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## **EVALUATION OF TRENDS IN RETURNS ON REAL ESTATE INVESTMENT AND INFRASTRUCTURE CONDITIONS INDICES IN ABUJA, NIGERIA**

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### **ABSTRACT**

Functional infrastructure tends to influence returns in the property investment market. This study adopted exploratory research design to evaluate the flow of returns on property investment and infrastructure conditions indices in Abuja between 2012 and 2021. Data were obtained via questionnaire, distributed to real property appraiser firms and residents of the selected neighbourhoods. Random variety technique was adopted to administer the questionnaire to six hundred and eighty two (682) respondents out of which four hundred and eighty five (485) were returned for the analysis representing a response rate of 71%. Descriptive system of data analysis were used, Coefficient of Variant (COV) and Rank-order relationship representation were also used to evaluate the returns on investment in the selected neighbourhoods of Abuja and to establish the indices of conditions bench mark for least suitable standard conditions of infrastructure. Kendall Coefficient of Concordance was applied to weigh up the relationship between the ranked variables. Analysis revealed higher ideal infrastructure conditions indices in Wuse II and Maitama (ranging from 82%-92% and 81%-94%) contrast with stipulated average at 60%, whereas the condition of infrastructure at Kubwa and Lugbe were discovered to be below the normal standard condition. Kubwa and Lugbe property markets in Abuja performed better than Maitama and Wuse on the basis of risk-return ratio analysis and showed reliable market performance while Maitama and Wuse property markets exhibited opposite. Kubwa and Lugbe real estate markets revealed stable market lower risk range of 8%-36%. It was concludes that, neighbourhood facilities play significant weight in influencing the returns on property investment and this calls for better consideration when taking property investment decision.

**KEY WORDS** Infrastructure conditions, Infrastructure index, Investment returns, Property investment, Trends, Urban neighbourhood

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## 1. INTRODUCTION

Infrastructure is the fundamental enabling system that serves neighbourhood, community, town and city for effective urban development. Infrastructure are the services and facilities crucial for economic growth as well as social functionalities of the nation (Tomlinson, 2010). Infrastructure is explained as public "operating cost capital", which includes neighbourhood amenities like potable water, sewage, power, telecommunication, and municipal works such as drainage, bridge, dams, as well as access roads (World Bank Group, 2014). Infrastructure is significantly suitable as yardsticks to measure a mock-up development in urban setting in terms of its economic impact because it plays critical roles in the developmental progression of urban community (World Bank Group, 2014).

According to Ajayi *et al* (2014), Property investment is considered as the real property investment which includes land or a building or both held to earn rentals or capital appreciation at a future date. It could be a purchased or purpose-constructed structure(s) with the intention of earning returns in later date by getting income from the rent or reselling it in future. The real property can be owned by a person or by corporate group of realtors. Ogbuefi (2012) and Ajayi *et al*, (2014) realistically discussed the essential advancement of property investment returns, value indices and yields in determining the performance of investment property in a definite location.

Over 75.5% of the nations of the world that surmount poverty and subsistence economy to a reasonable extent, had an acceptable standard right and access to infrastructure services satisfactorily and consequently shifted from universal scarcity and survival economic height to the expected world economic rank (Tomlinson, 2010). Also, Samjay (2017) opined that, universal infrastructure consists of physical networks of amenities that are basic to the performance of a contemporary

industrial nation. Singapore was ranked first in the world regarding infrastructure development and provision as at 2018 and 2019 while United Kingdom was rated to be leading in the infrastructure project and closely followed UK is Canada with approximate 63.3billion US dollar value for public amenities projects. Samjay (2017) supplementary opinion explained that, in continent of Africa, South Africa is also advancing as regards development of public amenities projects which is estimated at 24.57 billion US dollar contrast to Nigeria that have lesser than 8.605billion US dollar and only in all the State Capitals where the influence of infrastructure projects is being noticed

Most countries in Africa especially Nigeria, the real estate sector is generally cumbered with real estate market formative stage and bedevilled with insufficiency of related and applicable data for investment decisions and analysis (Ogunba, *et al* 2013), as a result, the impact of overseas or foreign investments is not experienced in such underdeveloped real estate markets, irrespective of experiential analysis from many school of thoughts like Oduwaye (2017) which concluded that such markets have potential for encouraging investment performance. Babarinde (2018) gave explanation on the efficacy of human activity that, real estate primarily relies on the availability of adequate and efficient infrastructure and that, functional infrastructure supply value to the realization of sound and physical healthy environment; encourages communal constancy, occupation expertise and self improvement..

In accordance with assertion of McNeil (1998) as substantiated by Dabara (2015), the pre-eminence of urban neighbourhood infrastructure in commercial property investment market can be summarised in the following statement "when infrastructure functions perfectly well, it will increase the productivity and labour; but when reverse becomes the case, the progression of the economic revitalisation can be delayed or even stopped". Many studies

opined that, the proviso of infrastructural facilities in Nigeria as a nation is at low level as affirmed by Iremiren (2001) that a considerable percentage of houses in Nigerian urban centres (up to 34%) have no accessibility to potable water, secured disposal system of wastes, electricity, effectual public health amenities, recreation centre facilities and good motorable access roads and these outstandingly have impact on the returns of investment properties in such areas by causing the problem of low or no inflow of returns of property investment and this a germane rationale upon which this study is carried out. This research was carried out to appraise trends of residential property investment performance in terms of proceeds (returns) as it relates to infrastructure conditions indices in Abuja, Nigeria, between year 2012 and 2021. This will make possible the understanding of the drift of the effectiveness of investing in real property especially in the study area.

## 2. LITERATURE REVIEW

Several submissions and findings from the studies previously carried out gave acceptance to public amenities as the existence line to investment property and also revealed that, it is a focal point to the values embedded in property investment. Quite many of the past studies conceptualised public amenities as determinant factor to return on property investment and accomplished success in weighing-up the influence of public amenities on returns on property investment (Hammer *et al.*, 2000; Mendez, 2007; Alausa 2007). The studies carried out by many authors such as, Olayide 2011; Ajibola *et al.*, 2013) affirmed strong connection between property standard values and public amenities such that the existing level of values relative to property in a selected neighbourhood is due to availability of public amenities (Ajayi *et al.*, 2014). In most of the researches, the values and returns on investment properties were discovered to be low because of poor infrastructure condition (Famuyiwa and Otegbulu, 2012; Gatawa and Murungi, 2015).

The study of Ajibola et al (2013) evaluated the influence of public infrastructure on returns property investment using Unity Estate in Lagos as a case study selected 2003 to 2011 as series year under study. The study adopted expressive analyses and find out that, electricity, potable water and good motorable road are major public infrastructure crucial to returns on real property in Unity Estate. Actually the research is insufficient of inferential verdicts and mock-up in determining the proportion of effect of the infrastructure on returns of property investment. In Olujimi and Bello (2009) the impact of public amenities on the investment in real property in Akure, Nigeria was modeled with data obtained from 189 inhabitant of the neighbourhoods and multiple regression analysis. (MRA) was applied on the data. The outcome indicated that infrastructure tremendously add about 30.5% variations to investment property returns and value

Gatauwa and Murungi (2015) investigated the effect of the development of infrastructure on the returns of investment on real estate in Kenya at Meru Municipal. Nine hundred and fifty five property investments were subjected to analytical model and it was discovered that telecommunication, industrial development, transport, educational institutions were all accounted for eighty nine point three percent (89.3%) average deviation in real estate investment. The research concluded by affirming that, public infrastructural improvement among others factors has effect on the performance of realty investment consequently public amenities availability and functionality actual lead to increase in demand for realty and will definitely influence returns on investment property. Olujimi (2010) assessed the relationship between the public infrastructural facilities and property standards values in Akure, Nigeria, inferential analytical technique was adopted using Pearson's association and regression model to mock-up the effect of housing infrastructure on the residential accommodation prices and values of one hundred and ninety residential accommodations. The step-

wise regression model showed that, security infrastructure such as fence wall is significant facility that enhanced value of property by 33.2%. Consequently, it is discovered that, all the reviewed work and their conclusions hinged on the expected values and returns on investment property relative to physical infrastructure but global standard on investment on real property and participation of commercial real estate investors to estimate the expected returns considering availability of infrastructure, provided a starting point for the research. None of all these researches relatively included the impact of public urban amenities on returns of investment property and none was capable of developing indices on property returns and infrastructure conditions which the effect of infrastructure conditions can be hinged and be adequately taken into consideration in order to serve as a measure for individual and corporate real property investor to determine the trends in return on investments in line with the infrastructure available.

Ian (2012) carried out a study on real estate investment index and residential accommodation investment in Hong Kong. The research aimed at exploring change in prices (values) prospect and assurance of the housing users over time, with the basic and fundamental objectives of generating an independent self-reliance index for residential property investment returns in Hong Kong. The real estate indices developed, made available a predictive platform for realty market performance.

The need for critical investment decision caused by inconsistency and systemic failure in the national economy needs urgent attention to bail out property investors from losing huge capital outlay invested in real estate. Many of the previous studies on property investments were unable to critically investigate the influence of infrastructure on returns but they succeeded in evaluating the effect of infrastructure on property values (Alausa, 2007). Furthermore, some of the existing studies have evaluated the impact of infrastructure on real estate

development with specific interest and attention on residential and commercial properties (Floyd, 2007 and Olayide, 2011).

Shiple (2012) studied the impact of historic designation of infrastructure under heritage legislation on residential property returns. The study is constrained by legislative regulation and not subject to forces of demand and supply under the free-market system, the outcome cannot be generalised and inference cannot be empirically made. This study is basically on demand and supply analytical model relative to current free-market in real estate residential accommodation.

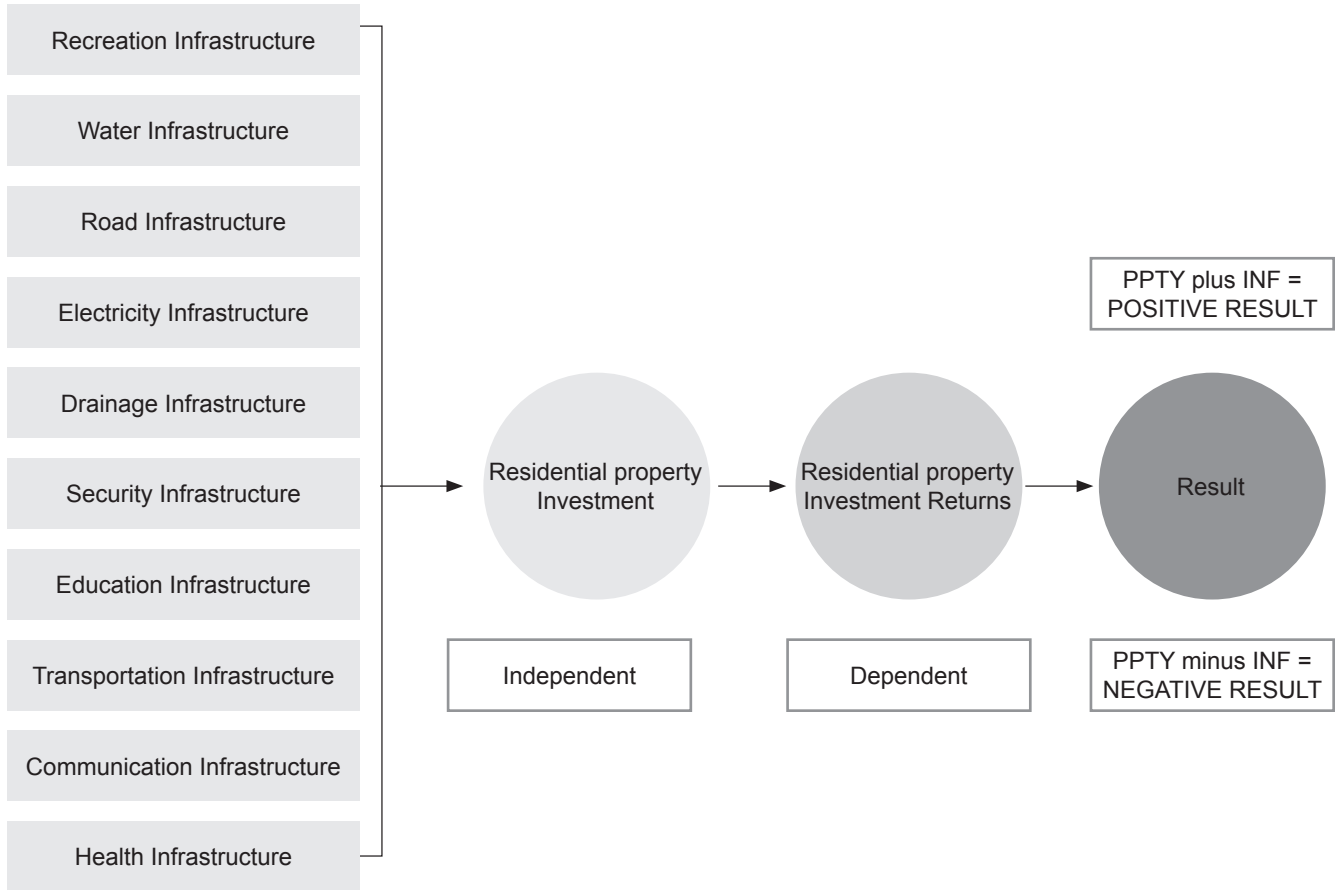
Walter (2009) based his research on the critical study of the association between public amenities and residential accommodation investment values. The research was carried out in Kumash, between 2001 and 2008. The study failed to identify types of infrastructure considered for the study and due to temporary analysis of the study, the result might have become obsolete, this justifies the need for this study.

### 3. RESEARCH HYPOTHESIS

The hypothesis for this study is:

H1: Infrastructure condition has significant relationship with residential property investment returns

**Figure 1: The Relationship between Urban Infrastructure and Realty Investment Sector**



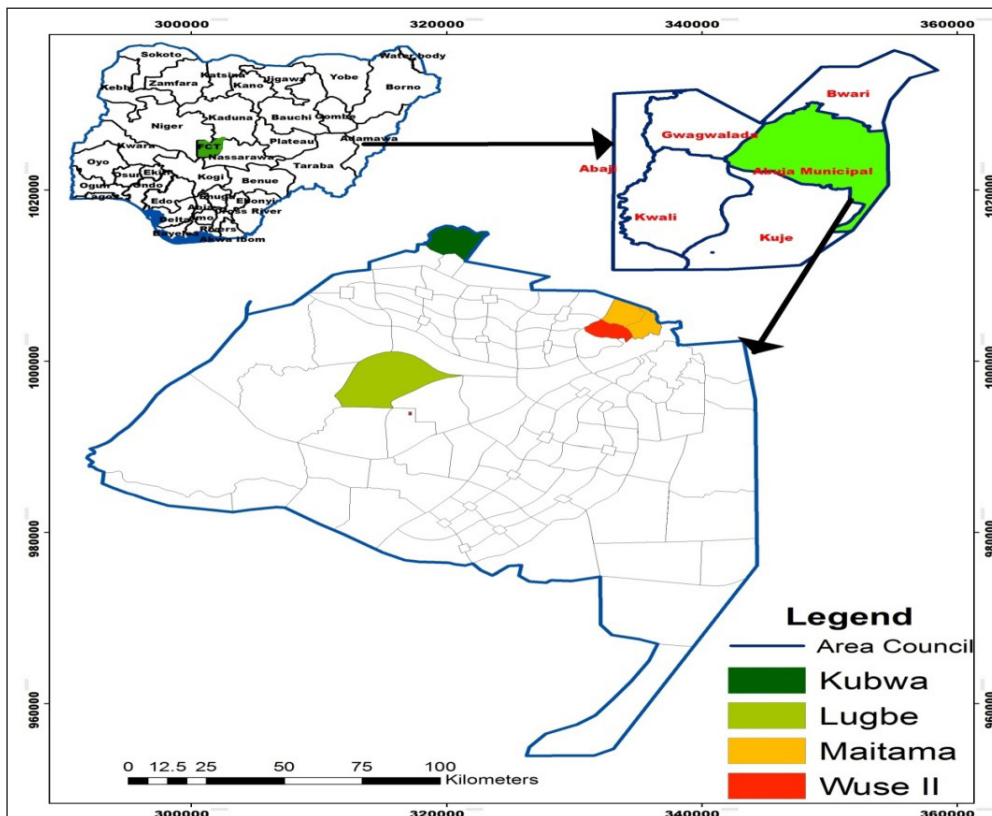
Source: Developed by the Authors

The construction of the study framework above depicts the conceptualisation of infrastructure such as potable water, constant electricity supply, sewage disposal system, security infrastructure, access and motorable road among others and property investment return. Infrastructure serves as self-governing (independent) variable and returns on property investment is reliant (dependent) variable according to Figure 1. Based on the framework, only one hypothesis was formulated and tested and the hypothesis indicates that, infrastructure condition has significant relationship with property investment returns.

### 4. METHODOLOGY

The case study of this research is Abuja; the administrative seat (capital) of Nigeria, with 6 area councils and with 4.6% projected population growth rate annually (2022). Abuja lies on latitude 070 45' 00" N and longitude 070 39' 00" E; in the middle province of the country Nigeria. The economy of Abuja is notably driven by the contribution of both public sector and private sector with enormous investment in real estate especially, residential and commercial properties leading the market. Abuja being the Capital of Nigeria, has functional infrastructure services including a broad range of good and motorable road network. The property investment market of Abuja is encouraging and attractive hence validation for the study and justification for the selection of the study area. The selected districts are: Maitama, Wuse II, Kubwa and Lugbe as shown in Figure 2.

Figure 2: Selected neighbourhoods in Abuja municipality



Source: Federal Capita Development Authority FCDA Cartography Section (2019)

This study adopted exploratory research blueprint and supported with quantitative model and explicitly centered on analytical format which requires the use of dependent and independent variables in line with conceptual formulation that showed the existing association between indices of public amenities condition and returns on property investment. The total number of property investments (PRIs) was generated through the households of the selected neighbourhoods while both the property sales and rental evidence (PSRs) were generated from the sales and rental records under the management portfolio of real estate firms in Abuja.

The sample frame produce was 1,145, by applying Frankfort–Nachmias (1996) model as adopted by Nasidi et al, (2017), the sample size was estimated to be 682 while only 485 were completed, returned and used for analytical computation. The Statistical Package for the Social Sciences (SPSS) was employed to code the data and its entry and analysis. Stratified random case procedure method was adopted for the research questionnaires were distributed to acquire nedded data. Analytical techniques used for the study include descriptive and inferential statistical techniques. Likert scale of 5-point keep-a-tally format (5 = Very Good, 4 = Good, 3 = Fair, 2 = Poor, 1 = Very poor) was lined out for the items and the point of reference for least acceptable order for public amenities infrastructure conditions index (ICI) was extracted through Australian Association of Higher Education Facilities Officers (AAPPA) model as used by Ikediashi, Ogunlana, and Boateng (2014)

The method was in addition corroborated by the introduction of infrastructure condition evaluation table to serve as the starting point for infrastructure condition indices as detailed below:

**Table 1: Condition Rating Standard for Neighbourhood Infrastructure**

Condition of Infrastructure	Description of the Infrastructure	Rating	Condition Index
<b>Very Good</b>	Here there is quality neighbourhood with functional infrastructure, there is absence of pollution and contamination Infrastructure are new and good condition	5	0.00 - 0.19
<b>Good</b>	In this case, minor neighbourhood deterioration noticed, minor maintenance on infrastructure needed as a preventive measure and infrastructure is in good condition.	4	0.20 - 0.49
<b>Fair</b>	The condition of neighbourhood is averagely okay, there are noticeable defects in public amenities, the functionality of infrastructure become erratic and unreliable, gradual degradation of the environmental condition is noticed and elements of pollution will begin show up.	3	0.50 - 0.74
<b>Poor</b>	The neighbourhood is deplorable and the condition deteriorated, there are structural defects on infrastructure, and non functional, the neighbourhood experience contamination and pollution.	2	0.75 - 0.94
<b>Very Poor</b>	Neighbourhood is seriously deteriorated, wild structural problems seen, decayed and non functional infrastructure, contamination and polluted neighbourhood.	1	0.95 - 1.00

Source: Excerpt from AAPP- Australian Association of Higher Education Facilities Officers (updated in 2017)

The Infrastructure Condition Index (ICI) refers to index numeral which points out the existing conditions of the infrastructure in relation to its perfect condition. That is stated below in fomula

## 5. RESULTS AND DISCUSSION

In the context of this study, only 3bedroom and 4bedroom houses were considered. The data are presented and analysed in Tables 2 and 3 and the trend graphically represented in Figures 3 and 4.

**Table 2: 3B/R property investment rate of returns in Abuja**

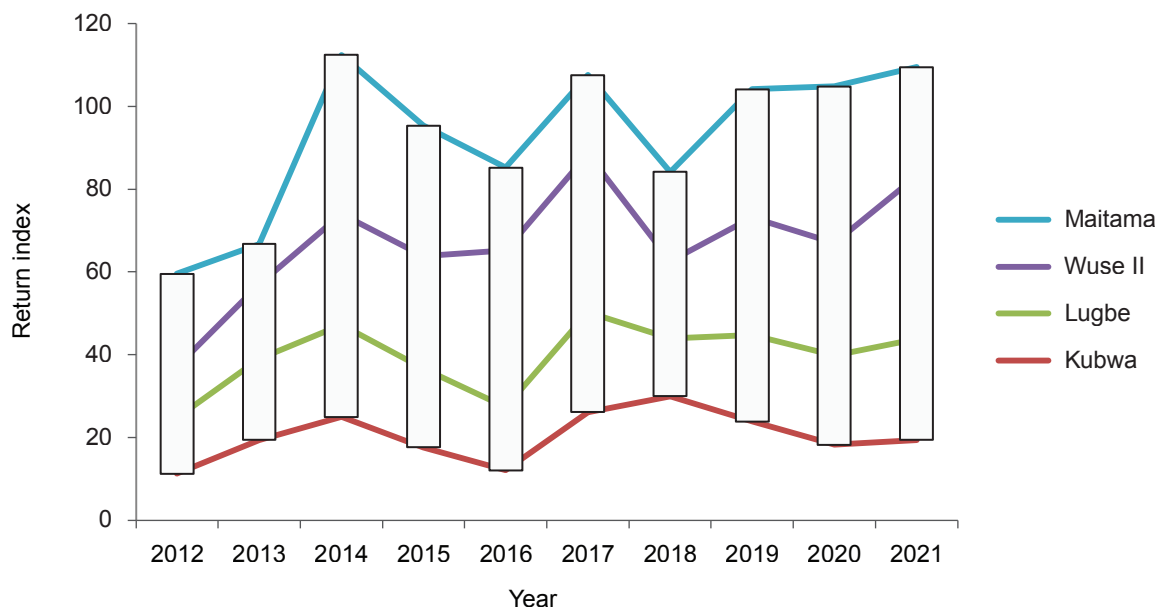
Year	Kubwa	Lugbe	Wuse II	Maitama
2012	13.44	11.24	12.45	22.44
2013	19.60	19.39	18.01	9.79
2014	22.28	24.96	26.72	38.49
2015	19.06	17.60	27.20	31.49
2016	15.26	12.09	37.87	20.02
2017	24.12	26.12	38.28	19.08
2018	29.97	13.97	18.62	21.63
2019	23.87	20.87	28.42	30.99
2020	18.27	21.50	27.24	37.82
2021	19.42	24.44	39.31	26.37
<b>Average Rate of return</b>	20.29	19.45	27.41	25.81
<b>Standard deviation</b>	6.01	4.01	9.19	8.99
<b>Coefficient of variation</b>	0.29	0.21	0.34	0.35

Source: Field Survey (2021)

Table 2 showed double-digit yearly returns rates on 3B/R residential accommodation investments in selected neighbourhoods within the study period indicating good returns outlook and only Maitama in 2013 confirmed a single digit rate which means weak

or low inflow proceeds. Risk profile analysis on property market computed through the use of standard deviation and coefficient of variant to measure risk per unit of the average return. Kubwa property market showed that investor will bear a risk of 29% to have a proceeds of 19.45% on investment, At Lugbe market, property investor will bear risk of 21% to get returns of 19.45% from the investment, In Wuse II market, property investor is bearing a risk of 34% in order to have 27.41% proceeds on the invested capital while in Maitama residential market, the property investor will give in to a risk of 35% to receive the inflow income of 25.81%. In view of this, Lugbe property market is desirable and encouraged property market, because investor will acquire the least and a considerable average return. Maitama residential market indicated a volatile market and is more riskier than other real estate markets in other selected areas

**Figure 3: Trend in 3B/R property investment return index in Abuja**



Source: Field Survey (2021)

The graphical movement in 3B/R property investment performance proceeds in form of returns in the entire study area is represented by Figure 3. Three Bedroom (3B/R) property investment return moved upwardly over the period under study. The Three Bedroom real property market in the study area moved at the same direction over certain period. The trend revealed that, between 2012 and 2015, the returns on property investment for 3B/R moved almost at the same pace, after 2015. Wuse II moved toward the same bearing with Maitama and both overlapped Lugbe and Kubwa property markets. This means that annual change in property investment returns of 3B/R property in Wuse II is faster compared to Maitama, though property investments thrive more in these neighbourhoods than Lugbe and Kubwa. These results are significant as they give suitable guidelines for investors to follow in order to make better real estate investment decision. The results are consistent with those of Ajibola *et al.* (2013) and Tomlinson (2010) where it was found that the returns of property investment centers around the availability of good neighbourhood infrastructure in any location.

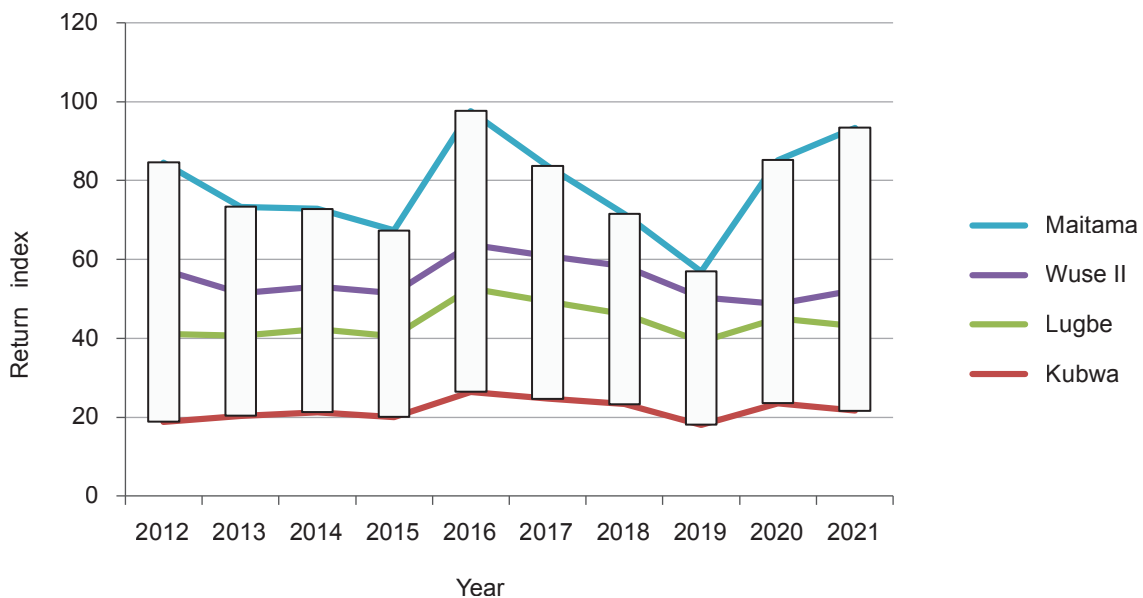
**Table 3: 4B/R property investment rate of returns in Abuja**

Year	Kubwa	Lugbe	Wuse II	Maitama
2012	18.86	18.86	27.21	16.34
2013	20.32	20.32	21.89	10.79
2014	21.27	21.09	19.65	10.80
2015	20.06	20.45	10.88	15.93
2016	26.26	26.44	11.03	33.92
2017	24.69	24.69	11.53	22.80
2018	23.79	22.34	12.08	13.30
2019	18.10	20.98	11.27	6.63
2020	23.54	21.46	3.75	36.42
2021	21.45	21.67	19.08	41.18
<b>Average Rate of return</b>	22.16	21.83	10.75	23.89
<b>Standard deviation</b>	2.65	1.92	3.09	10.87
<b>Variance Coefficient</b>	0.12	0.08	0.29	0.46

Source: Field Survey (2021)

Table 3, showed double digit annual returns over the periods, an indication of attractive returns in the property markets, but Wuse II and Maitama were exempted in 2020 and 2019. Risk analysis for the returns revealed that property investor in Kubwa property market is having a risk of 12% to get 21.83% returns, in Lugbe market, investor is bearing risk of 8% to be able to get 22.16% income flow from the investment. In Wuse II realty investment market, investor takes a risk of 29% to get 10.75% profits on investment while investor in Maitama property investment market undertakes a risk of 46% to get proceed of 23.89% on investment. From Table 3, Lugbe and Kubwa residential markets area adjudged better property market because the investment risks are lower when compared to other property markets in Abuja. Maitama and Wuse II property markets showed high volatility in returns than other property market locations in Abuja.

**Figure 3: Trend in 4B/R property investment return index in Abuja**



Source: Field Survey (2021)

Four bedroom (4B/R) investment property market returns as depicts in Figure 4, moved upwardly over the period of the study. The 4B/R property market in Lugbe and Kubwa moved in the same direction over the period which signified that the market witnessed frequent transactions. Maitama has similar movement from 2012 to 2018 after which there was a decline in 2019 and 2020 respectively due to recession in the Nigerian economy and the advent of COVID-19 which drastically affected the property

investment market. Only Wuse II property market was behind other locations in Abuja. This indicates that the market changed as a result of demand for 4B/R in Wuse II that was the reason for low movement compared to property market in other areas of Abuja. The outcome of this study supports the findings of Olujimi and Bello (2009) that differences in returns on property investment market is influenced as a result of the availability of functional infrastructure within the neighbourhood and that some public amenities have stronger impact on the returns from property investment than others even within the same location.

**Table 4: Analysis of variance (ANOVA) of property returns across the study areas in Abuja**

Market	Source of Variance	SS	Df	MS	F	P-value	F crit
3B/R	Between Groups	470.3934	3	156.7978	2.882826	0.049098	2.866266
	Within Groups	1958.051	36	54.39031			
	<b>Total</b>	<b>2328.07</b>	<b>39</b>				
4B/R	Between Groups	1081.731	3	360.5771	10.41513	0.000	2.866266
	Within Groups	1246.338	36	34.62051			
	<b>Total</b>	<b>2328.07</b>	<b>39</b>				

Source: Field Survey (2021)

The variations in residential in returns of property investment across the property market location in Abuja is represented in Table 4. Three Bedroom (3B/R) residential accommodation investment market revealed considerable difference in the proceeds or returns on property investment in the entire study areas and four bedroom (4B/R) property investment markets also showed significance variance in property returns in all selected neighbourhoods. Variation in preference for neighbourhoods by residential property investors causes differences in property returns performance in the residential property market.

**Table 5: Abuja Infrastructure Condition Index (ICI)**

Infrastructure	Kubwa (Alpha-α @0.77)					Lugbe (Alpha-α @0.79)					Wuse II (Alpha-α @0.86)					Maitama (Alpha-α @0.89)				
	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status
Potable Water supply	157	507	3.23	0.65	Fair	183	615	3.36	0.67	Good	193	886	4.59	0.92	Good	185	854	4.62	0.92	Good
Electricity	157	567	3.61	0.72	Good	183	651	3.56	0.71	Good	193	793	4.11	0.82	Good	185	871	4.71	0.94	Good
Access Motorable Road	157	515	3.28	0.66	Good	183	581	3.17	0.63	Fair	193	795	4.12	0.82	Good	185	864	4.67	0.93	Good
Security Infrastructure	157	471	3.00	0.60	Fair	183	515	2.81	0.56	Good	193	800	4.15	0.83	Good	185	793	4.01	0.80	Good
Drainage System	157	460	2.93	0.59	Good	183	560	3.06	0.61	Fair	193	790	4.10	0.82	Good	185	850	4.59	0.92	Good
Waste Disposal System	157	482	3.07	0.61	Fair	183	585	3.20	0.64	Fair	193	801	4.15	0.83	Good	185	759	4.10	0.82	Good
Relaxation/ Recreation Facilities	157	504	3.21	0.64	Fair	183	621	3.39	0.68	Good	193	794	4.11	0.82	Good	185	745	4.03	0.81	Good
Education Infrastructure	157	463	2.95	0.59	Good	183	512	2.80	0.56	Fair	193	809	4.19	0.84	Good	185	746	4.03	0.81	Good
Health Infrastructure	157	495	3.15	0.63	Good	183	590	3.22	0.64	Good	193	799	4.14	0.83	Good	185	784	4.24	0.85	Good
Street Lighting	157	512	3.26	0.65	Fair	183	610	3.33	0.67	Fair	193	820	4.25	0.85	Good	185	796	4.30	0.86	Good
Valid N (list-wise)	157					183					193					185				

Source: Field Survey (2021)

The hypothesized mean in Table 5 is estimated as  $(1+2+3+4+5= 15/5=3)$ . Any infrastructure in which its mean is higher than average threshold is indicated as infrastructure with an improved state. In view of this, infrastructure under analysis indicated improved condition infrastructure due to their efficiency, except education facilities in Lugbe and Kubwa and security infrastructure in Lugbe. The average mean condition index or hypothesized mean condition benchmark at 0.6 (3/5) for 5-point Likert scale

shown in Table 5 is adopted to find out infrastructure that are in better state, Invariably any infrastructure condition index exceeds 60% (0.60) indicated a improved and better condition index. The condition of infrastructure in Kubwa is between 0.59 - 0.72 (59% -72%), while that of Lugbe is between 0.56 - 0.71 (56% -71%), in Wuse II, ICI ranges between 0.82-0.92 (82% - 92%) and in Maitama, ICI ranges between 0.81 – 0.94 (81%-94%). In addition, this indicates that, the condition of infrastructure in Wuse II and Maitama are better than Kubwa and Kubwa is better than Lugbe respectively.

**Table 6: Test of Association (Link) among the Graded (Ranked) Infrastructure Condition across Abuja**

Neighbourhood Infrastructure	Abuja						W	rs
	Kubwa	Lugbe	Wuse II	Maitama	T1	$\Sigma T12$		
Potable Water	4	3	1	3	11	121	0.753 (0.021)	0.543 (0.035)
Electricity	1	1	7	1	10	100		
Access motorable Road	2	7	6	2	17	289		
Security Infrastructure	8	9	4	8	29	841		
Drainage System	10	8	8	4	30	900		
Waste Disposal System	7	6	4	9	26	676		
Relaxation Facilities	5	2	7	7	21	441		
Education Infrastructure	9	10	3	7	29	841		
Health Infrastructure	6	5	5	6	22	484		
Street Lighting	3	4	2	5	14	196		

Source: Field Survey (2021)

Further analysis of opinion of respondent on level of agreement on condition of infrastructure using Kendall's Coefficient of Concordance (KCC) and Spearman Rank Order Correlation is presented in Table 6. The product of the analytical model Kendall's Coefficient of Concordance (KCC) which by symbol represents (W) at 0.753 discovered a statistical verification of minor relation grading infrastructure condition in the entire study area, while the standard ranking correlation of variables of among the possible pairs of the areas  $rs= 0.543$  signifying a non strong agreement to the current state of infrastructure in the study selected neighbourhoods in the study area. This result thus suggests that, though each neighbourhood has its own weird state, the ranking of the overall factors are fairly related in the study area.

**Table 7: Relationship (Correlation) between Infrastructure and Returns on Property Investment in Abuja (Null or Void Hypothesis Testing)**

Infrastructure	Dependent	N	Correlation	p-value	Status
Potable Water supply	Cumulative return	717	.79*	0.001	Void hypothesis (rejected)
Electricity	Cumulative return	717	.501	0.062	Void hypothesis (accepted)
Access and Motorable Road	Cumulative return	717	.83*	0.000	Void hypothesis (rejected)
Security Infrastructure	Cumulative return	717	.56*	0.013	Void hypothesis (rejected)
Drainage System	Cumulative return	717	.16	0.102	Void hypothesis (accepted)
Waste Disposal System	Cumulative return	717	.79*	0.000	Void hypothesis (rejected)
Recreation Infrastructure	Cumulative return	717	.683*	0.000	Void hypothesis (rejected)
Education Infrastructure	Cumulative return	717	.432	0.231	Void hypothesis (accepted)
Health Infrastructure	Cumulative return	717	.602*	.014	Void hypothesis (rejected)
Street Lighting	Cumulative return	717	.498	.065	Void hypothesis (accepted)

N = quantity (numbers) of properties

Source: Author Analysis 2021

The result of void hypothesis computation (testing) which indicates insignificant relation between infrastructure index and returns on investment is represented in Table 7. Void hypothesis is discarded for 5 infrastructural variable variables at 0.05 significance point (potable water supply, access and motorable road, security infrastructure, waste disposal, recreation facilities and health infrastructure). The outcome of potency of relationship between the index of infrastructure and returns on investment is also indicated in Table 7. There are well-built relationships between potable water and cumulative returns of (0.79) on property investment, between access road, and property return (0.83), security infrastructure and property returns (0.56), between waste disposal and property returns (0.683), health infrastructure and property return (0.602) in the study areas in Abuja. This means that, functional infrastructure variables mentioned above are expected to cause positive and meaningful change in the returns of property investment across the study areas and therefore created correlation model with the realty investment returns in the study areas.

## 6. CONCLUSION

This study has evaluated the dynamic trends in the returns of property investment through improved public infrastructure condition in Abuja, Nigeria and this was accomplished by preparing infrastructure condition indices (ICI) for 10 urban neighbourhood infrastructure namely: drainage system, electricity, access road, security infrastructure, education infrastructure, potable water, recreational facilities, electricity, street light, waste disposal and health infrastructure. The trending property investment proceeds (returns) have captured to a acceptable point, the infrastructure condition index upon which the property investment option is measured. The outcome of the analysis revealed that, in a perfect property investment market, the investment performance is connected to the quality and functional public amenities (infrastructure). This research has validated that infrastructure is one

of the anchors for investment in real estate to be effectively performed and generated expected results since it offers considerable property investment market viability in terms of proceeds from investment in the study areas of Abuja. Thus, the result of the research also implies that infrastructure influences the inflow of returns on the investment in real estate in a perfect property market. As a result of this, there is need for the adequate and good infrastructure development project to advance property investment returns and to make it sustainable. This is achievable through Public Private Partnership (PPP) programme, adoption of little or low maintenance cost concept and planned maintenance schedules. This PPP should be wholly adopted and zealously supported by strong government policy on infrastructure as this will preserve the available infrastructure and sustaining the existing ones.

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