International Journal of Strategic Research in Education, Technology and Humanities
ISSN Print: 2465-731X | ISSN Online: 2467-818X

IJSRETH
Vol. 6, No. 1
January, 2019

Assessment of Cost Implication of Health and Safety Measures in Construction Projects in Nigeria

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Abstract

The feasibility study of every building project comprises among other things, cost and labour appraisal of the proposed project which provides the client with an idea of the likely completion period and cost without consideration to the Health and Safety of the worker, and its cost implication. The study appraises the cost implication of Health and Safety measures among construction projects in Nigeria. The purpose of the study is to identify the efficient Health and Safety measures require on construction site. Toward this end, a structured questionnaire was distributed to forty professional and contractors selected in a given geographical region Minna, Niger State, data collected were analyzed using statistical products for services solutions (SPSS), in order to attain the objective of the study as discussed, mean items score (MIS) was used, descriptive statistics was used to show the frequencies and mean of reaction to questions. It was deducing that most contractors do not provide safety measures on site and where it is provided the workers are not making good used of them. The Health and Safety measures if put in place and properly utilize by the construction workers this will grossly reduce the cost that will be incurred due to injuries. The findings signal the need for efficient monitoring, control, planning and ordinance of Health and Safety cost in the Nigeria construction industry.

Keywords: *Cost implication, Construction Project, Feasibility, Health and Safety and Nigeria*

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http://internationalpolicybrief.org/journals/international-scientific-research-consortium-journals/intl-jrnl-of-strategic-research-in-edu-tech-humanities-vol6-no1-january-2019

Research Concern

Construction industry is being regarded for its overt position in the economy of any nation and by the public as a highly profitable one, firmest and contractor is not aware of the cost implication of Health and Safety in construction project. However, Datta,(2000) added that the construction sector of developing countries also demonstrates poor performance in respect of health and safety due to the absence of any rigid safety and construction laws. The cost of health and safety implication of the industry remains a staring challenge in its effort to tackle the development initiative of many nations of which Nigeria is not excluded.

Research Questions

What are the effective measures required for the Health and Safety in construction Project site?

Aims

The aim of this paper is to assess the cost implications of health and safety measures in construction projects in Minna, with a view to suggesting strategies for minimizing the cost of Health and Safety.

Objectives

To identify the effective Health and Safety measures required on construction project site.

From time immemorial construction projects have been regarded by the public as a highly profitable one and through this, they earn their living. For this reasons many people are attracted to it by establishing their own firms without them knowing properly the cost implication of health and safety in construction project. Construction industry is an essential aspect of the economy in many countries and often seen as a vehicle of economic growth especially in developing countries. Typically, construction industries bring to 11% of gross domestic products (GDP) in most developing countries (Giang and Pheng, 2010). In Nigeria Construction industries make considerable contribution to country economy and provide large number of employment as per the latest statistics released in October, 2014 by the coordinating Minister of economy and finance, Iweala (2014). Cost implication of variation in design decisions, never the less, the problems of cost overflow, especially in the construction industry, is a worldwide remarkable development, and its riffle are normally a source of detritions between clients and contractors on the emerge of price variation.

The construction industry has consequently attained the reputation of being unsafe or highly hazardous industry because of the disproportionately high incidence of accidents and fatal disasters that occur on construction sites around the world (Smallwood, and Haupt, 2008). Also Sohail (1999) described construction industry as extremely hazardous. Internationally, construction workers are two to three times to a greater extent to die on the job than workers in other industries while the risk of serious injury is nearly three times higher. Health and safety therefore is economic as well as humanitarian concerns that postulate proper management control. Bima*et al* (2005) stated that "Health and Safety on its own is a global challenge to the sustainable development of our society and civilization". Also concord by (Okoye and Okolie, 2014), work related accidents and illnesses contribute

3.9 per cent of all deaths and 25 per cent of the world's population undergo a minor or major occupational accident or work related diseases inevery one year. Other than the moral concerns, the economic cost is immense.

Occupational health and safety programmes being first establish in Nigeria during the time the country was a British colony (Onyejeji, 2011). The programmes ascertain that occupational and other commercial task included plantation, for monitoring. This Initiative led to legislation that included Labour enactment Act of 1974, the refrain Factories Act of 1987 and the Workman's Compensation Act of 1987. Other relevant acts to occupational Health and Safety in Nigeria are Labour Acts of 1990 and Workman's Compensation Act, 2004 of the law of the Federation of Nigeria. According to Adeogun and Okafor (2013), and Okoye and Okolie (2014), these acts were not implemented in Nigeria as manifest from the reports of unhealthy exposure to risks of workers and employees in assorted organizations.

Nigeria happen to be among the Nations that signed the occupational health and safety law in the Geneva convention of 1981, the pitiable health and safety position in Nigerian construction industry made Idoro, (2008, 2011) to deduce that the contractors' management efforts on occupational health and safety do not reverberate in their orbit of operations and the accident and injury rates of the Nigerian construction industry are towering. Idoro, (2008) stated that the best move is to focus on proactive efforts dealing with the constituent responsible for such accidents and injuries and how to restraint them. Even so, it has been evidenced that investment in construction health and safety actually increases the profitability by increment in productivity rates, boosting employee morale and decreasing attrition (Mohammed, 2003), In (Ibijoju, 2016). Construction safety and health management therefore deals with actions that managers at all levels can adopt to create an organizational setting in which workers will be trained and motivated to carry out sound and fruitful construction work. The system eliminating hazards and key out expected hazards before they become the impart factors to miserable accidents.

Health and Safety in Construction Industry

Construction industry is being regarded for its barefaced situation in the economy of any country and by the public as a highly profitable one, most firm and contractor is not aware of the cost implication of Health and Safety in construction project. However, Datta (2000) append that the construction position of underdeveloped Nation likewise showcase pitiful performance in respect of health and safety attributable to the seizure of any unadoptable safety and construction laws. The cost of health and safety implication of the industry rest on a through going challenge in its effort to harness the development readiness of many countries of which Nigeria is not excluded. The economic cost is huge; the study caves the industry's effort towards sustainable construction and development. Also concord by Mohammed (2003) in Ibijoju (2016), the construction industry is at the same time recognized as a leading economic force and one of the most unsafe industries. Accidents not only result inconsiderable pain and suffering but also retard project productivity, quality, and time which consequently add to the cost of construction. Reckon the unfavourable shock of accidents, construction health and safety management should be of paramount concern to all stakeholders in the construction industry.

Health and Safety Measures in Construction Site

Construction work is an unsafe land-based job. Some construction site works include: construction of houses, roads, repair and conserve infrastructures base. This work includes many dangerous undertaking and weather such as working at height, excavation, dust, power tools and equipment. Endangerment on project sites can be low to a lot of different causes. Weather conditions, working with crash hazards, clock force, and lack of agreements all increase the risk of injury or accident to workers on site. As far as Health and Safety is concerns (Akpan, 2011); state that the industry still experiences careless attitudes, overconfidence and failure to provide hale and safe working measures as well as periodic health and safety seminar for the stakeholders and general public. Ikpe, (2009) and HSE, (2006) in Yakubu, (2014) summarized the regulations on the health and safety measures act in table 1.

Table 1: Health and Safety Measures

No./Title	Summary	First PPE Training Promotion Safety General aid Personnel
1. Health and Safety work act 1974.	General duties to ensure the health and safety of employees and others so far as is reasonably practicable.	* * * *
2. Electricity at work regulations 1989.	Control of exposure of Electricity.	*
3. Construction (Head protection) regulation 1989.	Ensuring head promotion is provided and won.	*
4. Workplace (Health Safety and Welfare) regulation 1992		

Source: SHE, (2006), and Ikpe, (2009), in Yakubu, (2014).

Poor Attitude towards Health and Safety Measures

Workers negative attitude towards HSE measures on construction sites should be properly monitor for save working environment, a positive safety attitude is essential to prevent accidents on the job and to other, safety attitude in workplace is very paramount because Human factors such as attitude influence our behaviours, hence, it's eventful for employers to key out posture that are potential barriers to working safety. Some workers often don't make use of safety equipment provide for them. Poor safety behaviour is common with some workers they feel big when told to use the safety equipment provided for them. The site/safety supervisor should ensure that all employees follow all safety rules at all times, take responsibility for their own safety, as well asthe safety of their co-workers and report any injuries or accidents to a supervisor immediately, Also concord by HSE (2004), employers are needful to make an appraisal of the health and safety risks to which employees and others are exposed on construction sites. The remarkable findings must be filmed or registered where more or five (5) people are employed.

Health and Safety Cost

The cost of health and safety was generally sensed as a needful/required and good business disbursement. In some instance input costs were reckon to be low, call for more investment in terms of time and effort than large financial sums. In others, the cost of compliance with certain aspects of legislation was reckoned to be high in relation to the sensed benefits. This latter position was most frequent among small company representatives. The immense majority of active organizations had notexplicitly demonstrated cost savings as a result of health and safety interventions. Generally, there seem to be more of a hold of 'softer benefits' (e.g. staff morale, retention, productivity) than nasty financial benefit (Haefeli, *et al*, 2005). The cost associated with health and safety performance can be resuming as follows;

1. The costs of safety programs
2. The costs in educating and training staff or workers
3. The costs of implementing and visiting health and safety plan in a construction site
4. The costs of commercial inducement.

These costs can be directly or indirectly incurred.

The Research Method

Having reviewed the related literature on various research methods, the study adopt the quantitative methods of approach, first handed source of data collection follow through the establishment of well-structured questionnaires to 40 potential respondents and completed questionnaires returned were analysed that is from the contractor and professionals groups respectively. The data collected was analysed using the computer software packages, Statistical Products for Services Solutions (SPSS), in order to attain the objectives of the study as discussed, mean items score (MIS) was used in analyzing the objective. Data was analysed using descriptive statistics to show the frequencies and mean of reaction to questions with fixed reactions to establish the background information of the respondents and other various project parameters to respondents organization, level on the effective Health and Safety measures require on construction site. Table is the medium use to present the findings of the study.

Data Analysis

Analysis of the Respondent's Profile: Forty (40) numbers of questionnaires was administered during the course of the study. From the questionnaire received shows a response rate of 5 civil engineer (12.5%), 9 Builder (22.5%), 20 Q/S (50%), 3 Architecture (7.5%), 3 others (7.5%).

Results

Table 2 and 3

Organization readiness in providing Health and Safety measures on construction site. Using a scale of 5 and 1

where 5 = very often, 4=often, 3= Moderate often, 2= Less Often, 1= Never and TR = Total Respondents.

Table 2: Your Organization Readiness in Providing Health and Safety Measure on Site

Your Organization Readiness In Providing Health And Safety Measure On Site.	**5**	**4**	**3**	**2**	**1**	**TR**
A First Aid Kits	09	10	17	01	03	40
B Personal Protective Clothing (PPE)	08	09	14	06	03	40
C Safety Policy	06	16	15	-	03	40
D Proper Site Layout Planning	12	18	08	01	01	40
E Health And Safety Warning Signs	04	13	17	04	02	40
F Health And Safety Risk Assessment	05	09	15	06	05	40
G Health And Safety Training	06	10	15	03	06	40
H Good Working Environment	09	19	12	-	-	40
I Welfare Facilities	02	14	16	06	02	40
J Others	-	-	-	-	-	-

Source: Field Survey(2018).

Table 3: How often is your organization in providing Health and Safety Procedures Required for Emergency Response On Construction Site?

How often is your organization in providing Health and Safety Procedures Required for Emergency Response On Construction Site?	**5**	**4**	**3**	**2**	**1**	**TR**
A Provision of insurance cover for site and employee	04	05	20	06	05	40
B Provision cloak and toilet services	02	15	16	03	04	40
C Provision of drinking water	10	19	07	01	03	40
D Provision of accidenting reporting procedure	-	15	19	02	04	40
E Designated HSE Personnel	-	12	18	06	04	40
F Safety Promotion	-	08	24	05	03	40
G Others	-	-	-	-	-	-

Source: Field survey (2018).

Table 2 and 3 above represent the frequency of the respondents in a lateral scale from very often to never (5-1). From the table, 10 organization often provide the first aid kits, 9 often provide the personal protective clothing (PPE), 16 often put in place the Safety policy, 18 often has proper site layout planning, 13 often provide Health and Safety Warning signs, 9 often assess Health and Safety risk, 10 often provide Health and Safety training to her staff, 19 often put in place a good working environment, while 14 organization often provide welfare facilities to her staff. On the provision of Health and Safety required for emergency response on construction site, 20 organization moderately provide insurance cover for site and employee, 16 moderately provide site cloak and toilet services, 19 often provide portable drinking water, 19 moderately put in place accident report procedure, 18 moderately employed HSE personnel, while 24 organization moderately put in place a means of safety promotion.

Table 4 and 5 show the mean items score, ranking and decision of the respondent on Health and Safety measures.

Table 4.

S/N	Health and Safety measure	MIS	RANK	DECISION
1	Proper site layout planning	3.975	1st	Often
2	Good working environment	3.925	2nd	Often
3	Safety policy	3.550	3rd	Often
4	First aid kits	3.525	4th	Often
5	Personal protective clothing (PPE)	3.500	5th	Often
6	Health and Safety warning signs	3.325	6th	Moderately often
7	Welfare facilities	3.200	7th	Moderately often
8	Health and Safety training	3.175	8th	Moderately often
9	Health and Safety risk assessment	3.075	9th	Moderately often
	Average	3.472		

Source: Field Survey(2018).

Table V.

S/N	HSE procedures for emergency response	MIS	RANK	DECISION
1	Provision of drinking water	3.800	1st	Often
2	Provision of cloak and toilet services	3.200	2nd	Moderately often
3	Provision of accident reporting procedure	3.125	3rd	Moderately often
4	Designated HSE Personnel	2.950	4th	Moderately often
5	Provision of insurance cover for site and employee	2.925	5th	Moderately often
6	Safety promotion	2.925	5th	Moderately often
	AVERAGE	3.154		

Source: Field Survey (2018).

The table 5 above shows the means item score (MIS) of the Health and Safety measures on Construction site. The statistical result of analysis via mean score affirm the ranged or the decisions to which these MIS impart to efficient Health and Safety measures required on construction project site. It's shown clearly from the table that proper site layout planning hold a mean value of 3.98 and placed 1st, this is follow by good working environment with a mean value of 3.93 and placed 2nd, safety policy with a mean value of 3.55 hence placed 3rd, likewise, first aid kits, personal protective clothing (PPE) and Health and Safety warning signs with their mean values of 3.53, 3.50, and 3.33 thus ranked as 4th, 5th and 6th respectively. The welfare facilities having a means values of 3.20 and ranked 7th, Health and safety training 8th, with a statistical mean value of 3.18 and Health and safety risk assessment observed to have the least bit statistical mean values of 3.08 placed 9th thusly signal that is the list factor identify in the effective Health and Safety measures require on construction project site.

Based on ranking the Health and Safety measures mostly put in place by the organization are: - proper site layout planning, good working environment, safety policy, first aid kits and personal protective clothe (PPE). These factors outlined have their means scores from 3.50 and above. Finding are related with Ikpe, *et al.,* (2011) who listed first aid facilities, PPE., Safety training, safety promotion, safety personnel as cost of accidents prevention. While Health and Safety warning signs, welfare facilities, Health and safety training and Health and safety risk assessment are least factors having their means scores less than 3.50?

While table 5 shows the mean item score (MIS) of the emergency response of the Health and Safety procedures. The mean scores and ranking revealed that the provision of drinking water has a mean score value of 3.8 and ranked 1st, provision of cloak and toilet services ranked 2nd with a mean score of (3.20), provision of accident reporting procedure (3.13), designated HSE personnel (2.95), provision of insurance cover for site and employee (2.93) and Safety promotion (2.93) were ranked 3rd, 4th, and 5th respectively. Findings are related to Sawacha*et al.,* (1999) who identify the above mentioned as factors affecting safety performance on construction sites if not provided.

Discussion

From the analyses of data showcase above indicate that most organization provide Health and Safety measures in the construction site as unveil by the mean score of the population more than 3.50, the finding also revealed that construction organization have Health and Safety Policy, first aid kits, personal protective equipment (PPE), good working environment, proper site layout planning and provision of drinking water often in place, while Health and Safety warning sings, welfare facilities, Health and safety training, Health and safety risk assessment and safety promotion where moderately in place. On the other hand provision of insurance cover for site and employee, designated HSE personnel, provision of accident reporting procedure and provision of cloak and toilet services are below the average (Decision rule 3.50). The findings also spotlight the items of Health and Safety measures on construction site and stratified the existence of proper site layout planning, good working environment, safety policy, first aid kits and personal protective equipment (PPE) as 1st, 2nd, 3rd, 4th, and 5th respectively. The Health and Safety measures if put in place and properly utilize by the construction workers this will grossly reduce the cost that will be incurred due to injuries.

Conclution

In conclusion, this work identify Health and Safety measures and Health and Safety procedures for emergency response in construction sites, in addition, the main Health and Safety measures are itemize and rated by the respondents. Most construction organization like awareness of site safety and disfavour to have on personal protective equipment (PPE), lack of training, recruitment of HSE officer, and provision of first aid kits are main drive for poor safety practices in construction sites in Nigeria.

Recommendations

The following points are the strategies to minimize the cost of Health and Safety Measures in Construction site.

1. Always encourage a constructive culture of safety in the workplace.
2. Exhibit management's allegiance to the safety and wellbeing of both workers and the work environment by providing the insurance cover to the employees and workplace.
3. Frequently communicating with employees about workplace safety.
4. Consulting and involve with employees in decision making procedure regarding Health and Safety.
5. Develop and participate in site-specific safety programs.
6. Often conduct survey to obtain employee feedback on Safety measures.
7. Recruit the HSE officer in the workplace

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