Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

IMPROVING HEALTH AND SAFETY MANAGEMENT PRACTICE OF BUILDING CONSTRUCTION PROJECTS IN EBONYI STATE

Agha Kalu Agwu[1], Mbamali Ikem[2], Okolie K. C[3]

[1]Departmet of Buiding Nnamdi AZikiwe University Awka Anambra State

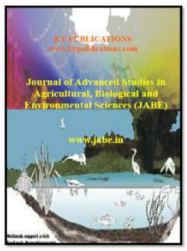
aghakalu@yahoo.com

[2]Departmet of Buiding Ahamadu Bello University Zaria

mbamalikem@yahoo.com

[3]Departmet of Buiding Nnamdi AZikiwe University Awka Anambra State

kc.okolie@unizik.edu.ng



ABSTRACT

The construction industry is an important part of the economy of any nation and is often seen as a driver of the economic growth especially in developing countries like ours. Owing to its relatively intensive nature, construction works provide opportunities for employment for a wide range of people like skilled workers, semi-skilled and unskilled. Despite its importance, construction industry is considered risky with frequent and high accident rate and ill-health problems to workers, practitioners and end users. In Ebonyi State there has been lack of managerial capacity at all levels of the health system which is increasingly cited as a binding constraint to scaling up health service delivery. Other constraints includes lack of health and safety skill, lack of funds and safety equipment by the building constructions companies in the State, inability to generate and use information, inadequate public health and safety information management. The study aim to improve health and safety management of building construction projects in Ebonyi State, with a view to identify key factors for accessing health and safety practices in the construction industry. To achieve this, hypothesis were formulated and a survey research design was employed for the study which the population cut across major actors in the construction industries ie the clients, construction professionals, registered contractors, artisans and non artisans, top senior management of construction companies and casual workers in the site. The population include those in private project sites and public project sites estimated for all the listed category of workers. Sample sizes of 200 workers were used for the study. Mean, sample variance, rank and z-test statistical method were used for data analysis, to answer the research questions and to test the hypothesis. The findings of the study show that to assemble and harmonise health and safety management criteria for building construction projects were recorganised and significantly affect the mean rating for the success of building projects. To access the health and safety management practices engaged in building construction are recorganised and there is significant benefit on the mean rating for building construction project. The study conclude that improving health and safety management practices is a fundamental component of any construction business principle and corporate culture and that effective management of health and safety affairs not only protects staff, workers but also contributes to continued success in the construction industry. It was therefore recommended that building construction companies should provide

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

adequate safety training to key employees in the process of risk and hazard identification during construction including health and safety management practices in design, also carry out thorough supervision in order to improve their safety awareness. The health and safety welfare regulation should be prioritised with full comply to its provision by the employer.

Key Words: Construction, Health, Safety, Management, Projects

Introduction

A building construction site is extremely hazardous workplace where most frequently non-fatal vocational injuries occur due to its unique nature. Several accidents occurred in the factories resulting in injuries, maiming, incapacitation and death. People also suffer illness from exposures to toxic fumes and gases. The accidents and illness occurred because workers are exposed to contact with dangerous moving parts of the machines that had no guard on them and the construction sites/factories are poorly littered and inadequately ventilated. In addition, the workers are not properly trained on the use of machines. Meanwhile employers are happy with the returns that resulted from increased production at lower cost, caring little about the suffering of the workers.

Safety in building construction therefore entails protection from any risk or danger when a building project is under construction or completed. To achieve this noble objective on the construction industry, health and safety is a collective co-operation of all persons involved in the construction industry ranging from contractor, operatives, supervisors and even the general public. As emphasized by Agha K.A and Agara O. (2013) that the best and most effective way to do any job is through safe way.

Building industry in Nigeria mostly in Ebonyi State needs special attention as far as health and safety is concerned, this is because the industry creates employment to different artisans e.g Trade Tested Artisans, Non trade tested Artisans and labourers who may be desperate tradesmen, and most building contracts in the rural areas of the state both private and government contracts always fall into their hands since there are loyalist to the politicians and has taken over construction jobs in Nigeria neglecting the contributions of the professionals in the industry. About 60% of our contractors who handle jobs below five million naira, (#5,000,000.00) are not professional. The other 40% of the contract involves professionals in building contract. Since the former weld a lot of influence and have more to throw around, they are better favored always than the professional group in the award of contract. This has made health and safety in the building construction industry which should have been a vital concern, to attract little or no attention over the years. The apparent neglect might be construed as meaning evident and infrequent and negligible on construction sites, but this is not so, as many accident are observed daily on sites.

The complexity of construction operations also makes execution of construction contracts to require the use of a combination of disparate professionals, heavy machines, equipments, tools in order to bring together different types of materials and components which are different in size, forms and shapes as well as physical and chemical nature.

The activities of the various individuals in the construction industry often resulted into a situation that can pose treat to the safety and health of one another just as the production processes often lead to operational and structural hazards (Ezeji 1984).

According to Bamidele (2006) the activities of the construction industry create some devastating effect on the environment. These activities create hazards, which sometimes resulted into loss of resources, in terms of men, machines, materials, time and money. Ezeji (1984), Follow *et al*, (2002), Babajide (2004) and

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

Idoro (2004) all agreed that although safety is of vital concern, but the Nigerian construction firm gives little or no attention to it.

Construction Industry Training Board (CITB) (1990) proclaimed that workers health, safety and welfare at work are protected by law. Employers have a duty to protect its workers and to keep them informed about health and safety standards. Workers have the responsibility to look after themselves and others. Anderson (1992) states that proactive safety performance is assured by providing the following: plant and equipment which fit the purpose of reducing risks from identified hazards as far as it is reasonably practicable; system and procedure to operate and maintain equipment in a satisfactory manner and to manage all associated activities; people who are competent, through knowledge, skills and attitude, operate the plant and equipment and to implement the system and procedure. The overall construction industry is still looking at positive way to change to a safer working environment as stated by Hinzer (1996). Kunju (2000) states that safety should look beyond accidents and more towards human behaviors and culture.

Too many operatives have been killed or maimed on construction site due to neglect of vital health and safety procedures. Recognizing the assessment of adequate health and safety management at construction worksites, the European union enacted the "control of hazard on temporary and mobile construction sites; directives that requires members states to adopt national, laws to formalize a process to ensure that construction site safety is considered during the construction process (Yakubu and Iyagba, 2011). According to Eurostat (2008), the problem of the assessment of health and safety is not that the hazards and risks on construction site are unknown, it is that they are very difficult to control in a constantly changing work environment. In Nigeria, Ebonyi State precisely, Health and safety has not been given the required attention to reduce or prevent hazards and accidents on construction sites, thereby posing serious threats to workers and even non-workers, creating the need for a quick solution for the issue to be addressed.

Oresegun (2009) opined that the attempt to determine the impact of health and safety on construction and its correlation with project performance, labour performance, labour motivation and safety plan is as a result of non-compliance of the Nigerian construction companies with health, safety and environmental (HSE) regulation. He further asserted that there is no reliable data on accident cases in construction in Ebonyi State because constructors neither report accident appropriately nor keep proper record on accidents.

In the developed countries like the Great Britain, about six hundred and fifty (650) people are killed by industrial and construction accidents due to lack of health and safety measures Onyejiji (2011). The figure would be higher in Nigerian situation because of our carefree attitude, negligence and indifference. Many Nigerians has been frustrated in their previous work endeavors or engagements and such people find their way into the building industry as last hope without the knowledge of health and safety. Attendant loss due to accident occurrence on site could be enormous as this may result loss of life, money, time and company reputations. Therefore safety of workers on construction project sites must be of paramount importance to any construction company that wants to continue to operate.

According to Onyejiji (2011), health and safety programmes were first introduced in Nigeria during the time the country was a British colony. According to him these program ensure that occupational health of 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 1957. Other relevant acts to occupational health and safety in Nigerian are labour Acts 1990 and workmen's compensation Act, 2004 of the laws of the Federation of Nigerian Similarly, Adeogun and Okafor (2003), noted that these acts are not being enforced in Nigeria as evidenced from the reports of unhealthy exposure to risks of workers and employees of various organization.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

llo (2001), observed that the health and safety on site are key areas to be addressed by the construction industry in order to reduce the risk of accidents on site. Accident on site raises condemnation of the industry by public, creating loss of confidence in the construction professionals as well as the loss of positive image of the industry. The concern generated by the loss resulting from the neglect of safety and health in the construction industry necessitated the curiosity of the researcher to delve into this topic with a view to proffer a minimal solution by ensuring a safer construction in Ebonyi State. To this end the need to assess health and safety management of building construction in Nigeria becomes very paramount so as to bring to fore the need to take on the situation proactively.

Statement of the Problem

In Nigeria, there are numerous barriers and challenges to the improving of health and safety service delivery. At the construction site, our community and household level, factors such as socioeconomic, workers behavior, access, use of care and absence of social pressures to improve access to safety equipments, are all determinants of the availability and quality of health and safety management in the building construction industry. In Ebonyi State they have been lack of managerial capacity at all levels of the health system which is increasingly cited as a binding constraint to scaling up health service delivery. Other constraints includes lack of health and safety skill, lack of funds and safety equipment by the building constructions companies in the State, inability to generate and use information, inadequate public health and safety information managements.

Among the many challenges facing improving health and safety management in the building construction projects in the State, there is also acute shortage of competent health and safety providers. This is as a result of inadequate infrastructure and poor compensation to the site health and safety personnel's. Some of the factors are insufficient resourced and neglected health and safety systems, poor human resources planning and management practices and structures, also unsatisfactory working conditions.

Leadership and governance of health and safety management also called stewardship that has been described as the most complex but critical building blocks of any health and safety management in the construction industry. Leadership and governance are associated with the role of the government in health and safety monitoring in the building construction industry and its relation to other actors like the construction professionals whose activities impact on health and this involves overseeing and guiding the whole health and safety management systems, private (construction sites) as well as the public and uses of the building, in order to protect the public interest.

Bamidele (2005) also observed that the construction industry in general have image problem among which social security and safety of workers were identified. Therefore, there is a considerable need to have an effective health and safety assessment procedure to improve the construction project performance.

These concerns necessitated an urgent investigation into the way and manner in which health and safety management should be assessed in building construction projects in Ebonyi State.

Aim and Objectives of the study

The aim of the study is to improve health and safety management of building construction projects in Ebonyi State, with a view to developing effective and efficient health and safety management practices in the state.

The objectives are to:

1. Assemble and harmonize the health and safety management assessment criteria for building construction projects.
2. Assess the health and safety management practices in building construction projects in Ebonyi State.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

Research Hypotheses

The following hypothesis were raised to check the level of significance of assessment of health and safety management

1. Criteria for assessment of health and safety management in building construction projects do not significantly affect the mean rating for the success of building project delivery.
2. There is no significant benefit on the mean rating for Health and Safety management practices engaged in building construction projects

REVIEW OF RELATED LITERATURE

Criteria for Health and Safety Management Assessment on Building Construction Project

The following criteria for assembling and harmonizing health and safety management in building construction projects were identified from the literature

Basis for Health and Safety in Building Construction Industry

The idea of safety dated back to the Stone Age as early man, in an attempt to protect themselves from attack by animals, reptile, weathers etc. made tents and various forms of shelters for themselves. Modern needs arise as result of improvement in technology resulting in changes and development of the old 'shelters' to modern buildings.

Orekoya (2003) stated that, the industrial revolution produces changes in the method of producing goods and these changes necessitated a greater focusing of attention on the safety of workers. The new methods used for converting raw materials introduced new risks of injuries and diseases. Also specialization by increasing the likelihood of boredom and in attentiveness also made the workplace a dangerous environment.

Public outcry over the years gave way to government attention on safety. The people of Manchester, England demands and, through public pressures forced government to pass a bill on the health and moral of Apprentices Act of 1802 (Oderinde 2003). Trade Unions were not left out in the struggle Chike (1999) asserted that Trade Unionism as a collective representation to protect and advance the interests of the workers as producer within the economic system, has long history of struggle which has not been limited to "bread and butter" alone but included the struggle for independence and social justice. Elegan (1979) also expressed the need for Nigeria Trade Union not to only call for increased salaries and wages, but to bargain for better welfare facilitates, etc, all of which will improve the quality of fife and thus enhance productivity of each workers.

According to International Labour Organization ILO (2004) in other countries Trade Unions are focusing attention on scanning positive improvements for all in the industry for example in Canada there has been joint initiatives with employees of various provinces to raise the level of safety, quality in the construction sector to world class.

Health Issues in Nigeria Constructor Industry

Health and productivity of workers are two issues that cannot be divorced; from one another. Egan (1998) declared that if the industry is to achieve its full potentials, it must provide decent and safe-working conditions and improve management and supervisory skills at all levels. Nigeria construction sites mostly construction sites in Ebonyi State lack essential provisions that gives workers a good health protections such things according to Bassey (1995) include decent sanitary facilities, canteens, drinking water, sleeping place and medical facilities. Also highlighted are health and safety challenges of poor project design, poor funding of project, compromise on building standards quackery and infiltration of non professionals, government policies, corruptions and use of low quality materials in building and infrastructural development. It reorganizes the health with regards to the untapped resources, thriving economy and large population with need to be sheltered as one of the health and safety measures. It was observed that health and safety management has been neglected in building and infrastructural projects in Nigeria; these have an effect on the performance and growth of the industry.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

Construction Safety in Nigerian

Latham (1998) argues that construction client reserves the absolute mandate to be put at the core of the construction process. Hatush and Skitmore (1997a) claim that all construction clients desire the maximum value for their project at the cheapest possible cost within the shortest possible time. Per se, the disposition of construction clients to the flow of resources has a lot to do with the quality and value of safety in any construction product development process, especially in recessionary economy where desires are delimited by insufficient resources.

However, the construction structure and the quality performance of materials and tools used for construction works are also very important. Obviously, achieving optimal safety performance of any construction project is a function of the vulnerability of constituent materials 'critical safety factor. Recommended standards and their standard descriptions are often prescribed in contract literatures (where applicable). However apart from the fact those manufacturers' qualities are always at variants with recommended standards, in some cases, the performance of material 'standards 'can be peculiar (thus restricted) to where they are recommended standards, in some cases, the performance of material 'standards' can be peculiar (thus restricted) to where they are recommended. To date, the Nigerian land construction industry (and indeed the most countries in Africa) has no coherent package of standard document to guide her material specification and standards. British and Australian standard are always referred.

Apart from substandard materials as principal causes of construction failure and most clients' poor economic capability to afford best quality materials as well as established standard triangulation for reference, most materials in use also pose conspicuous health hazards. An understudy of confirmed effects of some of the major primary construction materials reveals that almost all primary construction materials like cement, water, glass, metals, timbers paints, aggregate, asphalt, asbestos etc pose very severe health hazards during site applications than during manufacturing. For instance, silica, cement, timber, quarry and asbestos dusts are known to cause lung function impairment, chronic obstructive lung disease, restrictive lung disease, pneumoconiosis, serious bacteria infections, skin cancer and carcinoma of the lung, stomach and colon. Commonly, construction dusts have severe damaging effects when they enter system circulation, and dangers to heart, liver, spleen, bone, muscles, hairs, as their microstructure and physiological performance are being affected.

Regrettably, construction workers are commonly exposed to various hazardous substances, physical agents, ergonomic factors and severe environmental hazards through hazardous conditions and materials like asbestos, lead, silica dust, organic solvents, sewer gases, welding fumes, radiation, noise and vibration. Many workers are also exposed to acute injury, chronic illness, permanent disability or even death through immediate effects of direct exposures.

On the other hand, fatigue, loss of concentration at work, poor health condition, site condition, constantly changing environment and distraction by other activities on site also increases the risk of accidents. In other words, apart from the fact that Nigerian construction workers seldom receiving modern technological training imperative to modern dynamic requirements of their job and the impact of the recessionary economy of the state of tools being used, workers psyche are constantly being demonstrated because of low payment, poor working conditions and social perceptions. In Nigeria, construction workers are mostly seen as indigent workers who are rarely respected for their skills in terms of remuneration. Thus, the discrepant flow of workforce in the industry is frightening. While many deaths are recorded through bad condition on sites, operational accidents, accumulated diseases etc, and the industry's human capital also reduce tremendously through loss of interest of workers as many pick up other (better) jobs in vital industries of less risks and better appreciation.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

The labour attrition phenomenal in Nigerian construction industry is both abhorrent and not regenerating. Thus, though with incessant increase in construction cost principally propelled by rise in the costs of construction materials (material and results are cocooned priorities to clients), not labour achieving cost performance and maximizing the true value for money. Therefore, this cultural misalignment in people issue explicates one of the basic fundamentals of disputes and feasibility obstacles in construction.

Definition of Health and Safety in the Construction Industry

Health is the general condition of a person in mind, body and spirit, usually meaning to be free from illness, injury or pain. The World Health Organization (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 2006). In this study health means being free from illness, injury or pain which can be caused by construction activities. It is the level of functional metabolic efficiency of a living being. In addition to health care interventions and a person's surrounding, a number of other factors are known to influence the health status of the individuals including their background, lifestyle, economic and social conditions, these are referred to as 'determinants of health'. The main determinants of health include the social and economic environment and the person's individual characteristics and behaviours.

Safety is related to external threats, and the perception of being sheltered from threats.

According to the business Dictionary, safety is defined as a relative freedom from danger, risk, or threat of harm, injury, or loss of personnel and/or property, whether caused deliberately or by accident. Safety can also be defined as the control of recognized hazards to achieve an acceptable level of risk. In this study, safety means freedom from danger, harm, and injury to the person involved in construction activities. Hornby (2000) define safety as the state of being protected from danger or harm. According to Obande (1990) the word safety is a term used when planned measures are being taken to control situations and acts in an attempt to prevent injury to the person concerned, injury to others and damage to the workshop, its equipments and materials.

Safety precautions or measures start first with somebody initiates an action because that action, if adequate measures or control are not taken can cause accident leading to injury to himself, other person or thing around him.

Assessment of Health and Safety Management Practice in Building Construction

On the assessment of health and safety management practice and successful functioning of the process, there is need for regular check and control. The under listed subtitles were discussed

Evaluation of Health and Safety Management in Construction

The training content of human capital packaging and the psychological disposition of construction workers have a lot to determine in evaluating the quality of the industry's understanding of health and safety risk. Regrettably, the Nigerian construction industry is at verge of circumstantial criticism of the technical content of her professionals, ditto the training facilities in diverse places where manpower development is scheduled. This is largely blamed on the poor state of the economy, whereas systemic overview may mean lack of commitment and political will as well as the true spirit of collaboration with the outside world to entrench the facilitation of flow of value and knowledge from better parts of the world.

Although prequalification has gained tremendous support and popularity in contract procurement in Nigeria, regrettably health and safety factors of contractor performance are not popularly prioritized (Olatunji and Aje, 2005c; Olatunji, 2006d). However, since Nigeria, contractors are predominant risk bearers, assessing health and safety management disposition of the industry is largely a function of contractors firm. To measure this, major variables include; Experience Modification Rating (EMR), Occupational Safety and Health Administration (OSHA) produces and the general assessment of contractor Safety Attitudes and Practice.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

Experience Modification Rating (Emr)

The Experience Modification Rating (EMR) scheduled is an objective assessment of health and safety performance of contractors by independent rating bureaus. It was developed in America as an equitable means of determining premium for workers' compensation insurance. The methodology is such that record is made of the average workers' compensation losses expected to be paid by an employer in a designated period (mostly 3 years) over a given type of firm's work compared with other doing similar. When the coefficient of losses incurred by the

Construction Health and Safety Regulation and Implementation

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 and 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 and Olalusi, 2004; Idoro, 2007; Ede, 2010; Oloyede, Omoogum and Akinjare, 2010; Okolie and 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.

Health and Safety Management Regulation and Implementation

The management of health and safety is unequivocally one of the most important functions of construction management. Construction work is intrinsically hazardous. Injuries to person on and around construction site occur regularly. It is perhaps fortuitous that many injuries are minor, but others are serious

Research Article
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

and some are fatal. The construction industry has over the last 20years suffered a poor health and safety records. While the number of fatalities has shown a welcome decline in the 1990s, this should not encourage complicacy. Construction management has a perpetual and answering challenge to ensure a safe working environment.

The construction (Design and Management) Regulations 1994 introduced welcome and much-needed legislation to construction health and safety. The CDM Regulations are concerned with the management of health and safety throughout the whole construction process. Responsibility is clearly and specifically placed upon clients, designers and contractors to be proactive in the planning, coordination and management of health and safety. The Regulation focus on identifying the potential of hazards on health and dangers to safety through each stage of the construction process, together with the assessment of their risk. The CDM Regulation requires a two stage approach to health and safety planning and management. The first stage focuses on the project evaluation and development processes with the object of producing a pre-tender health and safety plan. The second stage focuses on the production site processes with the object of producing a construction health and safety plan. It is the essential element of planning within each stage which forms the basis for a systems management approach, within which risk assessment is the central theme.

Effective health and safety management system and working procedures are the goal of the main parties to the construction projects. The lead consultant, representing the client and working with sub consultants is charged with delivering a pre-tender health and safety plan and implementing management procedures that make a full contribution to project health and safety. The principal contractor is charged with delivering a construction health and safety plan. Moreover, the contractor must establish management systems and working procedures which ensure the maintenance of safe working conditions. Well formulated health and safety management system will identity, assess and control risk both within and across the professional boundaries of the parties. Feedback loops within the designer's and the contractor's approach will ensure that information is not only directed within the span of control of individual party but also contributes to the management processes within other systems. Within the context of the CDM Regulations a specific outcome from the management approach to health and safety is the delivery of a health and safety file- a complete profile of health and safety planning and management throughout the construction project. That systematic approach to health and safety management in construction is not in question. Government has reorganized and the industry accepted that the undesirable accident record of the construction must be improved. The CDM Regulations place clear and unambiguous responsibilities upon the main contracting parties to deliver health and safety management. It is suggested that the implementation of a clearly conceived, formally structured and well organized health and safety management is the most appropriate way for participants to ensure that they make a full contribution to providing a safe construction process. Health and safety management systems (H&SMS) development is following in much the same way as quality management and environmental management moving towards accredited certification schemes, an H&SMS should meet the requirements of BS8800, the UK's specification for health and safety management system development.

Research Methodology

One of the most technical areas of an investigation is the methodology. It is the detailed plan and strategy of how the study intends to find solution to the research questions. 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. The research was carried out in Ebonyi State. Ebonyi State consists of three zones and thirteen Local Government Areas. The major study area is Ebonyi South

Research Article
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

which has five Local Government Area, comprising of Afikpo South, Afikpo North, Ivo, Onicha and Ohaozara. A cross section of construction and contracting companies comprising of the different actor in the construction industry were drawn from every class and cadre of the organization of the study area.

The target population for this study is in four categories, who have been involved in building project that health and safety of workers are paramount. There are major actors in the construction industry i.e. clients, construction professionals, registered contractors with Federation of Construction Industry (2008), Artisans and Non Artisans and others. The other's comprised of top senior/management staff of some construction/contracting companies, Casual workers and other government agencies.

Furthermore, it is important to mention that the focus of this research is on selected corporate and public clients. Also, the construction professionals comprise of Architects, Quantity Surveyors, Engineers and Builders. Approximately 3 different residential project sites and 4 different commercial sites were visited in Ebonyi South Zone, which makes a total of 7 building project sites. The participants were residential and commercial workers and the total participants were 324 workers.

The sample was randomly selected and is targeted up to 200 respondents which are purely construction professionals and workers since the entire population cannot be studied. The researcher used a table of random numbers to determine which professional or workers to be chosen in the sample. Each random number in the table has six digits in groups of three since there are a total of 324 workers targeted and 324 is a three digit number as the researcher moved down the column, every individual in the population will be assigned a three digit number beginning 001, 002,003,.....324. Beginning at the fifth group of the first line (column), the researcher has: 014,235, 261, 279, 199,048, 218, 021, 164,174, 136 ...062. Some numbers were omitted because this numbers are greater than the total number of workers in the population. To obtain another subject, the researcher will move to the next column of the table. Any number that has already been included in the sample and repeats itself was not selected again, only numbers that fit the range and will not repeat a number that has already been selected for the sample will be chosen. Professional and workers who have been identified with the selected numbers were consulted and a well constructed survey was administered to this group.

Instrument and Method of Data Analysis (Results)

Mean and sample variances were employed to answer the research questions raised for the study and items with mean score of 2.50 and above were considered as Assembling and harmonizing the health and safety management assessment criteria for building construction projects. Assessment of the health and safety management practices in building construction projects in Ebonyi state. The z-test statistical tool for large independent samples (Best, 1983) at 0.05 (5%) level of significant was employed to test the hypothesis of the study.

In computation the following statistical symbols were used

$$M = \frac{\sum x_i}{n}$$

$$S^2 = \frac{\sum x^2 - (\Sigma x)^2}{n-1}$$

Where $\sum x_i$ is the total sum of the rates by the group response
n is the total no of response or sample size
$(\Sigma x)^2$= is the square of the rates by the group response

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

Table 1: Mean Response, Sample Variance and ranking of the recognition to assemble and harmonize health and safety management assessment criteria for building construction projects. (Residential Project Site and COMMERCIAL PROJECT SITE)

S/N	ITEMS	RESIDENTIAL PROJECT SITE						
	The following are among the recognition to assemble and harmonize health and safety management assessment criteria for building construction projects	**RESPONSE**				**TOTAL SCORE**	**$\overline{XI}$**	**S^2**
		4	3	**2**	**1**			
1	Does your organization/company provides a written procedure for health and safety investigation	(92) 368	(70) 210	(35) 70	(3) 3	651	3.26	0.64 0.80^2
2	Do you involve workers in the health and safety investigation	(65) 260	(78) 234	(50) 100	(7) 7	601	3.01	0.72 0.85^2
3	When last did you review your safety statement and your safety and health performance	(72) 288	(80) 240	(42) 84	(6) 6	618	3.09	0.67 0.81^2

Source: Field work 2016

NOTE: ACMR = Assessment Criteria Most Recognized

GROUP1= Residential Project Site

S/N	ITEM	COMMERCIAL PROJECT SITE							
	The following are among the recognition to assemble and harmonize health and safety management assessment criteria for building construction project	RESPONSE				TOTAL SCORE	**XI**	S^2	Decision
		4	3	2	1				
1	Does your organization/company provides a written procedure for health and safety investigation	(79) 316	(80) 240	(34) 68	(7) 7	631	3.16	(0.69) 0.83^2	AC MR
2	Does you involve workers in the health and safety investigation	(62) 248	(88) 264	(45) 90	(5) 5	607	3.04	(0.64) 0.80^2	
3	When last did you review your safety statement and your safety and health performance	(72) 288	(72) 222	(49) 98	(5) 5	613	3.07	(0.71) 0.84^2	

SOURCE: Field work 2016

NOTE: ACMR= Assessment Criteria Most Recognition

GROUP2= Commercial Project Site

Mean Score of the First Group (M_1) Residential Project Site

$Mi = \frac{1870}{600} = 3.12$ or $\frac{3.26 + 3.01 + 3.09}{3} = 9.36 = \frac{3.12}{3}$

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

Sample Variance of the First Group (S_1^2)

$S_1^2 = \frac{0.64 + 0.72 + 0.67}{3} = 0.68$

Mean Score of the Second Group (M_2) Commercial Project Site

$M_2 = \frac{1851}{600} = 3.09$ or $\frac{3.16 + 3.04 + 3.07}{3} = 9.27 = \frac{3.09}{3}$

Sample Variance of The Second Group (S_2^2)

$S_2^2 = \frac{0.69 + 0.64 + 0.71 = 0.68}{3}$

Hypothesis Testing For the Difference of Two Mean

H_0: $M_1 = M_2$ (Criteria for the assessment of health and Safety management in building construction project significantly affect the mean rating for the success of building project site)

H_1: $M_1 = M_2$ (Criteria for the assessment of health and Safety management in building construction project do not significantly affect the mean rating for the success of building project site)

$$Z = \frac{M_1 - M_2}{\sqrt{\left(\frac{S_1^2}{n_1}\right) + \left(\frac{S_2^2}{n_2}\right)}}$$

Where M1 = Mean rate for residential building project site

M_2 = Mean rate for commercial building project site

S_1^2 = Sample variance for residential building project site

S22 = Sample variance for commercial building project site

$n = n_1 = n_2$ = Sample size

$/Z_{cal}/ = 0.38$

$< = 0.05$

$</2 = 0.025$

$Z_{>2} = Z_{0.025} = 1.96$

Decision Rule: Reject HO if /Zcal/ > $Z_{</2}$ otherwise accept H0

Findings: From table 1 and the decision of hypothesis revealed that some organization/company provides a written procedure for health and safety investigation, involving workers in health and safety investigation and also help in the review of safety statement including health and safety performance. The findings also agree with the remark of Haslam *et al*. (2005), if injury is serious or has the potential for being serious, workplace health and safety should conduct an investigation at the work site and all employees are required to cooperate in the investigation.

Conclusion: Since Zcal = 0.38 < $Z_{0.05}$ = 1.96, we accept H0. Base on the available data there is sufficient evidence to believe that the criteria for assessment of health and safety management in building construction site significantly affect the mean rating of building project site.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

Table 2: Mean Response, Sample Variance and ranking of the recognition to assess health and safety management practices in building construction projects. (Residential Project Site and Commercial Project Site)

S/N	ITEMS	RESIDENTIAL PROJECT SITE						
	The following are among the recognition to assess health and safety management practices in building construction projects	RESPONSE				TOTAL SCORE	$\bar{XI}$	S^2
		4	3	2	1			
4	Use of health and safety risk assessment matrix.	(70) 280	(80) 240	(45) 90	(5) 5	615	3.08	0.67 0.82^2
5	What are your roles in ensuring that health and safety are managed in the construction site?	(60) 240	(98) 294	(32) 64	(10) 10	608	3.04	0.66 0.81^2
6	Does your organization/company keep a safety performance measurement and monitoring record on its health and safety practices?	(72) 288	(88) 264	(38) 76	(2) 2	630	3.15	0.58 0.76^2

Source: Field work 2016

NOTE: HSMP = Health and Safety management Most Recognized

Group1= Residential Project Site

S/N		COMMERCIAL PROJECT SITE							
	The following are among the recognition to assess health and safety management practices in building construction projects	RESPONSE				TOTAL SCORE	$\bar{XI}$	S^2	Decision
		4	3	2	1				
4	Use of health and safety risk assessment matrix.	(79) 288	(72) 216	(72) 100	(6) 6	610	3.05	(0.74) 0.86^2	
5	What are your roles in ensuring that health and safety are managed in the construction site?	(92) 368	(60) 180	(40) 80	(8) 8	638	3.18	(0.72) 0.85^2	
6	Do your organization keep a safety performance measurement and monitoring record on its health and safety practices	(100) 400	(70) 210	(25) 50	(5) 5	665	3.33	(0.62) 0.79^2	

SOURCE: Field work 2016

Note: HSMP=Health and Safety management Most Recognition

Group2=commercial building

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

Mean Score of the Second Group (M_2) Commercial Project Site

$M_2 = \frac{1913}{600} = 3.19$ or $\frac{3.05 + 3.18 + 3.33}{3} = 9.56 = \frac{3.19}{3}$

Sample Variance of the Second Group (S_2^2)

$S_2^2 = \frac{0.74 + 0.72 + 0.62}{3} = 0.69$

Hypothesis Testing For the Difference of Two Mean

H0: $M_1 = M_2$ (There is significant benefit on the mean rating for health and safety management practices engaged in building construction projects)

H_1: $M_1 = M_2$ (There is no significant benefit on the mean rating for health and safety management practices engaged in building construction projects)

$$Z = \frac{M_1 - M_2}{\sqrt{\left(\frac{S_1^2}{n_1}\right) + \left(\frac{S_2^2}{n_2}\right)}}$$

Where M1 = Mean rate for residential building project site

M_2 = Mean rate for commercial building project site

S_1^2 = Sample variance for residential building project site

S22 = Sample variance for commercial building project site

$n = n_1 = n_2$ = Sample size

/Zcal/ = 1.22

< = 0.05

</2 = 0.025

$Z_{>/2} = Z_{0.025} = 1.96$

Decision Rule: Reject **H_0** if /Zcal/ > $Z_{</2}$ otherwise accept **H_0**

Findings

From table 2 and decision of the hypothesis tested also shows that there is significant benefit on the health and safety practices engaged in building construction projects. Gould (2000) identifies substances abuse as unsafe action, which include alcoholic intake during work. The finding also agree with Adigo (2010) that man immediate role in his surrounding also help to manipulate for his existence and wrongful manipulation or role in ensuring that health and safety are managed in the construction site introduces hazards that make the environment unsafe.

Conclusion

Since /Zcal/ = 1.22 < Z0.05 = 1.96, we accept **H_0**. Base on the available data we conclude that there is significant benefit on the mean rating for Health and Safety management practices engaged in building construction projects)

Discussion of Results

From table 1, each mean score of the 3 items on both project sites are greater than 2.5 the cut-off point and the alternate hypotheses was accepted since the obtained Z score of 1.96 was greater than /Zcal/ value of 0.38 at df = 4-5% level of significance [Z(obt.) < Z (cal)]. This means that to assemble and harmonize health and safety management assessment criteria for building construction project are recognized and significantly affect the mean rating for the success of building project. The table also shows the ranking of observed frequencies on Residential project sites; item 1 has the highest frequency of 651 (34.8%) out of the total frequency of 1870, item 3 has the second highest frequency of 619 (33.1%), while item 2 attract the

Research Article
Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in
A Peer Reviewed & Refereed, International Open Access Journal
Vol.5.Issue.4.2018 (Oct-Dec) ISSN:2455-0221(P), 2394-2606(O)

lowest frequency of 601 (32.1). On the commercial project site, item 1 has the highest frequency of 631 (33.7%) followed by item 3 with frequency of 613(32.8%) and the least item 2 with frequency of 607(32.5%).

2. Each mean score of the items on both site are greater than the cut-off point 2.5 from table 2 and the alternate hypotheses H0 was accepted since the obtained Z score of 1.96 was greater than the /Zcal/ value of 1.22 at df = 4-5% level of significance [Z(obt.) < Z (cal)]. This means that to assess the health and safety management practices engaged in building construction are reorganized and there is significant benefit on the mean rating for building construction projects. The table also revealed the percentage differences on the frequency of ranking of both sites; Residential project site, item 6 ranked the highest frequency of 630(34%) of 1853, item 4 has the second ranked frequency of 615(33.2%) while item 5 has the least frequency of 608(32.8%). But of commercial project site, item 6 has the highest frequency 665(35.8%), followed by 5 of 638(34.4%) and least item 4 of 610(32, 9%)

Conclusion

The study has shown that improving Health and Safety management practice is a fundamental component of any construction business principles and corporate culture. The effective management of Health and Safety affairs not only protects staff, but also contributes to continued success in the construction industry. The study therefore places the highest priority on the health and safety of all employees, subcontractors and contractual partners, as well as the people and the environment that may be affected by the activity in the constructions. In the spirit of sustained improvement in Health and Safety performance, the researcher accent heavily in the implementation of the ongoing training of its workforce by some private contractors and public contractors.

The study also dedicates the resources necessary to promote increased Health and Safety management awareness, based on best practice standards, at all levels within the construction industry. The philosophy is to proactively remove and reduce potential hazards and therefore the risk. Residual hazards should be identified and mitigated through programs for incident prevention, assessment and analysis. Monitoring and control procedures including site inspections and audits, regular safety meetings, in addition to targeted educational campaigns, support the implementation of Health and Safety management policy and ensure compliance with set guidelines. Furthermore, essential programs including defensive driving courses for the construction site workers and supervisor training are key components in minimizing risk and promoting Health and Safety management targets.

Recommendations

Based on the findings and conclusion in this study, the following recommendations were made in order to improve health and safety management practice of building construction project to reduce the level of injury and maintain the good health of workers for better productivity on project site.

1. Building construction companies should provide adequate safety training to key employees in the process of risk and hazard identification during construction including health and safety management practice in design, also carryout thorough supervision in order to improve their safety awareness.
2. The health and safety welfare Regulation should be prioritise with full comply with its provision by the employers.
3. The construction site should be made friendly, exciting and conducive through active risk and hazard assessment by contractors and supervisors before work commence.
4. The construction Regulatory bodies such as CORBON, COREN, ARCON, QSRBN, NSE etc. Should be deeply involved in site inspection to reduce the spate of injuries on site and should also establish a standard design tool that will incorporate health and safety to serve as a guide to design professionals (Architects and Structural Engineers)

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

5. The professionals in the construction industry in collaboration with the Government Agencies should setup a task force and provide the necessary facilities that will enable them to move from construction site to the other in monitoring of any employer(s) that refuses to implement safety legislation, policies and procedures and employers should be made to understand that non-compliance will be punishable by law.
6. Having established health and safety objectives, it is essentially recommended that these objectives be maintained and improved where necessary. It is therefore important that safety performance is monitored and measured. This can be achieved through two basic system of monitoring (a) Active systems which monitors the achievement of plans and extent of compliance with standards. It provides the feedback for improvement. (b) Reactive system which monitors accidents, ill-health and safety. It provides feedback after the accident or ill-health occurs. It also analyse information suggesting failures in safety performance.

Contribution to knowledge

This study therefore will contribute to the sound management of occupational health and safety risks in the Nigerian construction management and risk management fields. Thus the findings will be informative for the actors on project construction management such as project supervisors, designers, project managers, construction managers, the procurement system, project investments, project insurances/actuarial perception, project economics, institutional and regulatory bodies concerning the practice of health and safety management.

It went further to focuses on the practice employed for health and safety, risk assessment, communication and control at construction sites in Ebonyi State.

Furthermore, improving the health and safety management of the construction projects has repeatedly been shown to save lives, time, and money, and to increase business goodwill and good reputations (Rwamamara, 2007; Kikwasi 2010). At the same time, the right to safe and healthy working conditions in construction industry has been a central issue in the global campaign where current health and safety laws and regulations have separate sections specifically for the construction industry (ILO 2005; ILO, 2007; CRB, 2010). Meanwhile, safer and healthier working conditions make an important contribution to poverty alleviation and sustainable development as construction is labour intensive, particularly in developing countries (Charles et al 2007).

REFERENCES

[1]. Agha, K. A and Agara, O. (2013) *An Assessment of Health and Safety Management of Building and Infrastructure projects for Innovative and Sustainable Economy:* 1st Annual Research Conference of The NIQS presented at Musa YarAdua centre Abuja 23rd-25th July 2013

[2]. Adeogun, B.K. and Okafor, C.C. (2013). Occupational Health, Safety and Environment (HSE) Trend in Nigeria: *Journal of Environmental Science, Management andEngineering Research:* Vol.2 (1), pp. 24-29, Jan-Feb. Available Online at http ://www.ijesmer.com assessed 23/3/2013.

[3]. Adigo, C (2010). Contractor employee HSE training manual: Nigerian Institute of Safety Professionals: Owerri Chidex.

[4]. Anderson, J.M (1992). *Managing Safety in Construction: Proceedings Of The Institute Of Civil Engineering* London: Construction Industry Training Board manual (1990). *Managing Health and Safety in Construction*: Principles and application to main contractor/sub-contractor projects. HMSO, London.

[5]. Ayedum, C.A., Durodola, O.D. and Akinjare, O.A. (2012). An Empirical Ascertainment of the Causes of Building Failure and Collapse in Nigeria: *Mediterranean Journal of Social Sciences:* Vol.3 (1), January, pp.313-322.

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

[6]. Ayininola, G.M. and Olalusi, O.O. (2004) Assessment of Building Failure in Nigeria: Lagos and Ibadan Case Study: *African Journal of Science and Technology (AJST), Science and Engineering Series:* Vol.5, No.1, pp.73-78.

[7]. Babajide, A.B. (2004). Evaluation of safety Performance of Multinational and Indigenous Construction Firm in Lagos State: Published Msc. Thesis Building Department, University of Lagos Nigeria

[8]. Bamidele, E.O. (2005). Project Quality Management in the Nigerian Construction Industry

[9]. Bamidele, E.O. & Obiegbu M.E.(2006). Sustainable developments and Agenda 21 The Role of the Construction Subsector: A seminar paper presented at the 1st National Conference of the Academic staff union of Polytechnic Ilaro Chapter, Ogun State

[10]. Bassey Nnimmo (19995) The Management of construction. (1st Edition). Nigerian Kraft Books Ltd.

[11]. Builders Document 2, Project Health and Safety Plan Template, by CORBON.

[12]. Chike Nwaocha (1979) Workers Participation Trade Union Activities in Nigeria A paper presented at a National Seminar on Individual Relations at Hotel Presidential Enugu 4th -7th December, 1979.

[13]. Ede, A.N. (2010). Building Collapse in Nigeria: The Trend of Causalities in the Last Decade (2000-2010). *International Journal of Civil and Environmental Engineering IJCEE* Vol.10, No.06.

[14]. Egan J. (1998). Rethinking Construction, the report of the construction task force on the scope for improving the quality and efficiency of UK construction. London DETR.

[15]. Elegan P.O (1979). Trade Unionism and the welfare of Nigerians. A paper presented at the National Seminar on Industrial Relations at the University of Nigeria Enugu Campus, 4th-7th December, 1979.

[16]. Ezeji S.C.A (1984). Building Construction: 1st edition Longman group ltd, London: Federal Tender Board (1985): Unpublished, Lagos, Nigeria.

[17]. Federal Environmental Protection Agency: Environmental Impact Assessment Decree 1992: *Official Gazette*. No.73 Vol. 79 of 31st December, 1992.

[18]. Federal Republic of Nigeria (2003).The Insurance Act, 2003. *Official Gazette*: Vol.90, No.37, Federal Government Press, Lagos, Nigeria.

[19]. Federal Republic of Nigeria (2010).The Employee's Compensation Act, 2010. *Official Gazette*:Vol.97, No.101, Federal Government Press, Abuja, Nigeria.

[20]. Federation of Civil Engineering Contractor's (F.C.E.C) (1975): *Supervisor safety booklet*. Published by the Federation of Civil Engineering Contractor 3rd edition London.

[21]. Fellow Richard, David Langford, Robert Newcombe & Sydney Umy (2002): Construction Management in Practice (2nd Edition): U.S.A Blacewell Science Ltd

[22]. Gould Frederick & Nancy E. Joyce (2000). Construction project management (5th Edition). New Jersey Prentice Hall.

[23]. Guidelines on occupational safety and health management systems, International Labour Office, Geneva, ILO - OSH 2001

[24]. Haefeli, K., Haslam, C. and Hsalam, R. (2005). Perceptions of the Cost Implications of Health and Safety Failures. *Health and Safety Executive Research Report 403.* Availableat http://creativecommons.org/licenses/by-nc-nd/2.5/ assessed 15/3/2013.

[25]. Haslam, R.A., Hide, S.A., Gibb, A.G.F., Gyi, D.E., Pavitt, T., Atkinson, S. and Duff, A.R.(2005). contributing factors in construction accidents: Applied Ergonomics.36, pp.401-415 Available at www.elsevier.com/locate/apergo: Assessed 28/9/2009

[26]. Hatush,Z & Skitmore, M.R(1997a) Criteria for contractor selection. Construction Management and Economics, 15(1), 19-38

[27]. Hatush, Z & Skitmore, M.R (1997b) Evaluating contractor prequalification data. Selection criteria and project success factors. Construction Management and Economics, 15(2), 15(2), 129-47

Research Article

Journal of Advanced Studies in Agricultural, Biological and Environmental Sciences (JABE) www.jabe.in

A Peer Reviewed & Refereed, International Open Access Journal

Vol.5.Issue.4.2018 (Oct-Dec) **ISSN:2455-0221(P), 2394-2606(O)**

[28]. Health and Safety (2006) Weekly construction site Health and Safety Checklist http:/waecapp.eaeconline.org.ng/confirmation again

[29]. Hinze J. (1996). *Construction Safety Record Since 1971*. Proceedings of ASCE National Convention, 1996 New York.

[30]. Hinze, J. (2005). A Paradigm Shift: Leading to Safety. *Proceedings of the 4th Triennial International Conference: Rethinking and Revitalizing Construction Safety, Health, Environment and Quality*: Port Elizabeth, South Africa. 17-20 May. CIB W99

[31]. Hornby A.S. (2000). Oxford Advanced Leaner's Dictionary of Current English. (6th Edition). New York. Oxford University Press

[32]. Idoro, G.I. (2004). The Effect of Globalization on Safety in the Construction Industry In Nigeria. *Proceedings of International Symposium on Globalization and Construction:* November, School of Civil Engineering, Asian Institute of Technology, Bangkok, Thailand.

[33]. Idoro, G.I. (2007). "A Comparative Evaluation of Health and Safety Performance of Indigenous and Multinational Construction Firms in Nigeria": Construction Research Journal, Lagos, Nigeria.

[34]. Idoro, G. I. (2007). Contractors Characteristics and Health and Safety Performance in the Nigerian construction Industry. *Proceedings of CIB World Building Conference on Construction for Development*, Cape Town, South Africa.

[35]. Idoro, G.I. (2008). Health and Safety Management Efforts as Correlates of Performance in the Nigeria construction Industry. *Journal of Civil Engineering and Management,* 14 (4), pp. 277-285. Available at http://www.jcem.uglu.it Accessed march 17, 2012.

[36]. International Labour Office (ILO) (2001). The Construction Industry in the 21st Century: It's Image, employments. Tripartite Meeting on the Construction Industry in the 21st Century. Geneva International Labour Office

[37]. International Labour Office (ILO). (2005). Baseline Study on Labour Practice on Large Construction Sites in the United Republic of Tanzania, *Working paper 225*, Geneva

[38]. International Labour Office (ILO). (2005). *Global estimates of fatal work related diseases and occupational accidents,* World Bank Regions. International Labour Organisation, Geneva.

[39]. International Labour Office. (2006). *Promotional Framework for Occupational Safety and Health: Fourth Item on the Agenda.* Geneva: International Labour Office.

[40]. International Labour Office. (2007). The Decent Work Agenda in Africa: 2007-2015. In:*Eleventh African Regional Meeting in Addis Ababa*., ILO, Geneva.

[41]. Kikwasi G. (2010). Client Involvement in Construction Safety and Health; *Journal for Building and Land development,* Ardhi University

[42]. Kunju A.R (2000). *Symposium of the ISSA Construction System*: Facility of Built Environment Technology, University of Malaysia, Malaysia.

[43]. Latham Report (1998): CONSTRUCTION THE TEAM": AU.S PERSPECTIVE. http:// www.nvo.com/vklaw/nss- folder/ukus construction comparison/visited 19th Feb, 2007

[44]. Liu, J. and Low, P. (2009). Developing an organizational learning-based model for risk management in Chinese construction firms. *Journal of Disaster Prevention and Management* 18, 170-186.

[45]. Occupational health and safety management systems – Specification, OHSAS 18001: 1999 and Guidelines for the implementation of OHSAS 18001, OHSAS 18002:2000, National Standards Authority of Ireland (NSAI)

[46]. Oderinde A. Adekunle (2003). Appraisal of Safety Policy in Nigeria Construction Industry: Unpublished HND Project. Department of Building Technology, Federal Polytechnic, Ilaro Ogun State. Oloyo R.A. (2001)

[47]. Okolie, K.C. and Okoye, P.U. (2012). Assessment of National Culture Dimensions and Construction Health and Safety Climate in Nigeria. Science *Journal of Environmental Engineering Research, Volume 2012, Article ID sjeer-167:*

[48]. Okolie K.C. and Okoye, P.U. (2013). Appraising the Influence of Cultural Determinants of Construction Workers Safety Perception and Behaviour in Nigeria. *International Journal of Engineering and Medical Science Research*: Vol. No.1, pp 11-24, March. European Centre for Research Training and Development UK.

[49]. Okoye, P.U. (2010). The Influence of National Culture on Workers Safety Climate in the Nigerian Construction Industry. *Unpublished M.Sc Thesis,* Department of Building, Faculty of Environmental Sciences, Nnamdi Azikiwe University,Awka.

[50]. Okoye, P. U. & Okolie, K. C. (2014), " Exploratory Study of the Cost of Health and Safety Performance of Building Contractors in South- east Nigeria: *British journal of Environmental sciences vol. 2*, no.1, pp. 21-33,(march 2014).

[51]. Olatunji, O.A., Aje, O. I. (2005). An Assessment of the Use of Prequalification in Contactor Selection in Construction Project Delivery: Challenges for Quantity Surveyors. *Proceedings for 2005 Quantity Surveyors' National Convention, Malaysia*

[52]. Olatunji, O. A. & Aje, O. I. (2007). Evaluating Health and Safety Performance of Nigerian Construction Site. CIB World Building Congress, 2007 (CIB 2007-051). PP.1176 –1190

[53]. Oloyede, S.A., Omoogun, C.B. and Akinjare, O.A. (2010). Tackling Causes of Frequent Building Collapse in Nigeria. *Journal of Sustainable Development:* Vol.3, No.3, pp. 127-132. Available on www.ccsenet.org/jsd. Assessed 23/9/2010

[54]. Onyejeji N., (2011), Nigeria Public Policy. *Global Policy Brief, No 18,* January: Available at www.bc.edu/agingandwork assessed 21/3/2013

[55]. Oresegun, D. (2009). "Health and Safety; the Nigerian Perspective": 2012, www.scribd.com

[56]. Oribuyaku, T. (2005) Accident prevention practices and procedures on construction sites and regulatory laws in Nigeria. Paper presented at 3-day Workshop on Duties andresponsibility of supervising engineers on construction projects. Tech grade Consulting.Ikeja. Nigeria

[57]. Rwamamara, A.R .(2007). Planning the Healthy Construction Workplace through Risk Assessment and Design Methods, *Doctorial thesis* Luleå University of Technology, Department of Civil, Mining and Environmental Engineering

[58]. Wong, F.K.W. (2002). Construction Project Management – Site Safety Performance in Hong Kong. *Project Management – impresario of the Construction Industry Symposium:* 22-23, March.

[59]. World Health Organization. (2006). *Constitution of the World Health Organization – Basic Documents:* (4-5 edition), Supplement, October 2006.