



Housing Infrastructural Facilities as Determinants of Rental Values of Residential Properties in Osogbo, Osun State – Nigeria

Okorie Augustina

Estate Management Department, Federal Polytechnic Ede, PMB 231, Ede, Osun State.

Abstract

Infrastructural facilities are generally believed to enhance the rental values of residential properties. This study aims at evaluating the infrastructural facilities that influence the rental values of residential properties in Osogbo, Osun State Nigeria. The study adopted the survey research design. Data were collected from a sample of 150 tenants and 15 practicing Estate surveyors and Valuers in the study area. Descriptive statistics (frequency, percentages, weighted mean score) and inferential statistics (Spearman's rank correlation and multiple linear regression analysis) were used to examine the relationships between the criterion variable (rental values) and the predictor variables (infrastructural facilities). The study indicated that there is a high positive correlation between the variables (0.905), implying that there is a strong positive relationship between rental values and availability/condition of housing facilities. However, Out of the eight predictors, only refuse disposal facility does not significantly influence rental values. The study recommended among others, that property developers should put in place those housing infrastructural facilities that influence rental values of residential properties in order to maximize returns from their property investment.

Keywords: Determinants; Infrastructural facilities; Rental values; Residential properties.

1. Introduction

Residential properties have continued to attract the investment interest of real estate developers. This is because of the increasing demand for residential properties in the urban centres (Olujimi and Bello, 2009); and because of the increase in rent (value), which is usually attached to the property (Oduwaye, 2007). Several factors exist that determine value of residential real properties. According to Britton et al (1989), determinants of individual property value include location, time, property interest, state of repair, accommodation details and services/facilities. These factors affect properties thereby causing either 'appreciation' or 'depreciation' in its values. Adebayo (2006) affirmed that infrastructures is one of the factors can cause property value to appreciate and depreciation may occur in property values due to infrastructural degradation. Nubi (2002) describes infrastructure as the aggregate of all facilities that allow a city to function effectively. They include housing, electricity, pipe-borne water, drainage, waste disposal, roads and sewage among others. The importance of infrastructural facilities in a residential property and indeed human life cannot be overemphasized. According to Babarinde (1998), the efficiency of any form of human activity system largely depends on the provision of adequate infrastructural facilities. Studies have shown that the level of availability of infrastructure in most developing countries is drastically low. For instance, Iremiren (2001) observed that a significant proportion up to 34% (in some cities) of the houses had no access to electricity, water, descent and safe waste disposal systems and unconnected by motor able roads. Babawale (2004) and Odudu (2003) decry about the deplorable conditions of electricity, water, roads, and drainage systems in metropolitan Lagos. The lack of and deplorable conditions of adequate infrastructural facilities have the tendencies of hindering the attainment of physical and moral health; discourage social stability, work efficiency, development of the individuals and generally affecting the quality of life. This study therefore, seeks to examine housing infrastructural facilities with a view to determining the infrastructural facilities that greatly influence the rental value of residential properties

in Osogbo. This is necessary in decision makings that will ensure maximization of annual return and the recoupment invested capital within the shortest possible time. To this end, the study objectives are set to:

- i. Identify the types of residential properties in Osogbo;
- ii. Evaluate the types and conditions of infrastructural facilities provided in the residential properties;
- iii. Evaluate the impact of infrastructural facilities on the rental values on the residential properties; and
- iv. Analyse the relationship between infrastructural facilities and the rental value of residential properties.

2. Literature Review

Infrastructure is describes as the aggregate of all facilities that allow a city to function effectively (Nubi, 2002). Kuye (2000) on the other hand posited that real property has significance only as it effectively satisfies man's needs and desires; and it is this man's collective desire for real property that give rise to value. One of the determinants of property values is infrastructural facilities, the presence of which leads to appreciation in property value (Adebayo, 2006). According to Hammer et al (2000), provision of good and adequate infrastructure is central to property values. Infrastructure includes physical structures, facilities or utilities that are put in place by private or public involvement and expenditure aimed at facilitating the effective functioning of the society (Adebayo, 2006). They include housing, electricity, pipe-borne water, drainage, waste disposal, roads, sewage, health, education, telecommunications and institutional structures like police station, fire fighting stations, banks and post office (Nubi, 2002). Harvey (1993) posited that a residential property user may be prepared to pay a high value for a property depending on his consideration for basic facilities such as accessibility, water and electricity. Litchfield (1974) also observed that areas with basic facilities such as access roads, good drainage, electricity, public water supply and telephone would attract high property values. For instance, accessibility which is a direct consequence of a good road network, in turn leads to high rental values of locations with greatest accessibility advantages. In a situation where all properties are accessible via motorable road network, such properties will enjoy high rental values conferred by virtue of accessibility, (Aibangbee, 1997).

3. Methodology

In this study, the survey research method was used to collect data from the study area. The target population for this study comprised tenants and practicing Estate surveyors and Valuers in the study area. Stratified sampling technique was adopted for sampling. The sampled areas included: Jaleyemi, Okefia, Fakunle in Osogbo. Both primary and secondary sources were used in this study. The primary data were sourced through structured questionnaire. In each of the strata, 50 questionnaire were distributed to family heads. In all 150 questionnaire were administered on family heads in the study area; however, only 133 questionnaire were retrieved from tenants representing 88.67% response rate. Also 15 questionnaire was distributed to practicing Estate surveyors and Valuers in the study area. All (100%) questionnaire was retrieved from the Estate Surveyors and Valuers. Data were collected on the types of residential property, the types and the conditions of infrastructural facilities provided and rents paid by tenants, the tenants' willing to pay more with improved facilities among others. Secondary data were sourced from relevant literature.

Descriptive statistics such as frequency, percentages and weighted mean score were used in the analysis of the collated data. Weighted mean score (WMS) was used to analyse the conditions of the infrastructural facilities in the occupied residential properties in Osogbo and was determined as follows:

$$\text{WMS} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{N}$$

Where n_5 = number of respondents who answered very good

n_4 = number of respondents who answered good

n_3 = number of respondents who answered fair

n_2 = number of respondents who answered poor

n_1 = number of respondents who answered nonexistent.

Furthermore, the study involves two variables i.e. the criterion variable (rental value of residential property) and the predictor variables (infrastructural facilities). Spearman's rank correlation and multiple linear regression analysis were also carried out to determine the relationship between the criterion and predictor variables.

The regression model adopted was $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_nX_n \dots \dots \dots$ (I)

Where:

Y is the dependent variable

X_1, X_2, \dots, X_n are the independent variables.

b_1, b_2, \dots, b_n are multiple regression coefficients for the independent variables

"a" is an error term.

However, the application of the model to our case study shows that

$Y = a + b_1WAT + b_2ELE + b_3REF + b_4ACC + b_5BUR + b_6DRA + b_7FEN + b_8KIT \dots \dots \dots$ (II)

Where: Y = RV (Rental Values)

$X_1 = WAT$ (Water)

$X_2 = ELE$ (Electricity)

$X_3 = REF$ (Refuse Dump)

$X_4 = ACC$ (Access Road)

$X_5 = BUR$ (Burglary Proof)

$X_6 = DRA$ (Drainage Channel)

$X_7 = FEN$ (Fence)

$X_8 = KIT$ (Kitchen)

4. The Study Area

Osogbo in Osun-State constitute the study area (Figure 1). The study area lies between Lat $7^{\circ}46'N$ $4^{\circ}34'E$ and $7^{\circ}44'N$ $4^{\circ}29'E$ / $7.733^{\circ}N$ 4.483° East of the Greenwich Meridian. Osogbo is the capital of Osun state. It covers an area of 47 km^2 (18 sq mi). According to 2006 Census, Osogbo has a population of 156,694. The political, social, economic and administrative roles as well as the population of the town have led to shortage of residential accommodation, which consequently result in increased rent for the available residential property most of which are devoid of necessary infrastructural facilities.

Osogbo



Figure 1: Map of Nigeria showing Osun State

Figure 2: Osun state showing the study area.

5. Results and Discussion

Table 1: Types of Residential Properties

Types	Frequency	Percentiles
Tenement	54	40.5
1 bedroom flat	23	17.3
2 bedroom flat	14	10.6
3 bedroom flat	38	28.6
Duplex	04	03.0
Total	133	100

Field Survey (2012)

Table 1 shows the various types of Residential properties that exist in the study area. These are tenement, flat and duplex. The tenement residential property is designed on room basis with tenants sharing facilities such as kitchen, toilet and bathroom. Flats are self-contained accommodation unit. It can be within a building block (semi-detached) or inclusively built on a site (detached). The duplex is a residential property with symmetrical accommodation unit where the sitting room and the kitchen are located in the ground floor while the bedrooms and the conveniences are in the first floor. From the Table, out of the sampled residential properties 56.5% were flats. This comprises 17.3%, 10.6% and 28.6% of 1-bedroom, 2-bedroom and 3-bedroom flats respectively. While 40.5% of the sampled residential properties are tenement type, only 3% of the residential properties are duplex.

Table 2: Types of Infrastructural Facilities in the Residential Properties

Infrastructural facilities	Frequency	Percentiles
Water	111	83.5
Electricity	133	100
Refuse Disposal Facility	49	36.8
Access road	104	78.2
Burglary proof	113	85.0
Drainage channel	83	62.4
Fence	94	70.7
Kitchen	126	97.0

Field Survey (2012)

Table 2 shows the infrastructural facilities that are available in the residential properties. These include water supply, electricity, refuse disposal facility, access road, burglary proof, drainage channel, wall-fence, kitchen and toilet. The level of provision of these facilities varies from one property to the other. Water is based on functional water supply from at least one of public water supply, hand-dug well or borehole. 83.5% of the sampled residential properties in the study area are provided with functional water supply. All the sampled residential properties are connected with electricity. Refuse disposal facility in residential properties is poor and only 36.8% of the sampled residential properties enjoyed refuse disposal services. The provision of access road to residential property ensures easy and safe movement of goods and services. In all, 78.2% of the sampled residential properties are accessible by motorable. Installation of burglary proof in residential property serves as means of ensuring security of properties in such building. 85.0% of the sampled residential buildings in are installed with burglary proof in their windows. The drainages are necessary in the residential areas to convey rain water thereby prevents flooding of the area. 62.4% of the sampled residential properties could boast of functional drainage channels. Fence round a residential property guides against unwanted interruption and ensures security and safety of property in the residential buildings. 70.7% of the sampled residential properties are provided with fence. Kitchens provide safe environment for cooking within a residential building. Out of the sampled residential properties, 97.0% are provided with kitchen facility. It can be implied that a good number of residential properties in Osogbo have infrastructural facilities.

Table 3: Conditions of the Infrastructural Facilities in the Residential Properties

S/No.	Infrastructural Facilities	Conditions					Mean score	Ranking
		Very Good 5	Good 4	Fair 3	Poor 2	Non existent 1		
1	Water	22	32	34	23	22	3.07	4
2	Electricity	14	24	50	45	00	3.05	5
3	Refuse Disposal Facility	08	10	20	11	84	1.84	8
4	Access road	32	35	23	14	29	3.20	3
5	Burglary proof	40	37	31	05	20	3.54	1
6	Drainage channel	26	24	14	17	50	2.65	7
7	Fence	19	29	24	22	39	2.75	6
8	Kitchen	32	37	28	32	04	3.64	2

Field Survey (2012)

Table 3 shows the tenant's perception of the conditions of the existing infrastructural facilities in the residential property based on five categories: very good, good, fair, poor and nonexistent. The Table shows that Burglary proof was rated highest with a weighted mean score of 3.54. This was followed by Kitchen; and access road with 3.46 and 3.20 rating respectively. Refuse Disposal on the other hand was the least rated by the respondents having a weighted mean score of 1.84. Electricity supply is rated fifth with 3.05 rating. This may not be unconnected with the general condition of electricity supply in the country.

Table 4. Impact of Infrastructural Facilities on Residential Properties Rental Value

Level of Impact	Frequency	Percentiles
Very High Impact	73	54.89
Significant Impact	41	30.83
Low Impact	19	14.28
No Impact	00	00.00
Total	133	100

Field Survey (2012)

Table 4 shows the respondents' opinions on the impact of infrastructural facilities on the rental values of the properties they occupy. The table shows that 54.89% asserted that infrastructural facilities have a very high impact on the rental values of the properties. Also, the data collected from the fifteen estate surveyors and valuers practicing in the study area confirmed that the type and conditions of infrastructural facilities provided in a property have direct impact its rental value.

Table 5: Annual Rental Value of Residential Property Types

Property Type	Annual Rental Value
Tenement	₦12000 – ₦25000
1 bedroom flat	₦45000 – ₦60000
2 bedroom flat	₦72000 – ₦100000
3 bedroom flat	₦120000 - ₦180000
Duplex	₦200000 – ₦250000

Field Survey (2012)

Table 5 shows that rent passing on tenement residential property in Osogbo ranges from ₦12000 – ₦25000 per annum while a 3 bedroom flat commands rent not lower than ₦120000. Furthermore, the data revealed that 55.6% of the responding tenants considered rental value of residential properties in Osogbo to be high. However 93.3% of the practicing estate surveyors and valuers in the area viewed the rental value as being moderate.

Table 6. Willingness to Pay Higher Rent for Improved Infrastructural Facilities

Infrastructural Facilities	Ready	Percentiles	Not Ready	Percentiles
Water	115	86.47	18	13.53
Electricity	98	73.68	35	26.31
Refuse Disposal Facility	32	24.06	101	75.94
Access road	126	94.73	07	05.26
Burglary proof	133	100	00	00.00
Drainage channel	89	66.92	44	33.08
Fence	130	97.74	03	02.26
Kitchen	78	58.65	51	38.34

Field Survey (2012)

Table 6 shows that the result of the survey on the willingness of tenants to pay higher rent for improved infrastructural facilities on the properties they occupy. The table shows that except for refuse disposal facility, at least 58.65% of the respondents were ready to pay higher rent in case of improvement of all other infrastructural facilities. Their requirements in order of preference are burglary proof 100% followed by fence 97.74%; access road 94.73; water 86.47%; electricity 73.68%, drainage channel 66.92%; kitchen 58.65% and refuse disposal facility 24.06%. This implies that refuse disposal facility does not necessarily influence rental values of residential properties.

The Relationship of the Infrastructure Variables

Table 7: Model Summary

Model	R	R Square	Adjusted R Square
1	.905 ^a	.818	.812

a. Predictors: (Constant), KIT, ACC, REF, FEN, WAT, DRA, ELE, BUR.

Table 7 indicates a high positive correlation between the variables (0.905), implying that there is a strong positive relationship between rental values and availability/condition of housing facilities. Thus there is a direct relationship between infrastructural facilities and rental values of residential property.

Table 8: ANOVA

Model	Sum of squares	df	Mean of squares	F	sig.
1 Regression	207.675	8	25.959	142.876	.000 ^a
Residue	46.150	254	.182		
Total	253.825	265			

Analysis of surveyed data (2012)

- a. Predictors , (Constant), KIT, ACC, REF, FEN, WAT, DRA, ELE, BUR.
- b. Dependent Variable: RVS.

Table 8: Tests the Overall Significance of the Coefficients (B's). The Result Indicates that the Overall Model is Statistically Significant, [F (8, 254) = 142.876, P = 0.000].

Table 9: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	-.022	.107		-.203	.839
WAT	.251	.109	.210	2.305	.022
ELE	.456	.124	.355	3.681	.000
REF	-.093	.072	-.073	-1.289	.199
ACC	.356	.046	.309	7.709	.000
BUR	-.355	.124	-.289	-2.862	.005
DRA	.674	.094	.552	7.180	.000
FEN	-.128	.085	-.115	-1.517	.131
KIT	.118	.050	.098	2.349	.020

- a. Dependent Variable: RVS

Table 9 presents the coefficients, the Enter Method was employed in the analysis (this will cause all predictors to be included in the output). Looking at the significant values of the individual β's, it can be deduced that the following variables significantly predict rental values in the study area: WAT, ELE, ACC, BUR, DRA and KIT, with t = 2.305, p = 0.022 < 0.05; t = 3.618, p = 0.000 < 0.01; t = 7.709, p = 0.000 < 0.01; t = -2.862, p = 0.005 < 0.01; t = 7.180, p = 0.000 < 0.01; t = 2.349, p = 0.020 < 0.05 respectively, hence they are statistically significant.

The regression equation therefore is $Y = -0.022 + 0.251X_1 + 0.456X_2 + 0.356X_4 - 0.355X_5 + 0.674X_6 + 0.118X_8$ (III)

This can be presented as:

$RV = -0.022 + 0.251(WAT) + 0.456(ELE) + 0.356(ACC) - 0.355(BUR) + 0.674(DRA) + 0.118(KIT)$ (IV)

5. CONCLUSION

Conclusively, improved quality of infrastructural facilities enhances the rental values of residential properties. The study revealed the infrastructural facilities that influence rental value of residential properties in Osogbo, Osun State. The study showed that refuse disposal infrastructural facility does not necessarily influence rental values of residential properties. This was evidenced in Osogbo where 75.94% of the respondents in the sampled residential properties were not willing to pay higher rent for the provision/improvement of refuse disposal facility. It is therefore recommended that property

developers should put in place those housing infrastructural facilities that influence rental values of residential properties in order to maximize returns from their residential property investment.

REFERENCES

- [1] Adebayo, M. A. (2006). The State of Urban Infrastructure and its Effects on Property Values in Lagos, Nigeria. *Journal of Land Use and Development Studies* (2), 1.
- [2] Aibangbee, S.S (1997) Functions of Urban Infrastructure in National Development. Paper presented at the 27th Annual Conference of the Nigeria Institution of Estate Surveyors and Valuers, at Premier Hotel, Ibadan 1st – 6th April
- [3] Babarinde, J. A. (1998). Analysis of Industrial Relocation in relation to Housing and Infrastructural Services in Metropolitan Lagos. *The Lagos Journal of Environmental studies* 1 (1), 97-108.
- [4] Babawale, G. K. (2004). 'Sustainable Urban Infrastructure Delivery in Nigeria: The role of the Private sector and community – based organizations (CBO's) Paper presented at the 34th Annual Conference of the Nigeria Institution of Estate Surveyors and Valuers held at Nicon Hilton, Abuja 30th March – 4th April.
- [5] Britton, W, Davies K and Johnson, T. (1988): *Modern Methods of Valuation* (8th ed.) The Estate Gazette, London.
- [6] Hammer L; Booth D. and Love H.E (2000) *Poverty and Transport; A Report prepared for the World Bank in collaboration with DFID, Overseas Development Institute.*
- [7] Harvey, J. (1993) *Urban Land Economics* 3rd ed. Macmillan Press Limited London
- [8] Iremiren, A. (2001). Impacts of the Private Provision of infrastructural facilities on Housing Cost. B. Tech Thesis, Department of Estate Management, Federal University of Technology, Akure.
- [9] Litchfield, N. (1974). *Economics of Planning Development.* Estate Gazette Limited, London.
- [10] Kuye, O. (2000). *Principles of Property Valuation in Nigeria Volume 1.* Nigeria National Library Cataloguing in publication Data, Lagos.
- [11] Nubi, T.O (2002): 'Procurring, Managing and Financing Urban Infrastructure: Towards Integrated Approach' Paper presented at a National Workshop on Land Management and Property Tax Reform in Nigeria. Organized by Estate Management Department, University of Lagos, Akoka.
- [12] Odudu, C.O (2003). 'Significance of Infrastructure in Determining Land and Rental Values in an Urban Area - The Case of Lagos Metropolis'. Land Management and Property Tax Reform in Nigeria. Omirin M. M et al (ed) Department of Estate Management, University of Lagos, Akoka.
- [13] Oduwaye, L. (2009). Spatial Variations of Values of Residential Land use in Lagos Metropolis. *Afr. Res. Rev.* (3)381-403. <http://ajol.info/index.php/afrrrev/article/view/43638>
- [14] Olujimi, J. A. B. and Bello, M. O. (2009) Effects of Infrastructural Facilities on the Rental Values of Residential Property. *Journal of Social Sciences* 5(4), 332-341.