FLOORS, FLOOR COVERING AND WALL FINISHING PRACTICES IN BUILDING CONSTRUCTION IN RURAL AREAS IN ZAMFARA STATE, NIGERIA

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Abstract: *This study determined floors, floor covering and wall finishing practices adopted by craftsmen in building construction in rural areas of Zamfara State, Nigeria. The descriptive survey research design was used for the study on a sample size of 322 master craftsmen comprising of 253 with educational qualification and 69 without educational qualification gotten with the aid of National Statistical Service Sample Size Calculator. An 11 item validated questionnaire with a Cronbach Alpha reliability of 0.84 was used for collecting data for the study. Mean and standard deviation was used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed that: the building construction floors, floor covering and wall finishing practices are not highly adopted by building master craftsmen in rural areas. There was no significant difference between the mean responses of the respondents on the building construction floors, floor covering and wall finishing practices adopted by building master craftsmen in rural areas. This implies that the incessant cases of building failures in rural areas could be attributed to the negligence towards adoption of standard building construction floors, floor covering and wall finishing practices in rural areas. It was recommended that there is urgent need for all categories of building craftsmen to highly adopt the building construction floors, floor covering and wall finishing practices stipulated by the standard building code to enhance the performance strength of buildings in rural areas as well as improve their building construction floors, floor covering and wall finishing practices of craftsmen in rural areas of Zamfara State, Nigeria.*

Keywords: *Building, Building construction, building construction floors, floor covering and wall finishing practices, craftsmen, rural areas*

1. INTRODUCTION

Generally, rural settlement represents large and isolated areas with low population density. A lot of agricultural activities are carried out in the rural areas and it forms a vital source of revenue for the government. The rural dwellers are usually involved in the production of agricultural products (Fagbenle & Oluwunmi, 2010). Despite the role of rural dwellers in nation building, these rural areas are not attractive to live in. There is the problem of inadequate infrastructures needed to improve the quality of life. Usually, there is absence of potable water, electricity, good feeder roads and much higher rate of illiteracy as well as low developmental activities.

The Federal Office of Statistics (FOS-2015) defined a community with less than 20,000 people as rural. According to Olagunju *et al* (2013), rural areas can be easily identified by various criteria, apart from population. Such criteria include the level of infrastructural development, such as road networks, educational institutions, water supply, electricity, health facilities, and communication among others. Other criteria used include craftsmen performance in building construction occupation, housing, extent of community planning and attractive building construction. The rural people in Zamfara State have low standard of living,

unattractive and low quality building constructions. These buildings are constructed by building craftsmen. A Craftsman is a person that possesses skills in an established occupational area and can perform a task with some level of expertise. Building craftsmen performs various building construction operations in both urban and rural areas. Some of the craftsmen in rural areas are educated to a level of been able to read and write while others are not. There is the likelihood that their level of education may influence their practices in the job as an educated craftsman can read and interpret building designs and regulations which may aid in improving his efficiency in his job. However, Yoon and Kang (2000) stated that the craftsman that is not educated may be practicing what is not appropriate due to lack of necessary knowledge and this is detrimental to the building construction industry as it affects the quality of constructed buildings.

It is as a result of the need to provide shelter that a building is constructed. Dimuna (2010) described a building is a relatively permanent enclosed construction over a plot of land having a roof and usually windows and often more than one level, used for any of a wide variety of activities, as living, entertaining, or manufacturing. Building construction is an ancient human activity that began with the purely functional need for a controlled environment to moderate the effects of climate. Building construction is a significant part of human existent. The building construction industry occupies a very critical position in the Nigerian economic landscape (Council of Registered Builders of Nigeria, 2015). It is a major contributor to the nation's gross domestic product (GDP) and one of the biggest employers of labour particularly in rural areas. The building construction sector is growing very fast in most parts of the world. Building construction trades practices include: building construction planning practices, foundation work practices, block laying practices, concreting work practices, floors and floor covering practices as well as wall finishing practices. This study however focused on the floors and floor covering practices as well as wall finishing practices.

Floor may be finished with stone, wood, bamboo, metal, or any other materials that can support the expected load. Floor is always some risk of rising damp with concrete floor slabs supported on the ground. It is therefore customary with new floors to insert an effective damp-proof membrane to prevent possible damage to the floor finish (Zairul, 2016). Different floor finishes offer varying degrees of resistance to dampness. Floor covering is term to generically describe any finish materials applied over a floor structure to provide a walking surface. Floor covering is affected by factors such as endurance, noise insulation, comfort and cleaning effort. Some types of flooring must be installed below grade, including laminate and hardwood due to potential damage from moisture. Good floor covering done by craftsmen may reduce extra work during finishing.

Finishing work is a fine job in building construction process where it forms the beauty of a building. Several types of finishes exist based on the materials used by the craftsmen, environmental condition and cost. This can be classified into: floor finishing, wall finishing and ceiling finishing, (Zairul, 2016). In building construction, successful finishing ensures good productivity, good quality work, and job satisfaction, accidents free and good assessment. Most of the floors and floor covering practices as well as wall finishing practices are not adequately carried out especially by craftsmen in rural areas and a poorly constructed floor and poorly finished wall may lower the strength of the buildings in relation to reactions to variation in climatic variations and land forms. A poorly constructed floor can have devastative effect to sudden earth movement due to soil structure. This calls for the need to determine the floors and floor covering practices as well as wall finishing practices adopted by craftsmen in the rural areas of Zamfara State.

1.1 Statement of the Problem

In an ideal situation, a well-constructed building structure is expected to serve its purpose and retain its performance strength over a number of years without sudden failure or collapse. However, over the last two decades literature evidence and physical observation showed that the number of structural failure and building collapse is on the increase especially in rural areas. This unfortunate situation may be partly due to poor productivity of craftsmen and inappropriate floors and floor covering practices as well as wall finishing practices carried out by these craftsmen. Even though, several researches have been carried out and directed towards investigating the cause of building failure in respect to quality of materials used and absence of professional building design, no study known to the researcher has been directed towards investigating the cause of building failure as a result of inappropriate floors and floor covering practices as well as wall finishing practices by craftsmen in rural areas in Zamfara State. Hence, the problem of this study stated in question form; what are the floors and floor covering practices as well as wall finishing practices of craftsmen in rural areas in Zamfara State?

1.2 Research Questions

The following two research questions were formulated to guide the study:

1. What are the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State?
2. What are the walls finishes practices adopted by craftsmen in rural areas in Zamfara State?

1.3 Research Hypotheses

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

H_{o1}: There is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.

H_{o2}: There is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.

2. METHODOLOGY

The descriptive survey research design was used for the study. The study was conducted in Zamfara State and covers nine local government areas that are located in rural areas on a target population of 2320 building construction master craftsmen in nine local government areas of Zamfara State excluding the major cities. The sampling technique used for this study is simple random sampling with the aid of National Statistical Service Sample Size Calculator. The population size of each local government was computed to give a total of 322 master craftsmen comprising of 253 master craftsmen with Educational Qualification and 69 Building Master Craftsmen without Educational Qualification. An 11 item questionnaire was used for collecting data for the study. The questionnaire was validated by three experts. Cronbach Alpha statistics was used to determine the reliability coefficient of the pilot tested instrument which was found to be 0.84. Data collected for this study was analyzed using mean, standard deviation and t-test statistics. Mean and standard deviation was used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. All statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) version 21. For the decision rule on the null hypotheses, if the t-probability value (Sig. 2-tailed) calculated by the computer is greater than 0.05, it means there is no significant difference, then the null hypothesis was upheld (accepted) but if the t-probability value (Sig. 2-tailed) is less than 0.05

then there is significant difference, therefore the null hypothesis is rejected. Decision on the research question items was based on Grand Mean ($\bar{x}_A$) with respect to the real limit of numbers on the five point rating scale used for the study {4.50 – 5.00 = Very Highly Adopted (VHA); 3.50 – 4.49 = Highly Adopted (HA); 2.50 – 3.49 = Moderately Adopted (MA); 1.50 – 2.49 = Lowly Adopted (LA) ; 0.5 – 1.49 = Not Adopted (NA).

3. RESULTS

3.1 Research Question One

What are the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State?

Result that answered this research question is presented in Table 1.

Table 1: Mean ratings and Standard deviation of the master craftsmen with educational qualification (MCEQ) and those without educational qualification (MCWEQ) on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.
N1=253, N2=69, Total N=322.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_A$	SD_1	SD_2	SD_A	D
1	provide level surface for flooring	3.59	3.61	3.60	0.63	0.62	0.63	HA
2	Observation of relevant precaution in performing a flooring	2.67	2.68	2.68	0.66	0.63	0.65	MA
3	Ram loose earth for flooring	3.60	3.59	3.60	0.65	0.65	0.65	HA
4	Handle strata floor covering properly	2.69	2.54	2.61	0.64	0.50	0.57	MA
5	Use Vinyl Composite Tile (VCT) for floor covering	1.88	2.23	2.06	0.68	0.60	0.64	LA
	Grand Mean	**2.89**	**2.93**	**2.91**				**MA**

Key: $\bar{x}_1$ = Mean of BMEQ; $\bar{x}_2$ = Mean of BMWEQ ; $\bar{x}_A$; Average Mean of respondents; SD_1 = Standard Deviation of MCEQ, Standard Deviation of MCWEQ; Average Standard Deviation of respondents. NA= Not Adopted, LA = Lowly Adopted, HA= Highly Adopted, MA = Moderately Adopted. D = Decision.

Table 1 shows that the respondents highly adopted the floors and floor covering practices in item 1 and 3 with a means score ranges from 3.60 to 3.60. Items 2 and 4 with means ranges from 2.61 to 268 signify that the respondents moderately adopted these floors and floor covering practices in rural areas in Zamfara State. Item 5 with average mean of 2.06 is an indication that the respondents lowly or rarely adopted this floors and floor covering practices in rural areas in Zamfara State or adopted them to a low level. The grand mean of MCEQ are 2.89 which shows that the MCEQ moderately adopted the floors and floor covering practices in rural areas in Zamfara State while MCWEQ with grand mean of 2.93 also moderately adopted the floors and floor covering practices in rural areas in Zamfara State. The total grand mean of is 2.91 which is an indication that these floors and floor covering practices are moderately adopted by both MCEQ and MCWEQ. The average standard deviation of the five items ranged from 0.57 – 0.65. The standard deviation values indicated that the respondents were not too far from one another in their mean responses.

3.2 Research Question Two

What are the walls finishes practices adopted by craftsmen in rural areas in Zamfara State?

Result that answered this research question is presented in Table 4.6.

Table 2: Mean ratings and Standard deviation of the master craftsmen with educational qualification (MCEQ) and those without educational qualification (MCWEQ) on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.
N1=253, N2=69, Total N=322.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_A$	SD_1	SD_2	SD_A	D
1	Setting out the base of the wall	3.55	3.49	3.52	0.62	0.59	0.60	HA
2	follow operational sequences in performing a given task	2.66	2.73	2.69	0.64	0.66	0.65	MA
3	complete all the work stage as on a given task at time	2.45	2.45	2.45	0.50	0.50	0.50	LA
4	use different materials for wall finishing	1.25	1.17	1.21	0.43	0.38	0.41	NA
5	construct wall with Steel stud gypsum wall board (GWB)	1.40	1.46	1.43	0.49	0.50	0.50	NA
6	construct wall with Steel stud GWB with recycled content	1.40	1.49	1.45	0.49	0.50	0.50	NA
	Grand Mean	**2.12**	**2.13**	**2.13**				**LA**

Table 2 shows that the respondents highly adopted the walls finishes practices in item 1 with a mean score of 3.52. Items 2 with mean score of 2.69 signify that the respondents moderately adopted these walls finishes practices in rural areas in Zamfara State. Items 3 with mean score of 2.45 is an indication that the respondents lowly or rarely adopted these walls finishes practices in rural areas in Zamfara State or adopted them to a low level. Items 4, 5 and 6 with a means ranging from 1.21 to 1.45 signify that the respondents do not adopt these walls finishes practices in rural areas in Zamfara State. The grand mean of MCEQ are 2.12 which shows that the MCEQ lowly or rarely adopted the walls finishes practices in rural areas in Zamfara State while MCWEQ with grand mean of 2.13 also rarely adopted the walls finishes practices in rural areas in Zamfara State. The total grand mean of is 2.13 which is an indication that these walls finishes practices are lowly or rarely adopted by both MCEQ and MCWEQ. The average standard deviation of the six items ranged from 0.41 – 0.65. The standard deviation values indicated that the respondents were not too far from one another in their mean responses.

3.3 Testing of Research Hypotheses

Hypothesis One

HO1: There is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.

Table 3: t-test analysis of the mean ratings of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.

Group	N	$\bar{x}$	SD	df	t-value	p-value, Sig. (2-tailed)	Alpha Level	Decision
BMEQ	253	2.883	0.287	320	1.243	0.215	0.05	Upheld(NS)
BMWEQ	69	2.930	0.256					

From Table 3, since the p-value, Sig. (2-tailed) (0.215) is greater than 0.05, it is an indication that there is no significant difference in the mean responses of the two groups of respondents.

Thus, the null hypothesis four was upheld (accepted). This implies that, there is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.

Hypothesis Two

HO2: There is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.

Table 4: t-test analysis of the mean ratings of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.

Group	N	$\bar{x}$	SD	Df	t-value	p-value, Sig. (2-tailed)	Alpha Level	Decision
BMEQ	253	2.118	0.219	320	0.500	0.617	0.05	Upheld(NS)
BMWEQ	69	2.133	0.222					

From Table 4, since the p-value, Sig. (2-tailed) (0.617) is greater than 0.05, it is an indication that there is no significant difference in the mean responses of the two groups of respondents. Thus, the null hypothesis four was upheld (accepted). This implies that, there is no significant difference in the mean ratings of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.

4. FINDINGS OF THE STUDY

Based on the data collected and analysed, the following findings emerged:

1. Floors and floor covering practices such as: provision level surface for flooring and Ram loose earth for flooring are highly adopted by the respondents. The respondents moderately adopted observation of relevant precaution in performing flooring as well as well handling strata floor covering properly. The respondents however, did not adopt the use Vinyl Composite Tile (VCT) for floor covering.
2. Setting out the base of the wall is one of the as a wall finishes practices is highly adopted by the respondent. The respondents moderately adopted the wall finish practice of following operational sequences in performing a given task. The respondents rarely adopted the wall finish practice of completing all the work stage as on a given task at time. However, the respondents did not adopt the use of different materials for wall finishing; construction of wall with steel stud gypsum wall board (GWB) as well as construction of wall with Steel stud GWB with recycled content.
3. There was no significant difference between the mean responses of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State.
4. There was no significant difference between the mean responses of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State.

4.1 Discussion of Findings

The result presented in Table 1 provided answer to research question one. The non-adoption of Vinyl Composite Tile (VCT) for floor covering in rural areas has great effect on the quality

and outlook of floors and floor covering in rural areas. To support the findings on floor and floor covering practices, Badejo (2009) in a study on multi-disciplinary approach to curb building collapse in rural areas revealed that low adherence and adoption of standard code of practice in floor and floor covering can lead to floor defect called limited deflection as well as excessive deflection. Similarly, Makinde (2007), in a study on minimizing the collapse of building in rural areas in Nigeria found out that limited deflection in a floor which causes a certain amount of cracking/distortion in partitions could reasonably be considered as defect but not a failure, whereas excessive deflection resulting in serious damage to partitions, ceilings and floor finishes could be classed as a failure.

Also Ikpo (2006) in a study on building maintenance management found out that excessive floor deflection can lead to building collapse. To buttress this findings, Olusola *et al* (2011) in a study on technological and non-technological factors responsible for the occurrence of collapse buildings in rural areas in South-Western Nigeria found out that collapse of a building resulting from poor floor coverings may be either a partial, progressive and total or sudden collapse. Similarly, Dare (2001) in a study on effect of building design, build ability and site production in building construction ascribed poor workmanship resulting to poor layout, faulty design, faulty execution of work and use of faulty materials as major causes of structural floor deflections.

The findings on hypothesis one presented in Table 3 revealed that, there was no significant difference between the mean responses of master craftsmen with educational qualification and those without educational qualification on the floors and floor covering practices adopted by craftsmen in rural areas in Zamfara State. From Table 3, since the p-value, Sig. (2-tailed) (0.215) is greater than 0.05, it is an indication that there is no significant difference in the mean responses of the two groups of respondents. Thus, the null hypothesis one was upheld (accepted).

The result presented in Table 2 provided answer to research question two. The findings on the wall finishes practices adopted by craftsmen in rural areas in Zamfara State revealed that setting out the base of the wall is one of the as a wall finishes practices is highly adopted by the respondent. The respondents moderately adopted the wall finish practice of following operational sequences in performing a given task. The respondents rarely adopted the wall finish practice of completing all the work stage as on a given task at time. However, the respondents did not adopt the use of different materials for wall finishing; construction of wall with steel stud gypsum wall board (GWB) as well as construction of wall with Steel stud GWB with recycled content.

The non-adoption of different materials for wall finishing; construction of wall with steel stud gypsum wall board (GWB) as well as construction of wall with GWB with recycled content has great effect on the quality of wall finish and aesthetic outlook. To buttress this findings, Richard (2002) in a study on concrete repair and protection technology found out that deterioration of reinforced wall finishes could occur as a result of corrosion of the reinforcement caused by carbonation and chloride ingress, cracking caused by overloading, subsidence or basic design faults, and construction defects. Similarly, Windapo and Rotimi (2012) in a study on contemporary issues in building collapse and its implications for sustainable development in rural areas unveiled that poor structural design, use of substandard building materials, non-compliance with approved building design, poor workmanship, and lack of qualified and appropriate professionals to ensure quality construction, and cost control

among others are major causes of poor wall finishing and consequently building failures in the contemporary Nigeria.

To support this findings, Olusola *et al* (2011) examined technological and non-technological factors that were responsible for the occurrence of poor wall finishing practices and identified technological factors to include building design, design error, site production, and use of poor materials, faulty design of foundation among others. While non-technological factors were lack of site-trade training and corruption. Furthermore, Ayininuola and Olalusi, (2004) in a study on assessment of building failures in rural areas in Lagos State found out that that the reasons for structural failures were due to limited knowledge of building structural behaviour and unanticipated environmental phenomena affecting the wall finishes problem. Also Olagunju, Aremu and Ogundele (2013) in a study on causes of incessant collapse of building in rural areas in Nigeria blamed the high rate of building collapse on the very low level of compliance with approval of building plans before construction commencement, ineffective monitoring mechanism put in place by the relevant government agencies and the low level of awareness of the existing Building/Planning Regulations by clients/contractors. The noncompliance with standard building construction plans in rural areas in Nigeria affects the specifications and overall quality of the buildings in rural areas.

The findings on hypothesis two presented in Table 4 revealed that there was no significant difference between the mean responses of master craftsmen with educational qualification and those without educational qualification on the walls finishes practices adopted by craftsmen in rural areas in Zamfara State. From Table 4, since the p-value, Sig. (2-tailed) (0.617) is greater than 0.05, it is an indication that there is no significant difference in the mean responses of the two groups of respondents. Thus, the null hypothesis two was upheld (accepted).

5. CONCLUSION

High adoption of the standard building code of practice in the area of building construction floors, floor covering and wall finishing practices is a necessary factor in ensuring that building strength have adequate strength and are able to withstand the various loads imposed of them without sudden failure. However, the extent of adoption of the standard building code of practice in the area of building construction floors, floor covering and wall finishing practices varies and has great effect on the strength of the buildings constructed. Based on the findings of the study, it was concluded that none of the building construction floors, floor covering and wall finishing practices was very highly adopted by the building craftsmen. It is thus necessary to ensure strict and very high adoption of the standard building code of practice in the area of building construction floors, floor covering and wall finishing practices to ensure that constructed buildings have adequate strength to withstand the various loads imposed of them without failure.

5.1 Recommendations

Based on the findings from this study, the following recommendations are made:

1. The building construction craftsmen in the various local governments in Zamfara State should cultivate positive building construction practices on building sites. This can be achieved by giving public orientation and awareness programme to building construction craftsmen on the dangers associated with not adopting the standard building code of practice in the area of building construction floors, floor covering and wall finishing practices.

2. The ministry of commerce, trade and industries should advise Zamfara State government on the need to set up monitoring team on residential and industrial building sites to ensure strict adherence and adoption of the Standard Building Code of Practice. This will reduce sudden building failures resulting from none adoption of the standard code of practice in the area of building construction floors, floor covering and wall finishing practices.
3. Zamfara State Ministry of Works should organize retraining programmes that will help in ensuring strict adherence and adoption of the standard building code of practice in the area of building construction floors, floor covering and wall finishing practices.
4. The building construction contractors in Zamfara State should encourage the building construction craftsmen working as employees on the need to always adopt the stipulated standard building code of practice on all building construction floors, floor covering and wall finishing practices on building sites.
5. The Nigeria Institute of Builders and other stakeholders in the building industries should organize public enlightenment campaigns for building construction craftsmen on the Standard Building Code of Practice necessary for adoption in the area of building construction floors, floor covering and wall finishing practices. This will go a long way to improve building construction floors, floor covering and wall finishing practices on the job.

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