

THE ECONOMIC AND SOCIAL IMPACTS OF SITE ACCIDENTS ON THE SMALL AND MEDIUM SIZED CONSTRUCTION COMPANIES IN NIGERIA

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Small and medium sized contractors represent the large number of construction companies in Nigeria. They play an important role in the construction industry. However, site fatalities and injuries cases among the small and medium sized construction companies still remain the most health and safety (H&S) issues around the world. This study seeks to examine the economic and social impacts of site accidents on the small and medium sized construction companies in Nigeria. Questionnaire survey was then structured from literature and administered to twenty (20) selected small and medium sized construction companies with not less than hundred (100) workers within the South-West Geopolitical zone of Nigeria. This was followed by interviews conducted with the owners/directors of the five selected companies and workers randomly picked among the selected companies. Data was electronically manipulated using MS Excel. From the analysis, the study revealed that site accidents contribute to loss of productivity, damage to plant and equipment, payment for settlements of injury or death claims, all these have economic impacts on the companies' balance sheets. The study further revealed that site accidents lead to loss of customers' confidence, tarnishing of image and loss of public confidence on the contractors, these are the social impacts. Nevertheless, there is a general lack of commitment to workers' health, safety and wellbeing among the small and medium sized construction companies. The study concludes that site fatalities and injuries cases among the small and medium sized construction companies still remain the most health and safety (H&S) issues. The study therefore, recommends that contractors irrespective of their sizes should demonstrate visible leadership and commitment to workers' H&S by training them on site H&S and providing adequate financial resources for improvement of site accidents.

Keyword: Accident, construction, company, economic, social, small and medium, Nigeria

1. INTROUCTION

The great number of registered construction companies in Nigeria is small and medium enterprises (SMEs). These categories of construction companies make up almost 85% of all registered construction companies in any country (International Labour Organization (ILO), 2011). Small and medium enterprises (SMEs) have been

defined as having 10 to 100 staffs (Brauer, 2006, ILO, 2011). They play important roles in the economy of any nation. According to the World Health Organization (WHO) (2010) reports, small and medium construction companies employ over 53% of all workforces and also contribute to 36% of the total gross domestic fixed investment. Despite their important roles in economic and social development of their countries, small and medium construction companies have poor accident records when compared with large companies (Hughes and Ferrett, 2010; ILO, 2011). Nonetheless, Occupational Safety and Health Act all over the world apply equally to all organisations irrespective of size. However, the ILO (2011) maintains that large proportions of small and medium construction companies are faced with inadequate financial and organisational resources and have limited occupational health and safety knowledge and preventive capacity for effective management of site accidents and incidents. Beside the above assertions by the ILO (2011), every working man or woman must return home healthy and safely. Therefore, small and medium companies should invest adequate financial resources for site H&S management.

Nonetheless, it could be argued that construction by its nature is complex and unique (Kheni, 2008; Hughes Ferrett, 2010), and also the nature and organisation of small and medium construction companies could partly compounded the problem (Coke, 2010, Hinze, 2006). Improvement of site accidents has been made difficult as a result. Lutchman, Maharaj and Ghanem (2012) point out that lack of management commitment to workers' H&S is more pronounced among the small and medium construction companies, and particularly in the developing countries like Nigeria. Additionally, anecdote evidence has shown that small and medium sized construction companies lack human capacity to manage workers' H&S therefore, present a serious H&S challenge all over the world. On this note, Goetsch (2013) argues that lack of human resources, managerial capacity, limited capital resources, a reactive approach, tacit knowledge and little attention given to the formalisation processes found in small and medium construction companies could be factors contributing for their ineffective site H&S management.

The current position all over the world is that H&S of construction site workers should be a priority to all organisation irrespective of size according to Health and Safety at Work Act (1974) and the Management of Health & Safety at Work Regulations (1999) cited in Health and Executive (HSE, 2010). However, small and medium enterprises perceived that they undertake less risk jobs and are not aware of what specific health and safety legislation apply to their companies (Goetsch, 2013). However, this should not be a prelude to their poor site H&S performance. Thus, the negative economic impacts of site accidents resulting in small and medium construction companies globally are enormous and should be prevented.

Beside the economic issues, the small and medium contractors have moral and cooperate obligation to maintain free accidents worksite. In fact the human costs are far beyond unacceptable. Roughly, 2-5 persons die on construction sites every day (ILO, 2011). According to ILO (2010), there were about 4.8 million work-related accidents that resulted in more than three days absence from work amounting to about \$167 million US dollar lost. In addition, they have legal responsibilities to ensure that health and safety of workers and the general public are protected.

Site accidents not only give arise to loss of productivity but, also it tarnishes company's image and lack of public confidence. The adversely publicity associated with site accidents damage company's reputation, which may hamper their ability to obtain future work. Therefore, there are clearly compelling reasons to improve

construction site accidents, particularly among the small and medium sized construction companies in Nigeria. Hinze (2006) points out that a project completed within cost, time, and quality with flaw in H&S is said to be unsuccessfully completed. Improved construction site accidents will invariably reduce the costs associated with site fatalities and injuries cases leading to increase in productivity and financial saving both to contractors and the nation.

Much have been researched on the causes of construction site accidents in Nigeria, but little or no research has been conducted in the area of the economic and social impacts of site accidents on the small and medium sized construction companies. This paper therefore, seeks to examine the economic and social impacts of site accidents on small and medium construction companies in Nigeria.

2.0 REVIEW OF LITERATURE

2.1 Causes of construction site accidents among small and medium companies

An accident can be defined as an unplanned, undesirable, unexpected, uncontrolled event. Not all accident results in an injury or damage. However, any of the accident resulting in injuries or fatalities receives the greatest attention (Hinze, 2006). All accidents, regardless of the nature of damage or loss, have both economic and social implications therefore they should be prevented.

Accident don't just happen, they are caused. Hinze (2006) argues that about 87% of all construction site accidents are caused by either unsafe acts or unsafe conditions or both. Thus, accidents can be prevented. The unsafe acts are violations of accepted safe procedures of work, while unsafe conditions are the existence of hazardous physical conditions in the working environment (Gambatese, 2008). Conchie, Taylor and Charlton (2011) argue that most accidents result from a combination of contributing causes. Notably, accidents occur due to failure of control by management. Flin and Yule (2003) and Goetsch (2013) contend that accidents occur due to poor leadership and lack of commitment towards workers' H&S. In support of the above statement, researchers amongst others identified the followings as factors contributing to site accidents: Musonda, Pretorius and Haupt (2012) poor H&S training of workers, Hughes and Ferrett (2010) inadequate financial provision for H&S, Lutchman et al. (2012) poor H&S culture and Wu and Fang (2012) lack of top management commitment to H&S.

However, causes of construction site accidents can be attributed to many factors. One the factor is a lack of H&S training of workers. Education and training plays a key role in the development of awareness and understanding of the specific hazards and risks associated with construction operations and its environment (Hughes and Ferrett, 2010; Lutchman et al. 2012). Despite the importance of H&S education and training, contractors particularly the small and medium sized companies do not have a good record of investing in training of its workers when compared with large companies (Hughes and Ferrett, 2010).

Globally, poor H&S training of construction site workers is common among the small and medium sized companies, particularly in the developing countries like Nigeria (WHO, 2010). This could be a major factor contributing to site accidents severity and frequency among them. Safe work practices not only pay in terms of financial gain, but also in terms of company corporate image, which is equally very important (ILO, 2011). Similarly, apart from satisfying legal and moral obligations of H&S training, the economic implications are boundless to employers, workers and the society.

Paucity of funds is one of the major factors contributing to contractors' poor H&S interventions on site. Inadequate allocation of financial resources to H&S during the early project planning or at the tender stage is one of the major factors hindering contractors' H&S interventions on site (Olatunji, Sher and Gu, 2011). It has been earlier noted that small and medium sized construction companies' lacks in financial and human resources for effective H&S management. The resultant effects of the lacks thereof could be a reason for inadequate allocation of financial resources in the contract documents. Adequate financial provision to project H&S can be realised through employment of professional quantity surveyor who ensured that funds for H&S have been provided in the contract documents. Olatunji et al. (2011) maintain that its provision can alleviate most of the H&S problems encountered on site. Arguably, lack of human resources found among the small and medium companies could be a factor for not allocating adequate finance for H&S in the contract documents. The consequences have been poor site H&S management that often resulted in site injuries, fatalities and equipment damage.

The ILO (2011) reports that in spite of the effort of governments and trade unions, incidents or accidents will continue to occur on construction sites unless the contracting organisations have an optimum H&S culture (Hinze, 2006). The site workers should share common beliefs, values, attitudes, opinions and motivation relative to H&S. This has been found lacking among the small and medium sized construction companies as many perceived they undertake less risk jobs (Yukl, 2010). Kheni (2008) points out that those organisations with a good H&S culture have employees with positive patterns of attitudes and behaviour toward H&S practices. Arguably, it can infer that small and medium sized construction companies are lacking in these qualities.

2.2 Economic impacts of site accidents on the construction company

The cost implications of site accidents are frequently cited as a major motivation for addressing construction H&S (Hinze, 2006). Hinze (2006) further describes construction accidents as the cancer of construction. According to the WHO (2010), over 1.25 trillion US dollars is spent annually on costs such as lost working time, workers' compensation, and medical expenses resulting in unsafe and unhealthy working conditions. This huge amount spent annually on construction site accidents has negative economic implications on contractors and the nation. The economic burden of site accidents is a serious concern to all the stakeholders and governments alike. From the business standpoint, site accidents and incidents affect the bottom line or profitability of a company. The WHO (2010) maintains that site accidents have forced many construction companies particularly the small and medium sized enterprise into liquidation due to high compensation paid to the family of a deceased worker(s) or through a protracted legal litigation occasioned by site accidents.

The motive of every organisation is to make profit, but when an accident occurs on site it has both direct and indirect economic implications on the organization. The direct costs tend to be those associated with the treatment of the injury and any unique compensation offered to workers as a consequence of being injured (Hinze, 2006), and while indirect costs are those costs that are borne by contractors through: reduced productivity of both returned worker(s); clean-up costs; replacement costs; costs of delays; costs of transportation, and wages paid while the injured is idle (Brauer, 2006). The economic implications of both the direct and indirect cost of accidents (CoAs) to

contractors affects their profit margins, which, in turn, indirectly impacts on the national economy. The overall economic implications of construction site accidents and ill health to contractors are very huge and unacceptable. On the national scale, the estimated costs of construction accidents and ill health can be as high as 7-10% of a country's gross national product (ILO, 2011). In reality, no one can really estimate the total costs of accidents in monetary terms because of the multitude of indirect costs which are difficult to measure besides the more obvious direct costs.

2.3 Social impacts of site accidents on the construction company

Construction site accidents have social impacts on contractors, workers and the community. Spangenberg (2009) points out that some site fatalities have the potential to cause a serious crisis within an organisation and sometimes permanent closure due to adverse publicity from the media. The adverse publicity by the media will lead to loss of confidence among the public which has social impacts on the affected company. In addition, serious site accidents can also cause psychological stress among top management, line managers, and workers leading to low morale of both management and workers. Furthermore, Spangenberg (2009) maintains that site fatalities create tensions within the organisations that are usually characterized with accusations and blames which may divert energies and resources away from the construction tasks at hand to accidents investigations. Consequently, the intangible costs arising from the accidents have attendant social impacts on contractors in the form of low morale of workers, lack of public confidence and tarnished image.

Construction site workers go through a state of shocks and overwhelmed with emotions of sympathy when one of their mate is involved in fatal accident. Beside this, the situation may lead to chaos. The social impacts of these are multifarious on the affected company namely, low morale among workers, loss of confidence and unable to recruit qualified personnel.

3.0 RESEARCH METHOD

To achieve the objectives of this study, a field survey involving members of the registered grade C' contractors in the Lagos State Ministry of works and housing were conducted. The Questionnaires were distributed to twenty (20) contractors presently having job with the State government. The main purpose of the questionnaire was to elicit response from the respondents' on the economic and social impacts of site accidents on the small and medium sized construction companies in Nigeria. One hundred and fifty (150) questionnaires were distributed, seventy were returned, and this resulted in a response rate of 47%. The response rate achieved for this research is similar to that achieved in other surveys (Collins, 2008; Sutrisna, 2009). It could be inferred from Sutrisna (2009) and Dainty (2008) that performing a statistical analysis in survey within the response rate equal to or above the threshold of thirty (30) is acceptable. Thus 47% response rate achieved in this survey provides reasonable data for analysis. Interviews were also conducted with the five selected companies and randomly picked workers on sites visited. An interview is an interaction between two or more people to gain insight relative to problems (Leedy and Ormrod, 2010). The interviews assisted the researcher to understand the awareness and perceptions of respondents relative to economic and social impacts of site accidents on the small and medium sized construction companies in Nigeria.

3.1 Data analysis

The majority of the responses (70%) were received from the owners/directors of the small and medium sized construction companies. Over 54% of the respondents have been involved in construction for the past 10 years; 40% have Bachelor degrees in various disciplines, while 20% have Bachelor degrees and Higher National Diploma in Built environment related courses. A 5-point Likert-scale measurement was used to obtain the opinions of the respondents and to analysis the results. Leedy and Ormrod (2010) maintain that Likert scales are effective to elicit participants' opinions on various statements. The statistica (version 10.0) was used to generate the descriptive and inferential statistics. When using Likert scales, it is imperative to calculate and report Cronbach's *alpha* coefficients as well as the internal consistency and reliability (Gliem and Gliem, 2003). Maree and Pietersen (2007) suggest that the following guidelines for the interpretation of Cronbach's *alpha* coefficient: 0.90 – high reliability; 0.80 – moderate reliability, and 0.70 low reliability. The questionnaire survey shows a high reliability Cronbach's alpha of 0.90.

4.0 INTERPRETATION OF RESULTS FINDINGS

4.1 Economic impacts of site accidents on the construction company

The questionnaire examines the economic and social impacts of site accidents on the small and medium construction companies in Nigeria. Table 1 indicates the respondents' perceptions of the extent to which identified statements contribute to economic impacts of site accidents on the small and medium sized construction companies. It shows in terms of percentage responses to a scale of 1 (minor) to 5 (major), and mean score (MS) ranging between 1.00 and 5.00. It is notable that eleven MSs were above the midpoint of 3.00, which, with an average MS of 3.29, indicates that the respondents perceived that the identified statements have economic impacts on the construction companies.

Table 1 Economic impacts of site accidents on the construction company

Statement	Unsure	Response (%)					MS	Rank
		Minor.....Major						
		1	2	3	4	5		
Loss of company productivity	4.2	6.3	11.9	25.2	29.4	23.1	3.51	1
Damage to plant and equipment	9.1	4.9	9.8	27.9	27.9	20.3	3.49	2
Payments for settlement of injury or death claims	7.7	5.6	14.7	23.1	28.7	20.3	3.43	3
Training costs for replacement of injured worker	8.4	7.7	10.5	27.9	31.5	13.9	3.34	4
Salaries and wages paid to injured while in hospital	6.3	5.6	11.9	40.6	12.7	13.9	3.27	5
Slowdowns in operations during accidents investigations	5.6	9.1	12.6	29.4	32.2	11.2	3.24	6
Medical bills and expense	7.0	9.9	16.9	26.1	24.7	15.5	3.23	7
Legal fees for defence against claims	7.7	6.9	18.2	30.8	27.3	14.1	3.21	8

Increased insurance costs	6.4	7.4	17.1	30.2	26.3	13.8	3.20	9
Costs of rescue and equipment	7.4	6.8	16.3	27.2	25.7	13.2	3.16	10
Costs of reworks or corrective works	8.3	7.1	15.6	27.1	23.1	10.2	3.13	11

Literature review supported the research findings. Brauer (2006) and Hinze (2006) identify costs of accident as direct and indirect costs that have negative impacts on the bottom line or profitability of construction companies. The direct costs tend to be those associated with the treatment of the injury and any unique compensation offered to workers as a consequence of being injured (Hinze, 2006), and while indirect costs are those costs that are borne by contractors through: reduced productivity of both returned worker(s); legal fees for defence against claims; replacement costs for reworks; training costs for replacement of injured worker(s); costs of transportation to hospital, and wages paid while the injured is idle (Brauer, 2006). Although costs of rescue and equipment and costs of reworks or corrective works have the lowest MSs of 3.16 and 3.15 respectively as indicated in Table 1, these statements however have negative economic impacts on small and medium construction companies.

A Director from one of the five selected companies to be interviewed agreed that site accidents have serious economic impacts on the company's productivity and annual balance sheets. In addition, one of the interviewed workers also agreed that site accidents have economic impacts on companies. He made this statement in support of his assertion "Mine Company paid all medical expenses and my salary when I was hospitalised for a month as a result of site accident". This statement, undoubtedly supported the questionnaire results

4.2 Social impacts of site accidents on the construction company

Table 2 indicates the respondents' perceptions of the extent to which identified statements contribute to social impacts of site accidents on the small and medium sized construction companies in Nigeria. It shows in terms of percentage responses to a scale of 1 (minor) to 5 (major), and mean score (MS) ranging between 1.00 and 5.00. It is notable that the five MSs were above the midpoint of 3.00, which, with an average MS of 3.41, indicates that the respondents perceived that the identified statements have social implications on construction companies. In general, the respondents perceive that the identified statements in Table 2 have significant social impacts on the small and medium sized construction companies.

Table 2 Social impacts of site accidents on the construction company

Statement	Unsure	Response (%)					MS	Rank
		Minor.....Major						
		1	2	3	4	5		
Loss of customers' confidence	4.2	6.3	11.9	25.2	29.4	23.1	3.51	1
Tarnished image	9.1	4.9	9.8	27.9	27.9	20.3	3.49	2
Loss of customers' satisfaction	7.7	5.6	14.7	23.1	28.7	20.3	3.43	3

Loss of public confidence	8.4	7.7	10.5	27.9	31.5	13.9	3.34	4
Low morale of workers	6.3	5.6	11.9	40.6	12.7	13.9	3.27	5

Statements made by the owners/directors of five selected companies during the interview session supported the research findings. All the five owners/directors interviewed attested that site fatalities have the potential to induce a serious crisis within the company and could lead to criminal proceedings and sometimes project closure. This often followed with adverse media publicity that is capable of tarnishing the company's image and public confidence. Furthermore, there will be loss of customers' satisfaction and all these have social implications on corporate existence of the company.

Some of the workers interviewed said that they lack words to express their states of shocks and emotions when they "see their co-worker(s) lying helpless on the ground or hand or leg cut off as a result of site accidents". One of the workers made this statement "there is no amount of compensation paid to the family of a diseased worker can replaced the family bread winner". The social impacts of site accidents to the workers, construction companies and the society cannot be measured with in any monetary terms (WHO, 2010).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Unfortunately, work-related accidents in small and medium sized construction companies are still one of the global H&S issues. The pains and sufferings borne by workers, their families and the economic impacts of site accidents to national economy is a serious concern to all. In addition, the negative social impacts of work-related accidents particularly to small and medium sized construction companies are unquantifiable. Construction site accident tarnishes company's image thereby making it difficult to obtain future job from prospective clients. The research therefore may reach the following recommendations to government, stakeholders and construction site workers:

- Small and medium sized construction companies should demonstrate visible leadership and commitment to all matters concerning workers' health, safety and well-being on site.
- Training of workers on H&S should also be a priority to small and medium contracting organizations irrespective of their size. In addition, owners/directors of small and medium construction companies should accept workplace H&S culture as a value.
- Small and medium construction companies should, as a matter of importance ensure that the workplace is free from accidents and health hazards to enable workers enjoy a healthy and productive life both during their active working years and beyond.

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