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Assessment of Defect in Building Services Equipment in Tertiary Institutions Across Lagos Megacity, Nigeria

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Abstract:- Despite the volume of research on Building defect, Defect remains major building construction problems. This paper examines the defect in building services equipment in tertiary across Lagos megacity Nigeria. To achieved the aim of the study, two hundred and fifty (250) was randomly administered among selected students across all tertiary institutions of Lagos megacity. The result of the findings revealed that maintenance aspects of the building are still weak in all the tertiary institutions of Lagos megacity. The study concludes the need to an established linkage between the students (users), and management of that institution (owners) to arrest building defects in time. However, the study further recommends the involvement of built professionally in every construction activities across the tertiary institution of Lagos megacity and Nigeria.

I. INTRODUCTION

Nigeria is one of the fastest-growing economies in Africa. With the highest number of tertiary institutions. With this great investment, the government of Nigeria is not concern about the importance of building maintenance aspect (Sani, 2012). Even though the concept of building maintenance has already been present in Nigeria since modern buildings were constructed the typical understanding and approaches require changes to suit to the current scenarios and demands (Olanrewaju, Babatunde, & Anifowose, 2015). Maintenance of the building is a complicated process and costly, there is a need to execute it wisely to minimized money and extends the life span of the building (Wu & Clements-Croome, 2007).

The (British Standard Institution (BSI), 1984) version of BS 3811 sees maintenance as the combination 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. BSI (1974) see building maintenance as work done to keep a building in or restore it to its initial state, or a currently acceptable standard (Olanrewaju et al, 2015). To implement building maintenance tasks efficiently, a proper building maintenance plan and monitoring system are necessary.

Building maintenance management is an operation involving the interaction or combination of technical, social, legal and fiscal determinants that govern and manage the use of buildings (Edmund Nana, Tindi, Lydia, & Oswin, 2017). It can be argued that many people do not understand the importance or significance of building maintenance and its management, in particular the realization that the efficiency of a building maintenance system contributes to the income of the company's owning or renting the building (Emma and Syahrul, 2009).

However, in terms of residential or housing buildings, the building occupants and maintenance team are more focused on the quality, safety and environmental factors. Meanwhile, previous Department of Trade and Industry statistics indicated that housing maintenance represents about 50 per cent of repair and maintenance expenditure over all sectors of building maintenance such as commercial, institutional, educational and others (Chanter and Swallow, 2007). The building maintenance was so significant to the economy not only because of the scale of expenditure involved, but also to ensure the nation's stock of buildings (Seeley, 1987 and Nyayiemi, 2013).

Also, the implementation of building maintenance permits the building to function its purpose efficiently and effectively. The studies of Nyayiemi, (2013), notes that the geographical and urban structure, lack of a properly designed system of the renovation of houses and schedule, inadequate skills and malfunctioning of tools and materials used, technical skills as well as lack of adequate funds for refurbishment and maintenance of residential houses are the main technical and financial problems facing most municipalities.

Past studies confirmed that social problems including lack of tenants' awareness, poor conditions of house maintenance, managers, lack of community involvement, incompetence of manpower/staff qualifications and training are some challenges that the municipality encounters. Also, insufficient funding, improper legislation and negative attitudes towards the cost of housing maintenances are significance. The maintenance of residential buildings has already been identified and studied in Nigeria (Odediran, Opadiran and Eghenure, 2012).

Studies had also been carried on the factors affecting housing maintenance cost in developed countries like the United Kingdom, the United States and Malaysia by Ali, Kamaruzzaman, Sulaiman and Peng (2010); But little or no literature has been documented on the factors affecting maintenance management of tertiary institution buildings'. Most of the institutional housing (buildings') have been in bad shapes, lack maintenance and refurbishment. While

others have been abandoned. The study, therefore, sought to examine defect in tertiary institution buildings across Lagos Nigeria.

II. METHODS OF DATA COLLECTION

The study delineated all tertiary institution within Lagos State namely, University of Lagos, Akoka, Lagos State University, Ojo, Yaba College of Technology, Lagos State Polytechnic, Ikorodu, Caleb University, Imota, Adeniran Ogunsanya College of Education, and Michael Otedola College of Primary Education, Epe, to identity defeat in building services within the study area. In all Two hundred and fifty (250) questionnaires were randomly administered among students of Technology, Science and Environmental related courses in all the selected institutions. The result of the finding was analysis using SPSS 26.0 and presented using descriptive statistics.

III. DISCUSSION OF FINDINGS

This section presents the result of findings on the analysis of factors affecting building services maintenance in typical tertiary institutions in Lagos Nigeria. All table, graph and chart in this section were derived from field survey (2020) except otherwise stated.

The study on figure 1 presents the result of findings on the condition of the building, facilities, and services in the study area. The study revealed that generally, a larger percentage of the studies population (56%) agreed that condition of building, facilities, and services within the campus is fairly good, while the remaining 44% of respondents' had that condition of building facilities, and services are bad. This indicates that there is a defect in the maintenance of building services in the study area.

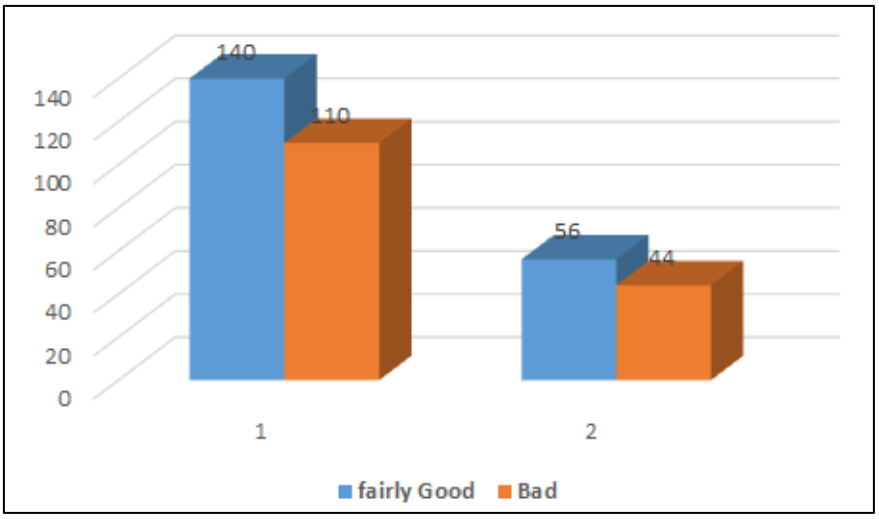

Fig 1:- Condition of Building, Facilities, and Services in the Study Area

The study on figure 2 shown the state of electricity, water and toilet on the campus. The result of the findings proven that 45.2% of the total population agreed that the state of the electricity, water and toilet within the study area was bad, and also, 43.6% of the respondents' agreed that the state of the conditions is electricity, water and toilet were fairly good while the remaining 11.2% agreed that the condition was good.

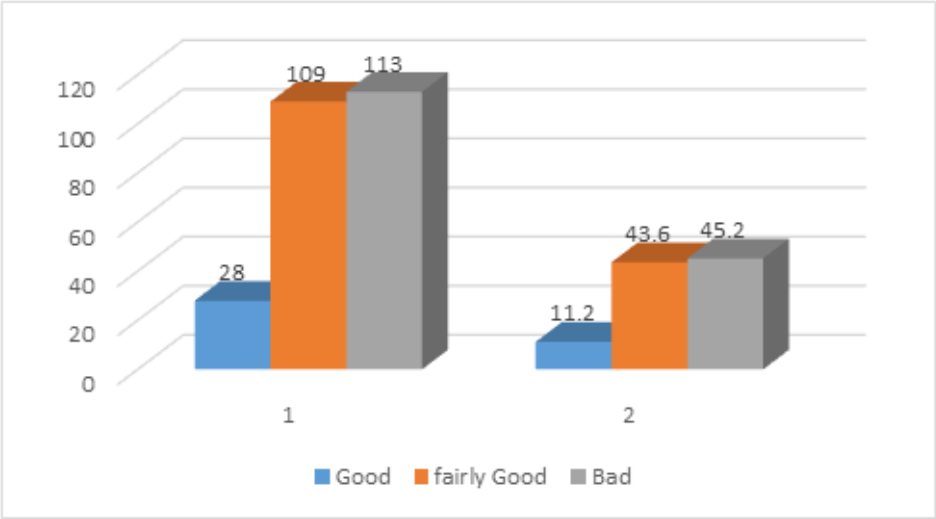

Fig 2:- State of Electricity, Water and Toilet in the Study Area

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Study on figure 3 presents findings on conditions of roofing in the hostels. The result of this finding implies that 56% of the total of building within the hostels building were rusty, 33.2% of the total population of the roof of building in the hostel were leaking, while only 10.8% had no defect.

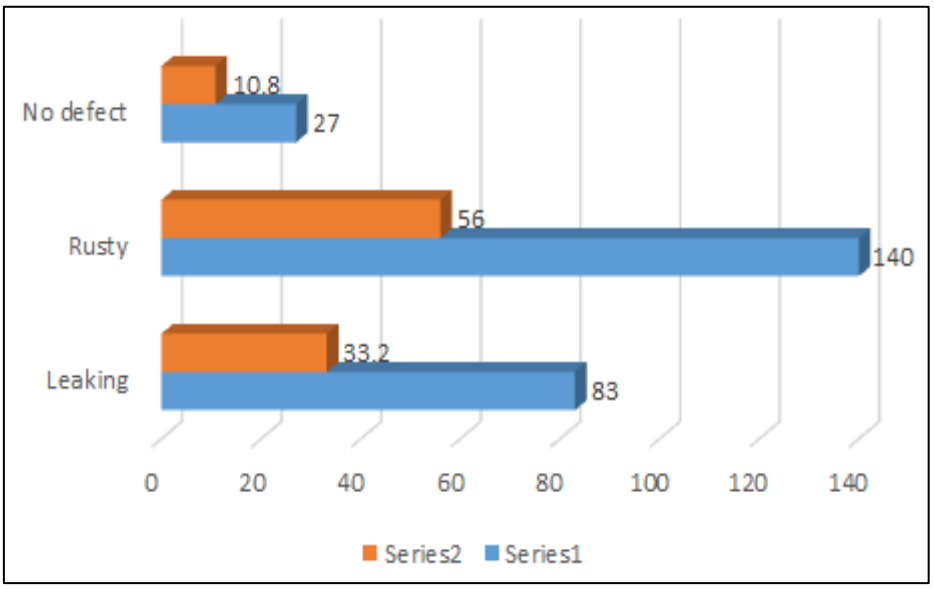

Fig 3:- Conditions of Roofing in Hostels

The study on figure 4 shown that 33.3% of the roof in the offices of lecturers were leaking, the study also confirms that 55.6% of the total population of the roof of offices and lecture rooms were rusty, and only 11.2% of the roof of offices and lecturers' rooms had no defect. This indicates the material used for roofing were those that can rust.

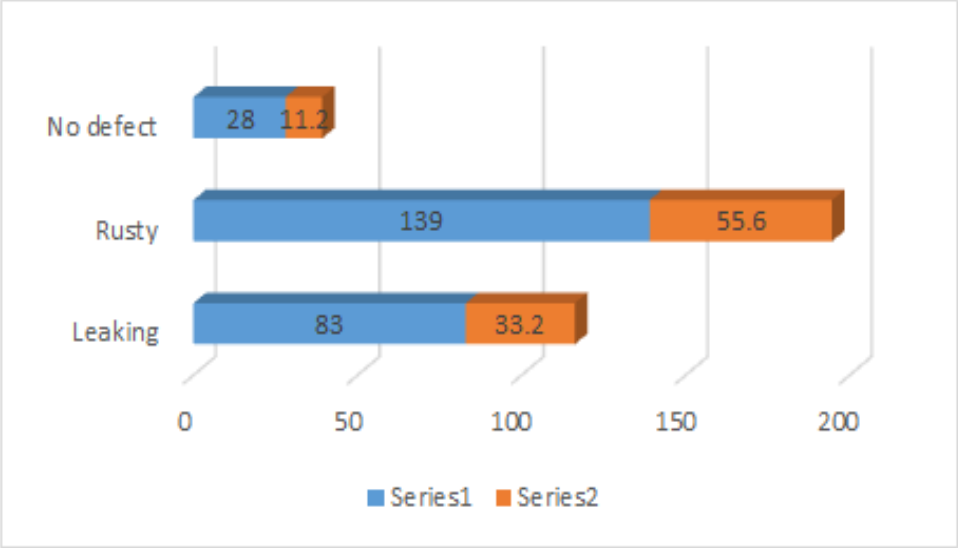

Fig 4:- Conditions of Roofing in Offices/Lecture Rooms

Study on figure 5 present findings on the conditions of flooring and paint on the building in the study area. The result of the finding reviewed that larger per cent of paint on the building in the study area had peel-off, and even cracks, and while the only little per cent of the floor and paint on the building in the study area had no defect.

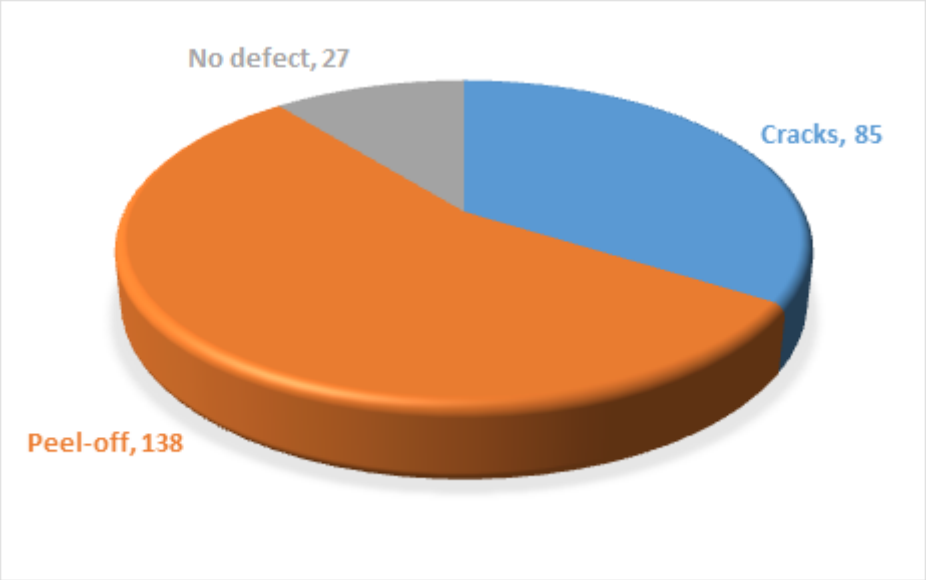

Fig 5:- Condition of Flooring and Paint on the Building

➢ *Causes of Building Services Defects*

This presents a variable that likely causes of building services defects that had been identified as major causes of building services defects to the impediments of achieving effective building maintenance. The result of the rank and percentile show that there is a significant relationship between variables that causes a defect in the building services equipment. Result of findings on table 1 shows that factors such as the use of idealized performance data for building services product, improper user behaviour or operations, unexpected power loads were rank highest and had the highest percentile. This indicates that there is a need for the development of performance data and for building services product, proper behaviour among users, development specification etc.

Point	***Column1***	***Rank***	***Percent***
15	4.23	1	100.00%
14	4.12	2	92.80%
13	4.10	3	85.70%
12	4.02	4	78.50%
11	4.00	5	71.40%
10	3.85	6	64.20%
9	3.84	7	57.10%
8	3.76	8	50.00%
7	3.76	9	42.80%
6	3.68	10	35.70%
5	3.51	11	28.50%
4	3.48	12	21.40%
3	3.35	13	14.20%
2	3.26	14	7.10%
1	3.04	15	0.00%

Table 1:- Causes of Buildings Services Defects

➢ *Factors Affecting Building Services*

This section rank factors affecting building services as major factors contributing to the issue of achieving maintenance of building services amenities on a five (5) Likert scale.

The result of ranking and percentile on table 3.2 shown that among those factors affecting building services equipment maintenance within the campus, the respondents' agreed that factors such as fluctuation and additional work/financial delays, moisture problem from wet areas leading to leakages, defective materials used for maintenance work, lack of training and skills of maintenance and, lack of preventive maintenance had a significant relationship and were ranked highest and had the highest percentile as factors affecting building services equipment maintenance in the study area.

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Point	*Column1*	*Rank*	*Percent*
16	4.2920	1	78.90%
17	4.2920	1	78.90%
18	4.2920	1	78.90%
19	4.2920	1	78.90%
20	4.2920	1	78.90%
10	4.2360	6	47.30%
11	4.2360	6	47.30%
12	4.2360	6	47.30%
13	4.2360	6	47.30%
14	4.2360	6	47.30%
15	4.2360	6	47.30%
9	4.2200	12	42.10%
8	4.0600	13	36.80%
7	3.8880	14	31.50%
6	3.8120	15	26.30%
1	3.7000	16	0.00%
2	3.7000	16	0.00%
3	3.7000	16	0.00%
4	3.7000	16	0.00%
5	3.7000	16	0.00%

Table 2:- Factors Building Services Equipment Maintenance

IV. CONCLUSION

The examine defect in building services equipment in tertiary institutions across Lagos megacity, Nigeria. The study established that quite a lot of challenges still were responsible buildings defect in the study area. Based on this the following conclusions are drawn; maintenance factors like poor workmanship, poor quality of spare parts and materials, poor maintenance management, budget constraints and poor budgetary controls affect the building maintenance management costs and the need to the established linkage between the students, and management of those institutions to arrest building defects in time.

V. RECOMMENDATION

Based on the conclusion, the following recommendation was made:

- Construction industry professional's builders in various department in the institutions e.g. Civil engineers, Architects etc. must be involved in all the stages of the planning, design, construction and, management processes.
- The materials to be used for construction must be tested, retested and confirmed authentic by qualified professional.
- Skills, Experienced and qualified artisans must be engaged in the construction and maintenance of building infrastructures.

All this will eliminate defect in tertiary institution buildings across tertiary institutions within Lagos megacity and Nigeria in general.

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