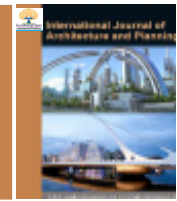




# International Journal of Architecture and Planning

Publisher's Home Page: <https://www.svedbergopen.com/>



Research Paper

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## Evaluation of Government Participation in Maintenance of Public Residential Housing in Different Climatic Zones in Nigeria

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### Article Info

Volume 4, Issue 1, March 2024

Received : 21 December 2023

Accepted : 19 February 2024

Published : 05 March 2024

doi: [10.51483/IJARP.4.1.2024.6-12](https://doi.org/10.51483/IJARP.4.1.2024.6-12)

### Abstract

Maintenance is a very important aspect of facilities management that requires serious planning since building maintenance involves preserving a building so that it can retain its economic value and durability in order to avoid economic loss. Despite the pivotal roles of housing in the socio-economic development of Nigeria and the life of the people, a majority of the public residential houses are in deplorable condition and states of disrepair due to long period of neglected maintenance. This paper examined the level of participation of various government agencies across the four public residential estates in Nigeria. Data was obtained through questionnaire conducted on a sample of 421 buildings constructed not later than twenty years ago. The findings revealed that Even though, concerted efforts were made in creating different functional management agencies with qualified relevant professionals, all the management agencies did not have any definite maintenance strategy or policy put in place for the housing estates. There was no commitment to maintain the estates as the maintenance was left to the hands of community development associations.

**Keywords:** *Housing, Maintenance, Public buildings, Residential estate, Strategy*

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### 1. Introduction

Maintenance according to BS 3811(1984), is the combination of all technical and associated actions intended to retain an item or restore it to a state in which it can perform its required function. Building maintenance is an important programme for the sustainability of infrastructural development, as it plays an important role among other activities in the building operations (Zulkarnain et al., 2011). Adejimi (2005) avers that the primary objective of building maintenance is to preserve buildings in their initial functional, structural and aesthetic states. This is to ensure that such facilities continue to remain in such state, and retain their investment value over a long period of existence. Odediran et al. (2012) opine that the ability of a building to provide the required environment for a particular activity is a measure of its functionality. Therefore, as the components of a building begin to deteriorate, it becomes necessary to take measures to ensure that the desired characteristics of that facility, which provide safety and convenience, are retained.

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British Standard (1993) defines maintenance as “a combination of any actions carried out to retain an item in, or restore it to, an acceptable condition”. It thus refers to the work undertaken to keep, restore or improve every facility to an agreed standard; the extent of maintenance being determined by the balance between need and available resources (Chanter and Swallow, 1996). The physical building and infrastructure stock form a very significant component of every nation’s total saving. For the well-being and upkeep of this vast building stock, it is well understood that buildings require continual maintenance throughout their lives to: a) enable them continue to perform satisfactorily the functions for which they were built, and b) maintain their value and utility by preventing and/or delaying their progressive deterioration due to age and usage (School of Building & Estate Management, 1991).

## 2. Literature Review

### 2.1. Maintenance in the Nigerian Public Housing Sector/ Housing Condition in Nigeria

Provision of adequate, affordable, high standard and quality housing that meets the social, economic and political aspirations of the citizenry remains the primary and major focus of all governments the world over. This is because the fulfilment of this desirable social objective is a key component of sustainable development (Ibem and Amole, 2010) and a measure of the well-being of the people. According to Leong (2009), housing is a major factor impacting on the health, safety, socio-economic and political life of the occupants. In fact, it impacts all aspects of human endeavour. According to Olatubora and Fatoye (2006), public residential estates, when compared with existing private housing estates, are known to be lacking in basic infrastructural facilities and services, and their respective maintenance that is meant to enhance the liveability of such estates. Maintenance of residential buildings is one major factor of housing ills in many cities of the world which needs urgent attention and cure. This problem seems pronounced most especially in developing countries, Nigeria inclusive where very little emphasis is laid on building maintenance functions and management. Consequently, maintenance of the existing housing stock in habitable condition still remains a great problem to be solved in Nigeria (Olagunju, 2012).

To address this intractable housing problem and ensure sustainable housing in Nigeria, all the three tiers of government had been investing heavily in the construction of new housing estates and maintenance of the existing ones as far back as 1928 when the Lagos Executive Development Board (now, Lagos State Development and Property Corporation), under the 1928 Town Planning Ordinance Law, Cap 95 of the Federation of Nigeria, was established.

It is in this connection that the National Housing Policy of 1991 charged various tiers of government and their housing corporations with the responsibilities of facilitating the design and construction of new housing units for low income group, improving upon the existing housing conditions, reducing the production cost of housing units, encouraging the manufacture and use of local building materials, providing scientifically-based physical plan, etc., inclusive of essential amenities and infrastructure to support habitable environment, which shall be revised from time to time.

However, due to dwindling budgetary allocation to the housing sector, and resources becoming more and more limited in the face of the growing population, governments are increasingly shifting their attention away from new housing development towards maintenance of existing ones (Leong, 2009). Olu-Sule (1990) and Akeju (2007) affirm that government investments in housing in the third world is limited and wasted on expensive projects designed to woo electorates rather than directed to meet real needs for housing. This scenario has resulted in the deplorable situation in most existing public housing schemes, Nigeria being no exception.

The main purpose of maintenance of property is essentially to retain its values for investment, aesthetic, safety and durability, with a view to ensuring that the property is continually in good condition for habitation, and to the satisfaction of the owners/users and communal prestige (Brennan, 2000). Odediran *et al.* (2012) posit that in order to prolong the economic life of property, it is necessary to have a programme of action that would be effectively implemented to keep the property in top form to enable optimum returns to be received on a continuous basis. This implies that, there is the need to look at the maintenance of existing public residential estates in order to restore them into acceptable conditions for habitation or at least to prolong the life-span of the buildings and other complementary services through regular maintenance activities. This is very important as the intensity of building maintenance becomes higher with its age, especially in the face of climatic change and its attendant effects on the building materials, elements and physical environment for sustainable development.

The tropical climate prevalent in Nigeria poses unique and major challenges to effective building maintenance. The climate in Nigeria can be characterised by:

- a) High temperatures with a relatively small difference between maximum and minimum levels;
- b) Abundant sunshine and high intensity of ultra-violet radiation;
- c) High relative humidity; and
- d) Frequent and heavy rain.

Such climatic conditions place significantly demanding requirements on the lifetime performance and durability of all building materials and components, and in particular the external wall surfaces which are continuously exposed to the vagaries of the physical environment.

Building maintenance management can be seen as a highly complex and intricate sphere of operations, involving the interaction between technical, fiscal, legal and social determinants, which govern the use of buildings (Lee and Wordsworth, 2001). Since maintenance is a diffuse operation, taking place incrementally through time, in many locations, and by different organizations, the scale and importance of building maintenance work is frequently undervalued in comparison with higher profile and more visible new construction. The poor design of construction details, a bad choice of the façade materials, their inadequate application, and non-existent maintenance are the core of the current problems in building façades.

New approaches to the efficient management of maintenance of different buildings' components, materials and systems are being developed all the time. Flores-Colen and Brito (2010) justify that:

- 1) The choice of optimal maintenance strategy should be based on an analysis of different maintenance policies, e.g reactive, corrective, preventive, time-based maintenance, condition-based maintenance, re-design (Rikey and Cotgrave, 2005; El-Haram and Horner, 2003). This is necessary in order to distinguish the maintenance concept from other terms normally used in building renovation, such as refurbishment, retrofit and modernization;
- 2) To globally address the issue of maintainability, the approaches of building performance and building LCC are essential (Chew et al., 2004)—maintainability is the ability of a functional unit, under given conditions of use, to be kept in, or restored to a state in which it can perform a required function when maintenance is performed under given conditions and using stated procedures and resources (ISO/IEC 2382-14 (1997);
- 3) Building performance evaluation is a crucial procedure that offers feedback as a function of the performance of building materials and components for future improvement (Wong et al., 2005);
- 4) Even if it is a complex issue, it is crucial to define in each study which component(s) of performance is(are) being studied: functional, physical or financial (Facilities Economics, 1994);
- 5) The reliability of the prediction of a building's service life strongly influences the effectiveness of a maintenance policy (Shohet and Paciuk, 2006). Methods based on coupling life-cycle cost assessment and service life prediction are needed (Rudbeck, 2002; Balaras et al., 2005); economic tools are needed for assessing the life-cycle cost advantages and disadvantages of new materials relative to conventional materials (Ehlen, 1997);
- 6) Users' perceptions, needs, expectations and budget are relevant issues to the real implementation of maintenance models (Lowry, 2002).

### 3. Materials and Methods

The population of the study comprises the occupants of public residential housing estates owned by the state governments in Jakande Housing Estate, Lagos; Bodija Housing Estate, Ibadan; Wuse Housing Estate, Abuja and Mandate 3 Housing Estate, Ilorin. There are 3784 housing units in all out of which 421 was used as sample size as shown in Table 1. Also, the sample size for the professionals managing the estates was 125 as shown in Table 2. Stratified random sampling technique was adopted for the study because of the different types of housing typologies that were within selected housing estates. Each sub-stratum was then randomly sampled and grouped into households. The household heads became the main target respondents. The study employed structured questionnaire to elicit information from the respondents on their expected level of maintenance from government and what was obtained from government

in public residential buildings in Lagos, Ibadan, Abuja and Ilorin. Also, the management of the various housing estates was part of the scope of the questionnaires.

<b>Estates</b>	<b>Housing Units</b>	<b>Sample Size</b>
Jakande Housing Estate, Lagos	962	109
Bodija Housing Estate, Ibadan	1034	118
Wuse Housing Estate, Abuja	1000	114
Mandate 3 Housing Estate, Ilorin	788	80
<b>Total</b>	<b>3784</b>	<b>421</b>

<b>Estates</b>	<b>Lagos</b>	<b>Bodija</b>	<b>Abuja</b>	<b>Ilorin</b>	<b>Total</b>
Architects	11	5	50	2	68
Builders	7	2	5	2	16
Structural Engineers	8	2	15	2	27
Quantity Surveyors	6	2	4	2	14
<b>Total</b>	<b>32</b>	<b>11</b>	<b>74</b>	<b>8</b>	<b>125</b>

## 4. Discussion and Findings

### 4.1. Government Participation in Maintenance Activities

The respondents were asked to rate their expectation from government in terms of maintenance works of the buildings in the various public residential estates and what was obtained from the government. The frequency result in Table 3 reveals that 365(89.9%) respondents across all the climatic design zones were not actually expecting so much from the government while 14(3.4%) respondents had some levels of expectations. The table further reveals that 371(91.2%) was what was got from the government which means that their expectation was at the minima level and so there were no expectations to be met from the government.

In other to validate the frequency result of the expectations and what was obtained, the significance of the difference observed between the expected and the obtained was tested using Wilcoxon-signed rank test at 95% confidence level. The result in Table 4 reveals that there is no significant difference between the expectation from the government and what was obtained from the state government ( $\rho = 0.481 > 0.05$ ). The result implies that there is the absence of any definite and effective maintenance strategy put in place by government/housing corporations which led to their poor performance at carrying out the required maintenance of works on the buildings. However, a self-maintained and community-based maintenance strategy by tenants/occupants was predominantly adopted across all the climatic design zones.

The result agrees with the position of Adejimi (1998) that theories and hypotheses are postulated and propounded daily, but maintenance problems still remain adamantly unyielding in public residential buildings. According to Olatubora and Fatoye (2006) and Musa (2002), public residential estates, when compared with existing private housing estates, are known to be lacking in basic infrastructural facilities and services and their respective maintenances that are meant to enhance the liveability of such estates. These deplorable housing standards and deteriorated physical environmental conditions in the opinion of Blome (2010) are responsible for the social problems, poverty, poor academic performance, poor health, riots, and high arsons and crime rates prevalent in our societies.

	Expectation from Govt		Obtained from Govt	
	Frequency	Percentage	Frequency	Percentage
Very Low	342	84.2	334	82.1
Low	23	5.7	37	9.1
Average	9	2.2	6	1.5
High	3	0.7	2	0.5
Very High	2	0.5	2	0.5

	Group	N	Mean Rank	Sum of Ranks	Z	P
Exp. Obtain	Expectation	406	403.22	163706.50		
	Obtained	407	410.77	167184.50	-0.704	0.481
	<b>Total</b>	<b>813</b>				

## 4.2. Level of Involvement of the Agencies Managing the Estates

### 4.2.1. Jakande Estate, Lagos-Lagos State Development and Property Corporations

Lagos State Development Corporation was created by the government of Lagos state in 1972 under the administration of Lateef Jakande. The focus is to build low-cost apartments for Lagosians. By 1992, the company had built more than 17000 units in Ojokoro, Isolo, Amuwo Odofin, Ijaye and Iba. On the number of building professionals working in the corporations, there were qualified professionals and were involved in the specification of the materials at the design stage of the housing project. The professionals were equally involved in the supervision of the buildings and the specifications made were implemented during the construction works. There was no definite maintenance strategy or policy put in place by the corporation for the houses in the estates. The professionals were also involved in the construction and supervision of the buildings. However, the buildings were outrightly sold to the allottees directly, while some got their allocation through mortgage and financial institutions. Lagos State Development Corporation has no commitment to maintain the estates. The maintenance is the sole responsibility of the estate community development associations (CDA).

### 4.2.2. Bodija Housing Estate, Ibadan: Oyo State Housing Corporation

On the number of building professionals working in the corporations, there were qualified professionals that were involved in the specification of the materials at the design stage of the housing project. The professionals were also involved in the construction and supervision of the buildings. There was no definite maintenance strategy or policy put in place by the corporation for the houses in the estates. However, the corporation still provides and maintains the public utilities, while the residents, through the community efforts, carry out the maintenance and security of the estate.

### 4.2.3. Mandate 3 Housing Estate, Ilorin: Kwara State Housing Corporation

Kwara State Housing Corporation was established and tasked with facilitating partnerships with private sector companies to deliver mass housing units throughout Kwara communities. The corporation was taken over by the Harmony Holdings Limited, which commenced business by acquiring the assets and liabilities of the existing 20 government-owned functional commercial entities including former Kwara Investment and Property Development Company Limited.

On the number of building professionals working in the corporations, there were qualified professionals and were involved in the specification of the materials at the design stage of the housing project. The professionals were also involved in the construction and supervision of the buildings. There was no definite maintenance strategy or policy put in place by the corporation for the houses in the estates. Harmony Holdings Limited has no commitment to maintain the estates, as the maintenance was left in the hands of the residents.

#### 4.2.4. Wuse Zone 2 Housing Estate, Abuja: Federal Capital Development Authority

The Federal Capital Development Authority (FCDA) was charged with the responsibility of co-ordinating the execution of the mass housing scheme in accordance with the Abuja master plan. On the number of building professionals working in the corporations, there were many qualified professionals in the organisation that were involved in the specification of the materials at the design stage of the housing project. The professionals were also involved in the construction and supervision of the buildings. There was no definite maintenance strategy or policy put in place by the authority for the houses in the estates. However, the buildings after completion were sold. FCDA has no commitment to maintain the estate as the maintenance was left for the community development association in the estate.

## 5. Conclusion

The results obtained from the evaluation of government participation in the maintenance of Public Residential Housing Estate of Lagos, Ibadan, Ilorin and Abuja constructed not later than twenty years ago in different climatic zones in Nigeria revealed that there is no significant difference between the expectation from the government and what was obtained from the state government. The implication of the result is that there is absence of any definite and effective maintenance strategy put in place by government/housing corporations which led to their poor performance at carrying out the required maintenance of works on the buildings. However, a self-maintained and community-based maintenance strategy by tenants/occupants was predominantly adopted across all the climatic design zones. This implies that the tenants/occupiers' coordinated maintenance strategy is most effective, sustainable and therefore conclude that, it is a suitable maintenance strategy for the estates in particular and public residential housing estates in Nigeria.

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**Cite this article as:** Aluko, Olaniyi Olanipekun, Awe, Foluso Charles and Bankole Idowu Emmanuel (2024). Evaluation of Government Participation in Maintenance of Public Residential Housing in Different Climatic Zones in Nigeria. *International Journal of Architecture and Planning*, 4(1), 6-12. doi: 10.51483/IJARP.4.1.2024.6-12.