

# **Effect of Lack of Adequate Attention to Safety Measures on Construction Sites in Akwa Ibom State, Nigeria**

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## **Abstract**

Considering the high number of work related fatal and non-fatal injuries, the construction industry has been a priority area for safety research and interventions. In most developing countries, safety consideration in construction projects delivery is not given a priority and the implementation of safety measures during construction is considered a burden. This study was conducted to investigate the common type of accidents, and to examine the effect of lack of adequate attention to safety measures on construction sites in Akwa Ibom State. A well-structured questionnaire was used to obtain data from workers and operatives in construction firms in the study area. A total of 114 completed and returned questionnaires were used for analysis. The result shows that the most common injuries on sites are injury while handling materials, and slips and trips on objects. It reveals that the neglect of safety on sites may have considerable impact of worker productivity and performance and capable of undermining the reputation of construction companies thereby increasing expenses. Construction managers should ensure that only trained workers are involved in handling of materials. Sites should be kept clean, and attention given to proper site layout to reduce or eliminate the possibility of trips and slips.

**Keywords:** Accidents, construction sites, health and safety, Nigeria, workers

## **1 Introduction**

In the developed as well as developing part of the world, construction industry is considered to be one of the most significant industries. However, the construction industry at the same time is also recognized to be the most hazardous (Suazo and Jaselskis, 1993; Farooqi, 2008). Although dramatic improvement has been made in recent decades, the safety record in the construction industry continues to be one of the poorest (Farooqi, 2008). The major causes of accidents in the construction industry are related to

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the unique nature of the industry, human behavior, difficult work site conditions, non-payment of adequate attention to safety measures, and poor safety management which result in unsafe work methods and procedures. Accident statistics represent not only terrible human tragedies but also substantial economic costs. This is because accident cause loss of productive work time until the normal site working rhythm and morale are affected. Accidents can also cause work disruption and reduce the work rate (Enhassi, Choudhry, Mayer and Shoman, 2008).

Hazard has been defined as a real or potential situation that may cause un-intentional injuries or deaths to people, or damage to, or loss of an item or belongings. It can be regarded as the counterpart of safety. Therefore the evaluation of the work place safety can be conducted by evaluating all on-site hazard elements. Safety performance of each element can then be measured by evaluating the correspondent on-site hazard factors. With the decrease in potential hazard, safety performance improves (Fang, Huang and Hinze, 2004).

The purpose of health and safety measures in the construction industry is to ensure health, safety and well-being of workers (Meekel and Hymak, 2012). Due to the high number of work related fatal and non-fatal injuries, the construction industry has been a priority area for safety research and interventions. Construction work is one of the most well-known high-risk occupational areas in modern society (Larsson, Pousette and Torner, 2006) and among the most hazardous, as measured by work related mortality, injury rates, and workers' compensation payments (McDonald, 2009). Akwa Ibom state has witness an influx of construction contractors and increase in construction activities in the last decade. With such surge in volume of construction, it is imperative for safety research to be conducted to provide insight to contractors, client and the society at large on the dangers of neglecting safety measures on construction sites. This study therefore intends to examine the safety performance of construction projects in Akwa Ibom state. To achieve this aim, the following objectives are to be accomplished:

- (i) to examine the most common type of accidents on construction sites, and
- (ii) to examine the effect of lack of adequate attention to safety measures on construction sites in Akwa Ibom State.

## **2 Health and Safety in Construction**

A large proportion of the Nigerian working population is employed in the construction industry and a great majority of them exposed to varying levels of risks to their health and lives. Construction takes place in the open, exposed to the weather and for limited periods of time, in comparison to the production industry. The present day construction is also marked by rapid execution of projects and extensive use of machinery and complicated production process. All these imply a greater exposure of workers to risks of hazards and accidents and thus require a strict compliance of all participants to the various labor protection, industrial sanitary and safety regulations. Regrettably, the construction industry is held to be one of the most dangerous industries ranking after mining and fishing industries in terms of fatal accidents (Ward, 1979; Wikipedia, 2015).

The factors causing construction site accidents have been addressed by several researchers. Toole (2002) listed the main causes of construction accidents. They include lack of proper training, deficient enforcement of safety, lack of safety equipment, unsafe methods or sequencing, unsafe site conditions, not using provided safety equipment, poor

attitude towards safety, and isolated, sudden deviation from prescribed behavior. Employee attitudes also play a significant part in health and safety; most employees are not committed to the idea of safety and fail to cooperate with safety initiatives, hence making safety measures become ineffective. Many studies demonstrate that the majority of accidents and resulting injuries in the construction industry are attributed to unsafe work practices of the construction workers rather than unsafe working conditions.

Mechanization goes with hazards as the use of plant and equipment is prone to accidents and injuries (Kartam, 1997; Idoro, 2011a). In most countries, the rate of accident and injury prevailing in the industry is higher than what prevails in other industries. For developed countries, Idoro (2011a) discovered that the United States construction industry account for over 22% of all occupational fatalities, even though it employs less than 7% of the country's workforce. Health and Safety Executive (2009) and Idoro (2011a) reports that Britain's construction industry which is one of the biggest industries as it provides employment for 2.2million peoples, is also one of the most dangerous recording over 2,800 deaths from injuries received at work in the last 25 years. The situation in developing countries is worst because research studies discover that accident and injury rates in many of the developing countries such as Nigeria, Thailand and Tanzania are considerably higher than in European countries (Mbuya and Lema, 2003; Idoro, 2004; 2007; 2011b).

In most developing countries, safety consideration in construction projects delivery is not given a priority and the implementation of safety measures during construction is considered a burden. Enhassi et al (2008) and Idoro (2011b) also discover that in many developing countries the legislation governing occupational health and safety is significantly limited when compared with the UK. The report further states that there are rarely any special provisions for construction on workers' safety and the general conditions for workers are often not addressed. Lee and Halpin (2003) and Idoro (2011b) also discovered that in many of the countries where safety legislation exists, the regulatory authority is weak or non-existent. Koehn, Ahmed and Jayanti (2000) and Idoro (2011b) further discovered that in developing countries injuries are often not reported and the employer only provides some form of cash compensation for an injury to the employee. This phenomenon has several implications on the construction industries of developing countries.

### **3 Construction Safety Performance**

In developed countries, recent advancement in technology on one hand, has contributed positively to industry productivity, but on the other hand, has created a more challenging and unsafe work environment. The Nigerian construction industry has no legislation governing Occupational Health and Safety (OHS), accident and injuries are not reported, and clients, consultants and contractors give little or no attention to OHS. The resulting implication is high incidences of accidents and injuries (Idoro, 2011b). A study by Ezenwa (2001) over a 10 year period (1987-1996) of fatal injuries reported to the Federal Ministry of Labour and Productivity (Inspectorate Division) shows that out of 3,183 injuries reported, 71 were fatal. In fact between 1990 and 1994, the overall fatality rate as recorded by Ezenwa (2001) is 22% of the above reported cases. Moreover, Idoro (2011b) in a study of 42 construction contractors in Nigeria found that in 2006 the best safety

record is 5 injuries per worker and 2 accidents per 100 workers. These records are high, whether compared to other countries or not (Idoro, 2011b).

#### **4 Effect of Lack of Adequate Attention to Safety Measures**

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 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.

In Hrymak and Perezgonzalez (2007), case studies on twenty (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 employer. Employer costs from the accidents included salary costs for replacement staff or overtime payments, production and productivity losses, retaining costs, personal injury claim compensation, repair bills, medical and travel expenses and increased supervision. Also, Li and Poon, (2009) reveal that there are substantial number of court cases in Hong Kong with respect to worker's compensation for non-fatal construction accidents.

#### **5 Research Methods**

The population of the study was the construction workers and operatives from the selected construction companies in Akwa Ibom State. The target respondents consisted of the Site Manager/Foreman, Architects, Quantity Surveyors, Engineers, Builders, and building trade operatives. A total of 182 respondents were sampled. Well-structured and standardized questionnaire were used for the collection of data on common causes of accidents and the effect of lack of adequate attention to safety measures on construction project site. Common causes of accident and effects of lack of adequate attention to safety measures were identified from literature search and presented to respondents to evaluate on a 5-point Likert scale. The levels of importance of identified factors were determined by the magnitude of their mean scores, with the greatest mean representing the most important factor.

## 6 Data Analysis and Results

The results from analysis of data obtained in the study are presented. Out of the 182 questionnaire that were distributed, only 114 were completed and returned, representing about 63% response rate. Table 1 shows the summary of the demographic characteristics of the respondents. A small proportion of respondents possess SSCE as academic qualification while about 86% possess academic qualification not less than National Diploma. Most of them (35.1%) have affiliation with engineering profession while not less than 75% have minimum of 5 years working experience in the construction industry. Most of them (about 47%) work for multinational construction firms while 41.2% are engaged by fully indigenous firms. About 59% of respondents work in firms with workforce less than 200 people.

Table 1: Characteristics of respondents

	Frequency	Percent	Cumulative %
<b>Qualification of respondents</b>			
SSCE	16	14.0	14.0
N.D	31	27.2	41.2
HND	45	39.5	80.7
B.Sc.	21	18.4	99.1
M.Sc.	1	0.90	100.0
<b>Profession of respondent</b>			
Architect	8	7.0	7.0
Quantity Surveyor	15	13.2	20.2
Builder	14	12.3	32.5
Engineer	40	35.1	67.5
Plant Operator	4	3.5	71.1
Others	33	28.9	100.0
<b>Years of experience</b>			
Below 5 years	28	24.6	24.6
5-10 years	44	38.6	63.2
10-15 years	22	19.3	82.5
15-20 years	18	15.8	98.2
20 years and above	2	1.8	100.0
<b>Number of years respondent has worked with current firm</b>			
Below 5 years	44	38.6	38.6
5-10 years	51	44.7	83.3
10-15 years	10	8.8	92.1
15-20 years	9	7.9	100.0
<b>Composition of organisation</b>			
Fully indigenous	47	41.2	41.2
Partially indigenous	13	11.4	52.6
Multinational	54	47.4	100.0
<b>Size of workforce</b>			
Under 50	26	22.8	22.8
50-100	25	21.9	44.7
100-150	5	4.4	49.1
150-200	11	9.6	58.8
200 and above	47	41.2	100.0

Table 2: Common accidents on construction sites

	N	Mean	Std. Dev.	Rank
Injury while handling materials/objects	114	3.10	.87208	1
Injury while lifting materials/objects	114	2.94	.69493	2
Slip	114	2.90	.87208	3
Trip on object	114	2.79	1.03457	4
Accident from operating damaged equipment	114	2.73	1.15433	5
Fall from heights	114	2.50	.95241	6
Being struck by moving objects	114	2.50	1.10710	7
Caving in of excavations	114	2.36	.84274	8
Being struck by moving machine/equipment	114	2.32	1.01594	9

In table 2, *Injury while handling materials/objects* with the mean score of 3.10 is the most common accidents that occur on construction sites. It is followed by injury caused while lifting materials/objects with a mean rating 2.94 and by slips with a mean rating of 2.90. Caving in of excavations with a mean rating of 2.36 and being struck by moving machine/equipment with a mean rating 2.32 ranks as the least important causes of accident as suggested by the respondents.

Table 3 shows the effect of non-payment of attention to safety. Demotivation of workers/reduce of morale ranks as the highest effect with a mean rating of 3.09, followed by negative impact on reputation of firms with the mean rating of 3.05, then by increase in project cost, with a mean rating of 2.96. Cost of investigating accident was the least effect with a mean rating of 2.02.

Table 3: Effect of non-payment of attention to safety

	N	Mean	Std. Dev.	Rank
Demotivation of workers/reduce morale	114	3.09	1.54325	1
Negative impact on reputation of firms	114	3.05	1.41323	2
Increase in project cost	114	2.96	1.15160	3
Damages to plant/equipment	114	2.94	.96709	4
Payment for settlement of injury/death claims	114	2.79	1.37087	5
Disruption of site operation	114	2.77	1.14471	6
Cost of rework/repair	114	2.75	.88058	7
Loss of opportunity to qualify for future tender	114	2.72	1.22300	8
Injuries	114	2.64	.81063	9
Cost of workman compensation	114	2.62	.87634	10
Transporting injured worker(s) to obtain treatment	114	2.61	1.23100	11
Lowering of efficiency	114	2.56	1.08925	12
Cost of medical bills/expenses	114	2.56	1.08925	13
Delay in work progress	114	2.51	1.19916	14
Loss of productivity	114	2.44	1.01349	15
Cost of rescue operation	114	2.42	.93973	16
Training cost for replacement worker	114	2.36	.83218	17
Damages to completed work	114	2.32	.98946	18
Cost of cases/litigation	114	2.28	1.13285	19
Loss of human lives	114	2.07	1.22452	20
Cost of investigating accident	114	2.02	.87705	21

## 7 Discussion of Findings

The result of the study indicates that injury while handling materials/objects is the most common accident that occurs on construction site. This is in consonance with the findings of HSE (2009) whose provisional statistics reported that construction sector accounted for the highest proportion of injuries to workers resulting from handling.

The findings of the study also provided insight into the effect of lack of payment of attention to safety issues on construction sites. Demotivation of workers/ reduced morale rank as the most severe effect. Negative impact on reputation of firm, increased project cost and payment of settlement of injury/death claims were also considered as having severe impact. The result agrees with the position of Okolie and Okoye (2012), Hrymak and Perezgoneales (2007). Also, Mthlane *et al* (2008) had identified payment of settlement for injury or death claim and increased insurance cost as major economic impact of site accident in construction. Cost of court cases/litigation was not considered as having a severe effect on construction in this study, and this finding appear to go contrary to the finding by Li and Poon (2000) which revealed a substantial number of court cases with respect to workers compensation for non-fatal construction accidents in Hong Kong.

## 8 Conclusion

The prevalence of accidents on construction sites may have considerable impact of worker productivity and performance. It is also capable of undermining the reputation of construction companies and increasing expenses incurred by firms. Some recommendation have been suggested here base on the findings and conclusion made in this study. Construction managers should ensure that only properly trained workers should be involved in handling of materials/ objects on construction sites to minimize the risk of accident. Construction organizations should improve their attitude towards safety issues by promoting safety and enforcing safety policies. Training and continuous education on safety precautions should be conducted for employers periodically to minimize construction accidents.

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