

Examining the implementation of health and safety measures among construction contractors in Nigeria

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Abstract

The implementation of health and safety measures in construction projects remains one of the critical parameters by which successful projects delivery can be determined. In order to maintain a healthy environment, the cost of health and safety is the expense incurred to comply with legal requirements with respect to accident prevention and improve health and safety conditions in all areas of the work performed. The lack of adequate provision for H&S during the forecasting of construction cost brings about a poor attitude of construction contractors towards implementing H&S measures on construction sites in Abuja, Nigeria. The study aimed to examine the implementation of H&S measures among construction contractors in Abuja. The study is a criteria-based study in which certain criteria were

outlined for selecting construction sites. The study employed the use of Safety and Health Assessment in construction (SHASSIC) in examining the implementation of health and safety measures among construction contractors, and the results show that the total SHASSIC score of the five sites visited is 63.40% which is a 3-star ranking. It was concluded that, H&S measures are documented and managed. However, there are still a few medium-risk work activities that are neglected. The study recommends that effective awareness of H&S measures is useful to improve its implementation on construction sites and reduce construction site accidents.

Keywords: contractors, construction, health and safety, implementation, measures.

1. Introduction

The laws guiding construction health and safety require full action and implementation to protect workers at their workplace just as well as the general public whom the work may influence. The Malaysian Occupational Health and Safety Act (OSHAct) of 1994 obliges employers to provide great and satisfactory health and safety measures in their workplaces. According to Chang (2008), more than

a hundred million individuals in different parts of the world partake in construction work as a profession. The Global Training Centre of the International Labour Organisation (ILO, 2011) stated that some of the six deadly accidents at work happen on a construction sites. Therefore, the significance of health and safety in the construction industry cannot be overemphasized. Providing a safe work environment has been reiterated by

various researchers; the breach of which has a negative and compounding effect on overall productivity and performance.

The application of health and safety measures on construction projects remains one of the essential criteria to which effective projects delivery can be determined (Ibrahim, 2015). This statement is supported as health and safety policy is seen as one of the important factors used in prequalifying contractors for the award of construction projects in the country (Windapo, 2013 and CDM, 2015).

The main contention of this research is that inadequate provision of H&S cost during construction forecasting brings about the poor attitude of construction contractors towards implementing H&S measures on construction sites in Abuja, Nigeria. This poor attitude leads to an increase in the rate of accidents, injuries, and fatalities; and victims are paid compensation. The resultant effect is an increase in the final cost of projects. The aim of the research is to examine the implementation of H&S measures among construction contractors in Abuja.

2. Literature review

Construction Health and Safety Measures

Rashid, Ahmad, Roomi and Iqbal (2016) reasoned that safety focuses upon minimizing accidents on the worksite and curtailing the possible adverse impact on the workers in each aspect. However, in light of different evaluations by many specialists, for example, Aniekwu (2007); Idoro (2011); Okoye and Okolie (2012); Idubor and Oisamoje (2013);

Umeokafor *et al.* (2014) and Dodo (2014) on the management and regulation of safety in construction projects, the fact remains that compliance and adoption of H&S provisions remains one of the significant catalysts in advancing the construction production measures. Then again, failure in consenting to H&S measures would increase accidents and raise the production cost. In light of this, Famakin and Fawehinmi (2012) expressed that safety routines are standards to rate successful building construction activity, which is generally important to the client since they extensively affect productivity and viability among experts and workers in the construction business.

The irregularities perceived as a result of failure to comply with minimum requirements regarding H&S practices in construction may waste both the victim and industry's time and bring about loss of money. Although construction organisations may have taken life assurance for their employees, there are additional direct costs that can accrue from injury suffered, and there still exists some specific risks which cannot be insured, like loss of workers, and hours of lost production (Aniekwu, 2007). Therefore, the non-compliance to safety implementation could cause some significant disruption to production and progress on construction projects.

A few measures have been taken into consideration by most construction organisations regarding improving their general safety performance. However, unlike developed countries, many developing countries

like Nigeria still lack universal laws and guidelines on H&S practices (Ikechukwu and Dorothy, 2013). The research posits that viable administration of safety practices is helped by different factors, such as socio-economic and humanitarian views. George *et al.* (2013) further point out that construction firms ought to create awareness, for every project, which includes a thorough review of the safety necessities, agreements and frameworks, disciplinary exercises, substance abuse scanning record and proactive administration strategies.

Boustras *et al.* (2015) carried out a general survey on supervision of H&S by small firms in Cyprus. The investigation centred on the factors determining safety performance in small scale firms in the work environment. It was a purposive report; hence, copies of a well-designed questionnaire were utilized to obtain the required information. The result of the study revealed that work safety settings in limited scope firms must be improved by the adoption of "guidance", "risk assessment," and "safety policy design".

Awwad *et al.* (2016) analyzed construction safety exercises and difficulties in a central Eastern agricultural nation. An experimental survey of construction specialists, insurance firms and governmental organizations was conducted. The outcomes of the research revealed the accessibility of construction work safety laws but also revealed the lack of the essential application, poor supervision, lack of safety awareness, weak support from the majority of

stakeholders handling safety routines on construction sites. The survey thus recommended that construction firms should be properly informed, which may help alleviate the difficulty.

Kolawole (2014) evaluated safety procedures on building construction sites: using North Central, Minna as a case study. Although the outcome from the analysis revealed that site workers supported a "safety policy" which improves performance and lowers injuries on-site, the government as a body lacks a definite precautionary measure for construction activities. Furthermore, the study suggested training and re-training workers on the significance of safety practices as a priority for all; the study also recommended that the government should enact a "safety act" to regulate activity and reduce accidents occurring at the sites.

Idoro (2011) reviewed the impact of support on the functioning of Occupational Health and Safety (OHS) of construction firms in Nigeria. His paper assessed the degree of mechanization and its correlation with OHS performance in the industry. The study established that mechanization has a significant effect on OHS functioning and advocated for viable OHS management by contractors. The result showed that accident and injury occurrences increased with increased mechanization. The research concluded that failure to manage mechanization degenerates OHS functioning on project sites. The study recommended that construction managers should devise efficient H&S measures rather than extra safety garments.

In an analysis conducted by Agwu (2012) on Total Safety Management (TSM), a methodology was designed to develop organisational implementation in selected construction companies in Nigeria. Both random and stratified sampling procedures were utilized in questionnaire administration to six (6) selected construction firms. The study proposed that incorporation of absolute safety management as a feature of the hierarchical arrangement would prompt improved safety practices on building projects.

In a research project by Okoye *et al.* (2016) carried out on construction workers' H&S knowledge on sites in Anambra State, Nigeria, the Mean Score Index and Pearson's Product-moment Correlation Coefficient (r) were used to analyse the information from fifteen (15) randomly selected sampled construction sites. Low safety responsiveness and inconsistency among the sites' agents were found to be the factors which lowered scheme management. The analysis suggested that knowledge and consistency of application of H&S practices alone cannot accomplish the optimum and desired project performance. It would be necessary to also refine safety measures, including elements like adopting strict safety regulations and ensuring full enforcement, workers' involvement, and management commitment. Given the above, Akinwale and Olusanya (2016) examined the implications of occupational health and safety intelligence in Nigeria through a cross-sectional study. An in-depth research interview was conducted on managers

and senior staff of selected organisations in Lagos State, Nigeria. The data collected were subjected to content analysis and demographic procedures.

The investigation found that workers and administrators suffer significantly from occurrence of industrial health threats, for example, loss of human resources, efficiency and employer stability. The study also found that though a high degree of understanding of the significance of occupational safety is required, there is, on the contrary, insufficient interest in capacity building on safety programmes in the union. Consequently, the research suggested an improvement in communication of safety and significant adjustment to insurances and safety knowledge sharing to improve individual and hierarchical advancement in Nigeria.

3. Research methodology

The study is utilised the survey research method and used quantitative measures in examining the implementation of H&S measures among construction contractors. The study is criteria – based, with the following criteria outlined:

- i. The area of the study is the Federal Capital Territory, Abuja.
- ii. The construction firms must have been in building/civil construction works for more than twenty (20) years.
- iii. The quantity surveyors with knowledge of H&S on the construction site selected for this study must have been with the construction firm for at least fifteen (15) years.

- iv. The selected construction projects should have been taken within the seventeen (17) years, between 2001-2018.
- v. Work progress should be within 25% - 75% (workers are in full force, construction is at its peak, potential accidents are identified)

Only five (5) construction sites met the study criteria and were selected for the study. The sample frame of this research constituted quantity surveyors with knowledge of H&S and H&S officers in the construction industry. The snowballing sampling technique was employed for this study. According to Mohammed (2018), the snowball sampling technique is used in two ways: -

- a. Identify potential targets in the population; often, one or two targets can be found initially.
- b. Ask those targets to recruit other

H&S measures among construction contractors in Abuja, Nigeria. The instrument has 61 questions in the Document check section; construction site inspection 235 questions, and employer's/construction workers interview 218 questions.

The study employed the SHASSIC method of analysis. SHASSIC is an acronym for Safety and Health Assessment in Construction. This assessment method is used in carrying out H&S evaluation in construction (SHASSIC) as explained below.

Weighting Percentage

The weighting for H&S performance is allocated with respect to three (3) factors, as shown in Table 1.

Table 1 Distribution of weighting percentage for Component

FACTORS	WEIGHTING PERCENTAGE
Document check	40%
Workplace inspection	40%
Employee interview	20%
Total score	100%

Source: CIDB CIS 10:2008, Mohammed Y. D 2015

target (and ask those targets again to recruit another target) etc.

This study employed the use of questionnaires to elicit information from the respondents. The questionnaire was allotted into four (2) parts - the first included background information of the respondents. The second section elicited information on implementing

The weighting order is designed to make the quantitative result denoting the H&S functioning of different contractors. The basic formulas for factor weighting are as follows;

a. Document Check

$$\frac{\text{Table number C scored}}{(61 - \text{number of NA})} \times 40\%$$

= SHASSIC score for document checking
– (A)

b. Workplace Inspection

$$\frac{\text{Total number C scored}}{(235 - \text{number of NA})} \times 40\%$$

= SHASSIC score for workplace inspection
– (B)

c. Employee's Interview

$$\frac{\text{Total number C scored}}{(218 - \text{number of NA})} \times 20\%$$

= SHASSIC score for employees interviewed
– (C)

Where C denotes the absolute number of "Compliance", NC represents the total number of "Noncompliance", and NA represents the total number of items "Not Valid".

Star ranking

The overall SHASSIC target in Document Check (A) plus (+) overall SHASSIC target in Workplace Inspection (B) plus (+) overall SHASSIC grade in Employees

Interview (C). The component will justify the ranking star(s), which ranges from 1 to 5 stars, as shown in Table 2.

4. Results and discussion

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The following were the analysis/result of assessments carried out in each of the five construction sites used for the analysis.

Document Check.

Using the SHASSIC, site 1 scored 30.16% out of 40% allocated to the document checking, implying that most documents needed for check are properly managed at the site office. Site 2 scored 25.96%, implying that documents needed for check are fairly managed at the site office. For Site 3, 3 out of the 61 questions were not applicable. The score was 29.96% which implies that documents needed for check are fairly managed at the site office. On site-4, three out of the 61 questions were not applicable; the SHASSIC score for site 4 was 29.96%. This means that documents needed for check are fairly managed at the site office. On site 5, eight out of the 61 questions were not applicable. The SHASSIC score was 17.36%, implying that documents needed for check are poorly managed at the site office.

Table 2 Stars ranking

SHASSIC (rank %)	Star(s) Awarded	Classification
85 to 100	*****	H&S Measures are managed and documented.
70 to 84	****	H&S Measures are maintained and recorded, although risks activities remain neglected.
55 to 69	***	H&S Measures are maintained and recognized. but few standard risks behaviors are neglected.
40 to 54	**	H&S Measures are partly managed and not properly documented.
39 and less	*	H&S Measures are inadequately managed and not properly documented.

Source: CIDB CIS 10:2008, Mohammed Y.D 2015

Table 3 General review of the five (5) sites

SITES	CONTRACT SUM	WORK PROGRESS	LOCATION
1	100 Million	75%	Abuja
2	150 Million	55%	Abuja
3	270 Million	60%	Abuja
4	225 Million	45%	Abuja
5	163 Million	68%	Abuja

Source: Researcher's Analysis (2020).

Table 4 Scores of the Five Sites.

SITES	COMPONENTS/ WEIGHTAGE (%)						SCORE
	Document check 40%	Workplace inspection 40%		Employees interview 20%			DC + WI+ EI
	<u>Total number 'c' score</u> X 40 (61-number of 'NA')	<u>Total number 'c' score</u> X 40 (235-number of 'NA')	<u>Total number 'c' score</u> X 40 (235-number of 'NA')	<u>Total number 'c' score</u> X 20 (218-number of 'NA')	<u>Total number 'c' score</u> X 20 (218-number of 'NA')		
1	<u>42</u> X40	<u>230</u> X 40	<u>203</u> X 20				87.91%
	61-0 =30.16%	235-0 =39.15%	218-0 =18.60%				
2	<u>37</u> X 40	<u>173</u> X 40	<u>157</u> X 20				70.15%
	61-4 =25.96%	235-0 =29.79%	218-0 =14.40%				
3	<u>24</u> X 40	<u>175</u> X 40	<u>130</u> X 20				58.26%
	61-3 =16.55%	235-0 =29.78%	218-0 =11.93%				
4	<u>24</u> X 40	<u>175</u> X 40	<u>130</u> X 20				58.26%
	61-3 =16.55%	235-0 =29.78%	218-0 =11.93%				
5	<u>23</u> X 40	<u>105</u> X 40	<u>80</u> X 20				42.96%
	61-8 =17.36%	235-5 =18.26%	218-0 = 7.34%				
TOTAL	106.58%	146.78%	64.20%				

Source: Researcher's Analysis (2020).

Workplace Inspection.

With respect to Workplace inspection for site one, the contractor scored 39.15%, which implies that the site is properly managed with regard to the issue of its safety. For site two workplace inspection, the contractor scored 29.79%. This implies that the site is well managed with regard to the issue of its safety. For Site 3 workplace inspection, the contractor scored

29.79%, which means that the site is well managed regarding the issue of its safety. On site four, the contractor scored 29.79%; this implies that the site is well managed with regard to the issue of its safety. Finally, for site 5, 5 out of them were not applicable; the contractor scored 18.26%, which implies that the site is poorly managed regarding its safety.

Table 5 Analysis of the Five Sites.

$\frac{106.58 \times 40}{200}$	$\frac{146.78 \times 40}{200}$	$\frac{64.20 \times 20}{100}$
=21.20%	=29.36%	=12.84%

THERE FORE TOTAL SHASSIC = 63.40% (55 – 69). 3 – STAR IN RANKING.

Sources: Researcher's Assessment.

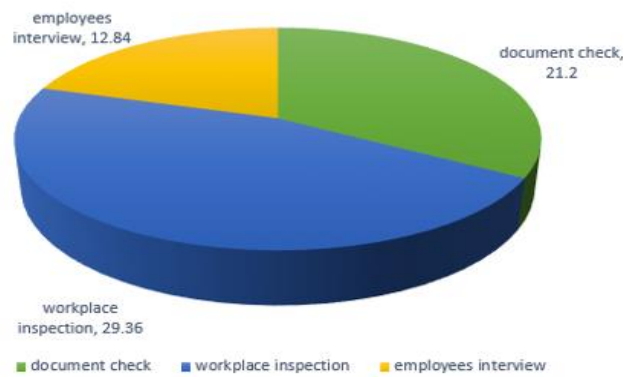


Figure 1 SHASSIC Result of the five (5) sites.

Employee's Interview.

This section is divided into three subsections, i.e. management personnel interview, health and safety personnel or committee members interview and construction workers interview.

For Site 1, the score was 18.60%, which implies that H&S measures on the site are well understood, well communicated and well managed among the employees. Site 2 had a score of 14.40%; this implies that H&S measures are understood, well communicated and well managed among the employees. For site three, employees' interview, the score was 11.93%; which implies that H&S measures are fairly understood, fairly communicated, and managed. Site 4 had a score of 11.93%; which implies that H&S measures are fairly understood, fairly communicated, and managed among the employees. Site 5 had a score of 7.34%; this implies that H&S measures are poorly understood, poorly communicated and poorly managed among the employees.

The total SHASSIC score of the five sites is 63.40%, which is three stars in ranking, implying that H&S Measures are maintained and recorded, but work risks activities are ignored. Figure 1 shows the contributions of the three basic components to the total SHASSIC, as shown in Table 5.

5. Conclusion and recommendations

The importance of H&S in construction cannot be overemphasized. Providing a safe work environment has been

reiterated by various researchers. The breach of H&S provisions has a negative and compounding effect on an organisation's overall productivity and performance. H&S implementation on construction projects remains an important aspect for determining successful project delivery. From the findings of the five (5) selected construction sites, the conclusion reached is that the contractors pay little attention to implementation of H&S measures.

Based on the results and conclusions reached, the following recommendations are made:

Effective awareness of H&S measures is a requirement for improved implementation on construction sites; and, Construction site accidents can be minimized when the implementation of H&S measures is given adequate attention; H&S measures should be included as part of project performance criteria and should also be one of the criteria for awarding construction projects to suitable contractors.

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