Innovations

Impact of Environmental Health and Safety Management in Building Construction Industry in Nigeria

Enyinna Gregory Chimere (PhD), Oguzie Joy Okwuchi Chizitere,

Jideobi Samuel Osuji

Corresponding Author: **Enyinna Gregory Chimere (PhD)**

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Abstract: *Health and safety are of extreme importance within the construction industry as different construction operations take place at about the same time. The study focused on the influence of environmental health and safety management in the Nigerian building construction industry, specifically in Naze, Imo State. Purposive sampling was used in the study to deliver 39 survey questionnaires to selected professionals from consulting and contracting organizations in the study area. The 39 copies of the questionnaire retrieved were evaluated to determine the elements that work against the building construction industry's environmental health and safety management. RII was used to score 10 identified elements that work against environmental health and safety management. The finding of the study revealed that failure to learn a lesson from previous incidents (RII=0.86), inadequate safety management systems (RII=0.88), space congestion (RII=0.89), were the top factors militating against materials management. The findings further indicate that Proper workers warfare (RII=0.9556), Creation and implementation of HS plans (RII=0.9556), and Health and safety training and induction programs (RII=0.9822), were the three major measures for preventing accidents on construction sites. According to the findings, construction management needs to improve health and safety management in all aspects.*

Keywords*: 1.Building construction, 2.health and safety, 3.Materials specification, 4.plants and equipment 5.Management.*

1.0 Introduction

According to Kassu and Kitaw (2016), the construction industry has been seen over time as a risky or extremely hazardous profession due to the disproportionately high incidence of accidents and fatalities that take place on construction sites globally. According to the International Labor Organization's International Training Centre, in Kassu et al, (2016), one out of every six fatal workplace accidents occurs on a construction site.

Due to the fact that multiple construction processes take place at almost the same time, and as a result of that, health and safety are of extreme importance in the construction sector. Building project and its subsequent delivery schedules agreed upon during bidding for construction tasks by building contractors may be blamed for any staff exposure to health and safety risk if the time scheduled for the project delivery is too short compared to the quantity of task given and amount of fund provided for the project. Though, both contractors and the entire workforce should take responsibility for the overall possible exposure to health and safety risk in the construction industry.

The importance of Health and safety is expected to be of focus in all fields of business, but it is of utmost importance in the construction industry (Abubakar, 2015). This has caused visible advancements mitigation of site accidents especially in developed countries of the world.

The Nigeria situation is occupied by tales of building site accidents, with even some foreign corporations falling victim to such accident cases. Managers of Construction companies over time, evolved a less costly method of engaging laborers casually or temporarily. This was initiated to avert being bound by any permanent employment contract that could expose them to any form of legal obligations in the country. This is in attempt to rob them of any insurance benefits provided by the construction companies or employers. This has caused the contractor's unconcerned attitude towards any accident that may occur as a result of the laborers' negligence. The resultant effect is much decline in productivity of such workers who take their personal issues take precedence over work in in their output as craftsmen. Most construction companies in Nigerian do not provide any business, information about accidents for proper documentation which part of what triggered this research. This has created much difficulties for researchers who want to obtain meaningful data regarding industrial accident to ascertain the level of health and safety operations in the construction industry. Okoye et al (2016). Stated that because most contractors neglect submitting cases of accidents to the ministerial offices, it becomes very difficult for government to monitor them therefore the negligence continue and cases of accidents occurrences increase. Workers may subsequently suffer severe injuries in the line of duty and are left to take care of themselves and in cases of mortality there is no information to be captured for proper investigation. Hundreds of construction workers are killed and many more are wounded on Nigerian building sites per year, according to Phung (2015). It has also resulted in death and certain severe circumstances due to some construction managers' failure to follow health and safety standards that are in work places. Neglecting these health and safety standards at common job descriptions for construction site workers like the cases of laborers working at heights, welding, working underground, and handling dangerous materials will expose construction workers to more Hazards. Accidents on construction sites are unavoidable, but they can be reduced to manageable levels provided parameters are established and are abided by all parties involved. To prevent additional tragic stories of site accidents, project managers and contractors must be trained on the critical importance of all health and safety protocols. Even with today's technology, which includes the use of construction tools and mechanisms, manual labor is still required in the building construction process. The purpose of this article is to look into construction managers' compliance with the health and safety management of their site construction employees to prevent accidents.

2.0 Theoretical Development

We can define work safety as a situation of effective risk control associated with specific work or all work environment and process. Thus safety is highly rated as a critical activity in maintenance of productivity. Therefore, workplace safety should concentrate in reduction of accidents and their negative impact on worker in the work environment. (Ahmad, Iqbal, and Rashid & Roomi, 2016). Health and safety practices becomes very necessary in all workplaces to reduce incidents could occur in pain, accidents, with

corresponding associated legal actions that could follow to become a strong driver of high production costs (Awwad, El Souki, & Jabbour, 2016). Safety procedures are part of criteria for measuring successful project delivery most important to the client since, they have a significant impact on professional and even worker efficiency and effectiveness in the construction industry. (Shamsuddin, Ani, Ismail, & Ibrahim, 2015). The irregularities, like building construction firm's failure to show compliance with minimum health and safety requirements, may result in workplace accidents and victim wasting time in hospital for treatment and the companies huge finances to pay hospital bills and face possible legal actions that may arise from such cases. Although construction firms may be covered by life insurance for their employees against certain direct costs resulting from injury, some costs may not be insured like loss of trained personnel, lost hours of production that may be linked to other operatives stopping the work in order to assist the injured staff. (Dodo, 2014). Therefore, failure to abide by safety procedures will vehemently affect output with drastic reduction of long-term development. The construction sector has carried out investigation on several approaches that can enhancing industrial safety performance. This has caused a paradigm shift from safety performance monitoring to proactive safety performance improvement. Nigeria, for example, is one of the developing countries though with adaptable health and safety legislation and regulations but with low enforcement capacity. Thus effective management of safety measures from a socio-humanitarian and economic standpoint could give a high result. (Muhammad, Abdulateef, and Ladi, 2015).

3.0 Hypotheses

H01: There are no factors militating against environmental health and safety management adopted by the building construction industry.

H02: Factors militating against environmental health and safety management have no significant effect on the building construction industry.

4.0 Methodology

This section displays the methods by which this research was undertaken. The sections included; the design of the research, study population and sample size, a technique for selecting the samples, the instrument used for collection of the primary data, as well as the technique used to analyze the data. The research design adopted by this research was descriptive as well as quantitative research approach. This was aimed at collecting information to examine the impact of environmental health and safety management in the building construction industry in Nigeria using a case study of selected construction projects in Obinze, Imo State as a case study. A total of thirty-nine (39) stakeholders were selected at random. The data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 21 software package. The respondent's level of agreement was measured using a five-point Likert scale (1=neutral, 2=strongly disagree, 3=disagree, 4=agree, 5=strongly agree). The relative Importance Index (RII) of the responses were ranked and presented in tables.

5.0 Results and Discussion

This section shows the presentation, analysis and interpretation of data gotten from the survey results from returned questionnaire administered to respondents in the field. The demographic characteristics of the respondents were analyzed using the simple percentage technique and relative importance index.

Table .1: **distribution of the respondents according to trade**					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Brick Layers	34	75.6	75.6	75.6
	Steel Benders	7	15.6	15.6	91.1
	Carpenters	4	8.9	8.9	100.0
	Total	45	100.0	100.0	

Table 1 tells us that 15.6% of the respondent's steel benders, 8.9% are carpenters and 75.6% are Bricklayers

Table 2: Distribution of the respondents according to nature of employment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Permanent staff	34	75.6	75.6	75.6
	Casual staff	7	15.6	15.6	91.1
	contract staff	4	8.9	8.9	100.0
	Total	45	100.0	100.0	

Table 2 tells us that 75.6% of the respondents are permanent staff, 15.6% are casual staff and 8.9% are contract staff

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	large organization	32	71.1	71.1	71.1
	Small organization	8	17.8	17.8	88.9
	Medium	5	11.1	11.1	100.0
	Total	45	100.0	100.0	

Table 3: tells us that 17.8% of the organizations interviewed are small organizations, 11.1% are medium, and 71.1% are large organizations.

5.1: Section Two Causes of accidents on construction sites

Table 4: Causes of accidents on construction sites

S/N	Levels of BIM	Code (X_i)
1	Excessive working hours resulting in mental fatigue	X1
2	Horseplay by workers	X2
3	Hazardous machine operations	X3
4	Unsafe working condition	X4

5	Space congestion	X5
6	Inadequate safety management systems	X6
7	Failure to learn lesson from previous incidents	X7
8	Unsafe act, /violation/non-compliance behavior	X8
9	Improper use of safety items/equipment and tools	X9
10	Lack of competency	X10

Table 5. Relative Importance Index of the factors that causes accidents on construction sites

Factors	1	AF	2	AF	3	AF	4	AF	5	AF	ΣAFi	RII	Ranking
X1	3	3	3	6	3	9	4	16	32	160	194	0.86	7th
X2	2	2	3	6	4	12	0	0	36	180	200	0.88	6th
X3	1	1	2	4	5	15	3	12	34	170	202	0.89	5th
X4	2	2	4	8	5	15	4	16	30	150	191	0.84	8th
X5	5	5	4	8	3	9	4	16	29	145	183	0.81	9th
X6	0	0	0	0	0	0	5	20	40	200	220	0.97	3rd
X7	0	0	0	0	1	3	0	0	44	220	223	0.99	1st
X8	0	0	0	0	0	0	3	12	42	210	222	0.98	2nd
X9	0	0	0	0	0	0	2	8	43	215	223	0.99	1st
X10	2	2	2	4	0	0	1	4	40	200	210	0.93	4th

From Table 5, a critical observation of the ranked measures reveals the following results in terms of the importance indices and ranking of the various factors that cause accidents on construction sites. Thus improper use of safety items/equipment and tools was ranked first with an RII of 0.99; unsafe act, /violation/non-compliance behavior was ranked second with an RII of 0.98; inadequate safety management systems were ranked third with an RII of 0.97, lack of competency was ranked fourth with an RII of 0.93; Hazardous machine operations was ranked fifth with an RII of 0.81. Horseplay by workers was ranked 6th with an RII of 0.88. Failure to learn lessons from previous incidents was ranked 7th with an RII of 0.86. Unsafe working condition was ranked 8th with an RII of 0.84, while space congestion was ranked 9th with an RII of 0.81.

Table 6: Measures for preventing accidents on construction sites

S/N	Measures	Code (X_i)
1	Client commitment to bring an improvement to safety	F1
2	Health and safety training and induction programmes	F2
3	Exchanges of knowledge and experience on HS best practices	F3
4	Strict monitoring and enforcement of safety regulation	F4

5	Reward and penalties for defaulters	F5
6	Effective communication system on site	F6
7	Government supports and commitment	F7
8	Creation and implementation of HS plans	F8
9	Proper workers warfare	F9
10	Daily toolbox or safety meetings	F10

Table 7. Relative Importance Index of the measures for preventing accidents on construction sites

Factors	1	AF	2	AF	3	AF	4	AF	5	AF	ΣAFi	RII	Ranking
F1	0	0	0	0	0	0	7	28	38	190	218	0.9689	6th
F2	0	0	0	0	0	0	4	16	41	205	221	0.9822	3rd
F3	0	0	0	0	0	0	9	36	36	180	216	0.96	8th
F4	0	0	0	0	0	0	6	24	39	195	219	0.9733	5th
F5	0	0	0	0	0	0	8	32	37	185	217	0.9644	7th
F6	0	0	0	0	0	0	3	12	42	210	222	0.9867	4th
F7	0	0	0	0	0	0	10	40	35	175	215	0.9556	9th
F8	0	0	0	0	0	0	2	8	43	215	223	0.9911	2nd
F9	0	0	0	0	0	0	1	4	44	220	224	0.9956	1st
F10	0	0	0	0	0	0	12	48	33	165	213	0.9467	10th

Table 7 above shows a critical examination of the ranked measures which reveals the results in terms of the importance indices and ranking the various indices for preventing accidents on construction sites. Proper worker's warfare was ranked first with an RII of 0.9956; Creation and implementation of Health and Safety plans were ranked second with an RII of 0.9911; Exchanges of knowledge and experience on Health and Safety best practices was ranked third with an RII of 0.9822, effective communication system on site was ranked fourth with an RII of 0.9867; Strict monitoring and enforcement of safety regulation were ranked fifth with an RII of 0.9733. Client commitment to bringing an improvement to safety was ranked 6th with an RII of 0.9689. Government support and commitment as ranked 7th with an RII of 0.9644. Exchanges of knowledge and experience on HS best practices was ranked 8th with an RII of 0.96: Government supports and commitment was ranked 9th with an RII of 0.9644 While daily toolbox or safety meetings ranked 10th with an RII of 0.9467

6.0 Conclusion and Recommendation

This research concentrated on the implementation of environmental health and safety management in the building construction industry in Nigeria. Special consideration was given to the construction firm operating in Owerri using Rhys construction. The result from the survey indicated that few Health and safety standards are implemented by construction worker and management, the health and safety records in Owerri needs to be upgraded and monitored so that workers could avoid being victims of all form of hazards that result to accident . The action is needed by the management of the construction industries to enhance health and safety management at workplaces. The support of the state government and other relevant professional bodies in line with the provision of training programs, initiating and enforcing health and safety regulations would be helpful. However, the provisions of the national building code as regards health and safety on

construction site is meant to be followed in adherence to that provision so as to help in maximizing the safety performance of these construction sites.

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