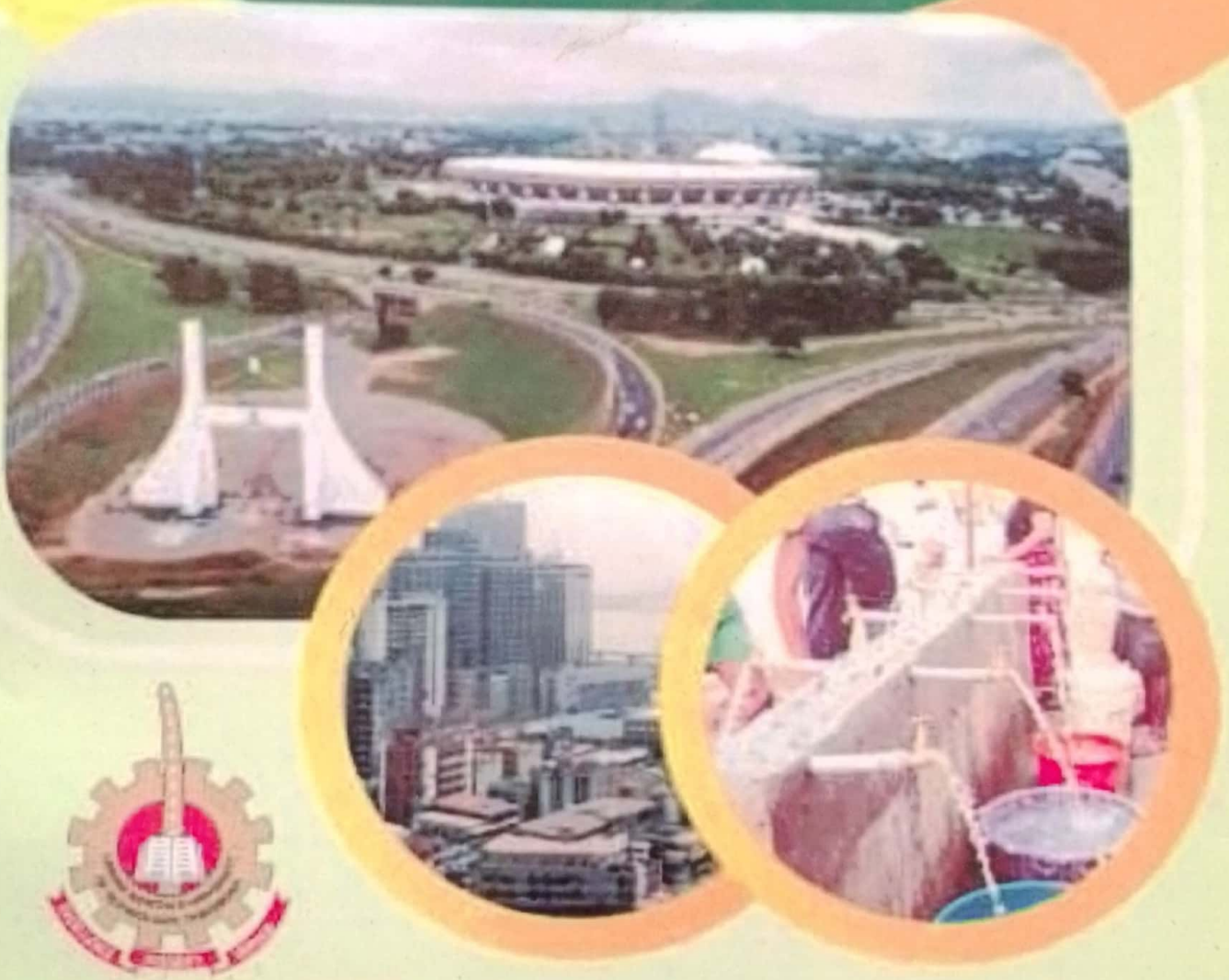
PLANNING AND MANAGEMENT OF SUSTAINABLE INFRASTRUCTURE DEVELOPMENT IN NIGERIA



A Book in Honour of

Professor Nurain Bolanle Tanimowo

Edited By

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CHAPTER THIRTY ONE

EVALUATION OF THE INTERPLAY BETWEEN URBAN INFRASTRUCTURE CONDITIONS AND RESIDENTIAL PROPERTY INVESTMENT RETURNS IN ILORIN, NIGERIA

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ABSTRACT

A weighty indicator of the neighbourhood quality is infrastructure and as one of the pointers that determine class of neighbourhood it creates standing-points for the returns on real estate investment. This paper therefore evaluates the interplay between public infrastructure conditions and residential property investment return in Ilorin with particular focus on standard two and three bedroom apartments in Adewole Housing Estate, GRA, Fate-Basin and Sabo-Oke neighbourhoods of Ilorin metropolis. Data were collected from Estate Surveyors and Valuers as well as residents of the selected neighbourhoods via structured and administered questionnaire using systematic random sampling technique with the sampled size of 287 and only 169 questionnaires were returned. Simple descriptive mean statistical method was adopted to determine standard deviation as well as coefficient of variation. Ranking method was used to determine infrastructure index with bench mark for minimum acceptable condition adopted. Kendall Coefficient of Concordance was also used to test relationship among the ranked factors. The study

revealed that, Adewole Housing Estate, Fate-Basin and Sabo-Oke maintained a single digit, indicating low performance when placing on average, property investment in GRA stands a risk of 22%, and 62% to have returns of 9.49% and 12.38% for two and three bedrooms respectively. The infrastructure condition indices in GRA is higher than ideal condition index and is better than other selected locations, and it was recommended that provision, rehabilitation and maintenance should be embarked on in earnest to enhance social life and better property performance within the areas

Keywords: Neighbourhood, Infrastructure, Property investment and Return.

INTRODUCTION

Infrastructure facilitates a place or neighbourhood's progress towards a better living. It is the great enabler of economic growth and better living condition. Tomlison (2001) declared there is no country in the world that had success with fighting poverty and moving away from a subsistence economy without a rising share of the population having access to infrastructure services. (Alausa *et.al,* 2007 and Aigbokan 2009) described infrastructure as fundamental facility and system that serve a city as well a neighbourhood to function effectively. Infrastructure in this context includes housing, electricity, pipe-borne water, drainage, waste disposal, roads, sewage, health, education and telecommunications among others to mention but a few. Ajayi *et al* (2014) affirmed that, investors in other forms of investment like shares and stock are pre-occupied with trends in daily income flow; so also, do real estate investors pursue returns generated by property. According to Bello *et al* (2006). Infrastructure as one of the indicators of urban economy creates the platforms upon which the return on real estate investment stands. (Amenyah 2013) opined that, all over the world, infrastructure is among one of the significant

pointers of real estate investment development because, it has the capability to attract returns on investment for corporate earnings and increase the value for the purchasing power of the real estate investors according to and more than 29.7% boosts of the economy in the majority of the European countries are from the real estate investment which is actually supported with daunting infrastructure (Mendez, 2007) further explained that, the workability of any economy undoubtedly comes from the good combination of ideal property investment and functional infrastructure.

STATEMENT PROBLEM

The residential property investments returns cannot be regarded as being sustainable as long as there is occurrence of the inherent problem of inadequate and functional deficiency in neighbourhood infrastructure (Bamgbe 2007) stated that, returns on residential property investments are affected by inadequacy of quality infrastructure. Several attempt had been made by public and private property investment sectors to ameliorate the problem of low or no returns in property investment in urban and peri-urban neighbourhoods in some of the cities in Nigeria, but they are still plagued with the predicament of lack and non-functionality of infrastructure as a result of bad condition (Ajibola *et al.*, 2013, Corgel, 1998 Dimis 2000). This study explored the motive behind the above problem which is a course for action and also answered the question of the development of residential investment property returns indices that does not take into consideration the condition of infrastructure indices on the residential property.

AIM AND OBJECTIVES

The targeted goal of the study is to evaluate the interaction between neighbourhood public infrastructure condition and return on residential

property investment. To achieve the set goal, the conditions of the available infrastructure were examined and trends in return on residential property investment was also assessed and focused was mainly on residential properties meant for investment purpose and functional neighbourhood infrastructure.

STUDY AREA

Ilorin is the capital of Kwara State, lies on Latitude 8^0 28'N and Longitude 4^0 33'E in the North Central Nigeria. Being the state capital it is populated more than any other city in the state, Ilorin is experiencing remarkable growth in real estate development and property investment is becoming increasingly attractive. Ilorin is blessed with basic infrastructure required of a city and there is room for more as the city expansion is taking place on daily basis. Property (NIEVS Kwara State Branch, 2017)



Figure 1 Selected Neighbourhoods in the Context of Ilorin Metropolis

Source:Kwara State Town Planning and Development Authority Cartography Section, (2018)

REVIEW OF LITERATURE

Investment's efficiency among others is a function of the return, risk and total cost of an investment management structure and this are subject to the infrastructure functionality and other constraints within which investors must operate (Dubben and Sayce 2009) and investment efficiency should be considered as a combination of financial efficiency and non-financial efficiency.

Zakout (2006) stated that infrastructure is important to attain adequate housing and good quality of life for individuals especially in the construction of low cost housing and therefore urban infrastructure should be classified into Basic Infrastructure Components and Supportive Infrastructure Components. According to (Hargitay 2003), supportive infrastructure includes all services which are considered to be supportive to the lives of the residents, but not necessary essential for their basic wellbeing. Supportive infrastructure components include one or more of the following service facilities: parks and green areas, schools, health centre, worship area, public market and public service buildings.

Aigbokan (2002) further states that public infrastructure does three things: first it provides services that are part of the consumption bundle of residents; secondly large-scale expenditures for public works increase aggregate demand and provide short-run stimulus to the economy; and the third is, it serves as an input into private sector production, thus augmenting output and productivity.

The concept of infrastructure by Aigbokan (2002) was objected, because it based only on the economic perspectives, but, infrastructure is to be seen beyond the economic angle as it prominently covered large vacuum in the physical and social aspect of life of individuals, government and corporate

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organisations. It can then be established here that infrastructure has grown in popularity. It is the basic physical and organisational structures needed for an economy to function.

Ajayi (2014) asserted that property investment is the act of laying out capital in expectation of future return.. Further explained that the anticipated reward from property investment may be in form of an income flow (rent) or by the receipt of a single capital sum (sale) or a combination of both; and that investment may not guarantee returns and it may not involve the investor in furthering action to obtain returns.

According to Ogbuefi (2002), investment can be seen as parting with present capital in return for future income. Essentially the primary purpose of investment is the future income. The income an investor expects from an investment can take two basic forms: income earned in form of interest, dividends and profits realized from appreciation in value and rents from the investment. (Ogbuefi 2002) classified investment into two: financial assets and non-financial assets and (Kuye 2008) also classified investment into real investment and financial investment.

Investment, as indicated by Olujimi and Bello (2000) is expenditure of an existing capital sum in anticipation of future benefits. If the benefits are measured in monetary term it may be in form of annual income if the investment is retained; or profit on the sale of such investment. For the analytical purposes, the return of benefits from most property investments is measured in monetary terms.

Corgel *et al.* (1998) asserted that infrastructure projects abandonment would always affect property investment values in the vicinity. Infrastructure, such as

water, energy, roads development, transport networks, information, and communication technology for sustainability and these urban services also positively influence the value of real estate as they improve housing conditions and quality (Famuyiwa and Otegbulu, 2012).

(Olujimi 2009 and 2010), whenever infrastructure is inadequately provided, the probability that the expected sustainable real property return will dwindle is very high. Real estate has no value if it has no infrastructure service to effectively support (Ajibola *et al.*, 2013). (Adebayo (2006); consequence upon the study carried out adopted inferential concept of data analysis substantiated it with analytical tool of hedonic regression model, (Boye 2000 and 2001) asserted that, an existence of profound relationships between property returns, economic development and infrastructure development such that the prevailing level of collective property returns in a neighbourhood at a particular point in time is function of factors range from physical, social and economic infrastructure services..

METHODOLOGY

The study adopted the approach that revealed the effect of infrastructure conditions on property investment returns across the selected areas and experimental research design was adopted. The data was sourced primarily from registered estate firms and residents of the selected neighbourhoods, systematic random sampling technique was employed and sample size was quantitatively determined using the model developed by Frankfort Nachmias (1996) to arrive at 287 sample size and only 169 questionnaires were returned. Analytical techniques such as Descriptive and Inferential methods of data analysis were used; Descriptive Mean was adopted as analytical tool. Ranking method of data analysis (Likert Scaling) was used and bench mark for

minimum acceptable standard of condition for infrastructure index was adopted and Kendall Coefficient of Concordance was applied to test relationship among the ranked factors. Spearman's Rank Order Correlation was also used to determine the relationship between neighbourhood infrastructure condition and residential property investment returns in Ilorin

RESULT AND DISCUSSION

Table 1: Rate of Returns of Two Bedroom (2B/R) Residential Properties in Ilorin

Year	GRA	Adewole Housing Estate	Sabo Oke	Fate Basin
2009	13.04	6.80	7.98	6.67
2010	10.62	7.07	7.53	6.79
2011	9.39	6.62	7.19	5.29
2012	11.81	7.96	7.66	8.89
2013	11.29	7.24	6.72	6.89
2014	11.50	6.75	7.19	5.75
2015	15.23	3.58	2.79	5.47
2016	19.15	3.49	5.00	3.11
2017	9.12	9.49	8.61	4.90
2018	8.31	8.23	20.21	6.88
Average Rate of return	9.95	6.72	8.09	6.07
Standard deviation	2.22	1.89	4.57	1.54
Coefficient of variation	0.22	0.28	0.57	0.25

Source: Author's Field Survey (Computed from the Parent Data collected from the Field)

The result of trends analysis of Two Bedroom (2B/R) property returns presented in the above Table 1revealed that Government Reservation Area (GRA) maintained double digits over certain period indicating a better performance on the basis of average, while Ademole Housing Estate, Sabo-Oke and Fate Basin maintained a single digit indicating a low performance. In

Government Reservation Area (GRA) residential markets revealed that an investor is undertaking a risk of 22% in order to have 9.94% return on investment, in Adewale Housing Estate residential market, an investor is undertaking a risk of 28% in order to have 6.72% returns on investment. In Sabo Oke residential market, an investor is undertaking a risk of 57% in order to have 8.09% return on investment and in Fate-Basin residential market, an investor is undertaking 25% risk in order to have 6.07% Therefore Sabo-Oke residential market is considered preferable to other residential property market, because investor will take the minutest risk at comparable average return

Table 2: Rate of Returns of Three Bedroom (3B/R) Residential Properties in Ilorin

Year	GRA	Adewale Housing Estate	Sabo Oke	Fate Basin
2009	10.83	6.18	6.07	6.17
2010	10.32	6.60	6.56	6.60
2011	7.45	6.26	6.24	6.24
2012	9.96	6.25	6.17	5.19
2013	10.61	6.41	6.32	6.19
2014	10.38	6.62	6.63	6.23
2015	7.62	5.51	5.09	6.52
2016	9.234	5.21	6.42	4.88
2017	13.62	6.51	6.42	5.55
2018	33.83	7.32	15.12	6.40
Average Rate of return	12.39	6.28	7.11	5.99
Standard deviation	7.73	0.59	2.85	0.59
Coefficient of variation	0.62	0.09	0.40	0.10

Source: Author's Field Survey (Computed from the Parent Data collected from the Field)

The analysis of trend in Three Bedroom (3B/R) property returns presented in the Table 2 above showed that property market in GRA maintained double digit rate of return over the period except in 2011 and 2015 showing a better market, but Adewole Housing Estate, Sabo-Oke and Fate-Basin operated on single digits rate of return thereby indicating low performance on the basis of average. In GRA residential markets revealed that an investor is undertaking a risk of 62% in order to have 12.38% return on investment respectively, in Adewale Housing Estate residential market, an investor is undertaking a risk of 9% in order to have 6.28% return on investment, In Sabo Oke residential market, an investor is undertaking a risk of 40% in order to have 7.10% return on investment and in Fate-Basin residential market, an investor is undertaking 10% risk in order to have 5.99% Therefore Adewale Housing Estate residential market is considered desirable and better residential market.

Table 3: Analysis of Variance in Residential Property Investment in Ilorin

Market	*Source of Variation*	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
	Between	1281.11		427.037	0.78693	0.50910	2.86626
2B/R	Groups	3	3	8	9	8	6
	Within	19535.6		542.657			
	Groups	5	36	1			
	Within	19535.6		542.657			
	Groups	5	36	1			
3B/R	Between	5837.47	3	1945.82	2.65497	0.06313	2.86626

n,	4		5	7	5	6
Groups						
Within	26384.2		732.896			
Groups	9	36	8			
		32221.7				
	Total	6	39			

Source: Author's Computation, 2018

The result of variation in returns on residential properties investment presented in table revealed that variation in returns on residential property investment across the markets in Ilorin is not statistically significant since p-values across the markets are less than 0.05 level of significance. This further points out that, returns on property investment are not significantly different across the selected areas, this insignificance is attributed the same nature and condition of infrastructure across the selected neighbourhoods the implication of this finding is that the selected areas are not viable area of property investment.

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Table 4: Infrastructure Condition Index (ICI) in Ilorin

Infrastructure	GRA (Alpha-α @0 80)					Adewole Housing Estate (Alpha-α @0 76)					Sabo Oke (Alpha-α @0 85)					Fate Basin (Alpha-α @0 88)				
	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status	N	Sum	Mean	ICI	Status
Water supply	153	651	4.25	0.85	Good	163	480	2.94	0.59	Fair	189	700	3.70	0.74	Fair	159	584	3.67	0.73	Fair
Electricity	153	643	4.20	0.84	Good	163	530	3.25	0.65	Fair	189	677	3.58	0.72	Fair	159	530	3.33	0.67	Fair
Access Road	153	591	3.86	0.77	Good	163	498	3.06	0.61	Fair	189	750	3.97	0.79	Good	159	556	3.50	0.70	Fair
Security Infrastructure	153	655	4.28	0.86	Good	163	542	3.33	0.67	Fair	189	690	3.65	0.73	Fair	159	656	4.12	0.82	Good
Drainage System	153	684	4.47	0.89	Good	163	503	3.09	0.62	Fair	189	597	3.16	0.63	Fair	159	621	3.91	0.78	Good
Waste Disposal	153	652	4.26	0.85	Good	163	504	3.09	0.62	Fair	189	673	3.56	0.71	Fair	159	593	3.73	0.67	Fair
Recreation Facilities	153	596	3.90	0.78	Good	163	499	3.06	0.61	Fair	189	618	3.27	0.65	Fair	159	585	3.68	0.74	Fair
Education Infrastructure	153	649	4.24	0.85	Good	163	524	3.21	0.64	Fair	189	658	3.48	0.69	Fair	159	574	3.61	0.72	Fair
Health Infrastructure	153	646	4.22	0.84	Good	163	499	3.06	0.61	Fair	189	677	3.58	0.72	Fair	159	642	4.04	0.81	Good
Street Light	153	650	4.25	0.85	Good	163	519	3.18	0.64	Fair	189	766	4.05	0.81	Good	159	596	3.74	0.75	Good
Valid N (list-wise)	153					163					189					159				

Authors' Field Survey 2018

ICI = Infrastructure Condition Index

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The above table showed the descriptive analysis of Liker Scale employed on five-point scale of measurement to establish the mean condition of infrastructure. The study carried out the test of reliability through Cronbach's Alpha and the result revealed that there is high degree of internal consistent among the variables. The result showed that at minimum acceptable alpha at 0.75 (75%), all the items across the study areas maintained high level of internal consistency at 80%, 76%, 85% and 88% for GRA, Adewole Housing Estate, Sabo-Oke and Fate Basin respectively. The hypothesized mean or benchmark is calculated as (5+4+3+2+1= 15/5=3). Also any infrastructure with mean condition higher than average threshold is referred to as infrastructure with a better condition.

The average mean condition index index (Benchmark) at 0.6 (3/5) for five – point Likert Scale Infrastructural condition index in GRA ranges between 0.77 and 0.85 (77% and 85%), in Sabo Oke infrastructure condition index (ICI) ranges 0.59 and 0.64 (56% and 71%), In Fate Basin, ICI ranges between 0.63 and 0.81 (63% and 81%) and in Adewole Housing Estate, ICI ranges between 0.67 and 0.82 (67% and 82%). This further advocates that infrastructure condition in GRA and Adewole Housing Estate are better than Fate-Basin and Fate-Basin is better than Sabo Oke.

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Table 5: Test of Relationship among the Ranked Infrastructure Condition in Ilorin

Infrastructure	Ilorin							
	GRA	Adewole H E	Sabo Oke	Fate Basin	T_1	$\sum T_1^2$	W	r_s
Water supply	4	7	3	5	19	361		
Electricity	7	2	5	8	22	484		
Access Road	9	6	2	7	24	576		
Security Infrastructure	2	1	4	1	8	64		
Drainage System	1	5	9	3	18	324	0.771	0.505
Waste Disposal	3	5	6	5	19	361	(0.021)	(0.058)
Recreation Facilities	8	6	8	6	28	784		
Education Infrastructure	5	3	7	6	21	441		
Health Infrastructure	6	6	5	2	19	361		
Street Light	4	4	1	4	13	169		

Author's Computation, 2018

The relationship among the ranked infrastructural variables using Kendall Coefficient of Concordance (W) to test relationship among the ranked factors and spearman's rank order correlation to test the level of agreement toward infrastructure condition. The result of significant test relationship was examined using Kendall's Coefficient of Concordance (W). The result revealed that W = 0.771 shows a statistical proof of a rational relationship in the ranking of the infrastructure condition across the study area in Ilorin, while the average rank correlation of variables between all possible pairs of the areas $r_s = 0.505$ indicating a weak agreement to the condition of infrastructure across the study areas. By implication this indicates that, each neighborhood has its own irregularity when it comes to conditions and notwithstanding the overall ranking of these factors across the study area are fairly associated.

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Infrastructure facilities condition index in GRA, Fate Basin and Sabo Oke are found to be higher than ideal condition index of 60% bench mark by international standard at 77% -85%, 67%-82% and 63% - 81% respectively, but few are found below benchmark. Property investment in Fate Basin is the most performed property market at minimum risk return ratio analysis. GRA showed high level of volatility by have the highest risk return ratio at a given comparable returns.

RECOMMENDATIONS AND CONCLUSION

There is need for quality and adequate provision of neighbourhood infrastructure for residential property investment returns' sustainability.

The infrastructure across the neighbourhood found not properly maintained. Therefore, planned and unplanned maintained schedule should be employed fully supported by infrastructure policy Performance of residential property investment is influenced by quality sustainable infrastructure therefore, investors should be provided supporting infrastructure that will enhance performance of residential investment at low maintenance cost.

This study provided a statistically significant effect on property investment performance in the Nigeria. The result of the study has shown that return in an ideal residential property investment is hanged on the quality of infrastructure condition.

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