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## Impact of Infrastructural Conditions on Residential Property Values Within Tunga and Barkin-Sale Areas of Minna, Nigeria

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### Abstract

Housing, infrastructures, environmental quality and housing value are bulk of inseparable factors in our living environment. The availability of infrastructural facilities is imperative for the overall development of any country. This study examined the impact of infrastructural quality on residential housing rental value in Tunga and Barkin-Sale areas of Minna. Data retrieved from the 261 questionnaires returned were analysed from which test of hypotheses using both one-sample and paired sample t-test revealed that there is statistical significant difference in the mean facilities condition of the two areas. Result of correlation coefficient also shows relationship between conditions of infrastructure and rental value at 99% confidence level; which accounts for differences in rental values passing in the two areas, even for similar properties. This shows that condition of facilities has a significant impact on rent passing at a particular point in time! Public sectors commitments and dedication in improving existing facilities, public-private participation in infrastructural provisions, and community participation in development projects were among the recommendations made in order to improve the quality of our environments and for optimum returns on capital invested.

**Keywords:** environmental quality, infrastructures, residential, rental value, and housing.

### Introduction

Infrastructure is defined by the Modern Dictionary of Human Geography (1986) as the amenities and services which are basic to most types of economic activities. It includes electricity, gas, telecommunications, water and sewage, airports, roads, railways and services rendered within a given area in a society. According to Mba (1980), the quality and quantity of infrastructural facilities available in a given society determines the level of comfort a man enjoys. If that is true, then there will be a resultant affects on the amount of money any household would be willing to part with in order to enjoy those facilities at a given point in time.

Britton et al(1980) defined rent as the annual amount paid to a lessor (landlord) by a lessee (tenant) as compensation for parting with the right of use and occupation of property by the lessor. Since housing is viewed as a bundle of services or a basket of goods which includes the physical structures itself, the ancillary facilities and services within and around it, as well as the general environmental qualities and amenities that surround the building then the availability and quality of these facilities and services will definitely boost the rent such property would command at any point in time. (Bourne 1984, Agbola 2000, Jinadu 2004). Every house, irrespective of its type, performs certain basic functions, which are geared towards user satisfaction. (Jinadu, 2004). A household would therefore want to live in a particular environment where their utility could best be maximised. It is generally believed that provision of infrastructure in residential property would continue to attract prospective tenants. (Julius et al, 2009). And naturally, as demand increases, rent definitely would increase; thereby resulting to good returns on capital invested. But unfortunately, the level of availability of infrastructure in most developing countries is drastically low which calls for concern particularly on the part of the government at all levels. (Mabogunje, 1993).

It is in view of this that this study set out to examine the conditions of facilities in the study areas and the impacts of such facilities on rent passing in the areas.

### Aim and Objectives

The study aimed at assessing the impact of infrastructural conditions on residential property values in Tunga and Barkin-sale areas of Minna.

To achieve this aim; the following objectives were observed;

- Assessment of conditions of facilities within the study areas;
- Ascertain the differences between conditions of facilities in the two areas under study;

- Examine the rental trend of residential properties within the areas from 2000-2009 and
- Find the relationships between infrastructural conditions and rental values;
- Recommend ways of improving infrastructure conditions and of boosting rental value optimum satisfactions.

#### Hypotheses

##### Hypothesis 1

$H_0$ : There is no statistical difference between mean conditions of facilities in Tunga and Barkin-sale areas of Minna.

$H_1$ : There is statistical difference between mean conditions of facilities in Tunga and Barkin-sale areas of Minna.

##### Hypothesis 2

$H_0$ : There is no statistical relationship between condition of infrastructure and rental value in study areas.

$H_1$ : There is statistical relationship between condition of infrastructure and rental value in study areas.

#### Research Methodology

The data used includes primary and secondary. The primary data were derived from questionnaires, personal interview and physical observation while secondary data were retrieved from relevant published and unpublished books and articles. A total number of 300 questionnaires were administered to the two neighbourhood under study; that is, 150 for each neighbourhood. A random sampling technique was used to delineate each neighbourhood into six (6) zones along roads and streets within the areas after which a systematic random sampling technique was adopted selecting 25 respondents respectively from each zone from where the 150 questionnaires were derived. Out of the 150 questionnaires administered in each zone, 131 were returned by respondents from Tunga area while 130 numbers were retrieved from Barkin-sale; representing 87.3% and 86.67% responses respectively. Data were analysed using statistical tools such as the Likert scale, mode, and SPSS software from which one-sampled- test, paired sample test and correlate coefficient were used to analyse data. Data presentation was done using descriptive methods and tables.

Analysis of Findings  
Conditions of Facilities in Tunga and Barkin-Sale Areas of Minna

Table 1: Frequency and Sum of Tunga Residents' Responses on the Conditions of Infrastructures in the Neighbourhood

S/N	OPINION	Strongly Agree x5	Agree x4	Undecided x3	Disagree x2	Strongly Disagree x1	Frequency/Sum
1	Pipe borne water supply and distribution within the neighbourhood is very efficient	63 / 315	55 / 220	-	7 / 14	6 / 6	131 / 555
2	The police force has helped to improve security of life & ppty within the neighbourhood	51 / 255	54 / 216	2 / 6	15 / 30	9 / 9	131 / 516
3	There is adequate drainage facility within the area	45 / 225	66 / 264	4 / 12	10 / 20	6 / 6	131 / 527
4	Waste disposal mgt within the neighbourhood is very good	42 / 210	60 / 240	3 / 9	20 / 40	6 / 6	131 / 505
5	There are adequate public & private health facilities within the neighbourhood	51 / 255	60 / 240	6 / 18	9 / 18	3 / 3	129 / 534
6	Conditions of education facilities in the neighbourhood is very good	58 / 290	60 / 240	2 / 6	6 / 12	3 / 3	129 / 551
7	Proximity of religious activities to residence is very reasonable	77 / 385	49 / 196	-	4 / 8	-	130 / 589
8	Electricity supply within the neighbourhood is considerably regular.	64 / 320	32 / 128	6 / 18	12 / 24	10 / 10	124 / 500
9	Accessibility to property in term of major roads & foot paths are very good	54 / 270	51 / 204	8 / 24	12 / 24	5 / 5	130 / 527

SOURCE: FIELD SURVEY, 2009.

Using Likert Scale, opinions were measured through a standardized 5 point response scale ranging from 'Strongly agree' through 'Undecided' to 'Strongly disagree. The result of the total responses frequency and sum is presented in table above.

**Table2: The Sum, Mean and Concensus Opinion of Tunga Residents' Responses**

S/N	OPINION	Frequency	Sum	Mean	Interpretation (Consensus opinion)
1	Pipe borne water supply and distribution within the neighbourhood is very efficient	131	555	4.24	Agree
2	The police force has helped to improve security of life & ppty within the neighbourhood	131	516	3.94	Agree
3	There is adequate drainage facility within the area	131	527	4.02	Agree
4	Waste disposal mgt within the neighbourhood is very good	131	505	3.85	Agree
5	There are adequate public & private health facilities within the neighbourhood	129	534	4.14	Agree
6	Conditions of education facilities in the neighbourhood is very good	129	551	4.27	Agree
7	Proximity of religious activities to residence is very reasonable	130	589	4.53	Strongly Agree
8	Electricity supply within the neighbourhood is considerably regular.	124	500	4.03	Agree
9	Accessibility to property in term of major roads & foot paths are very good	130	527	4.05	Agree

SOURCE: FIELD SURVEY, 2009.

The mean responses were measured on the scale below to arrive at a consensus opinion.

**CONSENSUS SCALE:**

- 1 – 1.50 = Strongly Disagree
- 1.51 - 2.49 = Disagree
- 2.50 - 3.49 = Undecided
- 3.50 - 4.49 = Agree
- > 4.50 = Strongly Agree

Majority of respondents seems to be satisfied with the conditions of facilities in the area. See table 2 above for the consensus opinion.



**Table 3: Frequency and Sum of Barkin-Sale Residents' Responses on the Conditions Of  
Infrastuctures In The Neighbourhood**

S/N	OPINION	Strongly Agree x5	Agree x4	Undecided x3	Disagree x2	Strongly Disagree x1	Frequency/ Sum
1	Pipe borne water supply and distribution within the neighbourhood is very efficient	11 / 55	12 / 48	-	58 / 116	49 / 49	130 / 268
2	The police force has helped to improve security of life & ppty within the neighbourhood	6 / 30	16 / 64	18 / 54	47 / 94	32 / 32	119 / 274
3	There is adequate drainage facility within the area	8 / 40	6 / 24	21 / 63	54 / 108	41 / 41	130 / 276
4	Waste disposal mgt within the neighbourhood is very good	-	18 / 72	6 / 18	65 / 130	32 / 32	121 / 252
5	There are adequate public & private health facilities within the neighbourhood	-	9 / 36	13 / 39	68 / 136	38 / 38	128 / 249
6	Conditions of education facilities in the neighbourhood is very good	5 / 25	21 / 84	-	56 / 112	39 / 39	121 / 260
7	Proximity of religious activities to residence is very reasonable	8 / 40	42 / 168	24 / 72	18 / 36	11 / 11	103 / 327
8	Electricity supply within the neighbourhood is considerably regular.	-	8 / 32	9 / 27	64 / 128	49 / 49	130 / 236
9	Accessibility to property in term of major roads & foot paths are very good	4 / 20	19 / 76	6 / 18	81 / 162	20 / 20	130 / 296

SOURCE: FIELD SURVEY, 2009.

Using Likert Scale, opinions were measured through a standardized 5 point response scale ranging from 'Strongly agree' through 'Undecided' to 'Strongly disagree. The result of the total responses frequency and sum is presented in table 3 above.

Table 4: The Sum, Mean and Consensus Opinion of Barkin-Sale Residents' Responses

S/N	OPINION	Frequency	Sum	Mean	Interpretation (Consensus opinion)
1	Pipe borne water supply and distribution within the neighbourhood is very efficient	130	268	2.06	Disagree
2	The police force has helped to improve security of life & ppty within the neighbourhood	119	274	2.30	Disagree
3	There is adequate drainage facility within the area	130	276	2.12	Disagree
4	Waste disposal mgt within the neighbourhood is very good	121	252	2.08	Disagree
5	There are adequate public & private health facilities within the neighbourhood	128	249	1.95	Disagree
6	Conditions of education facilities in the neighbourhood is very good	121	260	2.15	Disagree
7	Proximity of religious activities to residence is very reasonable	103	327	3.17	Undecided
8	Electricity supply within the neighbourhood is considerably regular.	130	236	1.82	Disagree
9	Accessibility to property in term of major roads & foot paths are very good	130	296	2.28	Disagree

SOURCE: FIELD SURVEY, 2009.

The mean responses were measured on the scale below to arrive at a consensus opinion.

CONSENSUS SCALE:

- 1 – 1.50 = Strongly Disagree
- 1.51 - 2.49 = Disagree
- 2.50 - 3.49 = Undecided
- 3.50 - 4.49 = Agree
- > 4.50 = Strongly Agree

Majority of respondents shows dissatisfaction with the conditions of facilities in the area. See table 4 above for the consensus opinion

**Hypothesis 2:**

**Test of statistical relationship between condition of infrastructure and rental value**

$H_0$ : There is no statistical relationship between condition of infrastructure and rental value in the study areas.

$H_1$ : There is statistical relationship between condition of infrastructure and rental value in the study areas.

**Table 8: Mean annual rental values of residential properties in Tunga and Barkin-Sale areas of Minna respectively (2000-2009).**

Property Type	One-bedroom		Two-bedroom		Three-bedroom	
	Tunga-Minna	Barkin-Sale	Tunga- Minna	Barkin-Sale	Tunga- Minna	Barkin-Sale
2000	N24,000	N14,000	N80,000	N25,000	N120,000	N30,000
2001	N24,000	N14,000	N80,000	N25,000	N120,000	N30,000
2002	N24,000	N14,000	N80,000	N25,000	N120,000	N30,000
2003	N24,000	N16,000	N80,000	N25,000	N120,000	N30,000
2004	N24,000	N16,000	N80,000	N25,000	N120,000	N30,000
2005	N30,000	N16,000	N80,000	N25,000	N120,000	N30,000
2006	N30,000	N16,000	N80,000 – N100,000	N25,000	N120,000 – N150,000	N30,000
2007	N30,000	N16,000	N100,000 – N120,000	N30,000	N150,000 – N180,000	N35,000
2008	N35,000	N16,000	N120,000 – N150,000	N30,000	N180,000 – N200,000	N80,000
2009	N70,000	N40,000	N180,000	N100,000	N200,000 – N250,000	N150,000

SOURCE: Field Survey, 2009.

Rental values of residential properties in Tunga area are significantly higher than those of Barkin-sale. This is as a result of disparities in conditions of infrastructures in the two areas, which has resultant effects on the quality of the environment and the rent commanding in each area.

**Table 9: Correlation of infrastructure and rental value.**

**Correlations**

			VALUE	COND
Kendall's tau_b	VALUE	Correlation Coefficient	1.000	1.000
		Sig. (2-tailed)	.	.
		N	2	2
	COND	Correlation Coefficient	1.000**	1.000
		Sig. (2-tailed)	.	.
		N	2	2

\*\* Correlation is significant at the .01 level (2-tailed).

The result of relationship between value and condition shows that there is significant relationship between condition of infrastructure and rental value at 99 % confidence level. The null hypothesis ( $H_0$ ) is therefore rejected. See table above. This shows that the conditions of infrastructures in a given area have a strong bearing on rental value of property in such area.

### Discussion of Findings

From findings, it was discovered that Tunga area is a medium density area, while Barkin-Sale, though, planned to be a medium density area but already tending towards high density due to increase in population as a result of crowded buildings. There is evidence of violation of planning regulations in both areas, though more evident with greater impacts on Barkin-Sale area. This is due to overstretched of existing facilities in the area. Hence, there is infrastructural decay and environmental quality.

Trends in rental value revealed that similar property in Tunga area commands higher rent than Barkin-Sale; this is due to better conditions of facilities in Tunga area which has helped in the quality of the environment. See **table 8 above**.

The result of the hypothesis revealed significance difference in the mean conditions of facilities in Tunga and Barkin-Sale areas of Minna. Results of correlation coefficient also show there is a significant relationship between conditions of infrastructures and rental value of property at 99% confidence level.

It is therefore very evident that infrastructures has a strong impact on the quality of the environment and is directly related to rent passing on a particular property in a particular local area at a given point in time.

### Conclusion and Recommendations

It is no doubt that infrastructural facilities such as roads, water, electricity & safe disposal of waste play a key role in achieving societal welfare as well as socio-economic and political growth in urban/rural areas. (World bank, 1994). The quality of these infrastructures also enhance the immediate housing environment which in turn determines the rent houses in such environment can command.

In order therefore, to improve the environmental quality and rental value of residential property, the following recommendations were suggested:

- Planning laws and regulations should be strictly enforced in order to curb the activities of illegal developers and to prevent violations of law.
- Government should refurbish deteriorating infrastructures and replacement should be carried out where necessary. Also routine maintenance of infrastructures should be carried out in order to prolong the useful life of facilities.
- Government should enter into more agreements with the private sectors in the areas to improve infrastructural provisions in order to increase the number of facilities on ground to meet the demand of the teeming populations in the areas.
- The residents' should be encouraged to indulge in community services within their areas in order to improve the quality of the environment where they reside.
- Finally, intending investor(s) in housing should first carryout feasibility studies on areas where they intend to site their projects as it would be more profitable to site projects where capital invested can easily be recoup in the shortest possible time. Since infrastructures is a major determinant of environment quality and has a direct impact on rent; then it would be more profitable for investors to get a good location for their projects in order to secure optimum returns from capital invested.

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