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Effect of Road Infrastructure Improvement on Rental Value of Residential Properties in OGUI New Layout, ENUGU URBAN, NIGERIA (2002 – 2017).

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ABSTRACT: This study investigated the effect of road infrastructure improvement on rental values of residential properties in Ogui New Layout, Enugu. Rental values of residential accommodation before and after the road infrastructure improvement were determined and compared. A sample of 50 properties was selected using stratified random sampling technique. The stated hypothesis was tested using the paired students ‘T’ test. It was discovered that rental values before and after the road infrastructure improvement were weakly and positively correlated ($r=0.940$, $P<0.001$) and that there was no significant average difference in the rental value before and after road infrastructure development ($t_{23} = -7.221$, $P<0.001$). The study therefore suggests that the relative increase in rental values may be attributed to other economic factors such as inflation, increase in population, etc. It was therefore recommended among other things that governments at all levels should encourage real estate research and that the Nigerian Institution of Estate Surveyors and Valuers should play a leading role in pointing to the direction of such researches.

KEYWORDS: Accessibility, Infrastructure, Property, Residential Properties, Property Values, Road Infrastructure, Roads, Rental Values, Rent.

I. BACKGROUND OF THE STUDY

Enugu, a very important administrative, industrial and commercial town in Southeastern Nigeria, is located between latitudes $6^{\circ}27'N$ and $7^{\circ}28' N$, and longitudes $7^{\circ}30'E$ and $8^{\circ}19'E$ (Enugu Master Plan 1978). Enugu has served at various times as the headquarters of Southern Province (1929), Eastern Province (1939), Capital of Eastern Region (1951), the East Central State (1967), Anambra State (1976) and Enugu State of Nigeria from 1991 till date. It should be mentioned that in 1967 a series of political crisis led to secession of the eastern region from the rest of Nigeria and the declaration of the independent state of Biafra with Enugu as capital. The civil war which out and lasted for nearly 3 years ended in 1970 and Nigeria remained one (Ikejiofor, 2004).

Meanwhile, Isichei (1976) opined that Enugu, which literally means “Hilltop” derives its name from its position among the Udi hills at an altitude of about 223 meters above the mean sea level. Infact, the origin of Enugu (“Enu-Ugwu” – Hilltop) dates back to the discovery of a rich seam of coal in the area in 1909 by a geological exploration team led by a British mining Engineer Mr. Kitson (ENSG 1991). In 1914, another British mining Engineer, Mr. W. J. Leck arrived with his team to commence coal mining in Enugu. While Leck and his men settled at the Hilltop Ngwo, his foremen host Alfred and his group settled at a nearby camp (the present “Ugwu Alfred in Enugu). The whites later relocated to what later became the European Quarters (now Government Reservation Area (GRA)).

In his own account, Njoku (2001) stated that the two communities of Ngwo and Ogui Nike are the original owners of Enugu. The then colonial government got the people of Ngwo and Ogui to cede 10 square miles of their land freely and voluntarily (without compensation) to enable the administration setup a colliery and railway stations. Nwoye (2014) pointed out that the first coal mine was opened at Udi siding in 1915 while the second one was opened in Iva-Valley (Iva-Mine) in 1917. In that same year Enugu attained a second-class



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township status under Lord Lugard's Township Ordinance with the name "Enugwu Ngwo". According to ENSG (1991), in 1923, 'Ngwo' was dropped from the name to distinguish the township from the Ngwo Village and "Enu-ugwu" re-spelt as Enugu for the convenience of the Europeans.

However, Aniagolu (1996) quoting Isichei (1976) asserted that in 1914 construction work commenced on the Enugu – Port Harcourt rail line with the discovery of deep-sea harbor in Port Harcourt. It was not until 1916 that the first freight of coal was transported by rail to Port Harcourt. As the coal mine attracted more workers another settlement was established for indigenous coal workers at coal camp otherwise known as Ogbete Layout. Ikejiofor (2004) went further to state that due to the bereft of mechanical devices, the coal mining industry relied mostly on manual labour in its early days. Most of the workers were recruited from towns, villages, clans and hamlets surrounding Enugu. Thus, Nnamani (2002) concludes that the muscles of the native people provided the force as well as the paid labour for the establishment and consolidation of colonial infrastructure and industries.

Enechukwu (1983) further stated that by 1923, China town developed as a special residential area for railway workers and European quarters (today called GRA) was carved for the whites. Later other residential areas such as Asata, Uwani and Ogui New Layout emerged.

II.STATEMENT OF THE PROBLEM

Before now, Ogui New Layout which is one of the well-planned layouts in Enugu, was neglected by succeeding governments. The layout before 2007 lacked basic infrastructural facilities. Within that period, roads within the layout deteriorated into deplorable situations. Pot-holes existed in all the roads thus causing traffic problems. Drainages were badly destroyed and run-off water from drains devastated roads. Effluents from shared public houses collected in drains and flow into roads creating breeding places for mosquitoes. The whole environment was defaced by these situations thus affecting rental value of residential properties within the layout.

In 2006, a new administration led by Barrister Sullivan Iheanacho Chime came in and became purposeful. Within a relatively short period basic infrastructure such as roads and drainages were provided in the layout. The environment which hitherto was a death-trap improved tremendously. This study therefore, tries to examine the effect of road infrastructural improvement on rental values of residential properties within Ogui New Layout Enugu from 2002 – 2017.

III.AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to examine the effect of road infrastructure improvement on rental values of residential properties in Ogui New Layout Enugu from 2002 – 2017. In order to achieve this aim this study intends to investigate the following:

- a. To determine the rental values of residential properties in Ogui New Layout Enugu when the roads were bad between 2002 and 2009.
- b. To determine the average rental values of residential properties in Ogui New Layout Enugu when the road situation improved between 2010 and 2017.
- c. To compare the rental values of residential properties within the two periods and determine the rate of improvement (if any).

IV.RESEARCH QUESTIONS

The following research questions will be investigated by this work:

- a. What is the rental value of residential properties in Ogui New Layout Enugu from 2002 – 2009 representing the period when road situation was bad?
- b. What became the average rental values of residential properties in Ogui New Layout Enugu from 2010 – 2017 representing the period when the road situation improved?
- c. How can the average rental values of residential properties in Ogui road be compared within the two periods (2002 – 2009 and 2010 – 2017)?



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V. HYPOTHESIS FORMULATION

The following null hypothesis was put forward for this study:

Ho: Road infrastructure improvement has no significant effect on rental values of residential properties in Ogui New Layout Enugu.

VI. BASIC ASSUMPTION OF THE STUDY

Within the period under review, it was observed that the major infrastructure that improved in Ogui New Layout include roads and drainages. Hence, the basic assumption of this study is that all other infrastructural factors remain constant and have not contributed significantly towards the current rental value existing in Ogui New Layout Enugu.

VII. SCOPE OF THE STUDY

The study covers the major residential streets in Ogui New Layout namely Ebe Lane, Ani Street, Onyiuke Streets, Udorji Street and Port Harcourt Street. Commercial streets were not included because the study is on rental values of residential properties. Also the study covers the three major types of residential properties found in Ogui New Layout which include, block of 3 bedrooms flats, block of 2 bedrooms flats and tenement rooms.

VIII. LITERATURE REVIEW

Many authors / researchers have tried to establish a link between road infrastructure improvement and value of residential properties within its immediate neighbourhood. At the international scene, Wachter (1971) carried out a study on property values after the opening of Victoria line in London. He found out that value of properties within the catchment areas of the line increase by between 1 – 5% when compared with properties outside the catchment area. Also in Philadelphia, Allen and Boyce (1974) studied the impact of Lindenwood High Speed Line on residential neighbourhoods within the line. The study established an increase in capital value of properties within the corridor through which the line passed.

In another study, Chau and Ng (1998) suggested that whenever the links between urban and suburban areas are improved, it results in decentralization of population which may affect the price gradient of properties along the transport route. Two major effects were recorded as follows relative decline in values of residential properties in the urban and relative rise in values of residential properties within the suburban area. In another vane, Tse and Love (2000) observed that transportation systems unarguably enhances accessibility, however they negatively affect property values because they bring with them manifestations of noise, pollution, crime and stigmatization especially with regards to properties located directly in their path. This suggests that both positive and negative factors translate into value of residential properties in the same way desirable locations, accessibility and extra facilities do.

Again, a study by Carey (2001) opined that the effect of road transportation development on property values differ from location to location. Hence generalizations amongst various locations may be inappropriate or misleading. No wonder then that Siethodf, Kockelman and Luce (2002) stated that the effects of road transportation improvement on property values have been comprehensively studied but are still not well understood.

In the local scene Alimi, Ayedun and Oni (2014) appraised the relationship between road improvements and immediate neighbourhood residential properties values in Metropolitan Lagos. The study reveals that road improvements were identified as a factor contributing to increase in rental/capital values. The study recognized accessibility as a factor that determines what people would want to pay for a particular location. Finally the study shows that there is a significant relationship between road improvements and neighbourhood properties values. Also, Adebayo (2006) is of the opinion that residential property values tend to reach a peak in areas that have easy access especially through road networks, electricity, pipe borne

water, etc. Again, Aderamo (2003) asserts that road networks is a very important element to be considered in urban development since roads create accessibility to the various land uses within the location. Further, Emoh, Oni and Egolum (2013) tried to prioritize residential land value determinants in Onitsha, South East Nigeria. Their study used regression analysis to establish, prioritize and rank factors shaping land values in Onitsha, Anambra State, South-East Nigeria as follows: accessibility (roads), neighbourhood quality, land title, zoning regulations, transportation, rent, improvement in tax, environmental quality, view of amenities, travel time to the city centre and irrevocable power of Attorney. Furthermore, Ogbuefi and Egbenta (2002) study the relationship between transport services and property values in Enugu, Nigeria. Their study tried to use regression analysis to determine the relationship between mean monthly rental values and time distance by bus. They concluded that time distance is a very poor predictor of value since with good transportation network residents can afford to stay anywhere outside the city centre and still enjoy infrastructural facilities provided in the city centre (CBD). Finally, Oruonye (2014) assessed the impact of road construction on land use patterns, land value changes and the economic, social and environmental impacts that results from road construction in Jalingo Local Government Area of Taraba State, Nigeria. He used Analysis of Variance (ANOVA) to assess the variation of land values over time along the newly constructed roads in Jalingo metropolis. The study concluded that land use along the major constructed roads has undergone substantial level of change from Agricultural farm lands and open fields to residential and commercial uses with the latter becoming more prevalent. Also reported in the study is a corresponding increase in both rental and capital values of landed properties on both sides of the newly constructed roads. It is against this background that this study decided to equally investigate the effect of road infrastructural improvement on rental value of residential properties in Ogui New Layout, Enugu Urban, Nigeria from 2002 – 2017.

IX . MATERIALS AND METHODS

The study adopted the survey research method. 50 residential properties were selected from the study area through stratified random sampling. The samples covered the three major types of residential accommodations in the study area namely 3 bedrooms flats, 2 bedrooms flats and tenement rooms. The paired students 'T' test was used to test the stated hypothesis although data collected from the field work were presented with tables, bar charts, pie charts and graphs.

X. DATA PRESENTATION AND ANALYSIS

A. **Presentation of Data on the Rental Values of Residential Accommodations in Ogui New Layout Enugu from 2002 – 2009.**

Section 7.0 pointed out the areas in Ogui New Layout that this study covered. It equally shows the types of accommodation that are prevalent in the study area. Data was collected through questionnaires distributed to landlords & tenants and Estate Surveyors and Valuers (that operate) within the study area. The result of this exercise is presented in table 1.

Table 1: Annual Rental Values of Residential Accommodations Ogui New Layout from 2002 – 2009

Years	Type of Accommodation	Ebe Line (₦)	Ani Street (₦)	Onyiuke Street (₦)	Udorji Street (₦)	Port Harcourt Street (₦)
2002	3 Bedroom Flats	30,000	32,000	32,500	30,000	33,000
	2 Bedroom Flats	24,000	25,000	24,000	22,000	22,000
	Tenement Room	6,000	6,500	7,200	6,000	6,400
2003	3 Bedroom Flats	30,000	32,000	32,500	30,000	33,000
	2 Bedroom Flats	24,000	25,000	24,000	22,000	22,000
	Tenement Room	6,000	6,500	7,200	6,000	6,400
2004	3 Bedroom Flats	36,000	38,000	38,000	34,000	35,000
	2 Bedroom Flats	24,000	26,000	25,000	24,000	24,500
	Tenement Room	12,000	14,000	12,500	12,000	12,000
2005	3 Bedroom Flats	36,000	38,000	38,000	34,000	35,500



	2 Bedroom Flats	30,000	26,000	25,000	24,000	24,500
	Tenement Room	12,000	14,000	12,500	12,500	12,000
2006	3 Bedroom Flats	54,000	60,000	55,000	54,000	58,000
	2 Bedroom Flats	42,000	42,500	42,000	45,000	43,000
	Tenement Room	18,000	18,500	19,000	18,000	18,000
2007	3 Bedroom Flats	54,000	60,000	58,000	56,000	55,000
	2 Bedroom Flats	42,000	42,000	43,000	43,000	42,000
	Tenement Room	18,000	18,500	18,500	18,000	18,800
2008	3 Bedroom Flats	72,000	75,000	74,000	76,000	74,000
	2 Bedroom Flats	60,000	65,000	64,000	64,000	62,000
	Tenement Room	30,000	36,000	34,000	35,000	34,000
2009	3 Bedroom Flats	84,000	86,000	85,000	84,000	85,000
	2 Bedroom Flats	72,000	75,000	74,000	73,000	74,000
	Tenement Room	30,000	36,000	34,000	35,000	35,000

It could be seen from table 1 that the range of rent for three bedrooms flats in Ogui New Layout for the period under review (i.e 2002 – 2009) is between ₦30,000pa and ₦85,000p.a while that of block of tenement rooms stand at between ₦6,000p.a to ₦36,500.

B. Presentation of Data on Rental Values of Residential Accommodation in Ogui New Layout Enugu from 2010 – 2017.

The study also carried out a survey of rental values of residential accommodations within the study area for the period between 2010 and 2017. The same properties that were use in section 10.1 were also used for this survey. The result is presented in table 2.

Table 2: Annual Rental Values of Residential Accommodation in Ogui New Layout from 2010 – 2017

Years	Type of Accommodation	Ebe Line (₦)	Ani Street (₦)	Onyiuke Street (₦)	Udorji Street (₦)	Port Harcourt Street (₦)
2010	3 Bedroom Flats	120,000	120,000	120,000	120,000	120,000
	2 Bedroom Flats	96,000	108,000	100,000	98,000	100,000
	Tenement Room	35,000	36,000	36,000	36,000	36,000
2011	3 Bedroom Flats	120,000	120,000	120,000	120,000	120,000
	2 Bedroom Flats	96,000	108,000	100,000	98,000	100,000
	Tenement Room	36,000	36,000	36,000	36,000	36,000
2012	3 Bedroom Flats	150,000	156,000	153,000	150,000	150,000
	2 Bedroom Flats	120,000	120,000	120,000	120,000	120,000
	Tenement Room	36,000	36,000	36,000	36,000	36,000
2013	3 Bedroom Flats	180,000	180,000	180,000	180,000	180,000
	2 Bedroom Flats	150,000	156,000	150,000	150,000	150,000
	Tenement Room	42,000	42,000	42,000	42,000	42,000
2014	3 Bedroom Flats	200,000	220,000	200,000	200,000	200,000
	2 Bedroom Flats	180,000	180,000	180,000	180,000	180,000
	Tenement Room	45,000	43,500	44,000	45,000	44,000
2015	3 Bedroom Flats	250,000	250,000	250,000	250,000	250,000
	2 Bedroom Flats	200,000	200,000	200,000	200,000	200,000
	Tenement Room	50,000	54,000	52,000	53,000	50,000
2016	3 Bedroom Flats	300,000	300,000	280,000	300,000	280,000
	2 Bedroom Flats	230,000	240,000	240,000	240,000	240,000
	Tenement Room	60,000	60,000	60,000	60,000	60,000
2017	3 Bedroom Flats	350,000	350,000	350,000	350,000	350,000
	2 Bedroom Flats	280,000	260,000	280,000	300,000	280,000
	Tenement Room	60,000	60,000	60,000	60,000	60,000

Table 2 similarly shows the range of rental values for three bedrooms flats, two bedrooms flats and tenement rooms within the study area to be between ₦120,000 – ₦350,000, ₦96,000 – ₦300,000 and ₦35,000 – ₦10,000 respectively.

C. Presentation of Data on Average Rental Value of Residential Accommodation in Ogui New Layout Enugu from 2002 – 2009.

Taking a clue from table 1, the study determines the average rental values of residential accommodations in Ogui New Layout Enugu for 2002 – 2009 as shown in figures 1 to 3.

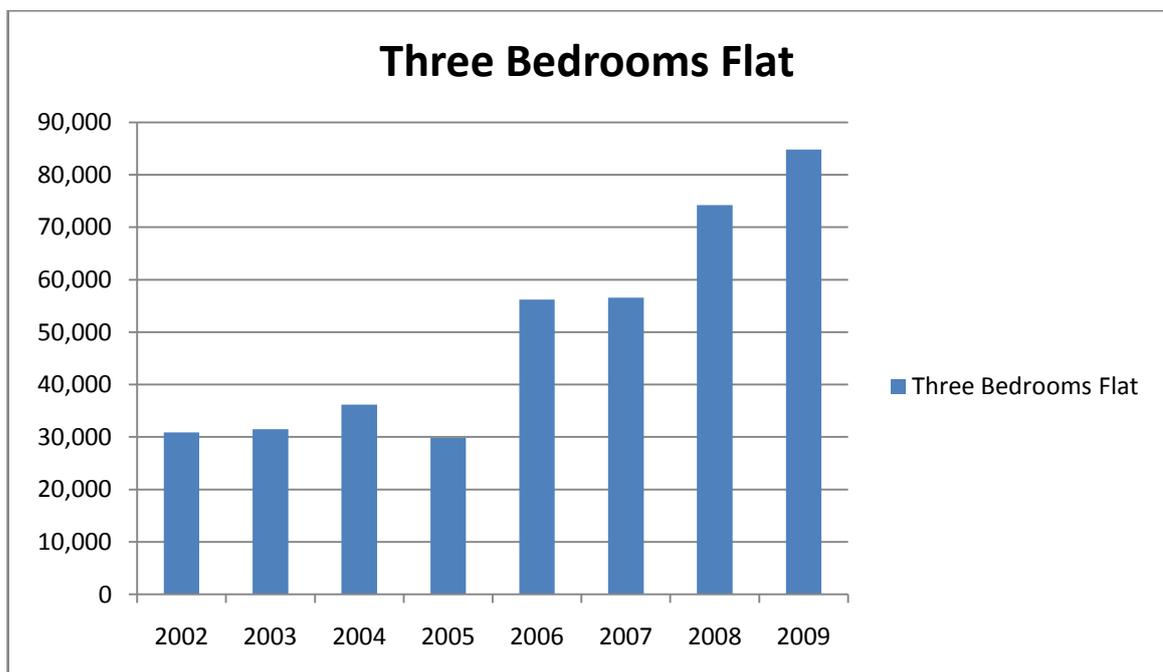


Fig. 1: Bar Chart Showing Average Rental Values of three bedrooms flats in Ogui New Layout Enugu from 2002 - 2009

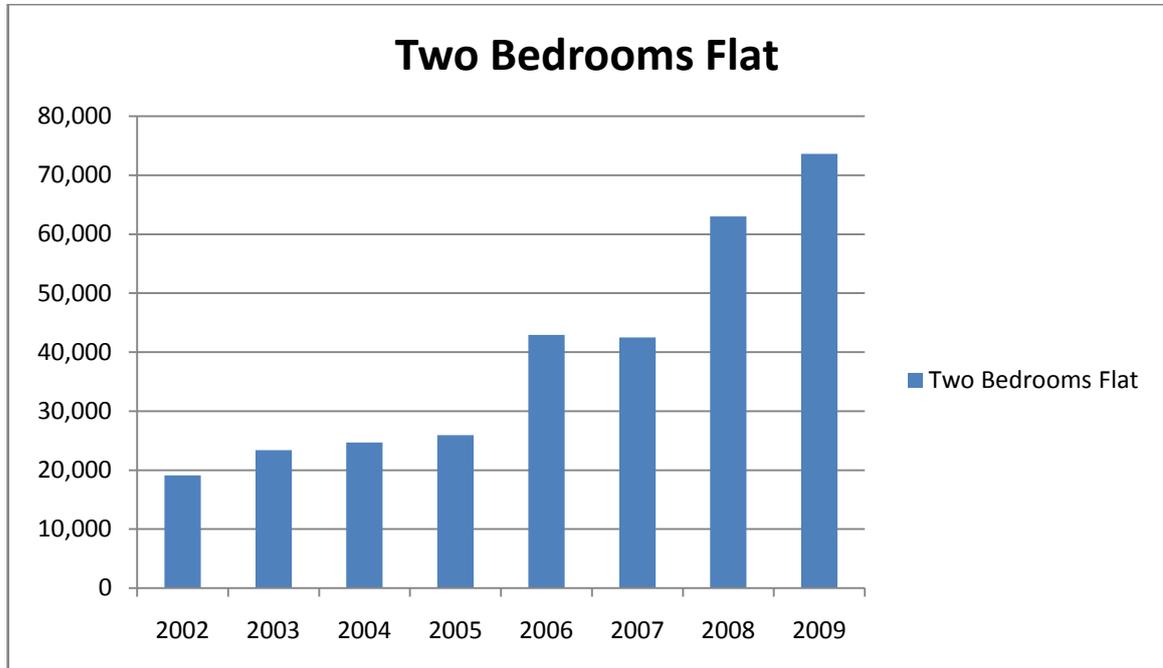


Fig. 2: Bar Chart Showing Average Rental Values of Two bedrooms flats in Ogui New Layout Enugu from 2002 – 2009

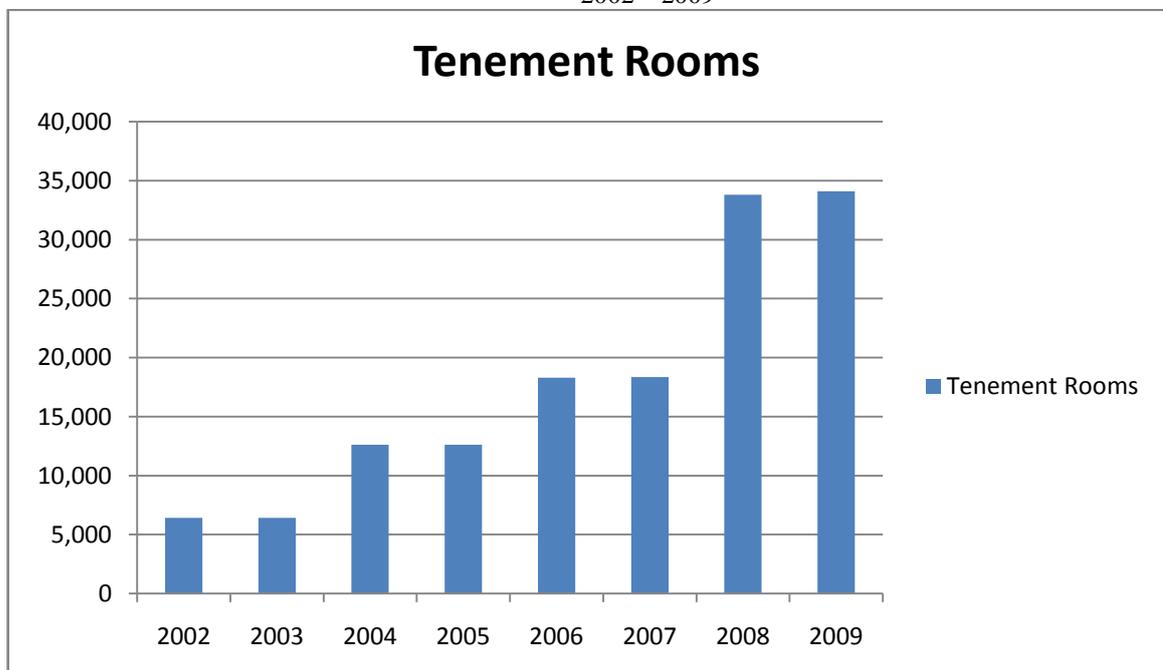


Fig. 3: Bar Chart Showing Average Rental Values of Tenement Rooms in Ogui New Layout Enugu from 2002 – 2009

D. Presentation of Data on Average Rental Value of Residential Accommodation in Ogui New Layout Enugu from 2010 – 2017.

Again the study used information in table 2 to determine the average rental value of residential accommodations in Ogui New Layout Enugu for the period between 2010 – 2017. The result is presented in figures 4 to 6.

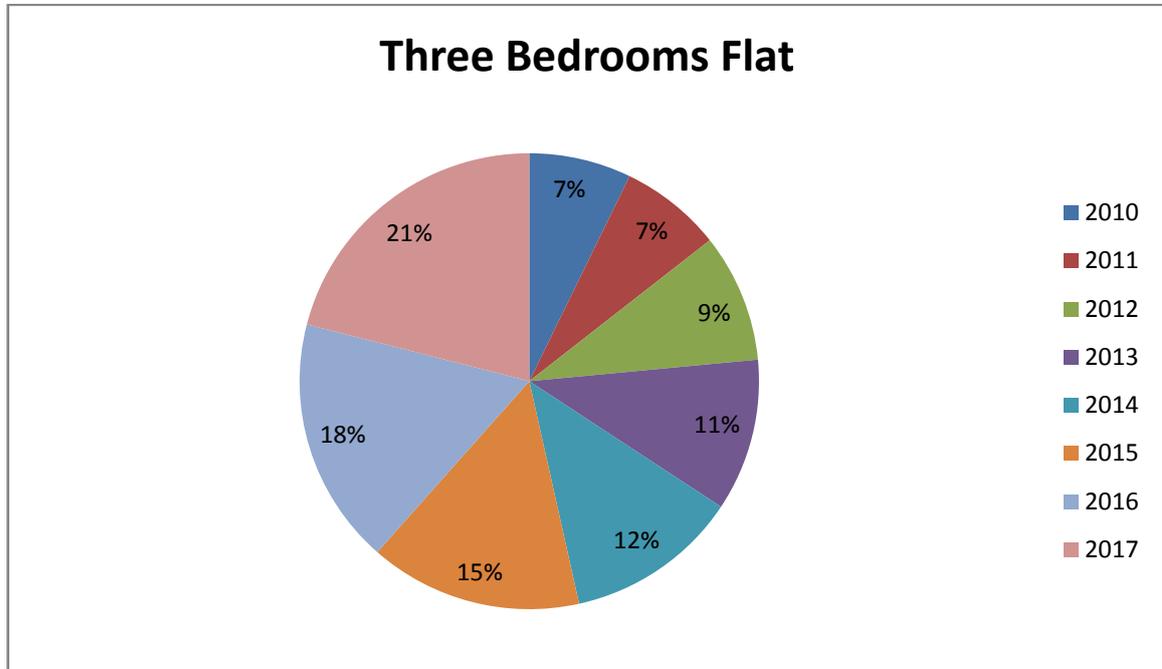


Fig. 4: Pie Chart showing Average Rental Values of Three Bedrooms Flats in Ogui New Layout Enugu from 2010 - 2017

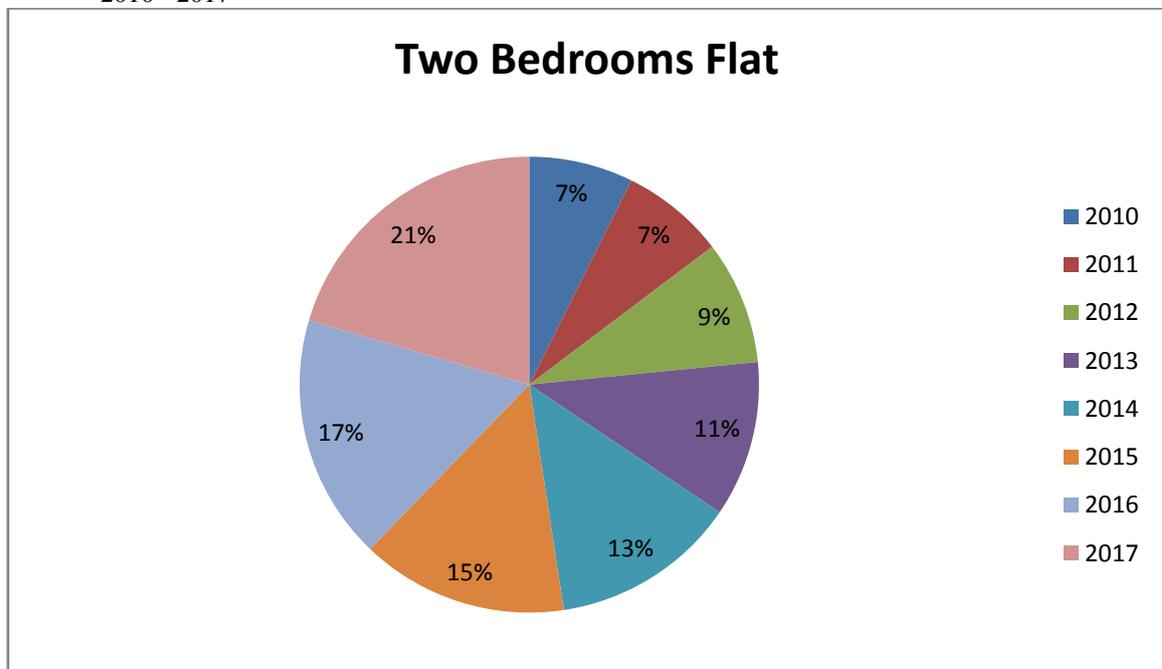


Fig. 5: Pie Chart showing Average Rental Values of Two Bedrooms Flats in Ogui New Layout Enugu from 2010 – 200917

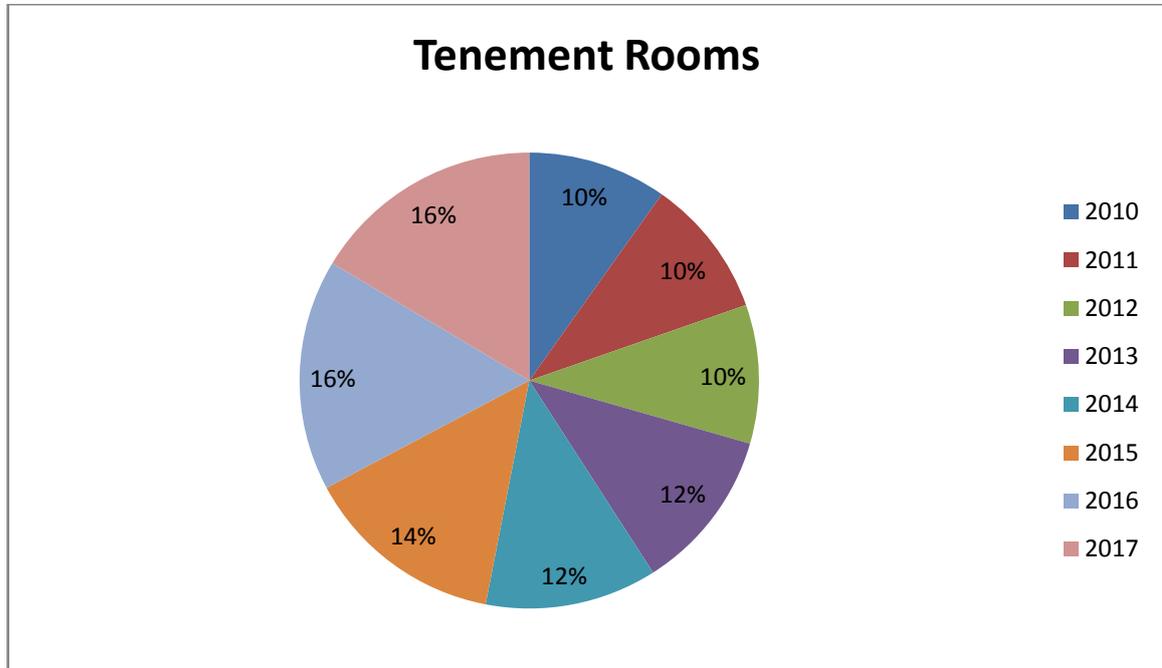


Fig. 6: Pie Chart showing Average Rental Values of Tenement Rooms in Ogui Layout Enugu from 2010 – 2017

E. Presentation of Data on Average Rental Value of Residential Accommodation in Ogui New Layout from 2002 – 2017

The average rental value of residential accommodation within the study area was presented in a spreadsheet for easy comparison. The result is presented in table 3 and figure 7 respectively.

Table 3: Average Rental Value of Residential Accommodation in Ogui New Layout from 2002 - 2017

Before Road Infrastructure				After Road Infrastructure			
Year	Three Bedroom Flats	Two Bedroom Flats	Tenement Rooms	Year	Three Bedroom Flats	Two Bedroom Flats	Tenement Rooms
2002	30,900	19,080	6,4200	2010	120,000	100,400	35,800
2003	31,500	23,400	6,420	2011	120,000	100,400	36,000
2004	36,200	25,700	12,600	2012	151,800	120,000	36,000
2005	29,820	25,900	12,600	2013	180,000	151,200	42,000
2006	56,200	42,900	18,300	2014	204,000	180,000	44,800
2007	56,600	42,500	18,360	2015	250,000	200,000	51,800
2008	74,200	63,000	33,800	2016	292,000	238,000	60,000
2009	84,800	73,600	34,100	2017	350,000	280,000	60,000

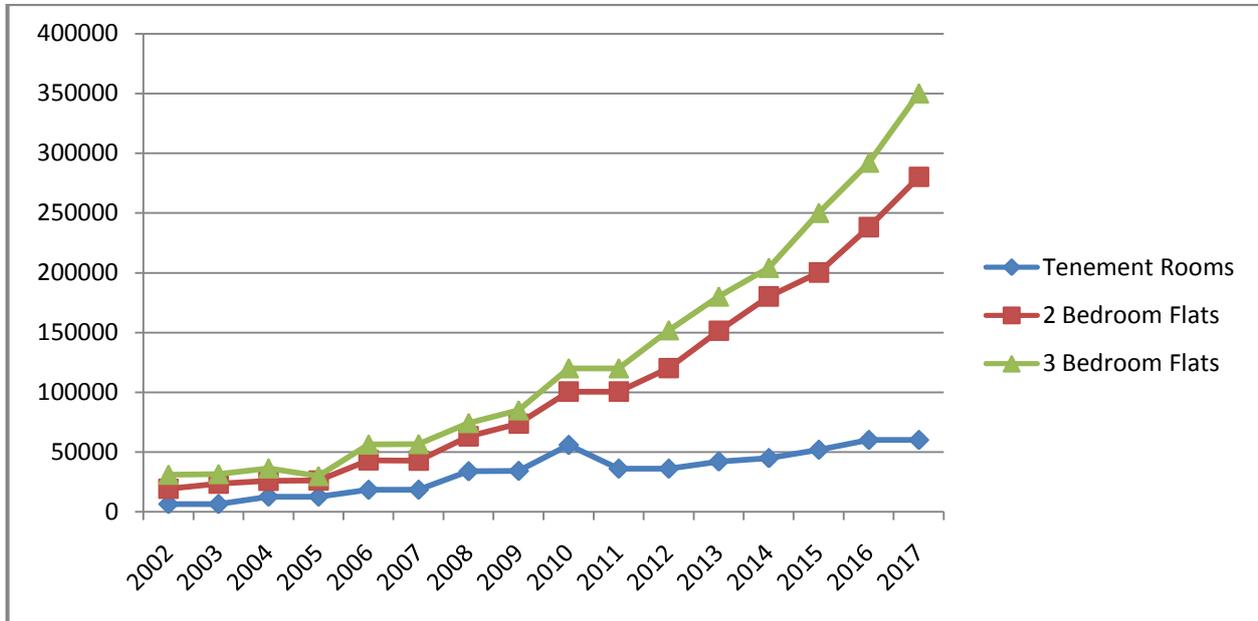


Fig. 7: Graph showing Average Rental Value of Residential Accommodation in Ogui New Layout from 2002 – 2017.

XI. HYPOTHESIS FORMULATION

The following null hypothesis was put forward for this study:

H₀: Road infrastructure development has no significant effect on rental values of residential properties in Ogui New Layout Enugu.

H₁: Road infrastructure development has significant effect on rental values of residential properties in Ogui New Layout Enugu.

T-Test: Paired Two Sample for Means

Table 4: T-Test Paired Two Sample Statistics

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Before	35787.5	24	21988.374	4488.358
After	141841.7	24	92233.050	18826.993

Table 5: T-Test Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Before & After	24	.940	.000

Table 6: T-Test Paired Samples Test

Paired Differences		t	df	Sig. (2-tailed)
Mean	Std. Deviation			
			Lower	Upper

Table 6: T-Test Paired Samples Test

	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1 Before - After	-106054.1667	71946.846	14686.088	-136434.655	-75673.678	-7.221	23	.000	

From the results, it could be seen that rental values before and after road infrastructure improvement were weakly and positively correlated ($r = 0.940$, $p < 0.001$). However, there was no significant average difference on the rental values before and after road infrastructure improvement ($t_{23} = -7.221$, $p < 0.001$). On the average, rental values before road improvement were ₦ -106054 lower than rental values after road infrastructure improvement (95% CI [₦ -136434.66, ₦ -75673.68]). This shows that the increase in rent is not as a result of improvement in road but may be as a result of inflation, increase in population, fashion and taste, type of society, standard of living, migration, etc.

It is also possible that the roads under study are already existing roads hence, the effect of their improvement on rental values was not significant.

XII.RECOMMENDATIONS

Researchers have warned that the effect of road infrastructural development on property values differ from location to location. Therefore making generalizations that will cover all location is inappropriate and may tend to be misleading. Hence, this study recommends that before such generalization are made in various locations studies should be carried out. Also governments in Nigeria (i.e federal, state and local government) should realize the interplay between economic factors so that they can come up with policies that can help stabilize the economy. This they can achieve by embracing research at all levels especially in the area of determining the relationship between infrastructural development and property values, knowing full well, that land resources constitute a greater percentage of a nation’s wealth. Finally, the Nigerian Institution of Estate Surveyors and Valuers through its research and development committee should at all times remind, sensitize, direct and inform the government and the entire populace on the importance of adding value to our land resources through various developmental services and service delivery.

XIII.CONCLUSION

This study has investigated the effect of road infrastructural improvement on rental values of residential properties in Ogui New Layout, Enugu. The study realized that the improvement of existing roads in the layout has little or no correlation with the increase in rental value of residential properties within the neighbourhood. It is therefore important that researchers should not make hasty generalizations in situations where results may differ from location to location.

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