URBAN INFRASTRUCTURE DEVELOPMENT: AN EXAMINATION OF IMPACT OF SITES AND SERVICES SCHEMES IN IBADAN

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ABSTRACT

Sites and Services Scheme (SSS) is a concept designed to provide affordable land for residential purposes through provision of infrastructure in urban areas. However, evaluation of such initiative impact on infrastructure development in Ibadan remains un-examined in urban research field. This study, therefore, considered 53 existing Sites and Services Scheme, that is, government reservation areas (GRAs)/estates in the eleven local government areas of Ibadan. In an attempt to drive home reliable and efficient results that could help inform government urban development policies the researcher employed simple random sampling technique to select 14 top-notch officials as heads of administrative staff in housing-related departments of institutions dealing with SSS in Ibadan Land. A well-structured questionnaire instrument was administered among the selected top officials with oral interview conducted among them. The researcher utilized robust techniques such as Orthogonal Varimax version of Principal-Component Factor Analysis, Correlation and Simple Linear Regression to arrive at important findings. The findings of the study revealed that there is positive and significant correlation between site and services scheme and urban infrastructure development. More importantly, the findings indicate that SSS has significant positive impact on infrastructure development in Ibadan and that for every increase in SSS urban infrastructural development increases approximately by 1. The study affirmed that SSS positively aid infrastructure development in urban areas such as Ibadan city. Sustainable financial plan with strict implementation subject to periodic review from time to time and adequate funding must therefore form the basis of new development.

Keywords: Ibadan, Impact, Infrastructure, Provision, Sites and Services Schemes,

INTRODUCTION

One of the principal goals of policy making in urban areas is to increase public satisfaction with city services (Aberbach and Walker, 1970). This simply means city administrators must always strive to achieve efficiency of public infrastructure at all times. However, this is not the situation in many Nigerian towns and cities that developed, before the arrival of colonial masters, without any master plan to serve as guide for orderly growth. As a result of this deficiency, there is haphazard development that creates chaotic urban environments, devoid of basic infrastructure such as water supply, electricity supply, motorable road network, drainage system, and sewerage system among others (Bello et al, 2014 and Olaniran and Yusuff, 2016).

Inefficient regulation of urban land delivery system in third world countries, of which Nigeria is one, also created and sustains dual land markets – formal and informal. This dual land markets became apparent in Nigeria after the promulgation of Land Use Act (formerly Decree) in 1978 (Federal Government of Nigeria (FGN), 1990). Since formal land market system is grossly inadequate to deliver required plot numbers for all competing uses – residential, commercial, industrial, public infrastructure, educational, recreational etc, majority of urban inhabitants resort to informal land market which aggravates ribbon development of urban landscape in the affected countries including Nigeria (Olaniran and Ashaolu, 2017).

Moreso, Oladokun et al, (2013) asserted that the importance of infrastructure and services in achieving efficient and effective functioning of cities and towns among others was paramount issue leading to the political declaration made at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa.

It is against this background, that sites and services scheme had earlier been recommended as a means of supplying adequate serviced residential plots with provision of services such as water, electricity, drainage, road network etc (Ajanlekoko, 2001 and Oladokun et al, 2013). Although, it could be deduced that the provision of infrastructure in urban centres is secondary to the main aim of sites and services scheme, it is apparent that the scheme aids urban infrastructure development (Olaniran and Ashaolu, 2017). It is, therefore, necessary to examine the impact that sites and services scheme has on provision and maintenance of the purported services in the study area.

The following questions are significant in such a study. Are there sites and services schemes in urban area? Which services are provided in the various schemes? What is the correlation between sites and services schemes and development of urban infrastructure in the study area?

Consequently, the aim of this study is to examine the level of provision and maintenance of infrastructural facilities in sites and services schemes in Ibadan Land with a view to determining the impact that the schemes had brought upon the development of urban infrastructure therein. The following objectives were pursued to achieve the aim. To identify sites and services schemes in the study area and to find out public services provided therein and their present conditions.

The appropriateness of Ibadan for this study could not be over-emphasized because the city became urbanized long before the advent of the colonial masters in the country and has

metamorphosed to different stages of development and administration with expansion in size, population and infrastructure provision and maintenance (Olaniran, 2012).

The paper is structured as follows. The first section is this introduction followed by literature review. Next to this are research methods, data analysis, discussion of results and conclusion.

LITERATURE REVIEW

The agrarian and industrial revolutions of the eighteenth and nineteenth centuries respectively triggered the growth of urbanization which has been sustained till date (Olaniran, 2012). The amenities afforded by urban centres are very attractive and serve as pulling factors that continue to draw people from hinterland to the urban centres across the world (Pinhero 1993 and Olaniran, 2006).

Thus, urbanization and urban population are rising rapidly especially in Nigeria and indeed all Africa that at present seem to exhibit inability to cope with enormity of the various challenges emanating from pressure being exerted on the fragile urban resources especially housing and infrastructure (Gonzalez-Navarro and Quintana-Domeque, 2010).. Funding is inadequate, technical know-how is lacking and enduring policy has not evolved to tackle the challenges. Couples with these enumerated shortages are low per capita income or persistent poverty and uncontrollable corruption.

One of the basic needs of man is housing, demand for which has continued to outpace its supply leading to rapid demand for residential land, among complementary but competing uses, within and at the peripheries of urban centres. Apparent result of unmet and ever-growing housing demand is rapid expansion of cities beyond their territorial boundaries. The competing uses include public services such as schools, roads and recreational facilities, parks, hospitals, drainage system, electricity and water supply among others. They are provided with a view to creating an attractive, functional and comfortable place for urban residents to live, train, work, trade and play.

As urban population bloated and land ownership and distribution became distorted majority of urban dwellers and governments could not access residential land and land for public use respectively across the globe. This led to unplanned or ribbon development of land in the urban periphery (UNESCAP, 2000, Aluko and Amidu, 2003 and Ansari and Von Einsiedel, 1998). Couple with this is the fact that most Nigerian urban centres including Ibadan developed haphazardly without master plans (Bello, et al 2014 and Olaniran and Yusuff, 2016).

Thus, housing conditions as well as neighbourhood environments have been worsening in urban areas as a result of non-availability and efficiency of facilities and utilities such as water supply, road construction, sanitation, sewage, electricity and social amenities (Mwangangi and Simiyu, 2014). A great proportion of Nigerian populations live in substandard and poor houses and in deplorable, unsanitary residential environments (Ademiluyi, 2010 and Olaniran and Ashaolu, 2017).

This problem prompted UN-HABITAT in 1976 to recommend public management and control of urban landscape (UN HABITAT, 1976). The two relevant objectives of the recommendation here are empower government to ensure a more judicious, orderly and easier access to land for public and private land development of urban areas and guarantee cheaper and easier access to land for both public and private land development. In a table of a multi-scale framework for sustainable housing policies, provision of serviced land for housing is recommended (UN-HABITAT, 2011).

Consequently, the Federal Government adopted Sites and Services Programme in 1986 as a viable means of increasing supply of serviced plots at affordable costs in order to achieve housing delivery. The aim of the programme was to create easy access to develop land, which had for long hindered home ownership. The programme involves the provision of serviced land for housing development and other activities in a well-laid out and planned environment. Such services include roads, drains, water supply, electricity and other municipal services (Ajanlekoko, 2001).

The 36 states of the federation and Federal Capital territory – Abuja as well as many local governments have embraced the programme in their various jurisdictions. For example, in Ibadan all levels of Government that is, Federal, State and Local, design and manage SSS with Oyo State Ministry of Lands, Survey and Physical Planning in the central stage. Others include the Federal Ministry of Land, Housing and Urban Development, Oyo State Housing Development Corporation, Estate and Town Planning Departments of various Local Governments and Ibadan Local Governments' Properties Company Limited.

There were 14 institutions charged with the responsibility of managing and administrating land for residential purposes in the city of Ibadan. They had 53 sites and services schemes, all together, across the Ibadan Land as at the time of this study. The schemes were at their different stages of development. Ibadan Metropolis has therefore benefitted immensely from this scheme.

In conformity with necessity of decent and affordable housing in urban centres, is the provision and maintenance of infrastructure (Ogu, 2009, Bello et al, 2014 and Olaniran and Ashaolu, 2017). Oladokun et al, (2013) asserted that the importance of infrastructure and services in achieving efficient and effective functioning of cities and towns among others was paramount issue leading to the political declaration made at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa.

As intense as importance of provision and maintenance of infrastructure is to housing and environment conducive to man's comfort couple with the fact that sites and services scheme began in Ibadan in 1903 with Dugbe commercial layout and Agodi GRA and the city has as many as 53 schemes (Olaniran, 2012), it is therefore apposite to give Ibadan a chance of this study.

It is pertinent and orderly in undertaking study of this nature in any urban area to examine and understand the geographical terrain of the study area. This study therefore leans on the spatial perspective used by Ogu, (2009) to discuss the morphological zones of Benin City. Ibadan, just like Benin City and other older cities and towns in the country, developed before the advent of

colonial masters who came to Nigeria from Britain and has four distinct morphological/residential zones: the core area, intermediate area, suburban areas, and the planned settlement areas with their distinct histories (which is not an issue herein) and characteristics in terms of housing, infrastructure development and environmental quality.

The planned settlement is the same as sites and services scheme and Ibadan, as earlier mentioned, has 53 existing schemes at different locations around the city. Researchers (Ogu, 2009, Oladokun et al, 2013, Bello et al, 2014 and Olaniran and Ashaolu, 2017) confirmed that it is only the areas with sites and services scheme that usually enjoy decent housing, functional infrastructure and environment conducive to healthy living in landscapes of older cities in the country. The reason for this assertiveness is not far-fetched because among the three strategies for urban infrastructure development in Nigeria identified by Ogu, (2009) as state provision, private involvement, and international-led participatory approach, the state dominates.

This assertiveness is without prejudice to massive development of road, drainage and bridge that took place within the last two decades in the South-Western Nigerian cities. It is also quintessential to note the contribution, to development of infrastructure, of other programmes like establishment and operation of higher institutions of learning and research institutes and Army Barracks. University of Ibadan, Lead City University, Ibadan Polytechnic, International Institute Tropical Agriculture (IITA) Nigerian Institute Social and Economic Research (NISER), Cocoa Research Institute of Nigeria (CRIN), Forest Research Institute of Nigeria (FRIN), Nigerian Institute of Horticulture (NIHORT), Institute of Agriculture Research and Training (IAR and T), MOOR Plantation have well-maintained infrastructure within their premises.

Equally, Ibadan has been profiting immensely from the third approach since Ogunpa stream flood disaster of 1981 and this has witnessed involvement of International Agencies and Donors, Non-governmental Organizations (NGOs) and Community Based Organizations (CBOs). For example, World Bank executed a number of projects such as channelization of Ogunpa stream in 1980s and Ibadan Development Fund (IDF) that covered Yemetu Resettlement Scheme, Mokola and Agugu Development in 1996. Channelization of Ona stream project is ongoing since 2018. United Nations' agencies, also executed the Sustainable Ibadan Project (SIP), as part of the global Sustainable City Program (SIP). These projects accommodate road upgrading and drainage construction.
Nevertheless, this study focused on only sites and services scheme within the study area.

RESEARCH METHODS

The study area, Ibadan is the capital of Oyo State in South Western Nigeria. It is located between longitudes 7°2' and 7°40'E and latitudes 3°35' and 4°10'N and about 128 kilometers northeast of Lagos. It is within the tropical rainfall. It had as at 2006 when the last census was conducted 2,550,593 population including population of surrounding towns and villages such as Lagelu, Lalupon, Ido, Omi Adio, Akaran, Egbeda, Idi Ayunre, Maniya, etc. (National Population Commisssion, 2006).

The study extensively makes use of primary data in order to make assembling and processing of relevant information, interpreting and presentation of results appropriate and to eventually reach sound conclusion. Empirical study of 53 existing residential GRAs/estates in the eleven local government areas of Ibadan was conducted. Population of study includes all 14 institutions that were charged with responsibility for acquisition, designing and preparation of land for and administration of sites and services in Ibadan Land. Hence, all the departments of these public institutions serve as the sampling frame of the study. The researcher obtained the total number of heads of administrative staff in housing-related departments of these institutions as 15 top-notch officials, thus, serves as study unit of analysis. This was achieved through physical counting during working hours. Following this process, the researcher estimated the sample size by applying Krejcie and Morgan (1970)'s sample size determination formula as closely observed in Amusa and Saka (2017) and arrived at 14.

Moreover, the researcher selected 14 senior administrative staff of the focused housing-related departments of sampled institutions through simple random sampling as numbers were assigned to each staff and shuffled from which the numbers were picked randomly until the required number was ascertained. Based on this, a well-structured questionnaire was administered and interview conducted among the selected 14 senior staff who serves as the respondents of the study. Data requirements include name and number of sites and services schemes owned by each institution, years of preparation and allocation, public facilities provided therein and their level of functionalities. Simple linear regression (OLS) model was formulated. This is informed by a single number of independent variable (site and services scheme) and one dependent variable (urban infrastructure development). Data analysis was conducted with percentage, frequency table, and correlation analysis and regression statistics.

More specifically, Factor Analysis (Orthogonal Varimax method of Principal-Component Factor Analysis) was applied to reduce set of questions on variables of interest to arrive at important indicators of both dependent variable and independent variable. Factor Analysis (FA) as a technique is designed to identify data order and structure that provides a parsimonious and meaningful explanation for variation and covariation in surface attributes of observed factors (Tucker and MacCallum, 1997). With the data now being converted to continuous through Factor Analysis outcome linear regression was finally employed to analyze the study OLS model in order to make reliable inference from the outcome or findings thereof.

Model Specification

Linear regression model was formulated for this study as there is a single independent variable. The model is implicitly stated as follows;
Urban Infrastructural Development = f (Site and Service Scheme)
UIB = f (SSS)
Explicitly as;
$UID = a + \beta SSS + \varepsilon$
Where;
UID = Urban Infrastructural Development; SSS = Site and Service Scheme; a = constant; β= slope/coefficient of SSS and ε = error term

DATA ANALYSIS

The study revealed in Table 1 (Descriptive Statistics) that all the schemes were designed with all the facilities but only 24 of them were provided with tarred roads. For water supply, 23 were connected with public mains and for electricity supply 17 estates were yet to be connected to National Grid. Only 18 estates had comprehensive drainage system and there was no single refuse disposal and treatment facility within any of the estates studied.

Table 1: Public Facilities and their conditions in Sites and Services Schemes in Ibadan Land

S/No	Number of schemes that had the facility	Number of schemes where the facilities were in good condition
Electricity supply	36	36
Water supply	23	23
Road network (Tarred) system	24	10
Drainage System	18	11
Police Station	5	5
Refuse disposal and treatment facility	0	0
Sewerage system	0	0
Shopping mall	0	0
Parks	0	0
Civic hall	0	0
School	16	1
Petrol Station	8	8

Source: Field survey, August 2018

Also in Table 2 average scores for the samples of urban infrastructural development and sites and services scheme used for the study were highlighted. It shows that the average number of sites and services scheme selected is approximately 11 and the average number of urban infrastructural facilities is approximately 8 utilities.

Table 2: Descriptive Statistics

	Mean	**Std. Deviation**	**N**
SSS	10.8333	12.29067	53
UID	7.5714	11.28018	53

Source: SPSS Output, 2018

The information in Table 3 reveals the outcome of the OLS simple linear regression analysis conducted following Orthogonal Varimax version of Principal-Component Factor Analysis (PFA) outcome. The Table depicts the overall significance of Site and Services Scheme model to explain urban infrastructure development in the study area, Ibadan Oyo State and thus shows significance of the study predictor, SSS. This is informed by probability (significance) value of *F* – statistics (*.000*) against adopted 5% level of significance as revealed in Table 4.

Although, the measure provides overall goodness of fit it is important to subject the result of regression thereof to additional scrutiny because a wrongly specified model may lead to erroneous inferences (Cameron and Trivedi, 2009). In other words, auto-correlation as

diagnostics check which has strong implications for cross-sectional data was performed. The information in Table 3 and Table 6 indicates that Durbin-Watson statistic of the model is within acceptable standard of values which by implication implies absence of auto-correlation or serial auto-correlation.

Table 3: Summary of OLS Regression Results
Dependent Variable: UID

Model	Predictor	Coefficient	Std. Error	Sig.
OLS MODEL	*F – Stat*	36.130		
	Constant	-0.966	2.161	.664
	SSS	0.812	.135	0.000
	R^2	0.78		
	Durbin-Watson	1.908		
	Correlation	.885	5.50834	0.000

Source: Author's Computation from SPSS Outputs, 2018

Table 4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1096.249	1	1096.249	36.130	.000[b]
	Residual	303.418	10	30.342		
	Total	1399.667	11			

a. Dependent Variable: UID
b. Predictors: (Constant), SSS
Source: SPSS Output, 2018

Inferentially, information in Table 3 and Table 5 reveal important findings about the kind and magnitude of relationship between urban infrastructural development and government sites and services scheme as measured by correlation coefficient. The result shows high positive relationship between site and service scheme and urban infrastructural development which is also statistically significant even at 1% level of significance. This means that there is a better relationship between the two variables. "A correlation coefficient of above 0.3 is adequate, the closer the coefficient to 1 the better is the relationship" (Cramer, 1998).

Table 5: Correlations

		SSS	UID
SSS	Pearson Correlation	1	.885**
	Sig. (2-tailed)		.000
	N	12	12
UID	Pearson Correlation	.885**	1
	Sig. (2-tailed)	.000	
	N	12	12

**. Correlation is significant at the 0.01 level (2-tailed).
Source: SPSS Output, 2018

The result in Table 3 and Table 6 show the amount or level of variation in urban infrastructural development as caused by government site and service scheme measured by R^2. The measure, R^2, from the table indicates a figure of 0.78 which is 78% thus this implies that 78% of variation in urban infrastructural development in the study area is caused by site and service scheme policy of the government and International Organisations like UN-HABITAT.

Table 6: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.885[a]	.783	.762	5.50834	1.908

a. Predictors: (Constant), SSS
b. Dependent Variable: UID
Source: SPSS Output, 2015

More importantly, the result in Table 3 and Table 7 indicate a positive coefficient value of SSS. This implies that Site and services Scheme has strong and significant positive impact on infrastructure development in Ibadan and that for every increase in SSS urban infrastructural development increases by 0.8 which can be approximately equalled to 1. The probability value of the explanatory variable is also statistically significant at 5% and 1% levels of significance respectively, thus, implies that SSS is a good variable to explain or measure urban infrastructural development in Ibadan, Oyo State of Nigeria. The overall results show that there is positive impact of SSS on urban infrastructural development in Oyo State.

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.966	2.161		-.447	.664	-5.782	3.850
	SSS	.812	.135	.885	6.011	.000	.511	1.113

a. Dependent Variable: UID
Source: SPSS Output, 2018

DISCUSSION OF RESULTS

The study reveals that all the sites and services schemes in the study area were designed with infrastructure but only 24 of them were provided with tarred roads and 23 were connected with public mains for water supply while only 18 estates had comprehensive drainage system. About 17 out of 53 existing estates were yet to be connected to National Grid for electricity supply. There was no refuse disposal and treatment facility within any of the estates studied.

Further enquiry revealed that 13 of the l4 responding institutions agreed that the key factor responsible for this near apparent failure was issue of financial incapacity or poor funding to undertake the development of the various GRAs/estates. The study fitted model indicates that sites and services scheme is an important indicator of urban infrastructural development in

Ibadan, study area. By implication, this illustrates that for every increase in site and service scheme urban infrastructural development increases *ceteris paribus* (all other things being equal). Thus, sites and services scheme has positive impact on urban infrastructure development.

Some general observations noted and responses to enquiries raised on them to boost understanding of the outcomes of the study are explained here. Some of the schemes were not large enough to sustain a school, primary and/or secondary, while some had public schools close by, a situation that does not justify establishment of new ones. Example of schemes under the first category are Eleyele, Apata Urban Lay Out, Old Cemetery, Oba Aleshinloye, Jercho Hill GRA, Oke Itunu Low Cost Housing Estate, etc. while under second category are Queen School GRA and Samonda GRA to mention but few. All the estates covered in the study were not provided with waste disposal facilities or system because of the general opinion that the elites would occupy them and would not want such facility to constitute nuisance to them therein.

Some of the schemes had not been developed and the provision of the infrastructure had not been carried out as designed in their layouts. The institutions in charge of the schemes provide the infrastructure as development extend to the areas in order to avoid repeated expenditures on such facilities because, according to respondents, Ibadan is located within tropical region where there is excessive rainfall that aids overgrowing of bush and rapid deterioration of infrastructure.

CONCLUSION

The study concludes that although, sites and services programme was intended for the provision of serviced residential plots in urban areas, it offered ample opportunity for provision of urban infrastructure. The overall results show that there is positive correlation or impact of Site and Services Schemes on urban infrastructural development in Ibadan.

However, it had not being fully used to develop infrastructural facilities in the study area as it was envisaged when it was recommended for adaptation. Up till the time of this research, there were dual land markets - formal and informal land transactions in the city and sites and services schemes were very scanty and not providing enough serviced plots for supply, hence, provision of urban facilities at the design stage were restricted to the few schemes. The city had adequate number of the institutions in charge of sites and services scheme but inadequate funding was mentioned as their major problem.

Hence, the study recommends that it is imperative that government at all levels embrace totally sites and services scheme in order to arrest further growth of haphazard development and slum in urban areas. This would necessitate necessary adjustment and total implementation of Land Use Act of 1978 for easy acquisition of land and eradication of informal land market that is responsible for inaccessibility to land for public use and unplanned development. Sustainable financial plan with strict implementation subject to periodic review from time to time must therefore form the basis of new development. Parent governments of the institutions charged with provision of site and services schemes should provide adequate fund to their respective organs/agencies for their smooth operations, continuous acquisition of land for, design and management of more schemes and coverage of the entire suburban periphery of cities.

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