
EXPLORATORY STUDY OF THE COST OF HEALTH AND SAFETY PERFORMANCE OF BUILDING CONTRACTORS IN SOUTH- EAST NIGERIA.

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ABSTRACT: *Organizations of all kinds are increasingly concerned with achieving and demonstrating sound occupational health and safety (OH&S) performance by controlling their OH&S risks, consistent with their OH&S policy and objectives. In view of this, the study is a detailed assessment of the cost of Health and Safety performance of building contractors in South East, Nigeria and the relationship between the cost of performance and success of building projects. It provides a framework through which contractors' health and safety actions can step down the rate of accidents on construction sites. It employed survey research method where a questionnaire was structured and randomly distributed to a total of 150 respondents comprising three construction stakeholders (clients, contractor sand professionals) across the zone. Data obtained were statistically analysed using Chi Square statistics (X^2) to ascertain if statistical relationships exist. Cramer's V test is conducted to establish the strength the relationship. The result reveals that health and safety performance of contractors affects the success of building projects in terms of delivery time, quality, cost and productive, while non-performance induces litigations/legal costs which inadvertently increase the overall building project cost. The result also portrayed the believe of the stakeholders that implementation of health and safety programmes and policies increases the overall project cost and as a result health and safety programmes are really implemented on site. The study recommends that the stakeholders especially the contractors should look beyond the immediate effect of implementing health and safety programmes and policies and focus on their long term comparative advantages which include quality reliability, profitability and timely delivery.*

KEYWORDS: Health and Safety, Performance, Cost, Building Contractors, Nigeria.

INTRODUCTION

Construction industry is indisputable for its overt position in the economy of any nation. However, the poor safety performance of the construction industry has continues to give international cause for concern (Haslam, *et al.*, 2005). The health and safety performance of the industry remains a

staring challenge in its effort to tackle the developmental initiative of many nations including Nigeria. Workplace Health and Safety on its own is a global challenge to the sustainable development of our society and civilisation. According to the international labour office, work related accidents and illnesses contribute 3.9 percent of all deaths and 25 percent of the world's population suffers a minor or major occupational accident or work related disease in any one year. Other than the moral concerns, the economic cost is huge. The work related injuries cost the United States 125.1 billion US Dollars in 1998 (1.5% of GDP) and Britain between 14.5 and 18 billion pounds annually (2.1 % to 2.6% of GDP) (Indecon 2006). This undermines the industry's effort towards sustainable construction and development. However, the legal responsibility is a requirement or set of duties for which a person's act towards others and the public would be prosecuted. If a contractor's action do not meet this standard of care, the Acts are considered claimed in a lawsuit for negligence.

According to Onyejeji (2011), occupational health and safety programmes were first introduced in Nigeria during the time the country was a British colony. These programmes ensured that occupational health workers were dispatched to industrial plants and other commercial undertakings, including plantations, for monitoring. This initiative led to legislation that included Labour Act of 1974, the 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 1990 and Workman's Compensation Act, 2004 of the laws of the Federation of Nigeria Similarly, Adeogun and Okafor (2013), note that these acts are not being enforced in Nigeria as evidenced from the reports of unhealthy exposure to risks of workers and employees in various organizations.

Furthermore, government intervention in the area of Health and Safety can be economically justified when there are imperfections in risk information. In theory, the goal of regulatory bodies is to isolate incidents where misinformation about health risks leads people to make non-optimal decisions in order internalize the situations where health and safety risks are not already realized in the market decision. Policy needs to strike a balance between the costs of prevention, borne by employers, and the costs of injuries and ill health which fall upon the individual and society (Indecon, 2006). Despite being among the countries that signed the occupational health and safety law in the Geneva Convention of 1981, the pathetic health and safety situation in Nigeria construction industry made Idoro (2008; 2011), to conclude that the contractors' management efforts on occupational health and safety do not reflect in their scope of operations and the accident and injury rates of the Nigerian construction industry are high. Idoro (2008) further maintains that a better approach is to focus on proactive efforts dealing with the factors responsible for such accidents and injuries and how to control them. To this end, the need to assess the cost and legal implications of health and safety performance of building contractors in Nigeria becomes very paramount so as to bring to fore the need to take-on the situation proactively.

To achieve this aim, this study will be guided by the following three hypotheses.

- 1 Health and safety performance of building contractors does not significantly affect the success of building projects outcome.
- 2 Health and safety programme of building contractors does not significantly increase the overall cost of building projects.
- 3 Health and safety non-performance of building contractors does not significantly induce litigation/ legal costs on building projects.

REVIEW OF RELATED LITERATURE

Health and Safety Performance of the Nigerian Construction Industry

Over the decades, construction industry has been intensifying efforts towards improving its health and safety performance. However, these efforts have been shifted from monitoring safety performance to proactive continuous improvement on safety performance. Hinze (2005) suggests that in order for the improvement of safety performance to be effective, construction firms must be structured and positioned to make changes when it is deemed appropriate. He further posits that to be truly proactive in safety, requires that a safety approach be adopted should not be dependent on the monitoring of injuries after they occur, and rather than basing safety actions on measures of failure (as is customary with a focus on injury occurrence), a shift in thinking is needed whereby the focus is on those actions that can lead to good safety performance.

Regrettably, Olatunji and Aje (2005) lament that though prequalification has gained tremendous support and popularity in contract procurement in Nigeria, health and safety factors of contractor performance are not popularly prioritized. In the same vein, Idoro (2011) reveals that all categories of contractors operating in the Nigerian construction industry do not perform better than each other in terms of health and safety and hence calls the stakeholders in the industry to improve their health and safety performance. This however, deprives the industry the opportunity to make appropriate changes when required. The resultant of health and safety non-performance in Nigerian construction industry is untold and can be seen in the number of fatalities and injuries arising from construction activities across the country (Awodele & Ayoola, 2005; Dimuna, 2010; Ayedun, Durodola & Akinjare, 2012).

Farooqui, Arif and Rafeeqi (2008) present a good picture of health and safety performance of developing countries. Despite the emphasis laid by Aksorn and Hadikusumo (2007) on the implementation of safety programs in order to improve construction site safety, and advocacy promoted by Molenaar, Brown, Caile and Smith (2002) that written safety plans of companies must go beyond the letter of the plan and create a true safety culture, the following health and safety conditions are still noticeable across most developing countries. Most large firms do have a safety policy, on paper, but employees in general are not aware of its existence. Maximization of

profit is the prime concern majority of contractors. Unsafe conditions exist on many sites, both large and small, and laborers are subjected to numerous hazards, no training programs for the staff and workers exist; therefore, no orientation for new staff or workers is conducted, hazards are not pointed out, and no safety meetings are held. Employees are required to learn from their own mistakes or experience. In addition, lack of medical facilities, shanty housing, and substandard sanitation tend to exist on remote projects. While working on site, workers undertake a number of risk and the following problem areas are common:

- While excavating in deep trenches (with no proper shoring or bracing), accidents due to cave-ins often occur;
- Concreting is done mainly by laborers, and cements burns due to the unavailability of protective gloves and boots are common;
- Workers fall from heights due to weak scaffolding and the unavailability of safety belts.
- Workers sustain injuries on the head, fingers, eyes, feet, and face due to absence of personal protection equipment; and
- There is improper housekeeping.

Lack of understanding of the job and poor equipment maintenance are also major causes of accidents. Injuries generally are unreported; however, if necessary, a laborer might receive first aid or preliminary medical care. In most cases, specialized medical treatment or compensation is unavailable. Workers themselves consider accidents as due to their own negligence, and accept that construction is a dangerous occupation. Nevertheless, major accidents involving the death of a worker may be reported due to the financial expenses and litigation that could be involved (Awodele & Ayoola, 2005; Idoro, 2008; 2011; Okoye, 2010; Farooqui, Arif & Rafeeqi, 2008; Olatunji, Aje & Odugboye, 2007; Dorji & Hadikusumo, 2006; Guha, & Biswas, 2013). In this regard, Okolie and Okoye (2013) posit that the emergence of new regulations, laws, standards and codes has also made many construction organizations to improve their safety performance.

Health and Safety Performance Cost

Haefeli, Haslam and Haslam (2005) report that avoidance or reduction of accident and work-related ill health costs per se does not appear to be the primary motivating factor for effective health and safety management. A combination of other interlinked factors emerged as being more influential in driving the health and safety agenda in most organizations, including: avoidance or reduction of liability claims; potential legal exposure; concern over the cost of insurance premiums; external pressures from insurance companies; maintenance of corporate image and reputation; customer and client expectations; government targets; moral obligations; staff morale; absence, recruitment and retention, and impact on productivity, efficiency and quality of service delivery. However, it was generally acknowledged that health and safety failures might ultimately

impact on the financial performance of an organization through any of these higher level factors, Haefeli, Haslam and Haslam (2005) submitted.

In view of the above position, Guha and Biswas (2013) argue that safety investment cannot be unbounded and a rational judgement for safety cost is required and maintain that costs associated with stringent safety parameters in developing countries might simply be unsustainable and that the stakeholders cannot bear the safety cost for economic survival if the real cost of accident is too low in the economy. Most organizations were perceived as having an established commitment to continuous improvement and therefore required no additional motivation to improve. However, a range of factors were identified as being potential levers for change, including: demonstration of the cost benefits of interventions, and the financial impact of health and safety failures; reductions in insurance premiums or pressure from insurers; a reduction in claims and legal exposure, and unsatisfactory trends in incident rates.

The cost of health and safety was generally perceived as a necessary and beneficial business expense. In some cases input costs were considered to be low, requiring more investment in terms of time and effort than large financial sums. In others, the cost of compliance with certain aspects of legislation was considered to be high in relation to the perceived benefits. This latter view was most prevalent among small company representatives. The vast majority of participating organizations had not explicitly demonstrated cost savings as a result of health and safety interventions. Overall there appears to be more of an appreciation of ‘softer benefits’ (e.g. staff morale, retention, productivity) than hard financial gains (Haefeli, Haslam & Haslam, 2005). The cost associated with health and safety performance can be summarized as follows;

- Costs of safety programs
- Costs in educating and training staff or workers
- Costs in enforcing and inspecting health and safety plan in a construction site
- Costs of commercial incentives.

These costs can be directly or indirectly incurred.

Construction Health and Safety Regulation

The need to institute construction health and safety regulation was borne out of the rate with which accidents occur on construction sites with impunity with no one being held responsible and in response to work-related deaths and injuries (Li & Poon, 2009). The first recorded construction safety regulation made by man was handed down by King Hammurabi of Babylon, in 18th Century BC. The law states that;

“If a builder has built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be slain”

“If a man has been too lazy to strengthen his dyke, and has not strengthened the dyke, and a breach has opened in the dyke, and the ground has flooded with water, the man in whose dyke the breach has opened shall be reimbursed the corn he has destroyed”

The above law is in addition to the specification given by God Himself in the Holy Bible which states thus:

“When you build a new house, make a parapet around your roof so that you may not bring the guilt of bloodshed on your house if someone falls from the roof.”
(Deuteronomy 22:8)

In the developed economies such as UK, researches show that there are a number of established construction health and safety regulations that are operational. In the developing countries like Nigeria, Okolie and Okoye (2012) aver that the institutional and regulatory framework for construction health and safety is highly fragmented and poorly implemented and call for urgent need for provision of adequate and enforceable health and safety regulations for construction operations as well as the establishment of construction industry training institutes including trade centres in different parts of Nigeria. . Unfortunately, Wong (2002) observes that despite the introduction of new legislation and schemes to improve site safety, the Hong Kong construction industry has continued to suffer from a consistently high accident rate. In Nigeria, researches into health and safety condition of construction industry show that the situation is more pathetic and calls for urgent proactive actions (Ayininola & Olalusi, 2004; Idoro, 2007; Ede, 2010; Oloyede, Omoogum & Akinjare, 2010; Okolie & Okoye, 2012).on his part, Idoro, (2004) attributed the problem to adopting almost all existing regulations of reference on health and safety in Nigeria from foreign countries. The regulations include, the Factory Act of 1990, which is an adaptation of the UK Factory Act of 1961. The Occupation Safety and Health Act of 1970 is an American legislation. The Control of Substance Hazardous to Health Regulations of 1988, the Personal Protective Equipment at Work Regulations of 1992, the Management of Health and Safety at Work Regulations of 1999 are all British laws and are applicable in European Countries. The Manual Handling Operations Regulations of 1992, the New Construction Design and Management Regulations of 1994 also originated from foreign countries.

The question however, is not whether there exist or not any regulation(s), but that no legislation or law can adequately describe all possible risks for all possible circumstances and provide all possible solutions to those risks. This inadequacy is further exacerbated by the fact that legislations and laws use language as a tool and no language can avoid the pitfall of interpretive differences. Hence parties involved in the industry may interpret the standards differently from the interpretation of the statutory enforcers. Yet again, these interpretations may totally differ from those held by the guardians of the law, the Courts. In general, the numbers of lawsuits filed against a company are probably a poor measure of safety performance. Some firms are much better than

others at managing claims and this may have no bearing on the actual safety performance realized on the jobsite.

Legal and Economic Implication of Health and Safety Non-Performance on Construction Site

Okolie and Okoye (2012) stress that the importance of safety on construction sites and safety of construction workers can never be over emphasized, because when accidents happen on site, they cause many human tragedies, de-motivate workers, disrupt site activities, delay project progress, and affect overall project cost, productivity and reputation of the firms concerned. In addition, Mthlane, Othman and Pearl (2008), identify loss of productivity, disruption of current work, training cost for replacement, damages to plant, equipment, completed work, corrective actions to prevent re-occurrence of accident, degradation of efficiency, expenditure on emergency equipment, slowdown in operations, costs of workman's compensation, medical payments, insurance premium, costs of rescue operations and equipment, loss of function and operations income, payments for settlements of injury or death claims, legal fees for defense against claims and increased insurance costs as major economic impact of site accident on construction companies. These singular acts underscore the magnitude of legal and economic implications of accident when it occurs on construction site. Common knowledge shows that every accident results in costs. These costs can be categorized into:

Direct: Medical expenses incurred from injuries sustained in the accident and indemnity payments to injured workers while away from work. These costs are most often reimbursed by insurance.

Indirect: Other "non-billable" costs that result from internal systems adapting to the accident and its aftermath. These costs are most often uninsured and therefore unrecoverable; they account for 70 to 90 percent of the true cost of an accident. Indirect costs may include: overtime, loss of production, replacement costs, product damage, and administrative costs.

In consonance with the above, Hrymak and Pérezgonzález, (2007) case studies on 20 construction sites in Ireland show that a wide range of negative costs and effects resulted from the accidents in terms of financial costs to employers, which the amounts varied greatly from €0 to over €3.8 million. Employer costs from the accidents included salary costs for replacement staff or overtime payments, production and productivity losses, retraining costs, personal injury claim compensation, repair bills, medical & travel expenses and increased supervision. Consequently, in Nigeria, Part III Sections 7 and 9 of Employee's Compensation Act, (2010) Act No. 13 of LFN, specify the conditions to which an employee is entitled to compensation when injures or suffers occupational diseases in the course of his employment. Part IV Section 17 of the same Act specifies the scale of compensation in fatal cases. In the like manner, the stipulations of Part XI of the Insurance Act, 2003 of LFN brings to focus the seriousness of this fact. In Hong Kong, Li and Poon, (2009) reveal that there are substantial number of court cases with respect to worker's

compensation for non-fatal construction accidents. To this effect, the legal and economic implications of health and safety failure on construction site are enormous and any attempt to underrate it will be detrimental to the success of the construction project.

RESEARCH METHODOLOGY

A questionnaire survey research design approach was adopted in the study. The approach involves the use of structured questionnaires which was considered to be the most appropriate tool to reach the population of the study especially when data required for the study can be obtained by the instrument. Respondents were randomly selected among three main categories of construction stakeholders (clients; contractors including main contractors and sub-contractors; and professionals of different backgrounds) across the South East states of Nigeria. The questionnaire was issued to 150 potential respondents, and 119 completed questionnaires were returned and found suitable for analysis, representing a response rate of 79.33%. Of these, 46, 40 and 33 were from the client, contractor and professional groups respectively.

The questionnaire contains twenty three (23) statements relating to cost and legal implications of health and safety performance of building contractors, and which were also directed towards the three hypotheses postulated above. These statements were divided into three parts; 8 statements each for hypothesis one and three, and 7 statements for hypothesis two. The data collected were analyzed using Chi-square (X^2) statistics, to test the three hypotheses postulated at 1% significant level ($\alpha = 0.01$) to ascertain if there is any significant relationship that exist between the concern variables. The Cramer's V (V) test was computed to ascertain the strength or extent of the association between variables. The results of the analyses are presented and discussed below.

DECISION: Reject H_0 if Chi-square (X^2) calculated is greater than Chi-square (X^2) critical value at $\alpha = 0.01$ and degree of freedom (ν) of 8. Otherwise, accept H_0 .

RESULTS AND DISCUSSION

Table 1: Result of Chi Square (X^2) Computation and Cramer's V Test for the Effect of Health and safety Performance of Building Contractors on the Success of Building Projects Outcome.

$X^2_{\text{calculated}}$	$X^2_{\text{critical}} (X^2_{0.01,8})$	P-value	Cramer's V	Decision
49.7006	20.090	0.00000005	0.46	Reject H_0

The result of table 1 above shows that computed Chi Square (X^2) value (49.7006) is greater than Chi Square critical value (20.090) at 1% significance level ($\alpha = 0.01$) and degree of freedom (v) of 8. That is to say that H_0 is rejected and that health and safety performance of building contractors significantly affects the success of building project outcome. However, when tested for its strength of effect, the value of Cramer's V test obtained (0.46) shows a moderate extent of association. The P-value (0.00000005) $< \alpha$ (0.01). The magnitude to which the p-value is less than the alpha (α) shows that the success of building project outcome is largely dependent on the issues relating to health and safety performance of building contractors, example is the provision of personal protective equipment (PPE) for site workers. The implication is that health and safety performance of building contractors has far reaching effects in determining the success of their projects in terms of time of delivery, cost, quality, productivity and so much more.

Table 2: Result of Chi Square (X^2) Computation and Cramer's V Test for the Effect of Health and Safety Programme of Building Contractors on the Overall Cost of Building Projects.

$X^2_{\text{calculated}}$	$X^2_{\text{critical}} (X^2_{0.01,8})$	P-value	Cramer's V	Decision
53.802	20.090	0.00000001	0.48	Reject H_0

The result of table 2 above shows that computed Chi Square (X^2) value (53.802) is greater than Chi Square critical value (20.090) at 1% significance level ($\alpha = 0.01$) and degree of freedom (v) of 8. In this case, the H_0 is rejected and concluded that Health and safety programme of building contractors significantly increase the overall cost of building projects. However, when tested for its strength of association and relationship, the value of Cramer's V test obtained (0.48) shows a moderate extent of association. The P-value (0.00000001) $< \alpha$ (0.01). The magnitude to which the p-value is less than the alpha (α) shows that an attempt to improve the health and safety performance of building contractors through initialization of health and safety programmes, policies, plans and education and training will amount to increase in the overall project cost. This result is not surprising in a way because it depicts the level of health and safety commitments of building project stakeholders. This commitment is a reflection of the health and safety situation in Nigerian construction sites where safety is being sacrificed at the altar of cost. It is however disheartening because implementation of health and safety programmes will always be resisted by the practitioners since they view safety as an additional cost to their projects. The implication is that health and safety will continue to suffer on construction project sites as long as this notion is not corrected.

Table 3: Result of Chi Square (X^2) Computation and Cramer's V Test for the Effect of Health and Safety Non-Performance of Building Contractors on Building Projects Litigation/ Legal Costs.

$X^2_{\text{calculated}}$	$X^2_{\text{critical}} (X^2_{0.01,8})$	P-value	Cramer's V	Decision
22.5907	20.090	0.0039	0.31	Reject H_0

The result of table 3 above reveals that computed Chi Square (X^2) value (22.5907) is greater than Chi Square critical value (20.090) at 1% significance level ($\alpha = 0.01$) and degree of freedom (v) of 8. Since $X^2_{\text{calculated}} (22.5907) > X^2_{(0.01,8)}(20.090)$, H_0 is rejected and it is concluded that health and safety non-performance of building contractors does significantly induce litigation/ legal costs on building projects. However, when tested for the extent of inducement, the value of Cramer's V test obtained (0.31) shows a low level of association. This notwithstanding is significant. From the result also, the P-value (0.00000005) $< \alpha$ (0.01). Considering the magnitude to which the p-value is less than the alpha (α), it can be deduced that litigation or court cases arising from health and safety non-performance of building contractors and which invariably leads to accidents on construction site can off shoot the cost of building projects. The implication is that unhealthy and unsafe work environment is a costly and expensive work environment. That is to say when accident occurs it may lead to various degrees of claims which inadvertently could lead to litigation and subsequent increase in the cost of building project. In view of this, building contractors have to tighten all avenues of non adding value cost such as litigation to their projects and focus attention on such health and safety programmes that are actually meant to reduce cost to their project. What is most important is the long term effects as against the short term effects of these programmes which the stakeholder view as increasing the cost of building projects.

CONCLUSION

Achievement of sustainable construction and subsequent sustainable development is an illusion if the issues of construction health and safety are not holistically tackled. It is a wrong axiom to believe that good health and safety performance increase the cost of building project. The construction stakeholders' opinion in this direction is a reflection of health and safety status of construction and building industry in Nigeria. In view of this, this study has succeeded in appraising the cost and legal implications of health and safety performance of building contractors in Nigeria and thereby providing avenues through which building contractors could step up their health and safety performance in order to achieve a reduced construction cost through reduction in accident rates on site. The result of the study is however quite revealing. It showed that health and safety performance of building contractors such as proper housekeeping, provision of personal protective equipment for the site workers, use of safety gadgets, etc actually affect the project

outcome in terms of time of delivery, cost, quality and productivity. It also established that non-performance in terms of health and safety by the contractors leads to litigation and court cases which invariably lead to increase in construction cost of the projects. Surprisingly however, the result revealed that construction stakeholders see improvement in health and safety through implementation of health and safety policies and programmes on site as an additional cost to the project. This suggests the level of stakeholders' commitment to health and safety wellbeing of construction workers on site and it is a true reflection of health and safety status of Nigerian construction sites.

The above is supported by Che Hassan, Basha and Wan Hanafi (2007), who stressed that developing a proactive safety culture may take long time and require spending of large sums of money for planning, investigating and implementing in each level within the organization. However, they added that once it succeeds, the relative rewards will be achieved in terms of competitive advantage, quality reliability and profitability within the organization.

In this regard, the study suggests that the stakeholders especially the building contractors should look beyond the immediate cost of implementing health and safety policies and programmes, rather focused on the aggregate value accruing from it which is both monetary and non monetary. They should also recognize that whatever action taken in areas of health and safety has a far reaching effect in the success of their projects. They should however identify those actions that are capable of minimizing accidents on site and imbibe by them as accident is proven to be one avenue too many through which construction cost is hyped intrinsically.

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