature of commercial land use against the residential land use in terms of the rental value. However, most developer and property owner prefer investing in commercial land use to residential land use in the neighbourhoods.

Impact of Low Density Residential Housing Conversion

The impact associated with residential Hosing conversion is based on the following:

Residential Rent: The property owners increase their residential rent due to competitive demand of commercial activities in the neighbourhood. This trend has significant impact to residential housing shortage which has led to increase in house rent in the neighbourhoods.

Traffic Congestion: Based on the intense level of commercial activities within the neighbourhoods. The site and services available in the neighbourhoods is over stress resulting to on – street parking which due to inadequate parking space. This has contributed to traffic congestion within the study area.

VII. CONCLUSION

Low density Residential housing conversion has been a continual process in the study area as alright established in this study. It has significant impact on the resident and environment such as increase in residential rent, traffic congestion and environmental degradation. This is due to the invasion of commercial activities in the study area. The residential housing storage in the neighbourhoods is attributed to residential housing conversion.

VIII. REFERENCE

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