

ASSESSMENT OF THE EFFECT OF URBAN INFRASTRUCTURE AS A TOOL FOR ENHANCING THE VALUES OF RESIDENTIAL PROPERTY IN AKURE

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Abstract

The study is aimed at investigating the effect of urban infrastructure as a tool for enhancing residential property values in Isolo/Araromi/Odokoyi and Irowo/Odige/Odopetu in Akure. The sampling frame of the houses in the study area was 412 and 405 respectively. However, Kothari formula was used to arrive at a sample size of 280 in Isolo/Araromi/Odokoyi and 289 Irowo/Odige/Odopetu for the study. Questionnaires were administered on occupants of residential properties in the study area to elicit information. Out of the 559 questionnaires administered 443 were duly filled and returned for analysis. The information collected was analyzed using descriptive statistics and Multiple Regression. The result reveals that the R^2 statistic (0.819) for Irowo/Odige/Odopetu indicates that the independent variables account for 81.9% of rental value. Also, the R^2 (0.781) for Isolo/Araromi/Odokoyi is 0.781 which implies that the independent variables account for 78.1% of the rental values. The study therefore recommends that the state government should put in place the necessary infrastructure in Isolo/Araromi/Odokoyi so as to enhance the residential property values. Also, the state government should enlighten the people on the need for maintenance culture.

Key Words: Sustainability, Urban Infrastructure, Residential and Property Values

Introduction

Housing has been universally accepted as a basic essential human need that comes only after food and clothing. Housing in all its ramifications is more than a mere shelter since it embraces all the social services and utilities that make a community or neighbourhood a livable environment (Adedeji *et al.*, 2010). The fact remains that unlike food and clothing, real property is difficult to acquire. Its importance can be seen in the vital roles it plays in socio-economic and psychological development of individuals, states and nations (Ibrahim, 2011). Man is a socio-economic being seeking to dwell in residential units that

provide him the maximum supply of the necessary facilities. Perhaps, one of the major challenges of successive government in Nigeria is the possibility of making cities good places and providing basic urban services and necessary facilities for its growing population (Adewusi and Akinbogun, 2010 and Olujimi, 2010). Unfortunately, the level of deficiencies and the degree of urban infrastructure in Nigeria urban centre is worrisome due to the inability of the government to meet up with the social needs of the people at large, because the instrument capable of positioning the cities and towns as an

economic base is the functional urban infrastructure.

The efficiency of any form of human activity system largely depends on the provision of the efficient infrastructural facilities and services (Adebayo, 2006 and Babarinde, 1998). The Urban infrastructure covers a wide range of services and facilities, namely electricity, water, roads, waste disposal, drainage, hospital, schools etc. Where urban infrastructure is adequately provided and efficiently managed, productive and profitable land uses are usually attracted towards such area and usually results in an increase in land and housing values, either sales or rentals (Harvey, 1994). Rental values of properties vary from place to place depending on various factors among which facilities availability stand prominent. Location, quality of building, demand and supply rate and the environmental characteristics of the area are some of the factors affecting rental values of residential properties. According to Hammer *et al.* (2000), provision of good and adequate infrastructure is central to property values. Availability and state of infrastructure provision come into play to enhance property values while areas that experience deficiencies command lower property values.

According to Adewusi and Akinbogun (2010), the assessment of property values depends on the property's unique characteristics, each of which provides utilities or disutility to individuals. These characteristics are generally classified into external (like road network, electricity, water supply, health facilities among others) and internal (design, size, age, etc) infrastructure. The urban infrastructural decay such as poor road network, lack of portable water supply, bad drainages and canals, poor housing and poor waste management system have increased the environmental threat within the urban

populace (Gbadegesin and Aluko, 2010). On the other hand, depreciation may occur in property values due to infrastructural degradation and negative changes in neighbourhood properties. Where urban infrastructure is adequately provided and efficiently managed, productive and profitable land uses are usually attracted towards such area (Harvey, 1993). This competition for location with good urban infrastructure usually results in an increase in land values. Adequacy of infrastructural facilities in a location will add both social and economic values to the land in such area and prospective buyers will be willing to pay more for land located in areas where there are adequate infrastructural facilities (Nwosu, 2004).

According to Hammer *et al.* (2000), provision of good and adequate infrastructure is central to property values. A residential user may be willing to pay a high value for a property depending on his consideration for basic facilities such as accessibility, water and electricity (Harvey, 1993). Litchfield (1974) also observed that areas with basic facilities such as access roads, good drainage, electricity, public water supply and hospitals would attract high property values.

Adebayo (2006) used descriptive analysis to study the state of urban infrastructure and its effect on property values in Lagos, the study reveals that the presence of essential infrastructural facilities and services serve as major determinant of property values. The property values tend to peak in those areas that enjoy easy accessibility (through road network), electricity, pipe borne water and efficient drainage system. In contrast, the low rate of rental values in some areas can be adduced to the poor state of the infrastructural facilities. Olujimi (2010) used multiple regression models to study the relationship of infrastructural facilities

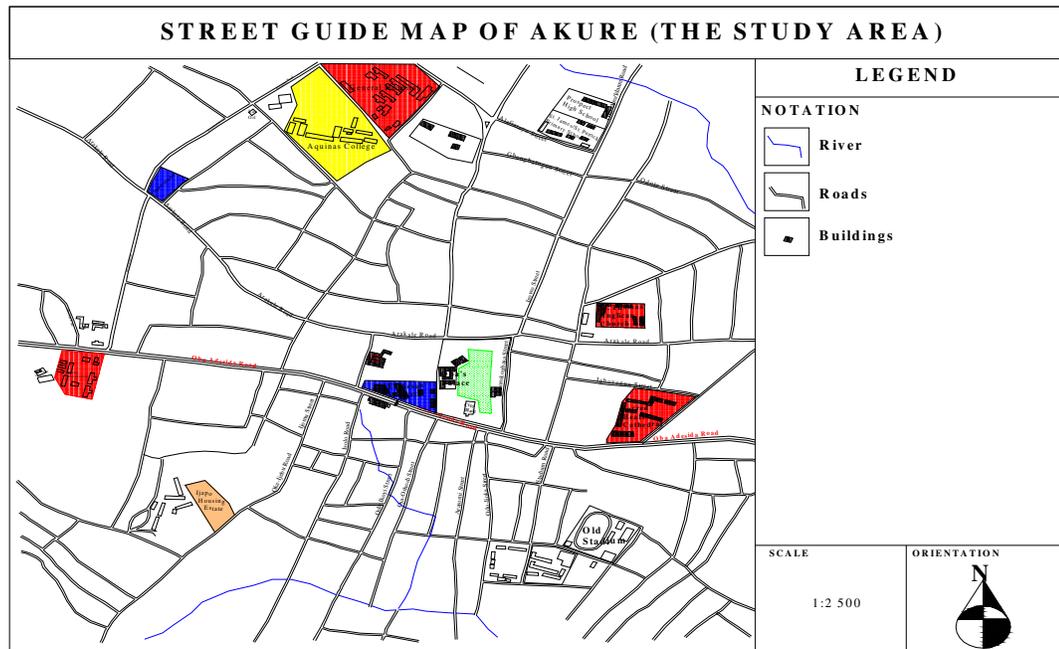
in the determination of rental values of residential property in Akure. The study reveals that wall-fence and installed burglary proof are significant determinants of rental values of residential properties in Akure. Olujimi and Bello (2009) studied the effects of infrastructural facilities on the rental values of residential property using Multiple Regression and the study reveals that infrastructural facilities contributed 30.50% in the determination of rental values of residential buildings in Akure. Adewusi and Akinbogun (2010) studied infrastructure development for sustainable economic growth in Nigeria using descriptive statistics. The study reveals that property value in the study area has continued to increase despite the deplorable condition of some infrastructural facilities. In general, increase in residential properties values are associated with the provision of adequate infrastructural facilities put in place for the occupiers to have access to. Facilities like electricity, waste disposal, road network, drainage, schools, streetlight, security etc add great value to an area and the demand for rental residential property. Ibrahim (2011) studied infrastructural facilities and their effect on rental values of residential properties in Ilorin metropolis using descriptive statistics and the study reveals that presence of facilities generates high preference, keen competition for properties and thus high rental values, while absence of facilities results in low patronage, disincentive to people, attraction of poor tenant and consequently low rental values.

Therefore, this paper assesses the adequacy of urban infrastructure and their effect on the values of residential property in Akure.

Study Area

Akure is a traditional city and like other Yoruba towns in the south western part of

the country. It lies approximately on latitude 7° 15' North of the Equator and longitude 5° 15' East of the Greenwich meridian. Akure is the capital of Ondo state which was created on 3rd of February, 1976. Consequently, heterogeneous activities have since characterized the town; it has cluster area of economic activities such as Oja-Oba, Oke-Aro, Eyinke, Irowo, Odige, Odopetu, Ondo road, Isolo, Araromi, Odokoyi etc. The estimated population of Akure in 1996 was 269,207 (National Population Commission, 1996) and 353,211 with male 175,495 and female 177,716 in 2006 (National Population Commission, 2006). Akure city is comprised of many communities of which Irowo/Odige/Odopetu and Isolo/Araromi/Odokoyi are part. Irowo/Odige/Odopetu community is bounded in the North by Arakale Road, in the East by Hospital Road, in the West by Irowo Street and in the South by Hospital road. Isolo/Araromi/Odokoyi community, however, is bounded in the North by Ilesha-Akure-Owo-Benin Express, in the East by Ijomu/oke-Ijebu Quarters in the West by Odo-Ijoka/Owode and in the South by Oba-Adesida road. The population of Irowo/Odige/Odopetu community is 54,730 and that of Isolo/Araromi/Odokoyi is 58,987 (Ondo State Planning Report, 2006). The number of houses is 405 for Irowo/ Odige/ Odopetu and 412 Isolo/Araromi/Odokoyi communities (Ondo State Planning Report, 2008). The communities were chosen for this study because Irowo/Odige/Odopetu community presently has experienced upgrading of urban infrastructure in recent times while Isolo/Araromi/Odokoyi area still suffer deficiencies of urban infrastructure and was used as basis for comparison because it is in the urban center but has not experienced any upgrading of urban infrastructure.



Source: Ondo State Planning Report, 2006

Research Methodology

The data for the study was collected from selected residents in Irowo/Odige/Odopetu and Isolo/Araromi/Odokoyi communities in Akure. The sampling frame of the houses in the communities is 412 for Isolo/Araromi/Odokoyi and Irowo/Odige/Odopetu is 405 (Ondo State Planning Report, 2006). However, with the use of Kothari (2004) formula as adopted by Bello (2009) and also adopted for this study, the calculation of the sample size was made easier. The sample size for the houses in the communities is 289 for Irowo/ Odige/Odopetu and 280 for Isolo/Araromi/Odokoyi.

Estimation of Sample Size using Kothari (2004) formula is given as:

$$n = \frac{Z^2 \cdot p \cdot q \cdot N}{e^2 (N - 1) + Z^2 \cdot p \cdot q} \text{ ----- (1)}$$

Where, **n** = sample size

z = value of standard deviation at a confidence level taken from table of normal

curve at variants (**z**) for 95% confidence, which is 1.96

p = sample proportion (**q=1-p**) which in this study is taken as 30% (0.3)

N = size of house from sample frame of the two communities are 405, (Irowo/Odige/Odopetu) and 412 (Isolo/Araromi/Odokoyi) in the study.

e = acceptable error at 3% (0.03) in this study.

Questionnaires were administered to occupants of residential properties in the neighbourhoods to elicit information. Systematic random sampling technique was used as it is convenient for the study. It affords the opportunity of picking every 3rd house on a street. Out of five hundred and fifty nine questionnaires administered on occupants in the two neighbourhoods, only four hundred and forty three were duly filled and returned for analysis. The mean

score was used to analyze the adequacy of the urban infrastructure in the study area. This is done on a 5-point Likert scale with a view to estimating the mean score, where numerical values are assigned to respondents rating.

For the purpose of this study, mean score is determined as follows:

$$\text{Mean score} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{N} \dots\dots\dots (2)$$

However, the multiple linear regressions were used to estimate the effect of urban infrastructure on residential property values

in the two communities (Irowo/Odige/Odopetu and

Isolo/Araromi/Odokoyi). The form of the regression function used is

$$\text{RENTV} = b_0 + b_1\text{ELEC} + b_2\text{WATR} + b_3\text{ROADNT} + b_4\text{DRAINF} + b_5\text{WASDP} + b_6\text{PACKSP} + b_7\text{STREETL} + b_8\text{SECTY} + \mu \dots\dots\dots (3)$$

Where
 $b_0 - b_8$ = Regression coefficient for the variables
 μ = error term

Results and Discussion

Table 1: Adequacy of Urban Infrastructure in the Study Areas

INFRASTRUCTURE	Irowo/Odige/Odopetu		Isolo/Araromi/Odokoyi	
	MEAN	RANK	MEAN	RANK
Electricity	3.64	3	2.93	2
Water	3.02	6	2.85	3
Road	4.11	2	1.76	7
Drainage	4.21	1	1.81	6
Waste disposal dumps	3.30	5	3.14	1
Parking space	1.62	8	2.18	5
Street light	3.47	4	1.63	8
Security	2.82	7	2.60	4
Total	225		217	

Table 1 above shows the mean score and ranking of the respondents view on the adequacy of urban infrastructure provided in the areas. This was done in order to identify which of these urban infrastructures is adequate for the residents of the community. It can be seen from Table 1 which shows that Irowo/Odige/Odopetu has a mean score of 3.64 for electricity while Isolo/Araromi/Odokoyi has a mean score of 2.93. However, the mean scores for the two neighbourhoods are relatively good enough as it ranked third among the facilities for the two communities. Also, the mean score for water in the two communities are 3.02 and 2.85 for Irowo/Odige/Odopetu and

Isolo/Araromi/Odokoyi. The table shows that mean score of road for Irowo/Odige/Odopetuis good as it ranked second while Isolo/Araromi/Odokoyi is very bad as it ranked seven among the facilities this is in conformity with the findings of Fadamiro (2002) that some buildings in Isolo/Araromi/Odokoyi are not accessible by roads. Also, the table shows that Irowo/Odige/Odopetu and Isolo/Araromi/Odokoyi mean score of 4.21 and 1.81 for drainage it is obvious that the mean score for Irowo/Odige/Odopetu is very good as it ranked first among the facilities and Isolo/Araromi/Odokoyi very bad as it ranked six. These findings implies that property in Isolo/Araromi/Odokoyi are

prone to risk of flooding when there is heavy rain because of insufficient drainage channels particularly from Ala River. From the table above, packing space in the neighbourhoods (Irowo/Odige/Odopetu and Isolo/Araromi/Odokoyi) are 1.62 and 2.18. However, the mean score for two communities are bad as it ranked eight for Irowo/Odige/Odopetu and fifth Isolo/Araromi/Odokoyi. This shows that

packing space facility is relatively bad. In summary, the road, drainage, electricity and waste disposal are good in Irowo/Odige/Odopetu, while drainage, road and street light are very bad in Isolo/Araromi/Odokoyi. This result is not contrary to the expectation as Adebayo (2006) noted the deplorable conditions of electricity, water, roads and drainage system in so many parts of the urban areas.

Table 2: Model Summary in Irowo/Odige/Odopetu.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.905 ^a	.819	.809	8161.828

Table 3: Analysis of Variance (ANOVA) in Irowo/Odige/Odopetu

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6.2E+010	11	5621070880	84.381	.000 ^a
Residual	1.4E+010	205	66615428.31		
Total	7.5E+010	216			

The performance of this model in Table 2 and 3 above is good as indicated by R² statistic (0.819). This implies that 81.9% of the sample variation in the rental values is attributed to the independent variables. The computed F statistic is 84.341. However, since the value of F statistic falls within the rejection region, the data thereby signify that at least one of the model coefficients is non-zero order

Table 4: Regression Coefficients in Irowo/Odige/Odopetu

Model	Unstandardized Coefficients		T	Sig.	Zero Order Correlation
	B	Std Error			
(Constant)	95436.648	3980.579	23.976	.000	
ELEC	1983.505	1703.053	1.165	.246	-.790
WATR	-8317.558	2051.714	-4.054	.000**	-.869
ROADNT	-7130.770	2841.017	-2.510	.013**	-.862
DRAINF	-3001.341	2668.919	-1.125	.002**	-.833
WASDP	4582.904	1979.819	2.315	.022**	-.833
PARKSP	-1746.702	2255.780	-.774	.004**	-.647
STREETL	-5951.920	2973.930	-2.001	.047**	-.859
SECTY	1234.252	1723.171	.716	.475	-.807

Significant at 0.05 ** denotes significant

Table 4 above shows that six of the variables are significant. These variables are Water (WATR), road network (ROADNT), drainage (DRAINF), waste disposal (WASDP), parking space (PARKSP), and security (SECTY). This may be because of the fact that tenants value

water, road, drainage, parking space, streetlight, and security when renting an apartment and they are ready to offer an increased rent for apartment where such infrastructural facilities are provided, while electricity (ELEC) is not significant). One may wonder why electricity facilities do not maintain significant relationship with rental value. This might be connected with the poor situation of electricity and the sharing of meters in most tenement buildings in the community.

Table 5: Model Summary in Isolo/Araromi/Odokoyi

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.884 ^a	.781	.770	6439.804

Table 6: Analysis of Variance (ANOVA) in Isolo/Araromi/Odokoyi

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3.2E+010	11	2865441088	69.095	.000 ^a
Residual	8.8E+009	213	41471072.45		
Total	4.0E+010	224			

The performance of the model in table 5 and 6 is good as indicated by R² statistic (.781). This implies that 78.1% of the sample variation in the rental value is attributed to the independent variables. The computed F statistic (69.095) falls within the rejection region. The data provides strong evidence that at least one of the model coefficients is non zero and hence the model appears to be useful for predicting rental values in Isolo.

Table 7: Regression Coefficients in Isolo/Araromi/Odokoyi

Model	Unstandardized Coefficients		T	Sig.	Zero Order Correlation
	B	Std Error			
(Constant)	58278.733	1610.409	36.189	.000	
ELEC	-5956.591	1708.750	-3.486	.001**	-.804
WATR	1861.915	1479.721	1.258	.210	-.754
ROADNT	-4061.008	2202.779	-1.844	.067	-.647
DRAINF	1428.599	1798.374	.794	.428	-.650
WASDP	-1590.319	1651.946	-.963	.337	-.845
PARKSP	2155.673	1497.911	1.439	.152	-.718
STREETL	6801.391	1363.026	4.990	.000**	-.520
SECTY	-3659.861	1952.073	-1.875	.062	-.759

Significant at 0.05 ** denotes significant

The model in Table 7 shows that two of the variables electricity (ELEC) and street light (STREETL) are significant in Isolo/Araromi/Odokoyi while water (WATR), road (ROADNT), drainage (DRAINF), waste disposal (WASDP), and parking space (PACKSP) is not significant. The relationship between the variables that are not significant is that they have negative influence on the dependent variable (rental value). Perhaps the occupiers consider these variables very paramount when renting an apartment.

Table 8: Time Series and Index Growth Rate of Tenement and 3 Bedroom Apartments in the Study Area

Year	Irowo/Odige/Odopetu				Isolo/Araromi/Odokoyi			
	Tenement	Index	3Bedroom Flat	Index	Tenement	Index	3Bedroom Flat	Index
2000	6000	1.000	18000	1.000	4800	1.000	18000	1.000
2001	6000	1.000	18000	1.000	6000	1.250	18000	1.000
2002	7200	1.200	24000	1.333	6000	1.000	24000	1.333
	8400	1.167	24000	1.000	7200	1.200	24000	1.000
2003	9500	1.131	36000	1.500	7200	1.000	36000	1.500
2004	12000	1.263	36000	1.000	7200	1.000	36000	1.000
2005	12800	1.067	51300	1.333	7200	1.000	36000	1.000
	18000	1.406	73500	1.531	8400	1.167	36000	1.000
2006	19125	1.063	89000	1.211	8400	1.000	42000	1.167
2007	24000	1.255	97500	1.096	12000	1.500	42000	1.000
2008								
2009								

The time series analysis reveals that between the years 2000-2001 the rents passing on the residential property in the areas were relatively stable. In year 2002-2004 there was a slight increase in the residential property values. The reason could be from the normal rent increase by the landlords. In the same vain in year 2005-2006 there was also a slight increase. There was a sharp increase in rental values in Irowo/Odige/Odopetu between the periods of 2007-2009. This is expected as the areas witnessed infrastructural development and urban renewal through rehabilitation/upgrading by the World Bank project undertaken by the State Government. Such improvement and rehabilitation scheme included the construction of drainage, tarring of roads, water provision, schools, electrification projects through installation of electric transformers, street light and waste disposal systems. On the other hand Isolo/Araromi/Odokoyi area attracted lower rental values since the area is characterized by old fashioned infrastructure in the form of poor road network, poor drainage, overcrowding, high occupancy ratio and dilapidated structures.

Recommendations and Conclusion

The paper has examined the impact of urban infrastructure as a tool for enhancing the values of residential property in Akure. It was revealed that rent paid for different residential apartment in Irowo/Odige/Odopetu have continued to increase from the periods of 2007-2009 as at when the survey was carry out because of the rehabilitation of some infrastructures and the provision of some that are not available at all and Isolo/Araromi/Odokoyi maintained a steady growth rate because of the deplorable condition of the urban infrastructures. The study further discovered that the demand pressure for properties contributed to rent increase because of the urban infrastructures they are enjoying in Irowo/Odige/Odopetu. The paper therefore makes the following recommendations:

The widely held view that Government should handle the provision of urban infrastructure despite obvious weaknesses of the public sector should be discouraged. The assistance of international bodies like the United Nation Children Environmental Funds, Centre for Human Settlement (HABITAT) and the Millennium Development Goals would be needed for

effective and enduring urban infrastructural provision in the study areas. Government should embark on comprehensive rehabilitation of infrastructural facilities in the Isolo/Araromi/ Odokoyi and other areas that need same. Also, the people need enlightenment on the importance and management of these infrastructural facilities. This is needful so as to sustain every improvement put in place.

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