

An Assessment of Maintenance Culture on Public Buildings in Nigeria (A Case Study of Osun State)

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Abstract: *The maintenance of public buildings in Nigeria has suffered from lack of fund and total negligence. So much emphasis is placed on aesthetics and infrastructures such that the maintenance takes the back seat. This research examines maintenance culture on public buildings in Nigeria with Osun State as a case study. The study further assesses the factors considered during design and construction stage and the extent of maintenance works on public buildings. These factors were identified and classified using a structured questionnaire that explains the relationship between factors and the elements. Findings were validated and supported by case study projects. This research equally pointed to ways of managing maintenance activities in the construction industry with a view of understanding the occurrence.*

Keywords: Maintenance, Maintenance Culture, Public Buildings

Date of Submission: 29 -09-2017

Date of acceptance: 10-10-2017

I. Introduction

Looking at the deplorable state of public buildings across the country for decades, a large chunk of the country's resources have been channelled towards Transportation Infrastructure, Government administrative Buildings for ministries and Parastatals, Colleges of Education, Universities, Primary and Secondary Schools. All are geared toward repositioning the underdeveloped economy. However, one remarkable action according to needed to ensure sustainability of these varieties of infrastructure has not been given the right and sufficient attention in terms of how to carry out its maintenance operations. Adenuga and Iyagba, (2005) submitted that public buildings are in very poor and deplorable conditions of structural and decorative disrepairs. In spite of millions of Naira spent to erect all these buildings, they are left, as soon as commissioned to face premature but steady and rapid deterioration, decay and dilapidation (Adenuga, 2012).

Building maintenance is referred to a way to preserve or keep the economic value of building. BS3811 (1984) defines maintenance as "the construction of all technical and associated administrative actions intended to retain an item in or restore it to a state in which it can perform its required function". According to Oladapo (2006) cited in Adenuga (2012) as seen in Samuel et. al. (2016). Buildings are required to provide a conducive and safe environment for various human activities. This, essentially, is the question of function. The extent to which the buildings provide the required environment for the required activity is measure of the functionality of the building. Buildings once constructed are expected to provide this major function of sheltering for a number of years. It is highly desirable to produce buildings that are maintenance free for the expected life span, however, this is very difficult to achieve owing to the rate at which buildings deteriorate overtime because of its initial design, construction techniques, the environmental conditions and the use or intensity of use of the building.

II. Literature Review

From a recent research carried out in the University of Lagos, the major finding was that Maintenance problems in buildings could be prevented or minimized by optimizing processes of design, using certain tested components which give maintenance strength to buildings. By properly resolving these components as design inputs at the planning stage, the architects can fully arm the buildings against future maintenance problems. Twelve such components identified and tested are here suggested to be used as design questions by architects for a high building maintainability.

III. Past Efforts Made On Maintenance Culture

Pre-Colonial Era: Before the advent of the Europeans into West African subregion, traditional houses were built, for both public and private uses. Most of these houses used locally available materials, on their readily available family land, and by the assistance of a readily available family members and friends to help build using their own local method of construction. During these times, there was no noticeable problem of maintenance, even though they were built with mud, thatch, bamboo, wood and other locally available materials. (Akin, 2005)

Colonial era: During the colonial era, foreign building designs started coming in. These came in different forms and styles that looked too complex for the local builders and owners to handle in copying or maintaining. These buildings were built and maintained by the Europeans with the assistance of few local artisans as labors. Some of the artisans ended up getting some skills on the technology of these buildings. However, this technology transfer was negligible if one looks at the replication of such foreign buildings which were limited to the homes of the Europeans and some glorified indigenous civil servants who enjoyed the Government Rest Houses.

Post colonial era: With the oil boom of the 70s various modern and post modern structures in form of high-rise and skyscrapers started springing up in Lagos and many of the State capitals. Materials and technology used in their construction were mostly imported. At this same time, population explosion struck the country which she has never recovered from even till now.

IV. The Concept Of Building Maintenance

Building maintenance according to (Anderson, 1996, Lee, 1991) as cited by (Owolabi, 2014) is an important aspect of building management that is often neglected. Maintenance assists retaining economic life of buildings. Moreover, it is an activity that requires high level of productivity at the private and the national levels. At the private level, proper maintenance leads to lower depreciation costs (due to longer economic life) and consequently leads to higher profitability. While at the national level, proper maintenance leads to lower expenditures on replacement. Thus, allowing more expenditure on expansion into new productive investment.

Carrying Out Maintenance Operations

Odediran (2012) stated that a large percentage of building occupants carry out “servicing” daily maintenance in form of daily, weekly, monthly, quarterly, and yearly. Albeit most do this without knowing they are carrying out maintenance they do this in form of cleaning, washing of windows, regular painting and decoration. This research totally agrees with this assertion with servicing ranking high along with rectification, replacement and renovation. Conversion and Extension ranks above average while Alteration ranks low. The Chartered Institute of Building (1975) as cited in Adenuga (2012) reiterates that the sizes, types and number of buildings to be maintained will invariably determine the source of manpower either in service or outsourcing. Lee (1987) also contends that the choice to be made should be according to which offers greater

V. Research Methodology

This study employed survey design and data collection method was through the use of questionnaires and observation of public Buildings in Osun State, Nigeria. Sampling was carried out with a total of 100 questionnaires administered. 75 questionnaires were retrieved representing about 75% of the total population which is considered sufficient for the study based on the assertion of Moser and Kalton, (1999) that the result of a survey could be considered as biased and little significant if the return rate was lower than 20-30%. Data gathered were analyzed using simple statistical tools such as mean item score, percentage and frequency.

VI. Analysis Of Data And Results

In this section, results of data analysis that was retrieved from the groups of respondents was presented.

Table 1: Effectiveness Factors Considered For Maintenance Operations

Effectiveness Factors Considered for Maintenance Operations	SA	A	U	D	SD	MEAN SCORE	RANK
Public maintenance work is conducted once a month regardless of complaints reported between the interval	7	19	14	23	12	3.1867	1
Maintenance problem emanate from the design stage, construction stage and usage stage	20	33	13	5	4	2.2000	9
Poor building maintenance mostly arose when it falls at the wrong hand for usage	25	17	14	10	9	2.4800	5
The general tendency is to execute work only when it becomes a matter of	14	32	15	8	6	2.4667	6

urgency							
There is lack of skilled man power to undertake maintenance work especially in those buildings design and constructed by expatriates	9	29	9	17	11	2.8933	2
Public building suffers due to insufficiency in fund allocation	26	29	12	5	3	2.0667	10
Some establishment are unwilling or reluctant to support innovation of public buildings	15	38	5	9	8	2.4267	8
There is absent of planned maintenance program	16	24	15	11	9	2.6400	4
There is adoption of appropriate maintenance for public buildings maintenance	15	16	16	24	4	2.8133	3
No attention is giving to our level of technology, our culture background and environment during design	22	24	10	11	8	2.4533	7

Source: Surveyed work, 2017

Effectiveness Factors Considered For Maintenance Operations

Table 2 above shows the results of various factors for maintenance operations. Public maintenance work is conducted once a month regardless of complaints reported between the intervals ranked 1st with mean score of 3.1867. Nine (9) respondents strongly agreed that there is lack of skilled man power to undertake maintenance work especially in those buildings design and constructed by expatriates which represents mean score 2.8933 and ranked 2nd. 26 respondents supported that Public building suffers due to insufficiency in fund allocation which ranked least on the table. This is an indication that maintenance work is only concentrated on bush clearing and not the supposed infrastructure and facilities as expected.

Table 3: Table 1: Effectiveness Factors Considered For Maintenance Operations

FACTORS		SUM OF SQUARES	DF	MEAN SQUARE	F	P VALUE	LS
Public maintenance work is conducted once a month regardless of complaints reported between the interval	Between groups	20.981	4	5.245	3.889	.007	
	Within groups	94.406	70	1.349			s
	Total	115.387	74				
Maintenance problem emanate from the following design stage, construction stage, usage stage	Between groups	9.310	4	2.328	2.125	.087	
	Within groups	76.690	70	1.096			NS
	Total	86.000	74				
Public building maintenance mostly arose when it falls at the wrong hand for usage	Between groups	15.663	4	3.916	2.157	.083	
	Within groups	127.057	70	1.815			NS
	Total	142.720	74				

Source: Surveyed work, 2017

The ANOVA table above was used to test the level of significance level of each of the factors with the tested objective. Public maintenance work is conducted once a month regardless of complaints reported between the intervals having P-value of 0.007; F-value of 3.889 is Significant. This is an indication that there is.....the last on the list “No attention is given to our level of technology, our culture background and environment during design” with P-value of 0.533 and F-value of 0.795. This implies that it is significant and it also implies based on ranking that the presence of incentive scheme (promotion, compensation etc.) stimulates workers commitment.

Table 4.4: Examination of maintenance in Public Building

Examining The Extent of Maintenance in Public Building	SA	A	U	D	SD	MEAN SCORE	RANK
What							
Maintenance work is carried out in the Building is up to your standard	4	25	9	23	14	3.2400	5
Replacement of Electrical Components/ Parts on regular interval	11	13	21	18	12	3.0933	7
Preventive Maintenance has been adopted	15	11	17	16	16	3.0933	8
Aesthetic measure are carried out annually	8	10	23	14	20	3.0667	4
Pipe linkages is attended to immediately	13	11	22	16	13	3.0667	9
Faulty electrical installation is attended to immediately	9	19	15	17	15	3.1333	6
Bush clearing is carried out monthly	6	6	14	27	22	3.7067	1
Building in the quarters receives prompt maintenance work	5	17	19	20	14	3.2800	3
Building dilapidation is a result of poor design	8	24	14	13	16	3.0667	10
Damage louvers, doors and windows are immediately removed and replaced	11	17	17	19	11	3.0267	11
The Presence of incentive schemes (promotion, compensation etc.) stimulates workers commitment	6	12	15	22	20	3.5067	2

Source: Surveyed work, 2017

The Table above shows explains the extent of maintenance on public buildings in Osun State. Bush clearing is carried out monthly ranked 1st with a mean rank of 3.7067; The Presence of incentive schemes (promotion, compensation etc.) stimulates workers commitment ranked 2nd with a mean score of 3.5067. this is an indication that the extent of work done on the survey is mostly bush clearing and the workers are also getting some incentives on the work done.

VII. Conclusion And Recommendations

This chapter represents the findings for the research work that has been carried out. Some factors, which can be inputted at the design stage into the building to reduce future maintenance problems and act as maintenance strength to the buildings. Components which had been tested to affect maintainability of buildings were briefly discussed and recommended as design inputs and in model form to guide and help designers achieve high maintainability in buildings. In essence, if prevention is better than cure, it is high time the Nigerian architects give their clients “Maintenance-Free Buildings”.

This study further reveals that there is no formal organisational structure showing the distribution of responsibility in all buildings. There is therefore need to construct a proper organisational chart showing the distribution and scheduling of responsibilities of power for proper functioning of the organisation and personnel. More so, maintenance work should be categorised according to their order of importance or severity as such maintenance work should be based on need “need driven” and not based on budget “budget driven”. User satisfaction survey should also be carried out regularly and maintenance work should be carried out in line with users’ requirement.

Other Recommendations include

- Adequate funds should be provided for effective maintenance practices to be achieved regularly. The policy maker also should be interested in maintenance, which must not be neglected.
- The need for economic analysis and workable financial plans should be prepared prior to the award of contracts.
- The maintenance department is advised to carry out routine inspections of existing buildings and not to wait until structure are completely dilapidated. This is supported by Owolabi (2014).

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Eke Emmanuel Chidi. “An Assessment of Maintenance Culture on Public Buildings in Nigeria (A Case Study of osun State).” *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)* , vol. 14, no. 5, 2017, pp. 53–57.