Analysis Of The Relationships Of Infrastructural Facilities In The Determination Of Rental Values Of Residential Properties In Akure, Nigeria

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Abstract

Housing represents the most basic of human need and it has a profound impact on the health, welfare, and productivity of individuals. For housing to produce these impacts, it must be adequately provided with functional infrastructure. In Nigerian urban centres, these basic infrastructure have suffered major neglect over a long period of time in the hands of government and its different agencies that are expected to provide and maintain the infrastructure. Therefore, property developers are responsible for the provision of the infrastructure in their properties which have increased the development cost of the properties. For the property developers to continue to invest in property development, the rental values of the property must continue to be attractive to allow developers recoup back the investment on such property. This study therefore investigated into the available infrastructural facilities in residential properties in Akure, Nigeria and analysed their influence in the determination of the rental values of the properties. Akure was divided into four residential zones and one hundred and ninety tenants were randomly selected for interview. Eleven infrastructural facilities were identified as peculiar to residential properties in Akure. The study employed multiple regression model to determine the influence of the infrastructural facilities in the rental values of the property while the step-wise analysis revealed that wall-fence and installed burglary proof are significant determinants of rental values of residential properties in Akure. However, Pearson's Product Moment Correlation Coefficient matrix was used to verify the significant level of the independent variables. The study concluded that although other infrastructural facilities are also necessary but residential property developers should essentially ensure the provision of these two infrastructural facilities in order to attract higher rental values.

Keywords: Infrastructural Facilities; Rental Values; Residential Zones; Akure Nigeria.

1. Introduction

Nigeria with 5.3 percent growth rate has a population of 140 million and it is one of the countries with the fastest rate of urbanization in the world [1]. One of the greatest challenges of successive governments in Nigeria had been the need to provide adequate housing to its teeming population. Submissions on appraisals of different housing programmes over the years revealed that no significant positive effects had been achieved [2, 3, 4]. Findings from recent studies of urban problems in Nigerian cities have revealed that a significant proportion up to 34 percent (in some cities) of the houses had no access to electricity, pipe-borne water, decent safe waste disposal systems and un-connected by motorable roads [5]. Unfortunately, the level of deficiencies and the degree of deterioration of infrastructure in Nigerian urban centres is becoming more alarming and worrisome due to the inability of the public sector to meet up its social responsibilities to the people.

The problems of deteriorated infrastructure are particularly pronounced in the old, indigenous core areas of the cities while the non-availability of infrastructure is peculiar to the outer spontaneous settlements that accommodate the low-income population. This led to the prevalence of a generally unwholesome and unhygienic environment in most Nigerian cities that pose a greater danger to the health of the inhabitants [6]. In addition to its health implication, Olanrewaju [7] has earlier qualified areas in cities with deteriorated infrastructure as poor areas that are characterized by spatial concentration of low-income population, which are possible sources of urban crimes and violence. The effects of infrastructural deterioration and their non-availability on the quality of lives notwithstanding; Floyd and Allen [8] have reiterated their importance in the local development process. Thus, concluding that infrastructure development or the lack of it is often used as a policy tool to encourage or discourage growth. However, this study focuses on the analysis of the effects of infrastructure on property development. It is an attempt to determine the influence of infrastructural provision on the rental value of residential properties based on the underlying view that improved infrastructural facilities would enhance the rental value of residential properties through which the invested capital could be profitably recouped. In the course of this investigation therefore, it becomes pertinent to provide answers to the following questions:

(a) What are the various types of residential properties in Akure?

(b) What are the existing infrastructural facilities in the residential properties in Akure?

(c) What are the relationships between the available infrastructural facilities in residential properties and their rental values?

2. Justification for the Study

Many factors interplay to create property values [9, 10]. This could be economic, institutional or environmental. Factors that negatively affect the value of real property injure ownership motives and goals. They also damage the investor's interest and discourage subsequent investment. For instance, Udo and Egbenta [10] have examined the effects of domestic waste dumpsites on rental values of residential properties in Enugu, Nigeria. They confirmed that contrary to popular belief, waste dumpsite does not necessarily affect property values negatively. However, other factors could be harnessed to boost rental values of properties in our cities. Since infrastructural facilities are regarded as booster to social well-being of city dwellers [11, 12]; hence the choice of infrastructural facilities as factors that may likely affect the rental value of residential properties in Nigerian cities is considered to be appropriate.

Akure, the study area, was chosen on the pragmatic basis that it offers access to richer data on residential properties than most towns in Ondo state because of its dual role as a state capital and as the headquarters of Akure South local government council. This makes Akure the seat of most federal establishments in the state. The increased relative political influence of Akure as a state capital is responsible for its vast expansion from an area of about 16km^2 in 1980 to about 30 km^2 in 2000. This has created greater opportunities especially for residential property development, hence justifying the choice of Akure where samples of different classifications of residential properties could be drawn for investigation purposes.

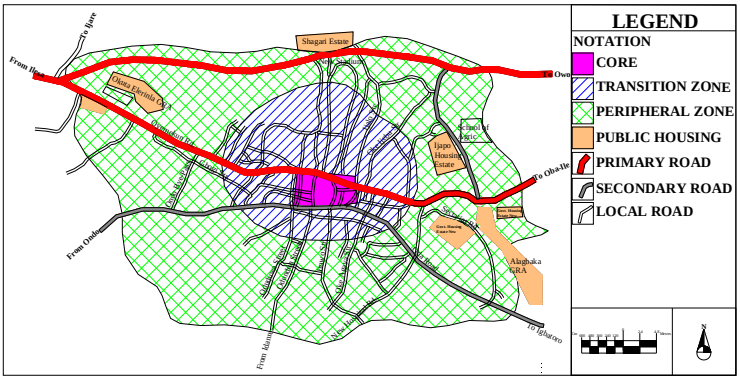
3. Methods

In this study, the research methodology was designed to obtain data on the effects of infrastructural facilities on the rental value of residential properties in Akure metropolis. As a necessary prelude to the assessment of the effects of infrastructural facilities on rental value of residential properties, a reconnaissance survey purposely designed to familiarize the researcher with the available types of housing property development in Akure was undertaken. This was followed by series of other field surveys conducted by the researcher ably assisted by field assistants. Data were collected on the distribution of residential properties, the types and the conditions of infrastructural facilities provided, and rents paid by tenants among others. The data were later processed to give the overall assessment of the rental values of residential properties as well as formed the basis for making recommendations that would improve the level of infrastructure provision in residential properties in Akure in particular and Nigeria in general; with a view to enhance the returns on capital invested by the property developers.

3.1 Sources and Data used in the Study: Data collected in the pursuit of this study were from primary sources. The primary data were sought from the field surveys conducted through the administration of a set of questionnaire. This set of questionnaire was designed for the tenants in rented residential properties. The questions in the questionnaire among others probed into the locations of the residential properties, available infrastructure, and conditions of the infrastructure, rent paid, income status and the household size of the tenants and the readiness of the tenants to pay increased rent whenever there is improvement in the level of infrastructural provision.

3.2 Research Locale: Akure, our study area is a medium-sized city and the capital of Ondo State, Nigeria. Akure possesses characteristics that are peculiar to other cities in Nigeria and most cities in the developing countries. Akure has residential quarters aggregated into natural areas. The general unifying attributes include the age of buildings, location attributes, available infrastructural facilities and their management. In administrating the questionnaire for the tenants in the residential properties in Akure, the city was divided into four zones, which was similar to the classification of Akinbamijo [6]. These are the core area, the transition area, the peripheral area and the public housing districts (see fig. 1).

3.3 The Core Zone: This area is predominantly made up of old structures, whose construction predating the colonial period in Nigeria (i.e. pre-1914).



Source: Ministry of Works and Housing, Akure, 2008

Fig. 1: Akure, showing the zones and major roads.

The core area covers Eruoba, Odo Ikoyi, Igann, Odo Ijoka, Immagun, Isolo, Erekefa, Erekesan, and Oritagun quarters among others. Most of the residential properties in the core area are generally old, poorly ventilated, dilapidated, squalid and deficient in infrastructural facilities like potable pipe-borne water, drainage, electricity, sewage and refuse disposal system [13].

3.4 The Transitional Zone: This is an extensive post-colonial development, spreading to all directions from the boundary of the city core [6]. The zone is characterised by a strong mix of land uses such as commercial, administrative and residential. Unlike the core area, most of the residential properties enjoy fair accessibility. However, the sanitary condition in the area is nothing to write home about. This area essentially covers Oke Arata, Oke Padi, Oke Aro, Aiyedun, NEPA area, and Oke Isinkan among others.

3.5 The Peripheral Zone: These areas are post 1976 development (i.e. after the creation of Ondo State). They are located at the outskirt and the residential properties in the areas are mostly of modern design and are physically sound. Most of residential properties were built on approved private residential layouts. The areas include Aule road, Gaga area, Ijoka road, Ologede area, Jegele and Igoba among others. The extension of infrastructural facilities to most of these areas is on community-based and individual efforts.

3.6 Government Residential Estate: These are housing districts developed by public initiative and noted for their strict compliance with the development control ethics [6]. The areas enjoy better infrastructural facilities such as pipe-borne water supply electricity, drainage system, access road and refuse disposal system. The districts include Alagbaka, Ijapo, Ala, Okuta Elerinla, Shagari, and Ilesha Road Housing Estates. In the administration of questionnaire on tenants in the zone, the Alagbaka and Ala Housing Estates were ignored. The estates are government-developed estates, where all the tenants have access to the same type and quality of facilities. The reason for this is that the tenants do not have the option of negotiating their rents even when there is an improvement in the facilities provided. They are civil servants and their rents are deducted from source. The remaining estates are Shagari housing estate; Okuta Elerinla housing estate and Ilesha Road housing estates. They are government estates in which the residential properties were developed by private individuals but the estates enjoy a reasonable measure of infrastructural facilities provided under the site and service programme.

In each of the four zones, 55 questionnaires were distributed to randomly selected tenants. Only 50 questionnaires were retrieved in a useable form in each of the first three zones i.e. core, transitional and peripheral zones while 40 questionnaires were retrieved from the selected government residential estate making 190 questionnaires. The survey–assistants asked the questions from the respondents and filled in the answers in the presence of the respondents particularly in the first three zones; whereas, in the fourth zone (i.e. government residential areas) survey-assistants were made to drop questionnaires for the respondents to complete because of their absence at home during the working period. This was responsible for the low recovery rate of questionnaires in the zone.

3.7 Data Analysis: The analysis of the data collected from the tenants was done using multiple regression models to determine the interrelationships between each of the isolated infrastructures (i.e. water, electricity, waste disposal facility, access road, and security enhancing facilities) which are the independent variables; and the rental value of the residential property (dependent variable). The model is not only capable of handling the problem of interactions amongst the independent variables

but also it enables us to know the contributions or the importance of each variable to the explanation of variation in the dependent variable (rental value). It also allows for the prediction of value of the dependent variable.

According to Bryman and Cramer [14], the equation of multiple regression y (dependent variable) on X_1, X_2, X_3, X_4 ....X (independent variables) is given as;

Y = a+bx=b2x2+b2x2 ..... bnxn+e ..... (1)

Where

x_1, x_2.....x_2 are the independent variables.

b_1, b_2 .....bn are multiple regression coefficients for the independent variables (the slope of the regression line relative to x-axis).

"a" is an error term which points to the fact that a proportion of the variance in the dependent variable.

Y is unexplained by the regression equation

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

$Y = a + b_1ELE + b_2WAT + b_3ACC + b_4BUG + b_5RD1 + b_6TO + b_7 KT + b_8DC + b_9WAF + b_{10}DAW + b_{11}NIW$..... (2)

Where

Y = is the annual Rental Value;
ELEC = Electricity
WAT = Water
ACC = Access Road
BUG = Burglary Proof
RDF = Refuse Disposal Facility
TO = Toilet
KT = Kitchen
DC = Drainage Channel
WAF = Wall Fence
DAW = Daywatch Security Services
NIW = Nightwatch Security Services

4. Discussion

4.1 Types of Residential Properties in Akure: Residential properties market in Akure covers a wide range of properties, which can be grouped into four types for convenience of discussion. These are face-to face, semi-detached flat, detached flat; and duplex.

The Face–to-Face Residential property as the name implies, is the residential building in which it is designed on room basis arranged on two opposite rolls, separated with a long passage. Tenants share the facilities such as toilet, kitchen and bathroom. It can be in form of a bungalow or a storey building.

The Semi-Detached flats are two flats combined on the same plot. It could be in bungalow or a storey building. The Detached flat is a single flat inclusively built on a site and usually a bungalow building. It promotes privacy of occupants or tenants.

The Duplex residential property is essentially depicted in its design; where the sitting room and the kitchen are placed in the ground floor while the bedrooms and the conveniences (such as bathroom, toilet and private sitting room are in the first floor. This type of building is essentially occupied by the high-income group.

Table 1. Types of Residential Properties by Zones (% in Parenthesis).

	ZONES				
Types	**Core**	**Transitional**	**Peripheral**	**Public Housing**	**Total**
Face-to-Face	30(60.0)	37(74.0)	20(40.0)	3(7.5)	90(47.4)
Semi-Detached Flat	18(36.0)	9(18.0)	14(28.0)	20(50.0)	61(32.1)
Detached Flat	2(24.0)	4(8.0)	14(28.0)	11(27.5)	31(16.3)
Duplex	0(0.0)	0(0.0)	2(4.0)	6(15.0)	8(4.2)
TOTAL	50(26.3)	50(26.3)	50(26.3)	40(21.1)	190(100.0)

Source: Author's Fieldwork, 2008.

Table 1 shows that 47.4 percent of the sampled residential properties are Face-to-Face type. This type of residential property is very prominent in the core, and the transitional zones of the town; where 60 percent and 74 percent of the residential properties correspondingly existed. However, 32.1 percent of the entire residential properties are Semi-Detached Flat. For instance, 50 percent of the residential properties in the public Housing Zone is made up of Semi-Detached Flats. The table also indicates that there is no single Duplex in both core and transitional Zones of town while 15 percent of the residential properties in the Public Housing Zone are duplex.

Table 2. Infrastructural Facilities Available in Residential Properties by Zones in Akure (% in Parenthesis).

	ZONES				
Infrastructural Facilities	**Core**	**Transition**	**Peripheral**	**Public Housing**	**Total**
Electricity	49(98.0)	49(98.0)	47(94)	40(100 .0)	185(97.4)
Water Supply	40(80.0)	38(76.0)	42(84.0)	29(72.5)	149(78.4)
Access Road	28(56.0)	45(90.0)	33(66.0)	39(97.5)	145(76.3)
Burglary Proof	36 (72.0)	41(82.0)	24(48.0)	39(97.5	140(73.7)
Refuse Disposal Facilities	28(56.0)	16(32.0)	17(34.0)	18(45.0)	79(41.6)
Toilet	49(98.0)	48(96.0)	41(82.0)	40(100.0)	178(93.7)
Kitchen	37(74.0)	45(90.0)	48(96.0)	40(100.0)	170(89.5)
Drainage Channel	26(52.0)	20(40.0)	33(66.0)	35(87.5)	114(60.0)
Fenced Round	26(52.0)	18(36.0)	22(44.0)	30(75.0)	96(50.5)
DayWatch sec. Service	2(40)	3(6.0)	9(18.0)	10(25.0)	24(12.6)
Nightwatch Services	25(50.0)	10(20.0)	20(40.0	35(87.5)	90(47.4)

Source: Author's Fieldwork, 2008.

4.2 Available Infrastructural Facilities in Residential Properties in Akure: The infrastructural facilities available in the residential properties include electricity, water supply, access road, burglary proof, refuse disposal facility, toilet kitchen, drainage channel, wall-fence, daywatch-security services and nightwatch-security services. The levels of provision of these facilities vary from building to building and from one zone to the other. About 97 percent of the residential properties in Akure are connected with electricity while the entire residential properties in the Public Housing Zone are connected with electricity. All the sampled tenants in these residential properties complained of erratic supply of the electricity. The issue of water supply is not based on the public water supply or connection to the public water supply because this is not functioning in Akure but on the provision of functional water supply either through hand-dug well or boreholes. In this respect, 78.4 percent of the residential properties are provided with water from either hand-dug well or borehole. It is necessary to note that none of the zones experienced less than 72 percent of its residential properties provided with water. The location of the well within the house compound influences the level of safety of such water; particularly in the core area where most of the hand-dug well are located within the septic field.

Every residential property is required to be provided with unhindered access road with a view to ensure safe movement of goods and services. Overall, 76.3 percent of the residential properties are accessible by motorable road. However, the residential properties in the core zone are mostly affected by inaccessibility, where only 56 percent were only accessible. This is followed by the peripheral zone, where 66 percent of the residential properties are accessible. In the remaining two zones (i.e. the transition and the Public Housing zones) not less than 90 percent of the residential properties are accessible by motorable roads. The installation of burglary proof in residential properties serves as ways of ensuring security of household properties in such building. Over 70 percent of the residential buildings in the core, transitional, and public housing zones are installed with burglary proof in their windows. However, only 48 percent of the residential buildings in the peripheral zone are installed with burglary proof.

Refuse disposal facility in residential properties in Akure is generally poor and only 41.6 percent of the residential properties enjoyed refuse disposal services. About 56 percent of the residential properties in the core zone enjoyed refuse disposal services. This is not unconnected with the special attention given to the core area of Akure by the Waste Management Board because of the intensive commercial activities in the zone. Toilet facility is one of the basic facilities in any functional residential property. Overall, 93.7 percent of the sampled residential properties in Akure are provided with toilet facility. It is necessary to note that all the residential properties in the Public Housing zone are provided with toilet and kitchen facilities as indicated in Table 2. Although, 74 percent of the residential properties in the core are provided with kitchen facility but this is much to be desired. Even when the kitchen is provided, some of the tenants carried out their cooking in hygienic environment. The drainage in the residential areas in Akure needs much to be desired. Overall, just 60 percent of the residential properties could boost of functional drainage. The provision of wall-fence round the residential properties is to guide against unwanted interruption and ensure security and safety of properties in the residential buildings. Only 50.5 percent of the residential buildings are provided with wall-fence, while 52, 36, 44 and 70 percent of residential properties in the core, transition, peripheral and public housing zones are correspondingly provided with wall-fence.

The provision of watching-day security services in the residential properties are not popular in Akure, with only 12.6 percent provided with these services. However, Table 2 shows that 24 percent of the residential properties in the public housing zone are provided with Day watch-security services and other zones (core, transitional and peripheral zones enjoyed Daywatch-security services correspondingly. Nightwatch-security services are provided in 47.4 percent of the residential properties in Akure but over 87 percent of the residential properties in the public housing zone are provided with night watch security services. It is hope, that when residential property is provided with these infrastructure, such property would enjoy high patronage and consequently attract high rental value.

4.3 Relationships between Rental Values and Infrastructural Facility Variables Using Regression Model

The regression of electricity (ELEC), Water (WAT), access road (ACC) burglary Proof (BUG), refuse disposal facilities (RDF), toilet (TO), Kitchen (KT), drainage Channel (DC), Wall fence (WAF), Daywatch security services (DAW), and Nightwatch security services (NIW) on rental value (Y) is considered.

Thus,

$$Y = a + b_1ELEC + B_2wat + b_3ACC + b_4BUG + b_5RDF + b_6TO + b_7KT + b_8DC + b_9WAF + b_{10}DAW + b_{11}NIW \quad \text{- - -} \ldots \text{(3)}$$

Table 3. Regression Results (Estimates) Between Annual Rental Values and Infrastructural Facility Variables.

Code	Variables	Regression Coefficient	Beta Coefficient	Absolute t-Value	Sig
	Constant	1.851		2.363	0.019
ELEC	**Electricity**	0.384	0.031	0.464	0.643
WAT	**Water**	0.299	0.080	1.211	0.228
ACC	**Access Rd**	-0.299	-0.067	-1.033	0.303
BUG	**Burglary Proof**	0.795	0.234	3.447	0.001*
RDF	**Refuse Disposal**	0.134	0.043	0.611	0.542
TO	**Toilet**	-4.229E-02	-0.007	-0.099	0.921
KT	**Kitchen**	-5.882E-02	-0.009	-0.124	0.902
DC	**Drainage Channel**	0.194	0.063	0.969	0.334
WAF	**Wall-Fence**	1.229	0.400	5.505	0.000*
DAW	**Daywatch Security**	0.164	0.034	0.489	0.625
NIW	**Nightwatch Sec.**	4.834-02	0.014	0.191	0.848
	R = 0.576				
	R^2 = 0.332				
	R^2 Adjusted = 0.291				
	FO.05 = 8.047				
	N = 189				

Source: Author's Fieldwork Analysis, 2008.

The empirical result presented in Table 3 reveals that wall fence and burglary proof are significant determinants of rental values by tenants of residential properties in Akure. In the consideration of the entire variables fitted into the model, R^2 (0.332) shows that about 33.2 percent of the variation in rental value are jointly accounted for by the variables. The standard coefficients (Beta) give a picture of the relative importance or influence of the independent variables on the rental value of residential properties in Akure. When the magnitude of beta is higher, then the influence of the variable becomes higher as well.

Rental Value (Y) = 1.851 + 1.229 (WAF) + 0.795 (BUG) + 0.299 (WAT) + 0.194(DC) + 0.134(RDF) + 0.164 (DAW) + 0.384(ELEC) + 4.834e-02 (NIW) + -0.220 (ACC) + -4.229E-02 (TO) + -5.882e-02 (KT)..... (4)

From the empirical results of the multiple regression model presented in Table 3, it shows that wall fence is the most determining variable of rental value. This is followed by installation of burglary proof in the building. Next to this in order of influence are water, functional drainage channel, availability of refuse disposal facility, Daywatch security services, access road, toilet facility, and kitchen respectively.

Table 4. Step-wise Regression Results (Estimates) Relationships between the Rental Values of Residential Properties and Infrastructural Facilities.

Variable Code	Regression Coefficient	Beta Coefficient	Absolute t-Value	Sign
Constant	2.340		12.930	.000
Wall-fence (WAF)	1.325	0.432	6.711	.000
Burglary Proof (BUG)	0.815	0.240	3.725	.00
R = 0.559				
R^2 = 0.313				
R^2 adjusted = 0.305				
F0.05 = 42.512				
N = 189				

Source: Author's Fieldwork Analysis, 2008.

Y = 2.340 + 1.325 (wall fence) + 0.815 (Burglary Proof)..... (5)

Y = Annual Rental Value

From the empirical result of the stepwise regression presented in Table 4 only two of the eleven (11) infrastructural facilities are very crucial for the determination of rental values by tenants of residential properties in Akure. The most crucial is wall fence with a regression coefficient of 1.325 and the second most important is burglary proof with 0.815 regression coefficient. The infrastructure put together contributed 30.5 percent in the determination of rental values. These two infrastructures are security and safety inclined. It can be concluded that tenants valued the safety and security of their lives and properties in those residential buildings very much that tenants are ready to offer an increased rent for apartments where these two infrastructures are available. On a general note, these two infrastructures are mostly available in the residential properties in the Public housing zone.

4.4 Analysis of the relationships of the Infrastructural Variables: This section examines relationships among the infrastructural variables; using the Zero-order Pearson Product Movement Correlation Matrix of the 11 key variables as shown in Table 5 to verify the results obtained in the use of the regression model. The annual rent of the residential properties has significant relationships with 8 other variables. The annual rent is related to water, Burglary proof, refuse disposal facility, toilet, drainage, wall fence Daywatch security services and Nightwatch security services. The annual rent has 0.151 correlation coefficient with water supply at 0.05 level. This is an indication that an increase in annual rent would attract an improvement in water supply to the residential properties. This is perfectly required to be true because tenants often based their demand for improved water supply either in the provision of new hand-dug well or reactivation of the existing hand-dug well based on the increase in rent.

Table 5. Correlation Matrix of Infrastructural Facility Variables.

Annual Rent	Elect	Water	Access	Burgl	Refdis	Toilet	Kitchen	Drain	Fence	D.Watcth	N.Watch
1.00	0.073	0.151*	0.060	0.389**	0.212**	0.159*	0.122	0.160*	0.523**	0.250**	0.287**
	1.00	0.139	0.092	0.014	0.107	0.287**	0.330**	0.040	0.044	0.045	0.019
		1.00	0.181*	0.123	0.313**	0.048	0.034	0.024	0.069	0.103	0.173*
			1.00	0.209**	0.223**	0.147*	0.116	0.143*	0.097	0.102	0.067
				1.00	0.224**	0.224**	0.094	0.057	0.333**	0.185*	0.224**
					1.00	0.197**	0.163*	0.157*	0.194**	0.248**	0.332**
						1.00	0.448**	0.006	0.245**	0.035	0.171*
							1.00	0.153*	0.205**	0.016	0.150*
								1.00	0.190**	0.192**	0.167*

1.00	0.315**	0.409**
	1.00	0.355**
		1.00

Source: Author's Fieldwork, 2008.
*Correlation is significant at 0.05 level.
** Correlation is significant at 0.01 level.

However, other infrastructural variables which annual rent maintains significant relationships with at 0.05 level are toilet with 0.159 and drainage channel with 0.160 correlation coefficient. Like water supply, both toilet and drainage channel maintain weak relationships. Toilet facility is a necessity in any functional residential buildings. Often times, when increased in rent is anchored on the provision of toilet, the quality of toilet provided is much to be desired. Rather than providing a water closet toilet, due to non-availability of water, pit toilets are often provided, which are poorly maintained. Therefore, the poor nature of the pit toilet would not strongly attract high rent thus, the reason for its weak relationships to rental values of residential properties.

Refuse disposal facility is another health related facility provided in residential properties. It maintains 0.212 correlation coefficient with rental value in the determination of rent for the residential properties in Akure at 0.01 level. When developer provides refuse disposal facility in residential properties, tenants do not hesitate to pay increased rent. It becomes cheaper for tenants to enjoy this facility from jointly arranged source than individual providing the facility. When refuse disposal facility is not provided in residential properties, tenants often dispose-off their waste indiscriminately; thereby constituting threats to healthy living.

Drainage channel in Akure is open-type, provided in the housing environment to tap-off both storm and domestic waste water to the drainage along the abutting access road. Drainage channel as a facility maintains 0.160 with rental value of residential property. Availability of drainage channel tells much on the environmental quality of the housing environment. Majority of the residential properties in the core zone are located in degraded environment coupled with blocked drainages while in the Public housing zone, the aesthetics quality of few of the housing environment is high and with well-maintained drainages thus, the residential properties in the zone attract high rental value.

At 0.01 level, five (5) of the infrastructural facilities (variables) maintain significant relationships with the annual rental value. These are installed burglary proof with 0.389 correlation coefficient; refuse disposal facility with 0.212 correlation coefficient; wall-fence with 0.523 correlation coefficient; Daywatch security services with 0.250; and Nightwatch security services with 0.287 correlation coefficient (see Table 5). Tenants do not toil with the issue of security. This is because of increased cases of burglary in most Nigerian urban centres. Often times, tenants jointly arranged for security services to keep watch of their rented apartments at day and night times particularly at the peripheral, and public housing zones that appear to be isolated and solitary during the daytime.

Of all the security related variables, the availability of wall-fence in residential property maintains the strongest relationship with rental value with a correlation coefficient of 0.523. This is followed by the installation of burglary proof in residential building with correlation coefficient of 0.389. Availability of tall wall-fence and installation of strong metal burglary proof on windows of residential buildings in Nigerian cities had been captured as 'architecture of fear' [11]. This is the use of architectural design and elements to guide against attack by robbers. Daywatch security-services and Nightwatch security-services maintain 0.250 and 0.287 correlation coefficient correspondingly with rental values of residential properties. Tenants prefer localities where they can enjoy both daywatch and nightwatch-security services, even if it will amount to paying additional money to their rent. Often times, on community basis tenants arranged on their own to secure security services for both day and night. This is mostly common in the peripheral and public housing zones in Akure where residential housing development is very scanty that are dotted with isolated undeveloped residential plots that can shield robbers.

However, three (3) of the infrastructural facilities exhibited no significant relationships with rental values of residential properties. These are electricity, access road, and kitchen with correlation coefficient of 0.073, 0.060, and 0.122 correspondingly (see Table 5). One may wonder why these infrastructural facilities do not maintain significant relationships with rental value. This is not unconnected with the poor situation of electricity supply in Nigeria in general and in Akure in particular. In Akure, some areas are without functional electricity transformer, which makes the tenants to live in perpetual darkness. Majority of the tenants depend on the use of generating plants for their electricity supply. Non-availability of access roads is usually as a result of non-compliance with planning laws and regulations by developers that encroached on access roads. Many of the tenants do not consider the condition of the access roads linking their rented apartments as too major; particularly in the core zone where most of the residential properties are poorly accessible or only accessible by footpaths.

5. Conclusion

This study has revealed that the relationships that exist among the infrastructural facilities in residential properties are very relevant in the determination of the rental value of these properties in Akure; a city typical of developing countries of the World. The available infrastructural facilities in most residential properties in Akure include electricity, water, access road, toilet, kitchen, drainage channel, wall-fence, burglary proof, waste disposal facility, daywatch-security services, and nightwatch-security services. Over 32 percent of the decisions for the determination of rental value of residential properties in Akure are based on available infrastructure facilities. This is weak and a departure from normal practice. Nonetheless, availability of wall-fence round the residential buildings and installation of burglary proof in the residential buildings contributed significantly to the rental values of residential properties in Akure. Tenants in residential properties in the city cherish security-enhancing infrastructure. Property developers in Akure should endeavour to provide the security-enhancing infrastructure. These essentially include wall-fence, and burglary proof. Since the issue of security of lives and properties is very germane to tenants of residential properties in cities in developing countries as typified of Akure, Nigeria, the intensification of Community Policing approach should be vigorously pursued. The state of infrastructural facilities in most cities in the developing countries is disappointedly appalling and Akure is not an exemption. Government at all levels should give priority attention to the maintenance of existing infrastructure and provision of new ones in the new areas of Akure in particular and other settlements in Nigeria in general. Nonetheless, government alone cannot handle successfully the maintenance and provision of infrastructure. Therefore, the people under the 'Public-Private Partnership' programme should be involved. Housing is one of the basic needs of Man and it is more than "mere shelter". Therefore, housing should be provided with necessary infrastructural facilities to enhance its functions as a place of habitation and this would increase the rental values, which the property developers would enjoy on their residential properties. Since the public housing zone in Akure enjoys better attention of the government in the provision of infrastructural facilities, property developers should divert their residential property investments to the Public housing zone, where they could derive the highest rental values.

End Note: One US Dollar was equivalent to N 125.00 (N = Naira, the Nigerian currency) during the period, the study was conducted.

6. Competing Interests

The author declares that he has no competing interests.

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