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Buildings Maintenance Practice among the Occupants of Government Science and Technical College Staff Quarters, Mubi-North Local Government Area, Adamawa State

Godwin Zira, Hyalaba
Department of Building Technology, Federal Polytechnic Mubi, Adamawa State -Nigeria.
Contact: *godwinhyalaba@gmail.com*. 08034160199

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Abstract
This study attempts to assess the effects of lack of maintenance practice in the neighbourhood of Government Science and Technical College, Mubi by identifying and examining the building components, effects of abandoned buildings in the school and maintenance practice carried out in the neighbourhood by the occupants. The study embarked on both physical observation and questionnaire survey for data collection. The building comprises of twenty nine (29) senior quarters and twenty (20) boy's quarters out of which Six (6) senior quarters, and five (5) boy's quarters are out of use. A two-section questionnaire was design as an instrument for data collection based on maintenance practice in the quarters and effects of abandoned building quarters; The questionnaires was distributed to each occupants of the quarters and a total of eighteen (18) were retrieved representing 75% of the total respondents. Data collected for section A were analyzed to obtain the Relative Importance Index (RII) and Cronbach's Alpha score was used for the interpretation, while the data for section B were analyzed using simple percentage. The questionnaire survey was complemented by physical observation to obtain data for discussion. The findings revealed that: the examined building components are on the verge of non-functionality, 61% need to be replaced or rehabilitated, the abandoned buildings, could turn out to crime hotspots or breeding grounds for dangerous animals, 2nd or 3rd ranking on RII respectively. On a general note, the study confirms, the involvement of occupants and School Management in the maintenance of quarter was recommended.

Keywords: Maintenance practice, Building Abandonment, Neighbourhood, School Building

Introduction

Maintenance of a building is the ability of preserving the building over its useful life. Inadequate or improper maintenance negatively affects the building in which people dwell, as a result affecting the overall output and also the overall service life of the building. Day to day maintenance or repairs of the building certainly delay the decay of the building structure. Any building including its services when built has objectives of providing shelter and comfort for man and during its usage has to be maintained. Maintenance is a continuous process requiring regular inspection and taking immediate remedial action when there is a problem. It is largely governed by the quality of the original construction. The property owners, builders, constructors, occupants and the maintenance agency are all involved in this process and share a responsibility towards the maintenance activity. The Situation in which all these agencies merge into one is ideal and most satisfactory (Bangladesh National Building Code, 2012,). No building made up of any type of good construction material is maintenance-free, so every structure, heritage or new, requires care to limit deterioration. Exposure to environmental elements causes all building materials to wear down eventually. Therefore periodic inspections can help you find problems at early stages and, along with regular maintenance, will extend the life of the building. These can also help in avoiding the need for potentially expensive and disruptive repair work, which may damage the buildings (Heritage Building Maintenance Manual, 2017).

Nowadays Occupants of buildings have little or no knowledge about the maintenance of buildings they occupied. A Study conducted by Ayodele and Alabi (2011), showed that the causes of project abandonment include inadequate project planning; and funding, inflation, bankruptcy of Contractor, variation of project scope, political factor, death of

client, political influences, death of client, incompetent project manager, wrong estimate, inadequate cost control, faulty design and delayed payment. However, little or no research was conducted on the subject of adequate or proper maintenance of buildings reduces abandonment of buildings. Most public and private buildings in Nigeria are not correctly maintained which causes deteriorations and subsequent defects of various degrees. Defects on buildings are prevented from increasing by carrying out preventive maintenance: carrying out work in expectation of failure. In order for an element or facility to continue to perform its required function, regular maintenance is needed over the life span of the building (Olanrewaju at el., 2015).

According to Olanrewaju (2010), maintenance is the required processes and services carried out to preserve, repair, protect and care for a buildings structure and engineering services after completion, repair, refurbishment or replacement to current standards to enable it to serve its intended functions throughout its entire life span without drastically upsetting its basic features and use. From this definition, maintenance is not necessarily about the building per se but rather about the occupants of the buildings. Therefore, "user care" is / should be the focus of maintenance. This is illustrated thus; Buildings are procured for the sake of the services (i.e. comfort, protection, accommodation, security and esteem) they offer to their users. It is the correct functioning of the building that the users desire, not the physical condition of the building. To the extent that the building is capable of allowing the users to perform their functions, the building is a source of value creation to the functional service of accommodating, learning, teaching and doing research, with specific reference to the educational institution.

Maintenance is defined by BS 3811:1993 as 'The combination of all technical and related administrative actions intended to retain an asset in or bring it to a state in which it can perform its required function'. As defined by the Standards and Guidelines for the Conservation of Historic Places in Canada, (2004), was cited in heritage building maintenance manual, (2017). Therefore maintenance is a routine, cyclical, non-destructive action necessary to slow the deterioration of a historic place. It entails periodic inspection; routine, cyclical, non-destructive cleaning; minor repair and refinishing operations; replacement of damaged or deteriorated materials that are impractical to save. Once complete, over time, building will need maintenance, repair, renovation and rectification.

The role of maintenance in the sustenance of a healthy building lifecycle as well as environment can never be overemphasized. Nevertheless, maintenance has always been treated with negligence, despite its essential role in keeping the structure in a state of comfort for its occupants. It is noted that neglect of maintenance has an increasing result with rapidly increasing deterioration of fabric and finishes of a building accompanied by harmful effects of the content and occupants, it is a known fact that every living environment requires proper maintenance for it to be tagged "nice" (Seeley, 2012, cited in Hyalaba G. Z., Ibrahim Y. G., and Mara W., 2020, p. 128).

According to Owolabi, Amusan, Gani, Peter, and Omuh (2014) observed that due to the growth of housing with the lack of building Standards, more maintenance, rehabilitation, and renovation work have become necessary to ensure the serviceability and safety of the constructed houses In addition, the existing houses need to be sustained as long as possible.

In a study by Stanley (2014) cited by Garba (2019), it was discovered that there are numerous building projects that have been unfinished in various neighbourhoods in Nigeria, with Abuja the Federal Capital of Nigeria has the highest number of abandoned projects.

Regulatory Agencies such as Building Development Control, Federal Capital Territory Administration (FCTA) and Ministry of Environment among others are seriously concerned about private and public building projects that have been abandoned in various neighbourhood of Abuja. These uncompleted building projects make the environment of the city less safe and inconvenient for living, business and recreation activities (Yusuf, 2014, cited by Garba, 2019).

Abandoned projects results to the following: Job loss and unemployment which result to loss of economic benefits of the projects. They bring no aesthetic pleasure to the residents neighbourhoods in which they are located has a negative impact on

government tax revenues thereby reducing the budget on services; results to wastage of resources, reduce social-economic activities and affect other properties within a neighbourhood by lowering property values, attract crime by providing centres for the pursuit of a range of criminal activities, including prostitution, consumption and trafficking of drugs and sites of illegal activity because of how isolated they are; criminal gangs often turn them into a meeting hall or warehouse to hide stolen goods or drugs (Ahmed, 2013, Setterfield, 1997, Giwa, 2011, Ahmed, 2014, Bala, 2012, Stanley, 2014, cited in Garba, 2019).

For every building facility to continue to accomplish its essential function, some degrees of improvement are needed over the life span of the building as standards of comfort and amenity arise where there are statutory requirements for maintenance. The acceptable standard must not be less than that necessary to meet them and the acceptable standard must sustain the utility and value of the facility (Olanrewaju and Anifowose, 2015).

Kunya (2012), cited in the work of Olanrewaju and Anifowose (2015) record peeling of wall surface, rising dampness in substructure, floor slab failure and doors and windows defect, leaking roof while foundation failure and Sagging of beam. He further advocated that maintenance culture requires the correct diagnosis of defects, current remedial measures, sound technical knowledge of material usage, management resources as well as the formulation and implementation of integrated plan and policies to sustain utility. The absence of these qualities has led to the decay of the nation's physical, social, aesthetic and economic environment. The aim of this study is to assess the level of maintenance practice in Government Science and Technical College, Mubi and how it can be achieved through the following objectives: to Examine the state of maintenance in the staff quarter; to find out the effects cause by abandoned staff quarter building; to find out whether maintenance practice was in used by the occupants. The study also answers the following questions: What is the state of the staff quarters buildings? What was the effects cause by abandoned buildings? Was maintenance practices in used by the occupants?

Dhillon (2002), classified maintenance as follows:

Corrective Maintenance: The set of tasks that is planned to correct the defects to be found in the different equipment and that are communicated to the maintenance department by users of the same equipment. Corrective maintenance may be defined as the remedial action carried out due to failure or deficiencies discovered during preventive maintenance, to repair an equipment/item to its operational state. Usually, corrective maintenance is an un-scheduled maintenance action, essentially composed of unpredictable maintenance needs that cannot be planned earlier or programmed on the basis of occurrence at particular time. Corrective or Breakdown maintenance implies that repairs are made after the equipment is failed and cannot perform its normal function anymore.

Corrective maintenance may be classified into five major categories.

Fail-repair: The failed item is reinstated to its working state

Salvage: This component of corrective maintenance is concerned with removal of non-repairable material and use of salvaged material from non-repairable equipment/item in the repair, overhaul, or rebuild programs.

Rebuild: This is concerned with restoring an item or building element to a standard as close as possible to original state in performance, life expectancy, and appearance. This is achieved through complete disassembly, examination of all components, repair and replacement of worn/unserviceable parts as per original specifications and manufacturing tolerances, and reassembly and testing to original production guidelines.

Overhaul: Refurbishing an item to its total serviceable state as per maintenance serviceability standards, using the "inspect and repair only as appropriate" approach.

Servicing: Servicing may be needed because of the corrective maintenance action; for example, engine repair can lead to crankcase refill, welding on, etc. Another example could be that the replacement of an air bottle may require system recharging.

Preventive Maintenance: Actions Carried out on a time-or machine-run-based schedule that detect, preclude, or lessen degradation of an element or system with the aim of sustaining or extending its useful life through controlling degradation to an acceptable level. It is used to be a systematic character, that is, the equipment is inspected even if

it has not given any symptoms of having a problem. On the other hand it is described as the care and servicing by persons involved with maintenance to keep equipment/facility in satisfactory operational state by providing for systematic inspection, detection, and correction of incipient failures either preceding to their occurrence or prior to their change into major failure. The objectives of preventive maintenance are to enhance capital equipment productive life, reduce critical equipment breakdowns, allow better planning and scheduling of needed maintenance work, minimize production losses due to equipment failures, and promote health and safety of maintenance personnel. Its essentials are: Inspection, servicing, calibration, testing, alignment, adjustment and installations (Sullivan. et el., 2002).

Predictive maintenance: Measurement or Techniques that defines the state of in-service equipment in order to predict when maintenance should be done; its primary aim is to reduce disruption of normal system, in operation, while allowing for budgeted scheduled repairs.

Materials and Methods

Government Science and Technical College, Mubi comprised of twenty nine (29) Staff quarter building, twenty three(23) of the quarters were used by the staff of the school while six(6) were out of used (abandoned) . In order to achieve the objective of this study, Sample survey was carried out by the researcher. The population comprised of all the occupied staff quarters (23 quarter in used by the staff), each household was given a questionnaire. The questionnaire has two section Sections A and B; the questions were designed based on maintenance practice and abandoned staff quarters buildings. A total of eighty (18) questionnaires were administered, with the aim of achieving the following: To examine the state of maintenance in the staff quarter. To find out whether maintenance practices was in used by the occupants. The Likert scale involving rating on interval scale of 5 and 1 developed for application in social sciences and management researches for quantification of qualitative variables was used. “Strongly agree” was scored 5, “Agree” was scored 4, “Undecided” was scored 3, “Disagree” was scored 2 and “Strongly disagree” was scored 1.

The Relative important index statistic was used in the rating, explained as follows;

RSI = Σμ / AN

Where **μ** is the weighting given to each factor by respondents;

A is the highest weight (i.e. 5 in this case);

N is the total number of respondents

But for this type of research work where a 5-point scale was used, the **RSI** shall be calculated via the equation:

RSI = 5a + 4b +3c + 2d + 1e (0 < index <1) jN

Where: a = number of respondents ‘‘strongly agree’’,

b = number of respondents ‘‘Agree’’

c = number of respondents ‘‘Undecided’’

d = number of respondents ‘‘Disagree’’

e = number of respondents ‘‘strongly disagree’’

N = sample size = 18

j = number of response categories = 5

The used of percentages was applied to compute table 1 and 3.

Results

Table 1: Examined building components of the staff quarters.

BUILDING ELEMENT	Roofing Sheets	Ceiling cladding	Facia board	Window	Door	External Painting/plaster	Function (%)	To lace/repair (%)
House No. 1	✓	X	✓	✓	X	X	50	50
House No. 2	✓	✓	X	✓	✓	X	67	33
House No. 3	✓	X	X	X	✓	X	33	67
House No. 4	✓	X	✓	✓	X	X	50	50
House No. 5	✓	✓	✓	X	X	X	50	50
House No. 6	X	X	✓	X	✓	X	50	50
House No. 7	✓	X	X	X	X	X	33	67
House No. 8	X	X	✓	X	X	X	17	83
House No. 9	X	X	X	X	X	✓	17	83
House No. 10	✓	X	X	✓	✓	X	50	50
House No. 11	✓	X	✓	✓	X	X	33	67
House No. 12	X	X	X	X	X	X	17	83
House No. 13	✓	X	✓	✓	X	X	50	50
House No. 14	✓	X	X	X	✓	X	33	67
House No. 15	X	X	X	✓	✓	X	17	83
House No. 16	X	X	X	X	✓	X	17	83
House No. 17	✓	✓	✓	X	✓	X	67	33
House No. 18	✓	✓	X	X	✓	X	50	50
							701/18	1099/18
						Total	**39%**	**61%**

Source: Field survey, 2021

Note: **X** Donate that the building element requires replacement or repair

✓ Donates that the building element was in good condition or functional

Table 2: Effects of abandoned building structures in Government Technical College Mubi

S/no.	Causes of Abandoned Building Structures	1	2	3	4	5	∑f	∑fx	Mean	RII	Ranking
1	Raise of criminal activities in the community	3	3		9	3	18	60	3.3	0.666	8th
2	Create Garbage dump site			3	9	6	18	75	4.2	0.84	5th
3	Negative aesthetics	3	6		6	3	18	54	3.0	0.600	8th
4	Loss of economic benefit of the building				3	15	18	87	4.8	0.96	1st
5	Environmental and physical danger to residents			3	9	6	18	75	4.2	0.84	5th
6	Adverse effect on Government tax	3	6	3	3	3	18	42	2.3	0.46	10th
7	Reduction in economic activities		9		9		18	54	3	0.600	9th
8	Bring about spread of disease in the neighborhoods			3	3	12	18	81	4.5	0.90	4th
9	Breeding ground for dangerous animals				6	12	18	84	4.6	0.91	3rd
10	Place for illegal activities				6	12	18	84	4.6	0.92	2nd
11	Environmental pollution			6	12		18	66	3.6	0.72	6th
12	Development problem	3	3		8	4	18	61	3.4	0.677	7th

Source: Field survey, 2021.

Note: **∑f** = Sum of Frequency, **∑fx**= Sum of frequency x number, **RII** = Relative important index

Table 3: Maintenance practice carried out in Government Technical and Science College Mubi Staff quarters

S/no.	Maintenance Practices	Response Immediately	Response Sometimes	Response Never
1	Painting and Plastering of exterior of the building has been done	3 (17.5%)	3 (17.5%)	12 (67%)
2	When there is linkage of roof or blown by wind, the school response		9 (50%)	9 (50%)
3	The toilets and bathroom facilities has been repaired when broken	5(28%)	4 (22%)	9 (50%)
4	Repairs of doors and windows were done when broken	5(28%)	3 (16%)	10 (56%)
5	Debris/rubbish removal and clearance	3 (17%)	6 (33%)	9 (50%)
6	Electricity appliances when damage, the school response	2 (11%)	4(22%)	12 (67%)
7	Gutter clearance has been carried out		5 (28%)	13 (72%)
8	Landscaping , paving and gardening has been done	1(6%)	2 (11%)	15 (83%)

Field survey, 2021.

Discussion

Table 1 above shows the physical performance of the selected building elements that requires maintenance at a specific interval of time. From the above table most of the building elements examined need to be repair or replace because it is 61% of the total elements. This element should be replaced immediately so that they can perform their required function.

From table 2 above, it can observe that, Loss of economic benefit of the building ranked 1st and place for illegal activities ranked 2nd which both have excellent response of the respondents, this abandoned buildings in the schools are dangerous places for criminal activities. Ranked 3rd and 4th are also are also excellent results with Breeding ground for dangerous animals and bring about spread of disease in the neighborhoods respectively. Ranking 1st to 4th above agreed with the study of Yusuf (2014), cited by Garba(2019, p.19) and Ahmed at el., (2013) cited by Garba, (2019, p. 20-21): That Abandoned/unfinished building structure in Abuja Metropolis causes of less safe and inconvenient for living, business and recreation activities; Attract crime by providing centre for the pursuit of a range of criminal activities, including prostitution, consumption and trafficking of drugs and sites of illegal activity because of how isolated they are; criminal gangs often turn them into a meeting hall or warehouse to hide stolen goods or drugs.

From table 3 above result shows that maintenance practice has not been practicing in the staff quarters of Government Science and Technical College Mubi. Landscaping, flooring and gardening has been done and Gutter clearance has not been carried out, they had more than 70% of the responses. Lack of maintenance of building has resulted to discomfort and building abandonment.

Conclusion

Based on the findings of this study, it can be concluded that there was poor or no maintenance practice in Government Science and Technical College, Mubi-North L.G.A, Adamawa State. Secondly, the school management should response immediately to any maintenance problem that may arise from all the building components. In all the questions raise on the maintenance practice carried out on the occupied building quarter, most of the responses was never done which indicates serious maintenance negligence in the school quarters also the questions raise on abandoned building quarter, most of the responses of the respondents was agree and strongly disagree on causes of abandoned buildings.

Therefore, it is recommended that;

i. The Staff of the quarters should also be involved in some of the maintenance practice not to wait for the School Management or the Government to respond.

ii. There is every possibility for the remaining staff quarters building to be abandoned soon as the other five (5) quarter there, was out of used and were abandoned.

iii. The school management should device a mean of generating money to complete the abandoned building which was used for many criminal activities and may lead to rise in insecurity.

iv. When there is little damage detected immediate repair should be carried out.

v. General renovation should be carried out at intervals of four to five years to maintain the aesthetic value of the building.

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