

EXTENT OF IMPLEMENTATION OF SAFETY RISK REGULATIONS IN NIGERIA CONSTRUCTION INDUSTRIES

Enebe Eucharia Chika

Department of Building, Enugu State University of Science and Technology, Enugu

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Abstract

This paper investigates the role of statutory health and safety (H&S) regulations in managing construction project risks. The study examines whether the decision made by contractors to comply with the regulations, the cost of compliance and savings of H&S regulatory requirements is influenced by the degree or level of risk, which the regulations are trying to prevent. The rationale for the examination stems from previous studies which establish that building designers and contractors perceive the cost of complying with regulations as additional burdens, which they have to conform to, and which are in some cases unnecessary, and also the fact that construction related injuries and fatalities are on the increase. Qualitative and quantitative data obtained from a descriptive survey and H&S site audit by the Master Builder Association of the Western Cape (MBAWC) were used as the measurements of risk, level of compliance to regulations, cost of compliance and savings. By correlating the quantitative and qualitative data, there is empirical evidence to support a negative relationship between the degree of risk, level and cost of compliance and cost savings. Based on the study's findings, this paper concludes that the decision made by contractors to comply with H&S regulatory requirements is influenced by the perceived cost saving on account of compliance and that cost savings are influenced by the probability of accident occurrence which is an element of the degree of risk which the regulation is trying to prevent or control.

Introduction

Construction industries worldwide are notorious for unacceptably high accident and fatality rates (Ulang, 2020). Construction workers are six times more likely to be killed at work than those in other industries (Odeyinka, 2017). Construction is a risky business prone to accidents due to the physical environment of the

work, nature of operations involved, types of materials and methods used for construction and the utilization of sophisticated equipment. In Nigeria, construction industry records show that work related deaths, occupational diseases and injury claims absorb a significant proportion of the Gross National Product (Benjamin & Greef, 2018). However, safety and health of every

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worker is crucial for any organization to thrive towards achieving its objectives because unsafe working conditions jeopardize employees' ability to efficiently discharge their duties (Coglianese, 2018).

Risk regulations are intended to address and satisfy the public mandate for managing the risks and benefits of technology, designed to improve the performance of individual and organizational behaviour in ways that reduces social harms and stimulates the building designer and contractor to follow strict sets of rules with regard to the way in which structures are built (Wolski, 2020).

The reasons for lack of compliance include regulatory authorities imposing regulations that are in practice unattainable or prohibitively expensive (Williams, 2015); building designers and contractors viewing regulations as additional burdens with which they have to comply (Gann, 2018) and that while regulations only apply in some cases, the extra precautions are considered an unnecessary cost (Emrath, 2019). The standards most cited by government regulation bodies diverge from the major sources of fatalities and injuries on construction projects. The level of safety or performance outcomes which a regulation is intended to provide, and thus the resulting costs and benefits derived from its implementation, relates to the degree or level of risk which the regulation attempts to prevent or control.

There are many reasons that account for this poor health and safety record and implementation in construction site, which include; diversity and complexity of the job, temporary and transitory nature of construction

workplaces and the construction workforce, the unique nature of the working environment, the dangerous nature of construction job itself consisting of many dangerous activities, and incoherent working system, abominable environment, increasing sociotechnical complexity of contemporary work environment, variability and degree of uncertainty (Haris & McCaffer, 2021).

Despite that the construction industry is a very lucrative and important industry, contributing massively towards the Gross Domestic Product (GDP) of countries across the world in terms of economic value. The construction industry is the second largest major source of employment worldwide, employing about 7% of the world's workforce (Spooner & Hopley, 2016). Economically, the industry generates an annual revenue of almost \$10 trillion and added value of \$3.6 trillion, and accounts for about 6% of global GDP according to a report by World Economic Forum (WEF, 2016). In developed countries, construction accounts for around 5% of total GDP, and more than 8% of GDP in developing countries (WEF, 2016). It has been estimated that in 2030 the global construction market will grow by \$8trillion (Global Construction Perspectives, 2018).

Therefore, based on the social and economic importance of the construction industry to a country, and the many risks the industry poses to workers (Ahmed, 2018), it is imperative and of paramount importance that health and safety problems facing workers in the industry should be investigated and safety framework developed to mitigate these problems. The reason for this is

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that such safety frameworks would help prevent accidents, improve working conditions, help organizations achieve performance excellence and save cost. The cost emanating from construction injuries has been stated to have a substantial impact on the financial success of construction firms and increase the cost of construction by up to 17% (Hallowell, 2021). Creating a safety framework would therefore help these problems to be effectively managed within construction sites.

Objectives of the Study

The main objective of the study is to examine the extent of implementation of safety risk regulations in Nigeria construction industries. Specifically, this study seeks to:

1. Assess the safety risk regulations in Nigeria construction industries.
2. Examine the level of implementation of the safety risk regulations in Nigeria construction industries.

Research Questions

This study will be guided by the following research questions

1. What are the identified safety risk and regulations in Nigeria construction industries?
2. What is the level of implementations of the safety risk regulations in Nigeria construction industries?

Scope of the Study

This focused on the extent of implementation of safety risk regulations in Nigeria construction industries. The study will be limited to two selected states in South East Region of Nigeria

(Enugu and Ebonyi). The study will operate within the time frame of 2010-2021.

LITERATURE REVIEW

Health and Safety on Construction sites

It is imperative to provide safe working conditions to construction workers due to intrinsic hazards and risks associated with every work situation (Olutuase, 2014). Oresgun (2019) observed that the performance of any construction personnel is usually a function of safe working condition which according to Kheni et al. (2018) deals with both physical and psychological well-being of workers on sites and other persons whose health is likely to be adversely affected by construction. Therefore it is necessary to provide and maintain relevant measures that would ensure high level of health and safety on construction sites to provide protection against risk and hazards emanating from high technological advancement in the construction industry. The European agency for health and safety at work EASHW (2014) recommends that employers and project supervisors must cooperate in order to protect employees' health and safety. The EASHW (2014) provide a minimum requirement for preventing accidents on small construction sites. The check list of the preventive actions contained in EASHW (2004) if properly implemented would go a long way in preventing accident at sites.

Health and Safety Regulations

Effective regulations are fundamental in ensuring employees state of work in the delivery of construction projects in safe atmosphere.

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Idoro (2018) and (2021) observed that almost all the existing safety and health regulations in Nigeria originated from foreign countries. The Factories Act of 1990 is an adaptation of the UK Factories Act of 1961 (Idoro, 2008) while the Occupation Safety and Health OSH Act of 1970 was said to originate from America. The control of substances hazardous to health regulation of 1988, the PPE at work regulations of 1992, and management of health and safety at work regulations of 1999 are all British regulations (Idoro, 2021). The first effort in terms of regulation relating to health and safety at work in Nigeria was the Factories Act of 1958 (Dodo, 2014). This Act was repealed and replaced by Factories decree 16 and workman compensation decree No. 17 which became effective in 1990. The Factories Act of 1990 (Article 47 and 48) contains regulations governing the provisions of Personal Protective Equipment (PPE) for workers. Idoro (2021) concluded that neither the Factories act of 1990 nor the PPE (EC directive) 1992, sufficiently capture the construction sites and their operations, which indicated that construction works in Nigeria is unregulated in terms of occupational health and safety.

Overview of Occupational Health and Safety Act Regulations in Nigeria

The activities in the construction industry due to its poor health and safety performance record are the subject of various legislative and institutional frameworks the country of which the primary objective is the prevention of accidents and their consequences in terms of injury, disablement, fatality and ill health within the work environment. The cidb report notes that Nigeria

is not lacking in terms of health and safety legislation and that Nigeria's legislative framework addresses health and safety at three levels firstly in terms of the national constitution, then in terms of Acts such as the Occupational Health and Safety Act No. 85 of 1993 (OH&S Act), and the complementary Compensation for Occupational Injuries and Diseases Act No 130 of 1993 (COID Act). These are followed by a range of regulations promulgated under OHSA, in particular the Construction Regulations promulgated in July 2003.

The OHSA No. 85 of 1993 of Nigeria stipulates the steps to be taken in order to ensure a safe and healthy work environment for all employees on a construction site (Hermanus, 2001) and contractors are obliged to comply with the requirements of the Act. However, Windapo (2011), Bettsworth (2011), MBAWC (2021) and cidb (2009) noted that building contractors in Nigeria do not comply fully with H & S regulations, and that even though H&S issues have seen some improvement over the years, the numbers of people that get injured or die on construction sites in South Africa is still high.

Enforcement of Health and Safety Regulations

The enforcement of any type of regulation is basically crucial for ensuring the efficacy of such regulation. Idubur and Osiamoje (2013) stated that "regulation devoid of enforcement is tantamount to no law". This by implication means that lack of proper enforcement of health and safety regulations often permits non-compliance which consequently contributes to poor state of occupational health and safety

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(Umeakafor, 2014). The Federal ministry of Labour and Productivity (Inspectorate Division) is responsible for the enforcement of these regulations whose main focus is the protection of health and welfare of people in the workplace and people that may be adversely affected by the activities of the workplace. The enforcement of occupational safety and Health in Nigeria has not been effective over the years, which could be attributed to lack of proper funding and lack of basic resources and training (Dodo, 2014), lack of safety culture, lack of implementation culture (Umeakafor, 2014), culture dimensions (Okolie and Okoye, 2012) and lack of training (Adenuga, 2013). The benefits of enforcement of occupational health and safety regulations are evident in countries with remarkable health and safety records like the UK, USA and Germany. Even though there is no reliable data to establish the level of compliance and enforcement of health and safety regulations in Nigeria, anecdotal evidences have indicated that enforcement and compliance to regulations is not a typical activity which is considered as a contributor for the low performance of the Nigerian construction industry.

Level of Implementation of Safety Risk in Nigeria Construction Industries

Weil (2021) notes that the health and safety standards cited most frequently diverge from the major sources of fatalities and injuries on construction projects and that it is not known if the standards frequently complied with are linked with underlying physical hazards, and are in turn associated with injuries and illnesses. The number and severity of health and safety

standard violations cited during an inspection provide one measure of the degree to which a contractor's operations comply with OSHA standards.

The level to which contractors' operations comply with OHSA regulatory requirements on construction sites in the Western Cape Region of South Africa were determined by the Master Builders Association Western Cape (MBAWC) for Year 2007, 2008, 2009 and 2010 for annual Safety Competitions using an audit system which was designed by the association for grading the H&S regulation compliance of construction projects. The Master Builder South Africa Audit Tool (MBSAT) used in the H&S assessment is classified into 19 different elements and the associated points achievable, each element targeting different requirements of OHSA. While scaffolding, formwork and support accounts for 366 or 19.9%, administrative and legal; cranes; personal, protective equipment and clothing account for 316 or 17.2%, 166 or 9% and 102 or 5.5% respectively of the H&S requirement total points of an achievable 1840.

The H&S audit undertaken by MBAWC between 2007 and 2010 when averaged and distributed by compliance to the 19 H&S requirements revealed that the contractors attained acceptable standards in three elements – cranes, demolition, and transport and material handling; unacceptable standards in eleven elements; and very poor standards in five elements - site plant and machinery workplace environment, health and hygiene, personal protective health and clothing, plant and storage yards, and excavation (Warwick 2021). While

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compliance to statutory regulations should mandatorily be set at 100%, the level of contractor compliance was rated by MBSAT based on the view that scores above 95% are seen as acceptable standards, scores between 90 and 95% can be rated as unacceptable standards which require attention in the short term and below 90% is rated as very poor standard which require immediate attention (Bester, 2022).

Health and Safety Management

A proactive safety management system has the core attributes of systematic identification of hazards, assessment and control of risks, evaluation and effective implementation of risk control measures (Bluff, 2003). The integration of health and safety measures in to the total quality management system within the construction sector could significantly contribute to cost efficiency, quality assurance, environmental sustainability and better employer-employee relationship (Okolie and Okoye, 2012). The adoption of health and safety management system demonstrates in practical terms the readiness of any organization to bring to minimum the frequency and severity of accidents, ill health and damage to property (Diugwu et al., 2012). Health and safety management system therefore highlights and emboldens the awareness of responsibilities and aspects of occupational safety and health as well as the impact of health and safety standards on the performance of organizations. Diugwu et al. (2012) is of the view that the potency of health and safety management system depends on the existence of functional health and safety laws

which guarantees the health, safety and welfare of workers and visitors.

Digwu et al., (2012) further observed that there is a serious gap in health and safety management in Nigeria due largely to dysfunctional laws causing apparent lack of regulations which conforms with the assertion of Idoro (2011) that the country is lacking requisite statutory occupational health and safety laws, reiterating that even those in force are skeletal in nature and nonfunctional. Olutuase (2014) also concluded that the existing safety management system is poorly organized and characterized by ineffective and poor documentation. This is further demonstrated by the frequency of number of accidents being recorded by construction companies (Olutuase 2014).

Common Accidents on Construction Sites

Accidents according to Aniekwu (2017) are unplanned and unexpected events, which result from mistake somewhere, somehow and by somebody. The causes of accidents on construction sites are a subject of many studies across the world (Ezenwa, 2021). Laryea and Mensah (2010) categorized construction related accidents causing factors as those at the Macro level consisting of factors such as lack of enforcement, lack of accident data; Mezzo; consisting of factors including inappropriate procurement and supply chain arrangements and Micro level factors such as inadequate competent supervisors, lack of training of personnel among others. Aniekwu (2017) identified major accident causing factors as use of faulty tools and equipment, non-compliance with standards, improper scaffolding, and lack of

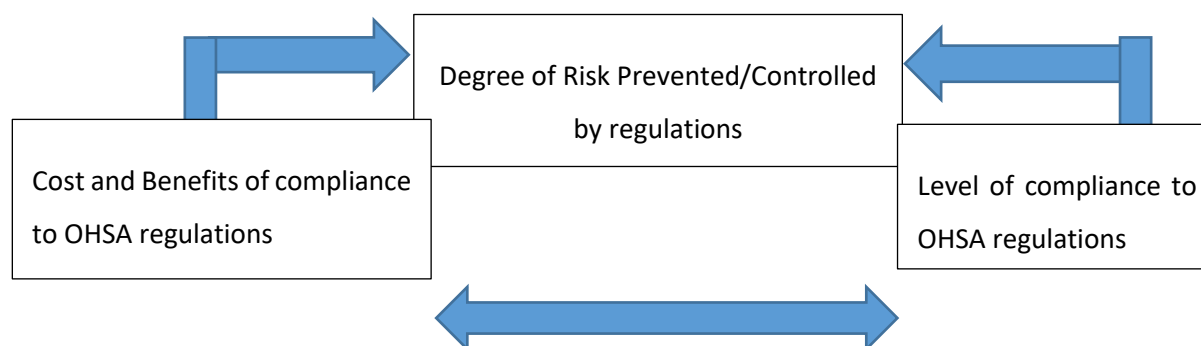
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experience and improper storage of dangerous and flammable substances.

The eccentric problems causing accidents on construction sites in Nigeria are improper keeping of records, non-reporting of accidents by employees, unsafe practices by contractors and lack of safety management as a whole on the side of the clients (Okolie, 2014).

Theoretical Framework

The research framework for this study is shown in Figure 1. Before these correlates are determined and discussed, the paper will first of all review the concept of OHSa regulations, the measurement of construction risks, the level of compliance, and costs and benefits of compliance to OHSa regulations.



Framework of Risk regulations in construction site

Research Design

This study is a qualitative research which adopts exploratory research design to achieve its objectives. However, exploratory research design is preferred in this study as the study interest is on revealing existing condition which are not obviously known.

Population and Sampling Technique

The target population for this study are the Architects and builders. The both construction team members have direct role on designing and actual construction of compound landscaping respectively, and as such, their views is accurate in making conclusive statement. However, the population size for the architects and builders in Enugu and Ebonyi state as obtained from the record of registered architects and builders in the

selected states is 80 and 40 respectively, giving a total of 120.

Sample Size Determination

To get the sample size of the study, the researcher used Taro Yamane's principles of arriving at a sample size which is given as

$$n = \frac{N}{1 + N(e)^2}$$

Where: n= Desired sample size

N= the entire population

e= level of significance or limit of tolerable error assumed to be 5% or 0.05

I= unit, constant figure

Sample for Architect

$$N = \frac{N}{1 + N(e)^2}$$

$$n = \frac{80}{1 + 80(0.05)^2}$$

$$n = \frac{80}{1+80(0.0025)}$$

$$n = 67$$

Sample for Builders

$$N = \frac{N}{1+N(e)^2}$$

$$n = \frac{40}{1+40(0.05)^2}$$

$$n = \frac{40}{1+40(0.0025)}$$

$$n = 36$$

Total sample size = 103

Analyses of the base data

S/N	CATEGORIES OF RESPONDENTS	NUMBER OF QUESTIONNAIRES DISTRIBUTED	NUMBER OF QUESTIONNAIRES RETURNED	NUMBER OF QUESTIONNAIRES NOT RETURNED	PERCENTAGE OF RETURNED QUESTIONNAIRES	PERCENTAGE OF QUESTIONNAIRES NOT RETURNED
1.	Architect	67	60	7	89.55%	10.45%
2.	Builders	36	32	4	88.88%	11.12%
	TOTAL	103	92	11		

Assessing the risk regulations in Nigeria construction industries?

Analysis on the First Objectives

S/N		W	SA-----SD 4 3 2 1				ΣFX	\bar{X}	DECISION
1	Provisions of first aid equipment to workers	F WF	43 172	26 78	13 26	10 10	92 286	3.10	ACCEPT
2	Personal protective equipment (PPE).	F WF	45 180	24 72	15 30	8 8	92 290	3.15	ACCEPT

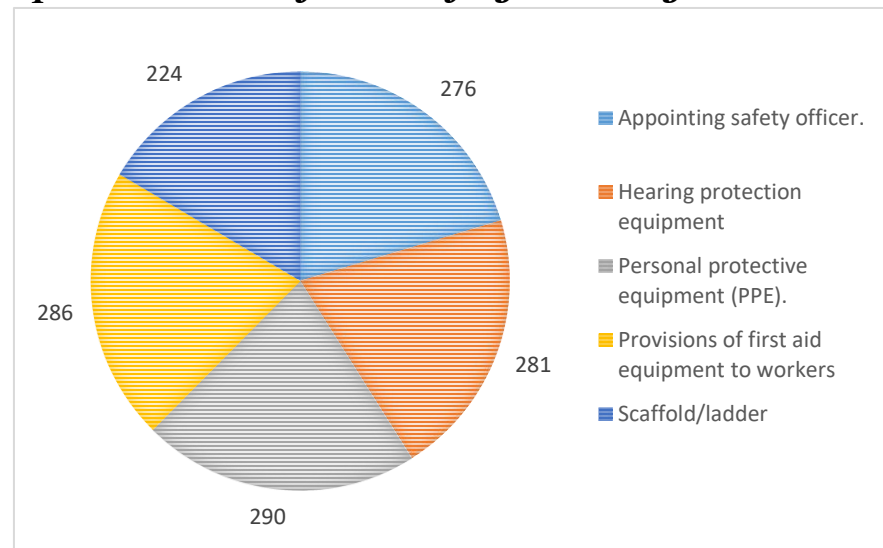
3	Appointing safety officer.	F	38	30	10	14	92		ACCEPT
		WF	152	90	20	14	276	3	
4	Scaffold/ladder	F	18	20	27	38	92		REJECT
		WF	72	60	54	38	224	2.43	
5	Hearing protection equipment	F	39	28	16	9	72		
		WF	156	84	32	9	281	3.05	
	Grand mean							2.95	ACCEPT

Source: field survey computation

Table 1. Five questionnaire items were used to answer research question one, all the questionnaire items tested have value above the criterion mean of 2.5 except research question 4 which has a mean rate of 2.43. The grand mean total is 2.95 which implies that the identified items are the risk regulations in Nigeria.

ANALYSES OF THE SECOND OBJECTIVES

Examine the level of implementation of the safety risk regulations in Nigeria



construction industries?

Source: field survey computation

From the result of the pie chart distribution, personal protective equipment have the highest frequency and mean index of 290 and 3.15 respectively. Strictly followed by provision of first aid equipment to workers with a frequency and mean index of 286 and 3.10 respectively. This is also followed by hearing protection equipment with a frequency and mean index of 281 and 3.05. This is also followed by appointing safety officer with a mean frequency and mean index of 276 and 3 respectively. Finally, scaffold/ladder has the lowest implementation with a mean index and frequency of 2.43 and 224 respectively.

Conclusion

Based on the findings of the study, the researcher concludes that there is a significant assessment of risk regulation in Nigeria construction industry as there are provision of first aid equipment to workers, personal protective equipment are made available, there is appointment of safety officer and there is provision of scaffold and ladder. More so, the study concludes that the level of implementation of the safety risk regulations in Nigeria is significant as the percentage value is above 50% average level.

Recommendations

From the findings of the study, the following recommendations are giving

1. There is need for government and relevant stakeholders in the construction industry to make provision for safety equipment as breakdown of the labour can lead to stoppage of work in construction site.

2. There is need for site managers to ensure that there is full implementation of safety risk regulations in construction sites in Nigeria; this will enhance the continuous work in the site.

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