International Journal of Environmental Studies and Safety Research
ISSN: 2536-7277 (Print) : 2536-7285 (Online)
Volume 3, Number 2, June 2018
http://www.casirmediapublishing.com

APPRAISAL OF BUILDING PROFESSIONAL LEVEL OF INVOLVEMENT IN THE MAINTENANCE OF RESIDENTIAL BUILDINGS IN MAKURDI LOCAL GOVERNMENT BENUE STATE

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ABSTRACT
The study assessed building professional's level of involvement in the maintenance of residential buildings in Makurdi local government area of Benue state. To guide the study, two (2) research questions were stated while two hypotheses were formulated and tested at 0.05 level of significance. The study used an analytical survey research design. A total population of 454 was used for the study. A disproportionate stratified random sampling technique was employed to select 25 Architects, 46 Builders, and 70 Engineers. This sampling procedure was found appropriate because the population was divided into strata of Architects, Builders and Engineers with each stratum sharing similar attributes as the case may be. A 40 item questionnaire Titled "appraisal of building professionals involvement in the maintenance of residential buildings" (ABPIMRB) was developed and used by the researcher. The instrument was given to one measurement and evaluation expert from Science and Technical Education Board Headquarters, Makurdi and three experts from building construction section in the Department of Vocational and Technical Education, Faculty of education, Benue State University. The researcher employed the direct delivery technique in administering the instrument to, builders, architects and engineers in respective places of contact. The study found out that most of the maintenance facilities especially tools and equipment are available but not adequate in some cases and are hardly applied by building professionals during maintenance. The study mainly recommended the need for building professionals to adequately provide all the needed maintenance facilities and apply same as required when carrying out maintenance

INTRODUCTION
A building generally is defined as a permanent or temporary structure enclosed within exterior walls and a roof. A building includes all attached apparatus, equipment and fixtures that cannot be removed without cutting into ceiling, floors or walls (Oladopo, 2005) Similarly, a building is considered as an edifice erected by art and fixed upon or over the soil, composed of stone, brick, wood or other proper substance connected together and designed for use in which it is so fixed (Saskatoon, 2014). Buildings are required to provide a conducive and safe environment for various human activities. The extent to which buildings provide the required environment for the required activity is a measure of the functionality of the building (Oladapo, 2005) Buildings come in a variety of shapes, sizes and functions and have been adapted throughout history for a wide number of factors, such as building materials available, the weather conditions, land prices, ground conditions, specific uses and aesthetic reasons. Buildings

serve several needs of the society, primarily as shelter from weather, security, living space, privacy to store belongings and to comfortably live and work in. They are available in variety of types according to the principal activity they perform or the function carried out within the building. Buildings used for more than one of such activities are assigned to the activity occupying the most floor space (Cobinnah, 2010). Similarly, Opaluwah (2005) said that, the absence of these qualities has led to the decay of the nation's physical, social, aesthetic and economic environment. Maintenance has been identified as a very critical factor necessary for the efficient use of any physical facility. Regrettably, effective maintenance has continued to be a very big problem to maintenance managers in developing countries such as Nigeria. Well conceived projects have often been abandoned or short lived largely as a result of poor maintenance. Government and individual investors lose or do not derive appropriate returns on investment due to poor or lack of maintenance.

Although the idea of building maintenance is laudable, the situation in most developing countries (most especially Nigeria) as earlier mentioned has not changed given the global economic depression and wide spread poverty. The problem of lack of maintenance may not be lack of funds alone but inadequate appreciation of the need for maintenance, ignorance and low priority accorded it (Odediran, Opatunji & Eghenure 2012).Similarly, Cannon (1990) noted that the availability, adequacy and effective application of maintenance facilities such as tools, equipment, maintenance manuals and plans are considered as an important characteristic that has also not been appropriately coordinated by both developers and building professionals. Tools and equipments are designed to make a maintenance job easier and enable you to work more efficiently. If they are not properly selected and applied, their advantages are lost to you. Regardless of the type of work to be done, you must have to choose and use the correct tools in order to do your work quickly, accurately and safely. Without the proper tools and the knowledge of how to use them, time is wasted, your efficiency is reduced and injury or lost of life may occur. (Adikwanduaba, 2014). Proper tools and equipment are essential for the effective operation of any maintenance work. Equipping the maintenance works with the correct tools and equipment plays an essential role in achieving timely and good quality results. For every construction activity, there is an optimal combination of tools, equipment and labour. Depending on the nature and content of the maintenance works, the building professionals needs to know which tools to use and how to effectively combine them with manual labour (Sharma, 2008).

Another maintenance facility identified by Seeley (1976) as cited in Amobi (2003) which is as well essential in maintenance work is the maintenance manual. In standard maintenance practice, maintenance manuals are supposed to be handed

over to occupants by builders or developers. The manual which contains maintenance practices required by both occupants and building professionals is a valuable, descriptive, technical literature, aid, memoir or handbook for carrying out maintenance work (Amobi, 2003). Also as it is contained in the Federal Republic of Nigeria; National Building Code (2007), maintenance manual is defined as a comprehensive guide that includes appropriate forms and log books for the maintenance of a buildings prepared by a consortium of registered architect, builders and registered engineers. The value of a building tends to decrease when maintenance is not carried out on the building; therefore, the need for maintenance will only intensify if the value for building is to be sustained. Building maintenance constantly affects everyone's life, because people's comfort and productivity are related to the performance of the buildings in which they live (Olanrewaju, Mohd & Arazil, 2011). This is to ensure that they continue to retain their value for investment within the period of its existence. Building maintenance practices are all measures initiated with the intent of keeping the building in better working condition. Jody (1999) has identified the followings as best maintenance practices necessary for building maintenance. They include; assessing the condition of building components, ranking of the maintenance work to be done and evaluating their cost, planning for building in the short and long-term maintenance. It also involves structuring a preventive maintenance framework, using the right tools and competency of maintenance workers as well as involving appropriate personnel in decision making and in communicating building needs. As earlier stated, the physical environment forms the principal dictator of the well-being of man (Ebenezer, 2012). Hence maintenance as the last leg of a relay team and the lubricating oil of an engine is a component of a conclusive phase of sustainable development. Nigeria has been experiencing periods of economic adversity in the last few decades which has witnessed massive investment in property development both in the public and private sectors of the economy but they are rarely maintained. This is because maintenance program in Nigeria has not received the desired attention (Yusif, 1998) in (Odediran, 2002). It appears the emphasis is directed more on the development of new properties. Developers build mostly for immediate value for their buildings not minding what becomes of the structure in the near future. For buildings to function properly the maintenance culture needs to change. It is in the light of the above that this study is carried out to assess the maintenance practices on residential buildings in Makurdi local Government Area of Benue State.

STATEMENT OF THE PROBLEM

The main purpose of building maintenance is to preserve machinery, building and services, in good operating condition. To restore it back to its original standards and to improve the facilities depending upon the development that is taking place

in the building engineering. All the buildings deteriorate from the time they are completed. The rate of deterioration depends on a number of factors. Not all the factors can be controlled by the occupants of the building. Regular maintenance is essential to keep building, equipment, machines and the work environment safe and reliable. It helps to eliminate workplace hazards. Lack of maintenance or inadequate maintenance can lead to dangerous situations, accidents and health problems. The maintenance of buildings has been neglected, this has led to the deterioration of the components of buildings which results to extensive and unavoidable damage to the building fabric or structure. This has often led to the collapse of the buildings which results to damage of properties, injuries, deterioration of building components and death of its occupants. . This alarming situation of lack of proper maintenance practices has depicted a negative national image to the outside world about Benue and Nigeria at large. Though building professionals are trained on maintenance practices, they do not always carry out building maintenance as prescribed by relevant authorities. Several researches have been conducted on the use of substandard materials, poor workmanship, poor design, and faulty construction methods as factors that have necessitated the deterioration of building components which gradually lead to building collapse. However, not much has been done on the aspect of building maintenance practices by occupants and building professionals. It is on the bases of this disclosure that this study is embarked upon to consider building professionals level of involvement in the maintenance of residential buildings in Makurdi local government area.

PURPOSE OF THE STUDY

The specific objectives of the study included to:

1. Determine the level of availability and the extent of application of maintenance facilities in residential buildings by architects, engineers and builders in residential buildings.
   State the purposes

RESEARCH QUESTIONS

One research questions are raised to guide the study:

1. What is the level of availability and extent of application of maintenance facilities with architects, engineers and builder for the maintenance of residential buildings?

RESEARCH HYPOTHESES

The following null hypotheses were Formulated and tested at 0.05 level of significance:

Ho_1: There is no significant difference among the mean responses of architects, engineers and builder on the level of availability of maintenance facilities on residential buildings

Ho_2: There is no significant difference among the mean responses of architects, engineers and builder on the extent of application of maintenance facilities on residential buildings.

METHODOLOGY

An analytical cross-sectional survey design was used for the study. The study was carried out in Makurdi local government area of Benue state, Nigeria. The study utilized a total population of 454 building professionals which comprise of 120 builders, from Nigeria Institute of Builders (NIOB) Makurdi Branch, 294 engineers from Nigerian Society Engineers (NSE) Makurdi Branch and 40 Architects Nigerian Institute of Architect (NIA) Makurdi Branch. A disproportionate stratified random sampling technique was employed to select 25 Architects, 46 Builders, and 70 Engineers. This sampling procedure is found appropriate because the population was divided into strata of Architects, Builders and Engineers with each stratum sharing similar attributes as the case may be. A 40 item questionnaire Titled "appraisal of building professionals involvement in the maintenance of residential buildings" (ABPIMRB) was developed and used by the researcher. The instrument was given to one measurement and evaluation expert from Science and Technical Education Board Headquarters, Makurdi and three experts from building construction section in the Department of Vocational and Technical Education, Faculty of education, Benue State University, Makurdi. Cronbach Alpha technique was employ to ascertain the internal consistency of the instrument which yielded a coefficient of 0.72. The researcher employed the direct delivery technique in administering the instrument to, builders, architects and engineers in respective places of contact.

Research Question One

What is the level of availability of maintenance facilities with architects, engineers and builders for the maintenance of residential buildings?

Data to address this research question is presented in table 1 below;

RESULTS

S/no.	Item Statement	N	X	SD	Remarks
1.	Maintenance manual	141	1.53	.968	Not available
2.	Maintenance plan	141	2.78	.698	Available
3.	Underpinning and shoring jacks	141	1.93	1.25	Not available
4.	Damp proof membrane (Dpc) injection machine	141	1.48	.833	Not available
5.	Measuring tools	141	3.28	1.09	Available
6.	Cutting tools	141	3.03	.573	Available
7.	Driving tools	141	2.67	.834	Available
8.	Finishing tools	141	3.62	.732	Available
9.	Fastening tools	141	3.57	.777	Available
10	Ladders and Scaffolds	141	2.82	.713	Available
11	Rammers	141	2.23	.873	Not available
12	Gauge box	141	2.23	.873	Not available
13	Sieves	141	2.35	.819	Not available
14	Dump truck	141	2.76	.584	Available
15	Compactors	141	2.83	.506	Available
16	Vibrators	141	2.98	.500	Available
17	Excavators	141	2.27	.631	Not available
18	Elevators	141	2.91	.620	Available
19	Moisture meter	141	2.22	.811	Not available
20	Cracks Magnifying lenses	141	2.42	.911	Not available

Table1: Mean Scores and Standard Deviation of Responses on the Availability of Maintenance Facilities in Residential Buildings in Makurdi Local Government Area.

Results from table 1 above shows that, eleven (11) items out of the twenty (20) items had their mean values ranging from 2.57 to 3.62 which are above the cut-off point. This indicates that the maintenance facilities are available for carrying out maintenance in residential buildings. However nine items got mean values ranging from 1.48 to 2.42 indicating not available. This implies that those maintenance facilities are not always available for carrying out maintenance on residential buildings in Makurdi local government area.
The table also shows a standard deviation (SD) of 0.500 to 1.252. This indicates homogeneity of responses by respondent on the instrument.

Research Question Two

What is the extent of application of maintenance facilities by architects, engineers and builders in the maintenance of residential buildings?
Data to address this research question is presented in table 2 below;

Table 2: Mean Scores and Standard Deviation on the Extent of Application of Maintenance Facilities by Building Professionals on Residential Buildings.

S/no.	Item Statement	N	X	SD	Remarks
1.	Maintenance manual	141	1.67	1.12	Hardly applied
2.	Maintenance plan	141	2.28	.803	Hardly applied
3.	Underpinning and shoring jacks	141	1.65	.957	Hardly applied
4.	Damp proof membrane (Dpc) injection machine`	141	1.69	1.03	Hardly applied
5.	Measuring tools	141	3.62	.692	Applied
6.	Cutting tools	141	3.72	.645	Applied
7.	Driving tools	141	3.44	.929	Applied
8.	Finishing tools	141	3.70	.808	Applied
9.	Fastening tools	141	3.51	.891	Applied
10.	Ladders and Scaffolds	141	3.36	1.11	Applied
11.	Rammers	141	3.62	.798	Applied
12.	Gauge box	141	3.36	1.01	Applied
13.	Sieves	141	3.12	1.20	Applied
14.	Dump truck	141	3.49	.915	Applied
15.	Compactors	141	3.62	.815	Applied
16.	Vibrators	141	3.56	.936	Applied
17.	Excavators	141	3.52	.850	Applied
18.	Elevators	141	3.50	.850	Applied
19.	Moisture meter	141	2.46	.833	Hardly applied
20.	Cracks Magnifying lenses	141	2.26	.823	Hardly applied

Table 2 shows all the means of fourteen (14) items ranging from 3.12 to 3.72. This indicate that the mean value of each of the items was above 2.50 point from a 4-point scale, it revealed that most building maintenance facilities are applied during maintenance work in the study area. However six (6) items with mean values ranging from 1.65 to 2.46 were also shown. This indicates that these maintenance facilities are hardly applied during maintenance. The table also shows a standard deviation (SD) of 0.645 to 1.204. This indicates homogeneity of responses by respondent on the instrument.

Hypothesis One (H_1)

There is no significant difference between the mean responses of architects, engineers and builder on the level of application of maintenance facilities on residential buildings. In order to test this hypothesis, the **ABPIMRB** questionnaire was administered to building professionals (Architect, Builder and Engineers). The mean scores were computed and the one way ANOVA was used to test for the significance. This is not necessary

Table 3: ANOVA test on the Level of Availability of Maintenance Facilities with Architect, Builders and Engineers for the Maintenance of Residential Buildings

Variables	SS	Df	F	Sig	Decision Rule
Between groups	730.973	2	2.271	0.107	Accepted
Within group	22213.679	138			

$P<0.05$

The result in table 3 show that *P*-value 0.107 is greater than 0.05 at df=2 for between the groups, df=138 for within groups and F=2.271. Therefore the null hypothesis was accepted, meaning that there is no significance difference among architects, builders and engineers on the level of availability of maintenance facilities in residential building.

Hypothesis Two (H_2)

There is no significant difference between the mean responses of architects, engineers and builder on the extent of application of maintenance facilities on residential buildings. In order to test this null hypothesis, the **ABPIMRB** was administered to building professionals and occupant. The mean scores were computed and one way ANOVA was used to test for the significance. This is not necessary

Table 4: ANOVA test on the Extent of Application of Maintenance Facilities by Architect, Builders and Engineers for the Maintenance of Residential Buildings

Variables	SS	Df	F	Sig	Decision Rule
Between groups	758.735	2	2.214	0.113	Accepted
Within group	2364.215	138			

$P<0.05$

The result in table 4 show that *P*-value 0.113 is greater than 0.05 at df=2 for between the groups, df=138 for within groups and F=2.214. Therefore the null hypothesis was accepted, meaning that there is no significance difference among architects, builders and engineers on the extent of application of maintenance facilities in residential building.

DISCUSSION OF FINDINGS

The study was conducted to assess building professional's involvement in the maintenance of residential buildings in Makurdi Local Government Area of Benue state The research questions were answered and hypotheses tested which led to the following findings;

The results from Table 1 shows that, eleven (11) items out of the twenty (20) items had their mean values ranging from 2.57 to 3.62 which are above the cut-off point. This indicates that maintenance facilities are available for carrying out maintenance in residential buildings. However nine items got mean values ranging from 1.48 to 2.42 indicating not available. This implies that those maintenance facilities are not always available for carrying out maintenance on residential buildings in Makurdi local government area. The table also shows a standard deviation (SD) of 0.500 to 1.252. This indicates homogeneity of responses by respondent on the instrument. Result from hypothesis one was tested to establish if there was a significant difference between the mean scores of building professionals and occupant and the result was presented in table 3. It showed that the P-value 0.107 is greater than 0.05 at df=2 for between the groups, df=138 for within groups and F=2.271. Therefore the null hypothesis was accepted, meaning that there is no significance difference among architects, builders and engineers on the level of availability of maintenance facilities in residential building.

The study found out that maintenance facilities especially tools and equipment are available but inadequately provided for carrying out maintenance as required in residential buildings. Evidence from literature shows that, the maintenance of residential buildings is more effectively carried out when the right facilities in the required degree are applied, however some of these facilities are available but not efficiently applied as required. These findings do not agree with Cannon (1990) who said, appropriate tools and equipment in the required quantity are essential for effective operation of any maintenance works. This study has addressed this issue by finding out from building professionals through a structured questionnaire on the level of availability and application of maintenance facilities for maintenance of residential buildings in Makurdi local government area. Equally, Table 2 shows all the means of fourteen (14) items ranging from 3.12 to 3.72. This indicates that the mean value of each of the items was above 2.50 point from a 4-point scale. It revealed that most building maintenance facilities are applied during maintenance work in the study area. However six (6) items with mean values ranging from 1.65 to 2.46 were also shown. This indicates that these maintenance facilities are hardly applied during maintenance. The table also shows a standard deviation (SD) of 0.645 to 1.204. This indicates homogeneity of responses by respondent on the instrument. Result from hypothesis two was equally tested to establish if there was a significant difference between the mean scores of building professionals and occupant and the result was presented in table 4. The result show that P-value 0.113 is greater than 0.05 at df=2 for between the groups, df=138 for within groups and F=2.214. Therefore the null hypothesis was accepted, meaning that there is no significant difference among architects, builders and engineers on the extent of application of maintenance

facilities in residential buildings. This finding gives credence to the work of Vorster and Sears (1990) who posited that, inappropriate selection and application of maintenance facilities are the common reasons for delay of efficient execution of maintenance works. When the correct maintenance facility is available and fittingly applied or used, the work becomes faster and accurate.

CONCLUSION

The study observe that efficient, timely and accurate maintenance practices are achieved by appropriate selection and application of building maintenance facilities during or before maintenance challenges. This disclosure contradicts the present practice by building maintenance stakeholders as reveled from the findings of the present study.

RECOMMENDATION

1. A National Maintenance Policy should be formulated as part of the National Housing Policy to compel people to undertake maintenance on the buildings they occupy to avoid a situation where huge sums of taxpayers' money go down the drain through deterioration of public buildings due to lack of maintenance.
2. Building designs and specifications should incorporate materials with least maintenance problems, for instance tiling the external walls of high rise buildings will solve the problem of painting due to the height of the building.
3. Individuals should embrace maintenance as a practice and government should engineer action towards more advocacy, policy and awareness on the essence of maintenance as a practice for national sustainability

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