**UNIVERSITY OF EDUCATION, WINNEBA**

# ASSESSING THE EFFECTS OF NON-COMPLIANCE AND ENFORCEMENT OF BUILDING SAFETY REGULATIONS ON CONSTRUCTION SITES IN THE ASSIN NORTH MUNICIPALITY


**ANTHONY RICHARD DEI**

**JUNE, 2016**

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**ANTHONY RICHARD DEI**

**7141190009**

**A Dissertation in the Department of CONSTRUCTION AND WOOD TECHNOLOGY EDUCATION, Faculty of TECHNICAL EDUCATION, submitted to the School of Graduate Studies, University of Education, Winneba in partial fulfillment of the requirements for the award of Master of Technology (Construction) degree.**

**JUNE, 2016**

# DECLARATION

## STUDENT'S DECLARATION

I, Anthony Richard Dei, declare that, this Dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: ……..

DATE:……

## SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Dissertation as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: PROF. NICHOLAS KYEI-BAFFOUR

SIGNATURE ……

DATE: ……..

## ACKNOWLEDGEMENT

My first and foremost appreciation goes to the Almighty God for his protections and guidance throughout my career. Many thanks to my supervisor, Prof. Nicholas Kyei-Baffour for his patience, humility and guidance throughout the study. I wish to express my warmest gratitude to Mr. Frederick Gbagbah (Assin North Municipal engineer), Mr. Pascal Adzah (Municipal Works Technician) and Mr. David Amo (Municipal Building Inspector) for their guidance, directives and advice during the survey. I express my profound appreciation to all lecturers in the Construction Department of University of Education, Winneba-Kumasi for their efforts.

# DEDICATION

This Dissertation is dedicated to my wife Mrs. Charlotte Dei and children, Justina Dei, Lorrita Dei, Raphael Dzidzornu Dei and Eugene Sedenu Dei for their love and support.

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## ABSTRACT

The issue of ensuring safety on construction sites remains a critical concern that every construction firm needs to adhere to. The progress and productivity of work output are greatly achieved when safety measures are instituted and observed at the workplace. The study sought to assess the effects of building safety regulations compliance and enforcement on construction sites using Assin North Municipality. A total number of 79 responded to the study out of the sample size of 81. The sampling technique used for chosing the sample size was convenience sampling and this was carried out based on the availability of the respondents to the study. Results from the study were analysed using descriptive statistics in the form of mean scores and rankings. It was found that accidents at the construction sites can lead to loss of lives; decrease in productivity; tarnishes the image of the affected firm; leads to huge sums of compensation and can delay projects. Challenges facing the firms in practising safety were unplanned and complex sub-contracting; inadequate training facilities on safety practices; inadequate skilled personnel to undertake the training programmes and low education on existing laws on safety practices. Safety issues are not strictly adhered to by both management and other employees on construction sites. It is recommended that the firms should ensure that they follow and observe safety rules and regulations on and off site. It is imperative for state agencies responsible for enforcing the laws on safety to ensure compliance by the firms. Training programmes should be organised on safety measures for both management and employees.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

The construction industry is one of major industry contributing significantly in the growth of socio-economic development. Achieving project completion on time and within budget at specified quality standards is major criterion of success of project (Memon et al., 2010). The construction industry is an important sector of the Ghanaian economy. It contributes an average of 8.5% of the Gross Domestic Product (Ghana Statistical Service, 2007). It employed about 2.3 % of the economically active population in 2002 (Amankwa, 2003). The industry provides means of production for other industries or commodities to be consumed. As Ghana aspires to become a middle income nation by 2015, and with the recent discovery of oil in commercial quantities, the role of the construction industry is absolutely important (Fugar & Agyakwah-Baah, 2010).

In terms of occupational building safety (OHS) in the construction industry, Kheni (2008) found, owners or managers of most construction firm have little or no knowledge of the legal frame work governing OHS. Earlier indication from Danso (2005) is that most firms in the construction sector in Ghana do not have safety policy and had poor safety awareness. Writing in similar vein, Quarm (2000) suggests that most building construction firms in Ghana, in terms of organizing, do not have safety department and safety representative from the government on site to deal with safety related issues. Further, Fugar (2009) asserted, most of the construction firms do not have Human Resource Management (HRM) departments together with its associated safety personnel to also deal with safety issues. In most developed countries, every worker is obligated to work under the safety standard rules.

Neglecting safety procedure would be a serious violation for anyone, regardless of their positions and this leads them to sanctions or penalty. In Ghana, safety violations in construction work has become routine. Holt (2001) has observed routine violation occurs when it becomes standard practice in a group or even an entire organization to break the rules although rules are enforced by law.

Amartey (2014) emphasized that the reasons the construction industry is risky and prone to safety risks are: the physical environment of work, nature of construction work operation, construction methods, construction materials, heavy equipments and physical properties of construction project itself. The annual toll of accidents in the construction industry is high, in terms of both cost and human suffering. Nevertheless, the financial consequences of accidents are an important matter to the construction industry and for an individual contractor. Adu-Boateng (2014) stressed that for success and safety, a team's approach should be developed and implemented on a daily basis through the general contractor or construction manager on the project. In this regard, successful general contractors share a common approach to safety that works-daily meetings with the workforce to remind them of the need for safety. The need for a team's approach to safety and to address particular safety concerns related to the work to be performed on a specific day, such statements and advice seem so basic, but are rarely executed perfectly on sites thus the occurrence of accidents on site (Kevin & Matthew 2008).

In a high-hazard industry like construction, safety is an investment that provides real benefits. A safe work environment helps to keep skilled employees on the job and projects on

track by reducing accidents that result in injuries and schedule delays, while also reducing the risks of litigation and regulatory action. A strong safety record enhances a company's reputation, makes it more competitive and helps to manage insurance costs over time. Fostering a successful safety culture, however, is a company-wide effort that requires commitment and participation from the chief executive to project managers, superintendents, foremen and individual workers on the job site. That commitment should extend to the selection of subcontractors who also embrace a strong safety ethic, particularly when a company is using a construction wrap-up insurance program (Cesarini et al., 2013).

### 1.2 Statement of the Problem

Armstrong (2006) stressed that thousands of people are killed at work every year and several hundred thousands more are injured. It is also estimated that apart from the pain and misery caused to those directly or indirectly concerned, the total cost to employers of work-related injury and illness exceed £4 billion a year. The complex nature of the construction industry in Ghana makes it vulnerable to potentially dangerous conditions that affect the safety of all personnel working on construction projects in the industry (Amartey, 2014). The Department of labour reports that the highest number of work related fatalities occur among construction workers. In Ghana the state of safety practices violation on construction site are very rampant and glaring. The Labour Department in Ghana in the year 2000 reported that the country's construction industry accounted for the highest rate of occupational accidents in comparison to other industrial sectors. According to the Department report 56 out of a total of 902 occupational accidents that occurred on construction site were fatal. Workers in the construction industry have little control over safety practices on their job sites. Construction safety should be of primary concern to employers, employees, government and project

participant. Thus the main parties responsible for safety on site are the client, main contractor, regulatory agencies and employees.

Safety duties and regulatory agencies, Government regulatory agencies should not neglect safety practices on site but this has become the norm. They are not ensuring that project is safe to build and use, and safe to maintain. Construction project are awarded to the lowest bidder, while this practice might promote cost effectiveness, it does not prevent contractors cutting corners on safety. The Labour Department in Ghana in the year 2009 reported that, injured jumped almost 40 percent. In a typical, one in 10 construction workers will be involved in a construction accident. Although workers compensation on a few occasion compensate injured construction workers, it does not cover all the costs and losses an injured worker may experience. Non-compliance and enforcement of occupational safety regulations have a lot of effects on construction works and the country as a whole. These effects include injury to workers, death as well as increase in cost of the contractor's expenditure or overheads. The Assin North Municipality is noted for poor compliance and enforcement of building safety regulations and therefore the study is expected to fill the gap.

### 1.3 Aim of the Study

The aim of the study is to investigate into the extent to which building safety regulations on construction sites are complied by workers and enforced.

### 1.4 Objectives of the Study

The following objectives are set for the study:

1. To identify building safety practices on construction sites.
2. To identify building safety challenges confronting workers on construction sites.
3. To identify the extent to which workers comply with safety regulation on site
4. To assess effects of enforcing building safety regulations on construction sites.

### 1.5 Research Questions

To achieve the objectives of the study, the following questions are formulated:

1. What are the building safety practices adopted on construction site?
2. What are the building safety challenges confronting workers on construction sites?
3. To what extent do building safety regulations abided by workers on site?
4. What are the effects of enforcing building safety regulations on construction sites?

### 1.6 Scope of the Study

The study covers building safety compliance and enforcement in the construction industry of Assin North Municipality. Issues dealt in the study are safety practices among construction workers, challenges to good safety practices, compliance level of safety regulations on construction sites and effects of building safety regulations enforcement on sites.

### 1.7 Significance of the Study

The study is carried out with the hope that building safety practices on construction site will be enforced and help expose unsafe practices on construction site in the Assin North Municipality. Also the study is expected to help create safety awareness on building construction site and be beneficial to the construction industry in the Assin North Municipality as form of reference material on safety practices on construction sites.

### 1.8 Limitations of the Study

The researcher encountered difficulty in getting adequate recording equipments for the interviews. The approval to conduct the study at the various construction sites was much stressful despite the academic purpose of the study and the assurance of confidentiality of data that would gathered from the workers. This delayed the progress of work since it took much time for the firms to give green light for the researcher to start data collection.

### 1.9 Arrangement of the Chapters

This study is divided into five chapters. The Chapter One deals with the introduction of the background of the study, statement of the problem, the aim and objectives of the study, significance of the study, scope of the study and limitations. Chapter Two also review the related literature review that provides an overall picture safety practices on construction site. Chapter Three discusses the methodology of the study. This includes research design, population, sample size, sampling techniques and data collection tools and procedure and data analysis. Chapter Four presents the findings and discussion of the data gathered and the Chapter Five presents summary of findings, conclusions, recommendations and areas for further research.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

In Chapter Two, related literature on the subject of the is reviewed which consists of definitions, theoretical and conceptual framework and other empirical studies relevant to the study to broaden the understanding of the research focus.

## 2.2 Concept of Regulations and Building Regulations

A regulation may be defined as any instrument by which governments, their subsidiary bodies, and supranational bodies (such as the EU or the WTO) set requirements on citizens and businesses that have legal force. The term may thus encompass a wide range of instruments: from primary laws and secondary regulations to implement primary laws, subordinate rules, administrative formalities and decisions that give effect to higher-level regulations (for example, the allocation of permits), and standards. Regulations may emanate from non-governmental or self-regulatory bodies to which governments have delegated regulatory powers (OECD, 2010).

The Building Regulations can be broken by not following the building control procedures set out for handling your building work. They can also be broken by carrying out building work which does not comply with the technical requirements contained in the Building Regulations. This will come to light during the inspections carried out by the building control service (Thomson Reuters, 2014). Regulation, one of the three key levers of state power (together with fiscal and monetary policy), is of critical importance in shaping the welfare of economies and society. The objective of regulatory policy is to ensure that the

regulatory lever works effectively, so that regulations and regulatory frameworks are in the public interest of governments (OECD, 2010).

In line with the decentralization policy of Ghana Government, and as part of measures taken to improve the planning and management of human settlements, the Local Government Act of 1993 (Act 462) was promulgated. This law came to classify and reinforce the planning and development function given to District Assemblies (Republic of Ghana, 1993). Metropolitan, Municipal and District Assemblies (MMDAs) were given legislative powers to make by-laws with respect to building construction, sanitation, and the environment. They were also given the mandate to prepare and approve planning schemes, grant building permits, enforce regulations, and to prescribe sanctions for non-compliance with laid down regulations (Mensah, 2010).

## 2.3 Enforcement

This represents the processing of set schedules via dispatching to execution. The latency of any type of human work force to escape under avert conditions from set demand for fulfillment with parameters of punctuality, performance and quality is compensated by procedures of enforcement, as e.g. reminders, admonition, disciplinary action, demand note and hierarchical challenge etc, enforcement of compliance is considered as a very sensitive responsibility that must be discharged if corporate behavior is to be regulated effectively (Kirfi et al, 2013).

The local authority has a general duty to enforce the Building Regulations in its area and will do so by informal means wherever possible. Where an approved inspector is

providing the building control service, the responsibility for checking that the Regulations are complied with will lie with that inspector. They will mainly do this by advising you. However, they do not have enforcement powers. In a situation where they consider your building work does not comply with the Regulations they will not issue you with a final certificate and will cancel the initial notice by notifying your local authority. If no other approved inspector takes on the work, the building control service will automatically be taken on by your local authority. From this point on your local authority will also have enforcement powers to require you to alter your work, if they consider this necessary (Thomson Reuters, 2014).

### 2.4 Compliance

In general, compliance means conforming to a rule, such as a specification, policy, standard or law. Regulatory compliance describes the goal that corporations or public agencies aspire to in their efforts to ensure that personnel are aware of and take steps to comply with relevant laws and regulations. Internationally, the International Organization for Standardization (ISO) produces international standards such as ISO17799 (Kirfi et al., 2013).

### 2.5 Concept of Safety and Building Safety in the Construction Industry

The American Heritage Dictionary of the English Language, Fourth Edition, defines safety' as the condition of being safe; freedom from danger, risk, or injury or state of being safe; freedom from danger or hazard; exemption from hurt, injury, or loss freedom from whatever exposes one to danger or from liability to cause danger or harm; safeness; hence, the quality of making safe or secure, or of giving confidence, justifying trust,

insuring against harm or loss. The concept of “safety” can also mean as "freedom from danger and risks" Concise Oxford Dictionary.

Construction building projects are considered as being risky with frequent and high accidents rate problems to work, practitioner end use due to violation to work place safety regulation (Liao, 2008; Nina, 2008; Hinze, 2008). Many construction activities are inherently risky. Working at great height, working underground, working in confined spaces and close proximity to falling material, handling load manually, handling hazardous substances, noises, dust, using plant and equipment, fire, exposure to live cable, poor housekeeping and ergonomics accidents. In an urban context, risky are high due to the fact that high rise buildings remain predominant with the fast-growing complexities of construction project to cope with modernizing city arena at the same time to cope with high daman of housing, offices, services and other infrastructure due to the high level of urbanization. Most construction sites are crowded. That is they do not have sufficient storage spaces for auxiliary equipment at the same, streets are congested with traffic impeding the flow of constructional supplies. Accident do terminate life or cause permanent and temporary disabilities to workers and users, and these result in reduced productivity, non-conformance to quality standards, time overruns and cost overruns of the projects. Improving safety practice in Ghana will not be achieved without the concern and involvement of the government (Danso, 2010; Kheni, 2008).

Developing a proactive safety culture might take a long time and require spending of large sums of money for planning, investigating and implementation. However, it is worthy of being compared with the invaluable life of human beings. Once it succeeds, the

relative rewards will be achieved in terms of competitive advantage, quality reliability and profitability within an organisation (Hassan et al., 2007). The two safety issues that most concern construction workers are safe working environments and building structures that are safe for people to inhabit or use. Hinze and Wilson (2002) found that, "many construction firms have begun considering safety to be one of the main factors in reducing costs associated with work related-accidents and injuries, but by also contributing to projects being delivered within budget and on time.

Improving occupational safety in the construction industry is essential, not only because enlightened clients demand excellent safety performance from contractors/builders, but also due to continuous search for more economic benefit and increased productivity. Economic pressures on construction firms to increase productivity can lead to increased exposure to new risks, such as increased accident and injury rates. Coupled with the organizational pressure for productivity, the individual motivation of the workers to minimize effort, push them to the brink of safe working zone. Furthermore, the dynamic, complex, and often unpredictable construction tasks and environment add to the risks (Ghosh & Young-Corbett, 2009). Thus, improving safety in construction remains a priority in almost every country around the world, because the construction industry stands out among all other industries as the main contributor to severe and fatal accidents. While there have been improvements in occupational safety outcomes over the last few decades, the construction industry remains the sector with the greatest number of fatalities. A Centre to Protect Workers' Rights report states that the fatality rate in construction industry accounts for an annual total in excess of 1,000, which is more than three times the fatality rate of the manufacturing sector. The report also states that there

are more than 182,000 serious injuries annually in construction (Ghosh & Young-Corbett, 2009).

Safety improvement is one of the essential issues in construction projects. Comparing with other industry, construction industry faces with several hazards environment. It also shows the highest accident record due to its characteristics such as decentralization, high mobility, weather condition and uncertainty of work condition (Arditi et al., 2007; Chan & Au, 2007). Moreover, the consequences from construction accident are uncountable. It causes human tragedies, adversely affects other workers and breaks the goals of project such as cost overrun, project delay and low productivity. In addition, it can ruin reputation of the construction company (Mohamed, 1999). Safety management aims to ensure the construction process performed in safety status. By providing an effective safety regulation and positively workplace environment, safety management can improve spirit of workers. A good safety management system can bring more benefit to company than expected such as increase competitive bidding, improve reputation, raise company profit by saving accident cost and high productivity (Nguyen & Peansupap, 2010).

According to Sacks, Rozenfeld and Rozenfeld (2005), the dynamic, complex, and often unpredictable construction tasks and environment add to the risks. Thus, improving safety in construction remains a priority in almost every country around the world, because the construction industry stands out among all other industries as the main contributor to severe and fatal accidents. While there have been improvements in occupational safety outcomes over the last few decades, the construction industry remains

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**2.6 Building Safety Practices on Construction Sites**

Safety practices generally implemented comply with safety statutory in the developing countries. Safety regulations are strictly applied, and it is everyone's obligation involved in hazardous work place to implement it. This may be true in advanced industrial countries where safety programs are taken seriously and programs are maintained as a priority before commencing high risk jobs. Safety practices which are identical to the techniques of accident prevention (Holt, 2001). Generally, in the Gaza Strip, it is observed that most of construction organizations do not have formal safety training. This will lead to absence of safety application and will contribute to occurrence of many accidents and problems in the site. Cheung et al (2004) remarked that safety factors affect strongly on performance of construction projects (Shaban, 2008).

The contractor is responsible to use proper material when building hoarding (e.g. lumber, plywood, scaffold frames, tarps). All hoarding must be designed to sustain loads that it is likely to be subjected to such as wind and snow loads and falling debris. Hoarding must meet permit conditions and be constructed in accordance with all local regulatory requirements. Site fencing must be adequately braced and/or secured to withstand site conditions including wind. Consider securing bases and avoid base details that create a

tripping hazard. Jersey barriers can be utilized at strategic points around a construction site to protect the public and construction workers from high incident traffic intersections that are in close proximity to the entrance gates of work sites. Jersey barriers may also be used to protect fire hydrants, gas valves and main power distribution equipment. Heavy duty scaffold is the preferred system if a contractor is planning to utilize the space on top of the hoarding for storage of materials or for locating their field office. This system must be engineered to comply with the building code and OHS Code and have a height of not less than 2.5 meters (8'- 3") and a clear width of not less than 1.5 meters (5' – 0"). The roofing system must be designed and constructed to safely support a minimum of 2.4 kPa (50 PSF) (Krsek, 2012).

At the building construction site, planning and carrying out an assessment of the works including selection of appropriate methods of carrying out such works, ensuring that the training and experience of all team members are commensurate with the assigned task and providing training if necessary; ensuring that necessary tools, plant and equipment are properly maintained and are available for immediate use and that a plant/equipment register is kept up-to-date containing maintenance records and test and examination certificates; providing necessary information, drawings, manuals, instructions and training to the workers on all aspects related to the works including the use of tools, plant/ equipment, safe practices and emergency procedures; ensuring that adequate number of persons trained in first aid are included in the site working personnel and that necessary first aid equipment such as the first aid box, etc. are provided and maintained

in accordance with the requirements under the construction sites (Occupational Safety and Health Branch, 1997).

Before any organization can expect good safety performance, top management must establish goals and commit to a safe work environment. This commitment must continue in an unbroken chain to the line supervisor. Supervisory safety performance evaluations (SSPE) provide a complete method for determining the safety capabilities of each first-line supervisor. Including the SSPE on performance appraisals will help to determine which supervisors have a good and consistent safety performance, and which ones need additional training. Construction firms should make safety training available to all supervisors to ensure the company achieves its goals and objectives (Ohio Bureau of Workers Compensation, 2012).

Danso (2010) in his study noted that on safety provisions, hard hats or helmet emerged within the first three rankings of the employers and casual workers. This is also an indication that hard hats or helmet is important safety material in addressing the occupational safety issues of casual workers on Ghanaian construction site. Again, for employers, the training of casual workers in safety norms and appointment of safety officer on sites is a kind of proactive measures for preventing accident on site (Danso, 2010).

In developing countries, safety practices generally implemented comply with statutory safety requirement. Safety regulations are strictly applied, and it is everyone's obligation

involved in hazardous work place to implement it. This may be true in advanced industrial countries where safety programmes are taken seriously and programmes are maintained as a priority before commencing high risk jobs. Safety programmes directly lead to safety practices which are identical to the techniques of accident prevention. Accident prevention in the construction industry is not just a matter of setting up list of rules and making safety inspections, although both of these have their place. What is required is a system for managing H&S which meets the needs of business and complies with the law (Permana, 2007).

## 2.7 Building Safety Regulations/Legislation in the Construction Industry of Ghana

### *The Labour Act*

Safety is the protection of people from physical injury (Hughes et al., 2008). Due to this Part XV of the Labour Act, 2003 (Act 651) which relates to the H&S and environment of workplaces provides that:*"It is the duty of an employer to ensure that every worker employed byhim or her works under satisfactory, safe and healthy conditions"*

This means the employer should provide and maintain the workplace, plant and ensure the work is safe and without risk to the health of all workers including casual workers. Further, the employer should provide the necessary information, instructions, training and supervision, taking into account the age, literacy level and other circumstances of the worker to ensure, so far as it is reasonably practicable, H&S at work of other workers engaged on the particular work. The Act further provides that:

*"It is the obligation of every worker to use the safety appliances, fire-fighting equipment and PPE provided by the employer in compliance with the employer's instructions".*

- *An employer shall not be liable for injury suffered by a worker who contravenes subsection (3) where the injury is caused solely by non-compliance by the worker.*
- *An employer who, without reasonable excuse, fails to discharge any of the obligations under subsection(1) or (2) commits an offence and is liable on summary conviction to a fine not exceeding 1000 penalty units or to imprisonment for a term not exceeding 3 years or to both* (Dadzie, 2013).

***Factories, Offices and Shop Act of 1970***

The Factories, Offices and Shop Act 1970 in Ghana is detailed to be preventive measures to health and safety in general. This Act caters for factories, offices, shops, ports and construction. The Act provides for the minister for manpower, development and labour to make regulations in respect of construction works to address specific hazards including imposing duties on persons in respect of the hazards. According to this Act, every contractor or employer shall comply with the requirements designed to ensure the health, safety and welfare of all persons engaged in building operations on building construction sites. Furthermore, it provides that adequate and suitable accommodation in the form of canteen must be provided by the contractor to contain tables and seats or benches for taking meals, with facilities for boiling water. Where the employer or contractor has more than ten persons in his employment on a site, adequate facilities for heating food must be provided as well as drinking water. On the provision of first-aid, the Act states that employers provide first-aid room properly constructed and accessible to workers during working hours (Kheni, 2008; Dadzie, 2013).

***The Workmen's Compensation Law***

The first Ordinance on health and safety was the Workmen's Compensation Ordinance, 1940 (No. 52) which came into force on the 1st of July, 1942 as the Workmen's Compensation Ordinance (Cap.94). Another important provision of the Ordinance of 1954 was that which gave the Minister responsible for Labour the power to extend the scope of the Ordinance to occupational diseases. This was followed by the Workmen's Compensation (Amendment) Act, 1961 (Act 53).It further provided for compensation for disfiguring and other social injuries to workmen. In 1963, a new law was enacted (Workmen's Compensation Act 1963).In 1966, the Act was further amended by the Workmen's Compensation Act, 1963 (Amendment) Decree, 1966 (N.L.C.D. 86) by substituting a new section 15 for section 15 so as to clarify the effect of the amendments carried out by the Workmen's Compensation (Amendment) Act, 1965 (Act 295).This Decree repealed Act 295.This was later repealed by the Current Workmen's Compensation Law 1987 (PNDCL 187).The Act provides that the employer is required to bear the hospital expenses of the injured worker. The Workmen's Compensation Act 1987 imposes employer liability to pay compensation to employees incapacitated by accidents arising out of and in the course of their employment. Compensation payment to accident victims is independent of negligence on the part of employer or fellow-worker (Kheni, 2008 as cited in Dadzie, 2013).

Generally, a code of practice is a set of rules according to which people in a particular profession are expected to behave or practise. The ILO's Code of Practice on H&S on Construction site provides guidelines in the implementation of the H&S practise on construction sites for all workers including casual workers. The document outlines the

steps that have to be taken, among others, to provide adequate welfare facilities, personal protective equipment appropriate for a job and provision and maintenance of safe working environment to all workers on site. Salient portions of the code relevant to this study are explained and presented by Danso (2010).

The Act also gives opportunity to all workers on site including casual workers to express their feelings without fear if their safety is threatened. For example, the understanding from section 119 of Act 651 is that, when a worker finds himself or herself in any situation at the workplace which she or he has reasonable cause to believe, presents an imminent and serious danger to his or her life, safety or health, the worker shall immediately report this fact to his or her immediate supervisor and remove himself or herself from the situation. In such event, the employer shall not dismiss or terminate the employment of a worker or withhold any remuneration of a worker who has removed himself or herself from a work situation which the worker has reason to believe presents imminent and serious danger to his or her life, safety or health. Again, the employer shall not require a worker to return to work in circumstances where there is a continuing imminent and serious danger to the life, safety or health of the worker (Danso, 2010).

### 2.8 Ghana Environmental Protection Agency

The country of Ghana is in Western Africa, bordering the Gulf of Guinea, between Cote d'Ivoire, Burkina Faso, and Togo. Ghana has rich and diverse natural resources. These resources are exploited to meet the growing demands of the populace. The uncontrolled manner of utilisation of these natural resources has resulted in reversible and irreversible

changes within the environment. Ghana has a long history of attempting to safeguard the environment from being abused by enacting and including environmental protection in appropriate legislation. The best result from all of these attempts is the establishment of an organisation solely responsible for the environment – the Environmental Protection Agency (EPA). The Ghana Environmental Protection Agency, since its establishment in 1994 as an Agency with powers to regulate the activities within the environment, has been using the Environmental Assessment Administration procedures as its major tool for achieving compliance with its legislation. The number of applications received for environmental permits within a certain time frame is used as a measure of environmental compliance (Tamakloe, 2001).

To be able to enforce the environmental legislation, the Agency promotes compliance by working in partnership with other stakeholders, especially those state organisations with an equal mandate to enforce certain legislation. Compliance monitoring is done by the Environmental Quality Department of the Agency in collaboration with other departmental staff within and outside the Agency. Non-compliance response involves mainly using statutory notices, site visits, and, as the last resort, legal action. The main challenges of compliance and enforcement are the political will to see the environment as a priority area, the lack of adequate resources for environmental management and the carrying out of compliance and enforcement activities. The other challenge is review of existing legislation to reflect the current trend of events and enactment of new legislation (Tamakloe, 2001).

## 2.9 Construction Accidents

Amartey (2014) posited that the construction work site is usually a busy place with incredibly high activities on going. The accident rates closely correlate to the level of activity within the industry, indicating that when work load is high, safety tends to receive less attention. The dangers faced by construction workers are alarming. The rate of death of workers is higher in construction industry than any other industry. Moreover, construction industry presents a high rate of death by injury. Although construction represents only 6% of US workers, it produces 20% of the fatalities (El Safty et al., 2012). Job accidents impose on the construction industry a tremendous burden of needless and avoidable expense. An accident or a mishap is an unforeseen and unplanned event or circumstance, often with lack of intention or necessity. It usually implies a generally negative outcome which might have been avoided or prevented had circumstances leading up to the accident been recognized and acted upon, prior to its occurrence. Injury prevention refers to activities designed to foresee and avoid accidents (Adu-Boateng, 2014).

### 2.9.1 Causes of accidents on construction sites due noncompliance of health and safety

Workers are deemed to be the cause of site accidents due to their fatigue, lack of discipline, carelessness and distractions, alternatively, some accidents are attributed to senior management because of its ignorance, lack of training and poor communication. Martin (2010) believes that accidents are part and parcel of the construction industry and

that the incidence of accident cannot be eradicated totally but can be reduced if healthy and safe practices are employed.

Falling has been identified as the leading cause of fatalities in construction operations. In order to minimise fall-related accidents and injuries, the international literature advocates that nonslip flooring, handrails, guardrails with safety lines and belts, harnesses and safety nets should increasingly be used onsite. Unsafe site conditions, continuously changing worksites, multiple operations and crews working in close proximity are recognised as other common causes of construction-related deaths and injuries. Secondary causes of construction accidents have been associated with management system pressures such as financial restrictions, lack of commitment to safety, policy, standards, knowledge and information, restricted training and task selection, and poor quality-control systems. Construction accidents have also been linked indirectly to social pressures, particularly group attitudes, trade customs, industry traditions, attitudes to risk-taking, workplace behaviour norms and commercial or financial pressures experienced by contractors. The poor health and safety performance in construction is further exacerbated by the highly fragmented nature of operations, in addition to time and budgetary pressures (Charles, Pillay & Ryan, 2004).

### 2.9.2 Effects of Accidents on Construction Sites

The construction industry has been identified with the highest occurrence rate of accidents compared to any other industry. In the recent past, death tolls, permanent disability, partial disability and some other severe environmental threat had increasingly been on the rise through collapse of buildings and other major operational accidents

(Olatunji et al., 2007; Orji 2014, cited in Orji, Nwachukwu and Enebe 2016). Construction projects involves numerous unpredictable and complex processes and as such earned the construction sites the reputation of having the highest injury rate of all dangerous working environment. Hunter (2011) emphasized that construction sites are the most potentially hazardous and accident prone parts of any working environment. This implies that construction workers are constantly exposed to excessive site hazards which exposes them to injuries and possibly death. Occupational safety and health administration (2005) cited in Kadiri et al. (2014) has fixed the number of fatal accidents on constructions sites around the world annually at 60,000.

According to Oladiran, Ogunsanmi and Soyingbe (2008), accidents in construction sites are inevitable and unquantifiable, whether minor or fatal could result to loss of resources. In line with this ascertain, Auguster, Mimi, and Kamarizan (2015) submitted that accidents can result in direct and indirect impacts. Injuries in construction sites may have direct impacts on the individual involved as well as the productivity level. On the other hand, indirect impact could be revenue losses on the side of the client due to late delivery. Many Employers according to Abdul and Muhd (2008), have not established comprehensive accident prevention policies, instead, they concentrate on maximizing profit. They do not emphasize on safety because they do not know how high the cost of an accident is until it occurs. That is why Oladiran, Ogunsanmi and Soyingbe (2008) revealed that greater emphasis has been on cost, schedule and quality at the expense of the safety of the workers who are the facilitators of construction work. Again, Abdul and Muhd (2008) strongly agreed with Oladiran, Ogunsanmi and Soyingbe's revelation and

further revealed that lack of adherence to safety requirement has led to increased exposure of workers and the general public to risky situation at construction sites resulting in a high chance of accident occurrence.

Direct cost is the tangible cash involvement in the accident (medical, insurance, compensation, etc.) and the indirect cost is all other costs, which has contribution to the incident or the victim or the costs not covered in the insurance premium. Lost labour, Continuing payments to injured worker after accident, Insurance costs, Damage to equipment or material, Legal costs, loss of other employee time, cost of work delay etc can be taken as indirect costs (Arachchige & Ranasinghe, 2015).

## 2.10 Factors responsible Violation of building safety Regulations and Poor enforcement

Hislop (1999) has observed that safety violation and injuries occurred because of three factors: personal factor, work factors, and those factors out of workers control. Therefore, evaluating these factors is most critical to achieve safety practices. In his study, when we talk about construction safety, our first thought is generally that this is a responsibility of the contractor. The focus reflects the contractor's control over their work place and their work practices. There are, however, many more characters that should be involved in establishing a safe job site than just the contractor. All participants in the construction process, from the client commissioning the work to the constructor and to the men and women who perform the work, are integral to the process of establishing a safe work place. Therefore, throughout the construction process we must have means in place by which hazards can be identified and effectively controlled, and safe work practices

promoted. Safety practices are effective in controlling hazard by eliminating major symptoms of accident to minimize loss. The key to critical safety practices is very much influenced by the behavior of the construction workers. The behavior of construction workers varies all over the world despite complying with the global safety regulation standard of safety practices.

Reasons for poor OS performance in developing countries include bureaucracy, time pressures, ineffective institutional structures for implementing OS laws and ignorance on the part of workers about their rights to a decent workplace (Koehnet al., 1995). The influences of cultural practices on OS management have been noted by many authors to be relatively stronger in developing countries. However the literature remains unclear about the extent to which these practices facilitate OS management or hinder businesses from managing OS effectively. For example, Coble and Haupt (1999) argue that cultural influences on OS management in developing countries are stronger than in developed countries and advocate integrating positive cultural aspects with OS management. Similarly, Peckitt et al (2002; 2004) found that Caribbean construction workers considered values of freedom, love and social interactions as having impact on site safety. OS management in developing countries is not devoid of religious influences. As Smallwood (2002) found, there is a strong link between many religions and OS. These studies attribute problems in construction OS management within developing countries to economic conditions, methods of working, attitudes and physical environment. With the exception of the first study, implementation of OS programs is rarely documented (Kheni et al., 2010).

## 2.11 The Effects of Non-Compliance and Enforcement of Building Safety Regulations on Construction Sites

In examining the impact of enforcing worker safety attitudes on construction safety outcomes, McCabe et al. (2005) surveyed construction workers and supervisors. The research revealed that employee demographics influence safety attitudes and compliance. Chau et al. (2004) examined the relationship between individual characteristics and OHS injuries in the French construction sector. Their case-control study involved surveying 880 male workers who had experienced one or more workplace injuries within a two-year period. Chau et al. (2004) observed that, although young age, sleep disorders, smoking, disabilities, sporting activities and experience influenced the likelihood of occupational injuries, the risk for individual workers was dependent on their specific position within the construction supply chain.

Poor building safety compliance and enforcement records lead to increases in insurance premiums which in turn lead to increases in construction project costs. Contractors with poor safety records pay approximately twice the amount of insurance premiums of those with good safety records. In the United States, the construction industry accounts for 20 percent of traumatic occupational injuries and 12 percent of disabling injuries, but only represents 5 percent of the nation's employed workforce (Liska, 1993).

It is commonly known that accidents have serious implications to the construction industry both in financial and humanitarian terms. Construction accidents may cause many problems, such as demotivation of workers; disruption of site activities; delay of project progress; and adversely affecting the overall cost, productivity and reputation of

the construction industry (Mohamed, 1999). Considering the adverse impacts of accidents, construction safety management is of genuine concern to all stakeholders in the construction industry. Government, unions and insurers have spent a great deal of time and effort attempting to evolve legislation, rules and regulations to help reduce the large loss of life and limbs, and the high number of "lost-work days" (Dorji & Hadikusumo, 2006).

Applying safety brings financial benefits to the table. Direct Costs associated with accidents, including workers compensation claims, insurance costs and legal fees are minimized in a safe working environment. Also, the indirect costs such as reduced productivity which occurs as a result of workmen turning their attention to deal with an accident are also minimized if safety is treated as key. Safety when adhered to effectively on the construction sites leads to fewer schedule interruptions which will minimize your production cost and maximize productivity in the long run. On the flip side, a safe work environment boosts employee morale, which, in turn, increases productivity, efficiency and profit margins. When workers know they have a good, safe working environment, they work hard and make a difference. Moreover there are fewer staff absenteeism, low staff turnover and improved quality of work. A solid safety program can help protect a company's reputation. Clients feel safer when entrusting their jobs in the hands of such companies (Amartey, 2014).

According to Hughes and Ferrett (2005), the construction industry is a very accident-prone industry. Odeyinka et al ( 2005) believe that construction workers are more likely

to be killed than any other workers, as explained by Maloney (2012) non compliance of occupational health and safety have several effects which include accidents such as falling from heights, cutting off of limbs due to mishandling of heavy equipment, objects falling from heights. Construction works suffer a lot from accidents depending on the severity of the injury however some workers may require light or restricted duties. Others are forced to miss multiple days of work to recover, resulting in lost wages (Ransasky, 2013). Aside the accidents, Haggins (2009) makes it clear that non compliance will definitely lead to high cost of construction works emanating from payment of compensations to the affected victims. In all, the following can be described as the various effects due to non compliance of occupational health and safety.

1. Common accidents as a result of non compliance.
2. Increased budgeted cost of construction works.
3. Elapsed time.

**2.12 Safety Management within the Construction Industry in Developing Countries**

Effective safety programmes have several features in common. They are manifest throughout organizations, from the highest offices of a general contractor to project managers, supervisors, union officials and workers on the job. Codes of practice are conscientiously implemented and evaluated. Costs of injury and illness are calculated and performance is measured; those that do well are rewarded, those that do not are penalized. Safety is an integral part of contracts and subcontracts. Everybody-managers, supervisors and workers-receives general, site-specific and site-relevant training and re-training. Inexperienced workers receive on-the-job training from experienced workers. In

projects where such measures are implemented, injury rates are significantly lower than on otherwise comparable sites (Weeks, 2011).

Management and planning is one way to avoid unplanned events. Since accidents are unplanned events, an effective safety management can help avoid job injuries. Safety management must be thorough, and it must be applicable to all aspects of the job, from the estimating phase of the project until the last worker has left the premise at the completion of the project. All parties to a construction project must be included in some way in the safety program every party is responsible (Al-Kilani, 2011). Studies conducted by Peckittet al (2004); Gibb & Bust (2006 cited in Agumba & Haupt, 2009) on safety management in construction in developing countries provide ample evidence of lapses in the management of safety at construction sites. Their findings revealed weaknesses in occupational safety administration, economic conditions, climatic conditions and the characteristics of the construction industry of developing countries influence safety at construction sites. Also, the effective implementation of safety programmes is absent in most construction businesses in developing countries.

Safety Management is an area that is concerned with ensuring the safety of people engaged in work or employment. It goes further too to protect co-workers, family members, employers, customers, suppliers, nearby communities and other members of the public who are impacted by the workplace environment (Ferris & Buckley, 2006). While it may be true that organizations exist for the major purpose of making profit in the long run, they have also come to realize that the health, safety and welfare of their

employees cannot be separated from their continued effective existence. Hence organizations are taking more interest in the welfare of their employees not only as a means of protecting their profit line but also because certain laws have been put in place to ensure that organizations provide their employees with a safe environment within which to work (Idubor & Oisamoje, 2013).

Idoro (2008) in his study has revealed that many of the efforts of Nigerian contractors on safety are correlates of safety performance. The structures for managing building safety on site are discovered to be the best correlate of safety performance. However, the level of these efforts is discovered to be low. The levels of contractors' efforts on provision of PPE, compliance with safety regulations and provision of facilities to ensure safe work environment are very high but their correlation with safety performance is limited to only contractors' perception of the performance of structures for managing safety in head office. The levels of contractors' efforts on structures for managing safety in head office and provision of incentives on safety are very low and they also have little or no correlation with safety performance. The conclusion from these results is that almost all the efforts of Nigerian contractors are correlates of safety performance; however, they have one limitation or the other which make their expected impact on safety performance not to be fully achieved. These results call for efforts that will increase the level of contractors' efforts on safety and their correlation with safety performance. Such efforts include enacting and enforcing local regulations on safety, putting in place necessary structures for managing safety in both head and site offices and implementing more

incentive schemes that will encourage the practice of good building safety habits among construction workers.

## 2.13 Improving Building Safety Practices and Regulations on Construction sites

Safety officers should visit construction sites regularly to ensure the daily practice of occupational health and safety policies. The ministry of water resource works and housing in conjunction with various local authorities such as the District Assemblies should impose fines on construction companies who flout the Health and safety law (Adu-Boateng, 2014).

Identifying and assessing the hazards and risks is an essential step in safety management (Holt, 2001). Job Safety Analysis (JSA), also known as Job Hazard Analysis (JHA), is a practical method for identifying, evaluating and controlling risks in industrial procedures (Chao & Henshaw, 2002). However, the differences between construction sites and manufacturing facilities give rise to the need for a specialized method for construction. Construction projects are dynamic (Bobick, 2004). They are characterized by many unique factors – such as frequent work team rotations, exposure to weather conditions, high proportions of unskilled and temporary workers. Construction sites, unlike other production facilities, undergo changes in topography, topology and work conditions throughout the duration of the projects. These features make managing construction site-safety more difficult than managing safety in manufacturing plants. Particularly in construction, a different approach is needed to identify hazards and risks, increase safety and prevent accidents (Rozenfeld, Sacks, Rosenfeld & Baum, 2010).

A successful corporate safety programme should include a clear statement of policy by the client or owner, expressly showing management support for meeting safety objectives and the involvement of different stakeholders in the management system. Contractors who have experience of undertaking public sector projects should be quite familiar with concepts of a site safety plan, risk assessment, safe working method statement and other safety management arrangements, but private sector clients and contractors may not have the same experience and exposure, particularly for the smaller developers and contractors (The Real Estate Developers Association of Hong Kong and The Hong Kong Construction Association, 2005).

The nation has to adopt or develop a broad based Occupational Safety policy that is in line with the ILO convention 155 as a minimum. This must seek to address safety issues regarding all projects and operations from design stage, through procurement, construction and decommissioning. The aim of this must seek to first protect the worker from injuries, ensure standards are put in place to prevent losses of property or damages due to accidents, and must show the Ghana Government's commitment. Achieving this means all the scattered generic Occupational Safety requirements under the different agencies of the Ghana Government such as the Environmental Protection Agency, Department of Factory Inspectorate and the Ghana Labour Commission with confusing responsibilities must be brought under a common umbrella body. Such a body must be empowered and resourced adequately to enable them organize how the policy would be

implemented nationwide and by who. This policy must be authenticated by the Ghana Government and form part of the nation's legal document (Annan, 2010).

Appropriate safety material must be produced in such a way as to be understood and followed by the industry parties themselves. Everyone within the industry has a duty to protect themselves and others who may be affected by their own work or process. The role of workplace safety officers, workplace safety representatives and workplace safety committees are extremely important in providing the information and support necessary where informed decisions can be made to minimise risk. Greater workplace consultation requires further consideration and will cut across all industry boundaries for development and resolution. The consultative process is essential in providing avenues where genuine safety concerns can be raised and resolved in an atmosphere of cooperation and trust (The Department of Employment, Training and Industrial Relations, 2000).

The parties responsible for ensuring internationally acceptable standards of safety on construction sites in Ghana are Government, clients, consultants, contractors, workers and civil society. Government should take the lead in enacting appropriate legislation and enforcing this by resourcing the appropriate Ministries, Agencies and Departments of Government to do their jobs well. Clients, contractors and consultants of the construction sector in Ghana should ensure that every construction contract takes comprehensive account of safety requirements for the project, environment and the workers. Workers and civil society should ensure and demand the provision of adequate safety policies, procedures and provisions to govern construction work (Laryea & Mensah, 2010).

Re-orientation and continuing professional development of built environment and construction industry practitioners in terms of their safety responsibilities is necessary; Construction safety should be included in the tertiary education curricula of all built environment stakeholders; All stakeholders should provide safety leadership, be committed to safety, and view safety as a strategic issue, as opposed to an operational issue; All stakeholders should budget relative to safety, and all construction workers should receive safety training (Chiocha, Smallwood & Emuze, 2011).

# CHAPTER THREE

## METHODOLOGY

### 3.1 Introduction

The third chapter presents the methodology that the researcher adopted in conducting the study. The chapter includes factors such as how the research was designed, the population that was studied, the sample size drawn from the population, the sampling technique, sources of data, data collection tools and how the data was analysed.

### 3.2 Research Design

The study employed descriptive method to handle the process by using a cross sectional survey and observational means to conduct the work. The study employed the use of convenience sampling technique to select the sample size from the construction firms. The sources of data were gathered from two areas being primary and secondary data sources. Administered questionnaires and interviews were used as the main instruments for gathering the data from the respondents. The mixed approach that consists of both quantitative and qualitative methods in analysing the data was employed by the researcher. The quantitative aspect was backed by the administered questionnaires and the qualitative aspect was facilitated by the interviews that were conducted. The data gathered was analysed by using descriptive statistics. The academic purpose of the study was effectively communicated to the authorities and the respondents before and during the process of the data gathering.

### 3.3 Population and Sample Size

The study was centred on workers of construction firms in the Assin North Municipality. For the purpose of anonymity, the researcher did not include the names of the construction firms as well as the workers in the study. Population is individuals or group of people or organisation that the study is focused and data gathered from them. The sample size is a representation of the population. The researcher chose to use a sample size of 81 to represent the population. The sample size was determined using Miller and Brewer mathematical formular for calculating sample size which states that:

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

N= sample frame

α= 10% margin of Error

$= \frac{420}{1+420(0.1)^2}$

$= \frac{420}{1+420(0.01)}$

$= \frac{420}{1+4.2}$

$= \frac{420}{5.2}$

**Total=81**

### 3.4 Sampling Technique

The researcher employed the use of convenience sampling technique in selecting the sample size. The respondents were chosen by the researcher during his visit to the construction sites in the Assin North Municipality and the selected respondents were the ones who had the chance to respond to the questionnaires and the interviews. The technique was preferable to other alternatives such as simple random sampling and

purposive sampling techniques since the population was infinite and the method was quick and dealt with persons willing to respond to the study.

### 3.5 Sources of Data

To be able to achieve a good outcome of any research, there must be the sources from which data would be collected for the study. In respect to this study, the researcher collected data from two angles namely primary and secondary data sources. The primary data are gathered from the questionnaires administered and the interviews conducted. In the study, the primary data was analysed quantitatively and the interviews were qualitatively analysed to give better understanding to the outcome of the study. In addition to the primary data, secondary data was used by the researcher in diverse ways by reviewing literature selected for the study in both empirical and theoretical perspectives. These include books, journals, reports, articles, newsletters and from internet search engines. The secondary data aided the researcher in understanding the issues related to the study.

### 3.6 Data Collection Tools and Procedure

The researcher used administered questionnaires, interviews and personal observations in gathering data from the respondents. The questionnaire was grouped into five sections with A presenting the respondents personal data. Section B presents building safety gadgets and practices on construction sites, C presents building safety regulations compliance and enforcement on construction sites, D shows factors affecting safety performance in the construction industry and causes of accidents on construction sites

and E deals with effects of non-compliance and enforcement of building safety practices and ways of improving safety on construction sites. The questionnaires were administered and collected on the same day and as well as the interviews. The interview conducted was structured to follow the pattern of the questionnaires to get reliable data from the respondents.

### 3.7. Pilot Study

The researcher conducted a pilot study in a construction firm close to his vicinity. The questionnaire and interview guide prepared were tested to check for errors and better ways of phrasing the questions to get accurate responses from the final respondents. The detected errors were corrected before administering the final questionnaires to the respondents.

### 3.8 Data Analysis

In the process of analysing the gathered data, there was cleaning of the data, sorting and grouping them in their respective categories. The categories include factors such as gender, age, educational background, nationality, safety practices on site and causes of accident to mention a few. The questionnaire was quantitatively analysed and the interview was qualitatively analysed. These were carried out by using descriptive statistics. The entries were coded and tested for their consistency, validity and reliability. The final results were presented in tabular, graphical and chart forms.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.1 Introduction

In this chapter, the results from the data gathered was presented in a meaningful way. The results were presented in the form of pie charts, bar charts and tables in a form of mean scores, rankings and percentages. They included the demographic characteristics of the respondents, the consequences of accidents on sites, adherence to safety rules and regulations, and safety practices on site. From the study, 79 participants responded out of the 81 selected sample size.

## 4.2 Demographic Characteristics of the Respondents

The demographic characteristics of the respondents in this study comprised of their gender, age interval, educational background and nationality. This was done without including the names of the respondents to ensure anonymity.

### 4.2.1 Gender of Respondents

Gender was important in the study because it was crucial to know the number of males who responded to the study as well as that of the females. The outcome of the number of males relative to that of the females respondent have been presented in Figure 4.1.

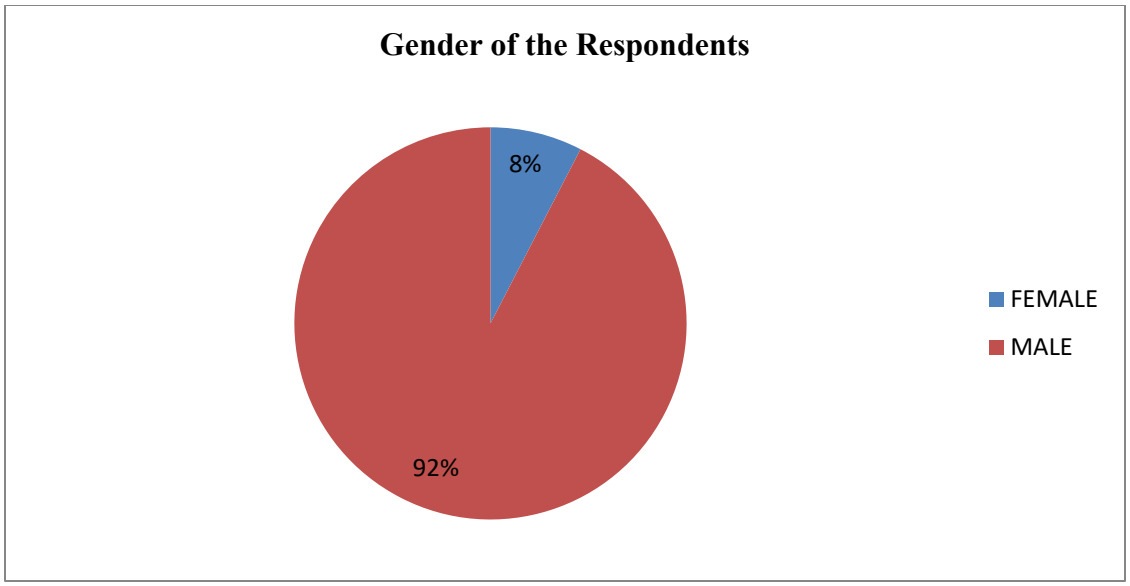


**Figure 4.1: Gender of Respondents**

It was found from the study that the male respondents accounted for 92% and the female respondents were 8%. It was appropriate to know the gender distribution of the respondents in relation to the study. It has been often said in the Ghanaian culture that the issue of gender equality cannot always hold despite the fact that men and woman can be equally placed on jobs and societal roles in general. Taking keen exception to these claims, it was not strange to find from the study that the construction industry due to its nature attracts more males than females. Thus it is necessary to employ men who can lift heavy equipment and perform other duties that may require the use of maximum strength. This is not to say that women are not strong enough to undertake heavy duties but cannot be compared to men in the construction firms.

### 4.2.2 Age Interval of Respondents

The views of age groups may be different with respect to safety issues based on the experience and years served within the various firms selected for the study. The responses are shown in Figure 4.2.

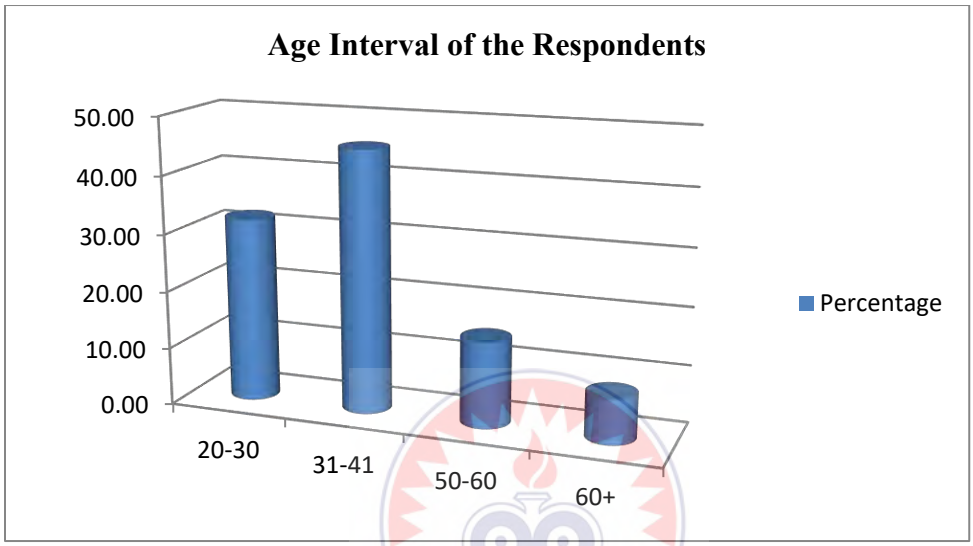


**Figure 4.2: Age Interval of the Respondents**

From Figure 4.2, it was realised that 45 % of the respondents were within the age interval of 31-41. This represented the highest in the response and by that it clearly shows the youthful nature of the respondents. Thus they would be in position to carry out effectively operational activities because the youth are mostly smart, active and energetic in performing duties. Moreover, 32% of respondents had their age interval being 20-30. The members within this category were heavily workers who have not had long experience on the job. Respondents within the age interval of 50-60 years had a representation of 15%. A majority of them were in management and supervisory roles. Thus they were in charge of running the day-to-day affairs of the construction activities

on site. The respondents with 60+ were very experienced personnel and constituted 8%. Experience and age had a positive link to compliance of safety issues on construction sites.

### 4.2.3 Educational Background of the Respondent

The study considers qualification of the respondents since it was significant in knowing their educational background in relation to their profession. The responses to this are presented in Figure 4.3.

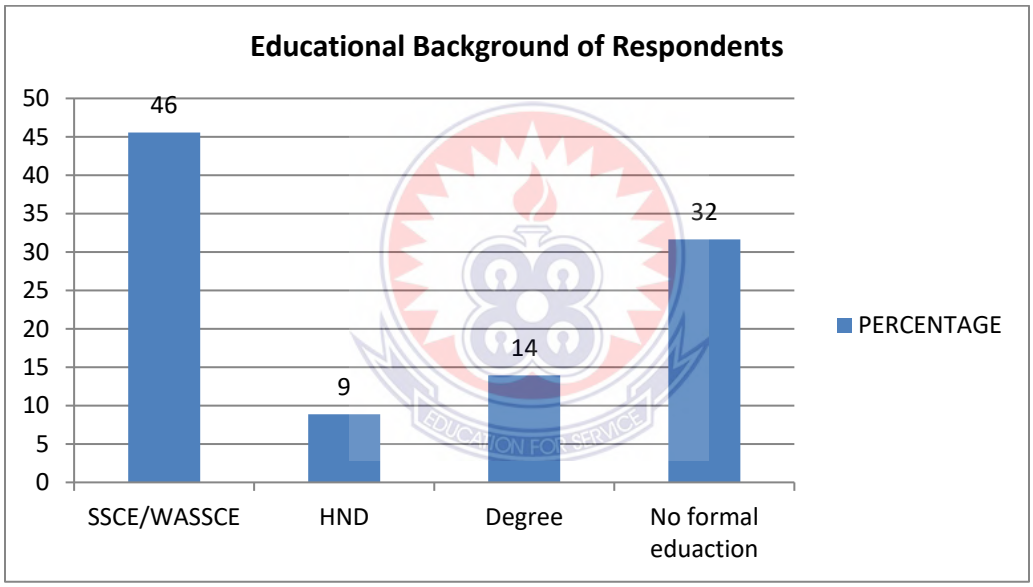


**Figure 4. 3: Educational Background of the Respondents**

From Figure 4.3, the highest representation of the respondents came from the workers who had completed Senior High School with 46%. In addition to this, 32% of the respondents had no formal education and 14% of the respondents were degree holders. 9% of respondents held HND as their educational qualification. The graduate respondents were in the majority of the position of supervisors and management. The overall

indication depicts that majority of respondents are not highly educated and this could influence their safety compliance on construction sites.

### 4.2.4: Nationality of Respondents

Since the construction industry of Ghana is a growing one full of multinationals and the local people, it was important to ascertain the number of respondents who were Ghanaians and that of Non-Ghanaians who responded to the study. The Figure 4.4 presents the nationality of the respondents.

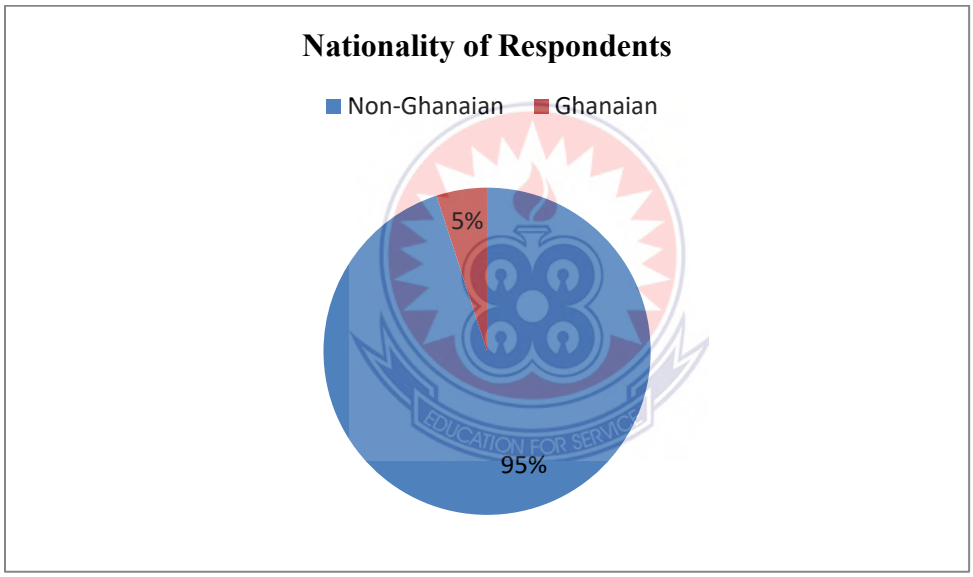


**Figure 4.4: Nationality of the Respondents**

It was found that 95% of respondents are Ghanaians and 5% of them been foreigners. The foreigners were mainly Chinese nationals. The foreign nationals acted majority as supervisors for the various sections of work activities. This was applicable to the large firms owned by foreign nationals. Nationality of respondents did not have any positive link with safety practices on construction sites.

### 4.2.5: Type of Job on Site (Respondent)

Figure 4.5 presents jobs the type of jobs that respondents are engage on site.

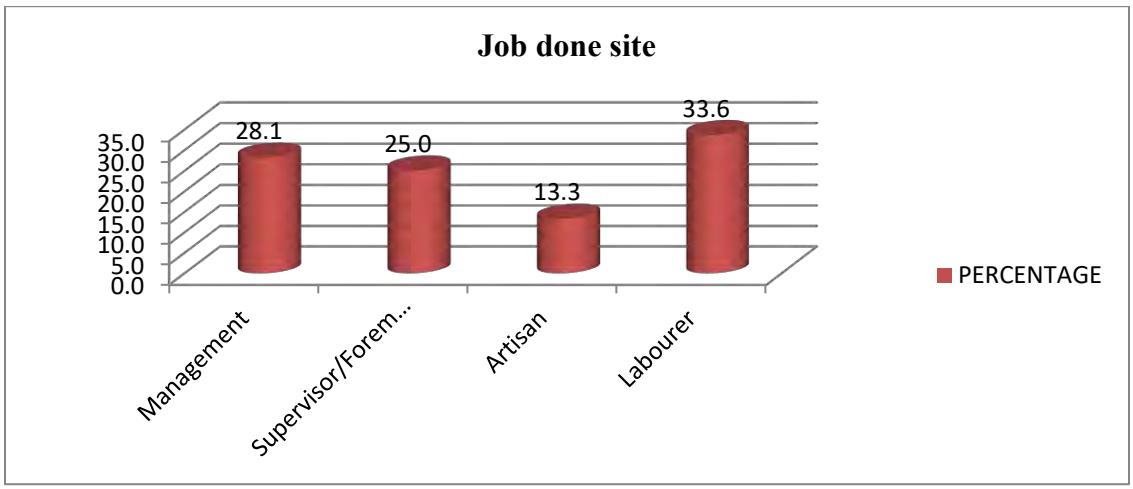


**Figure 4.5: Type of Job on Site (Respondents)**

From the study, it was realised that the labourers constituted majority of the respondents with 34 %. The labourers were the workers undertaken the tasks on the various aspects like mixing of concrete, steel bending, operating equipments, laying blocks and fixing materials. They receive instructions from the management on how to carryout operational activities. Supervisor/Foremen contributed 25% of respondents to the study. They were responsible for checking on the labourers to make sure that they perform up to standard. The number of respondents at management level constituted 28%. The management develop policies for the firms and are in charge of the administration of the day-to-day operations of the construction activities. The artisans were the workers involved in the manual way of carrying out tasks using their hands. They represented 13. % of the respondents. These indicate that respondents of the study cut across different positions with similar and divergent views on the issue of safety practices at the various sites.

### 4.3 Safety Gadgets provided and used by construction workers on site

**Table 4.1: Safety Gadgets provided and used by construction workers on site**

| Safety Gadgets | Mean | Ranking |
|---|---|---|
| Safety signs | 3.49 | 1st |
| Hard hats or helmets | 2.94 | 4th |
| Shields | 1.42 | 13th |
| Safety glasses or goggles | 2.63 | 5th |
| Safety boots | 2.37 | 7th |
| Rain gear | 2.20 | 9th |
| Hearing protection | 2.41 | 6th |
| Knee pads | 2.35 | 8th |
| Gloves | 3.12 | 3rd |
| Safety nets | 1.98 | 11th |
| Flashlights | 2.00 | 10th |
| Ladder/scaffold/platforms | 3.22 | 2nd |
| Hoisting equipment | 1.65 | 12th |

Source: Survey data, 2016

The following range are used to explain the weighted means of the responses:

[1-1.5= Strongly disagree 1.6-2.25= Disagree 2.6-3.5=Agree 3.5-4= Strongly Agree]

A majority of the respondents alluded that safety signs are often provided on site to caution workers on unsafe practices (Mean=3.49). It was found that most of the firms which put in place safety signs on site were to a large extent registered construction firms. Most of informal contractors undertaking construction activities across various sites in Assin North Municipality do not have safety signs. This does not promote the culture of adherence and enforcement of safety regulations on site since contractors fail

to provide such logistics on site. In view of this, large construction firms adhere to safety rules and regulations than smaller ones. A number of the respondents were of the view that their firms or contractors do not provide them with hard hats or helmets to protect them from sustaining injuries on the head in the case of accidents. This is in support of Aksorn and Hadikusumo (2007) who asserted that ignoring to wear PPE may increase chances of getting injured, e.g. workers without hard hats are more prone to getting head injuries from falling objects. A number of respondents were of the indicated shields were not provided on site. This situation makes workers' prone to accidents on site. With the issue of shields availability on site, majority of respondents noted they do not have such facilities (Mean= 1.42). The use of goggles on most construction sites was absent. The use of goggles is meant to prevent damage to the eye as a result of operational activities. It was established that there were poor and inadequate provision of goggles for workers (Mean= 2.63). This was a worrying situation which calls for massive and urgent attention from concerned stakeholders. This means the use of goggles or safety glasses was a major problem to some workers. Carter and Smith (2001) noted that it has been established that the reduction of hazardous events is fundamental to good construction safety management because it is these events that have the potential to cause accidents which may result in injuries and fatalities.

The use of safety boots on site is an essential tool that contractors need to ensure its provision site. This has the potential of preventing accidents caused by stepping on harmful materials and equipments on site. A mean score of 2.37 is an indication that

workers are not provided with the needed safety boots on sites and this is harmful to their safety and subject them to vulnerable acts of accidents on site.

Majority of respondents agreed that gloves were adequately provided on site. This was a common practice undertaken by most contractors in the Assin-North Municipality. The provision of gloves on site is crucial in ensuring that injuries or stains from liquids harmful to the human body are prevented from affecting palms of workers (mean=3.12). Another most common logistic found from the survey was ladder or scaffolds. Ladders or scaffolds were mostly found on construction sites the researcher visited. This made height-work possible and easy to undertake by workers on site. The use of flashlights were indicated by majority of the respondent that their usage were not that effective especially when it comes to the smaller firms. This was found to be used by the large firms that dealt with major projects such as roads and other commercial projects. These assertions are in line with the findings of Laryea and Mensah (2010) that a typical construction site may require workers to wear a hard hat, coveralls, safety footwear, gloves, eye protection and high visibility vest.

### 4.4 Observation of Safety Measures by Personnel on Site

**Table 4.2: Observation of Safety Measures by Personnel on Site**

| Statement | Mean | Ranking |
|---|---|---|
| Workers normally wear helmet on site | 2.98 | 3rd |
| Workers always wear safety boot on site | 2.46 | 7th |
| Operators wear goggles | 2.67 | 5th |
| Operator use protective clothing other than those mentioned above | 2.49 | 6th |
| Operators ask for permission before using any equipment and machine | 3.44 | 1st |
| Workers always use first kits aid when injured | 3.24 | 2nd |
| Official visitor use safety clothing's | 2.23 | 8th |
| Inspection of tools and equipments are done before usage | 2.06 | 9th |
| Site Layout dimension is properly arrange to all workers | 2.86 | 4th |

Source: Survey data, 2016

Out of the nine Statements of safety measures by personnel on sites, it was observed that respondents abide by all except these, "Operators wear goggles", "Operator use protective clothing other than those mentioned above and Inspection of tools" Official visitor use safety clothing's'', Workers always wear safety boot on site,, and "equipment are done before usage".

The four top safety measures by personnel on sites are "Operators ask for permission before using any equipment and machine", "Workers always use first kits aid when injured", "Site Layout dimension is properly arrange to all department" and "Workers

normally wear helmet on site". The least is "Inspection of tools and equipment are done before usage". The respondents agreed with view on wearing helmet on site to protect themselves from any potential accidents. From the interviews, it was realised that helmet are worn by the workers to prevent being hurt from undue object falls and being hit on the head by possible materials whiles working or carrying out duties/ visiting. This supports the assertion by Worker' Compensation Board of British Columbia (2005) that workers must wear protective equipments on sites such as helmet to prevent fatalities.

A majority of the respondents did not agree on the statement that safety boots are worn at the construction site. The boots are worn to prevent the workers/ visitors from sustaining injuries that may result from stepping on sharp objects on site such as nails, iron rods and sharp equipments. This they said sometimes makes them vulnerable to injuries. A large number of the respondents agreed that goggles are worn at the construction sites during operational activities. It was asserted that normally the act of wearing goggles during work activities are not normally adhered to and that all that was needed was to be diligent in carrying out task. The respondents disagreed that workers use other protective clothing other than the ones mentioned earlier. In their view, when the firms provide their own prescribed clothing's, the workers are forced to use them without having to rely on other ones outside the firm's. They indicated that the statement holds when the firms fails to provide the workers with their own designed/prescribed clothing. Laryea and Mensah (2010) indicated that Ghanaians does not place high premium on safety issues on construction sites. The respondents agreed that permissions are sought from their supervisors and equipment managers before using machines and equipments especially

when they are not official operators but are conversant the usage of such equipments. In addition, first kits were given to injured workers in the course of duty/visit. The kits were given to cater for the victim before taking him/her to the hospital for treatment. Most of the respondents rejected the statement that equipments and tools are inspected before and after use. This means that equipments are not well catered for by some of the firms and this reduces their life span and thereby increasing the firms operational and maintenance cost. It was the views of majority of the respondents that site lay out at the construction sites are properly laid to ensure that each employee/department knows his/her domain.

### 4.5 Fatal Accident during Construction

In the Figure 4.6, the views on the issue of whether fatal accidents have occurred during construction activities was presented.

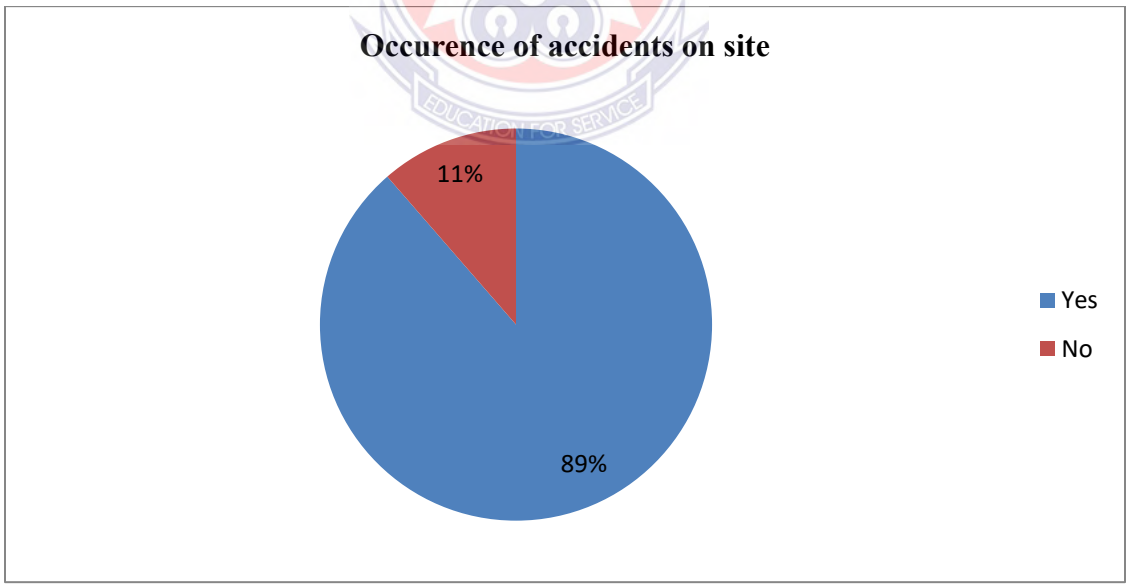


**Figure 4.6: Fatal Accident during Construction**

Out of the 79 respondents to this issue, 89% indicated that indeed fatal accidents do occur during their operations and 11%, however noted that they have not experienced such cases. A majority of the respondents noted that they have witnessed fatal accidents on site. They indicated that the fatal accidents involved both workers and visitors at places where safety measures were not effectively adhered to. Fatal accidents that occur on site are due to poor safety measures and put in place the construction and the unwillingness of some workers to abide by them. This affirms the position of Martin (2010) that unsafe practices on construction sites lead to fatal accidents.

### 4.6 Insurance for Workers

It is supposed to be normal for permanent workers on construction sites to be insured. Figure 4.7 presents responses of respondents towards insurance for worker.

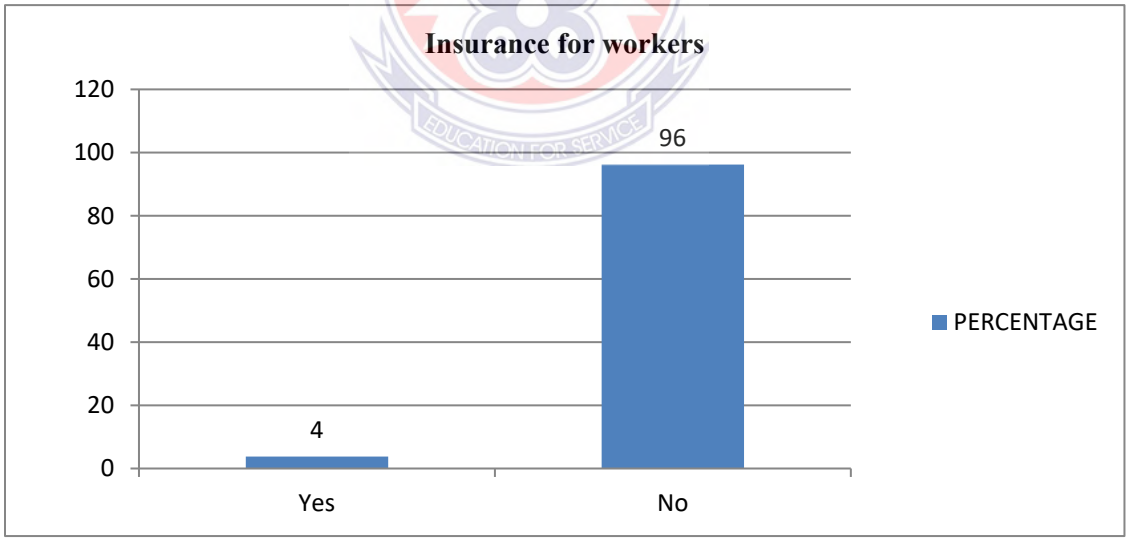


**Figure 4.7: Insurance for Workers**

From Figure 4.7, it was realised that a majority of the respondents consisting 96% indicated that they do not benefit from insurance and 4% indicates that they are insured.

In most cases casual workers have been at disadvantage since employers of construction firms do not provide any insurance for them in the course of their duties. The overwhelming majority assertion that workers lack insurance facilities is an indication that most contractors or management of construction firms have not prioritised insurance as important. In a related study conducted by Kheni et al (2010), it was established that since it is not compulsory for employers to insure workers by law, most workers are subjected to performing high risk duties on construction sites without insurance.

### 4.7 Workers observe building safety regulations on site

Respondents were probed further to ascertain whether observe building safety regulations on site. Figure 4.8 presents workers opinions on observing safety regulations on site.

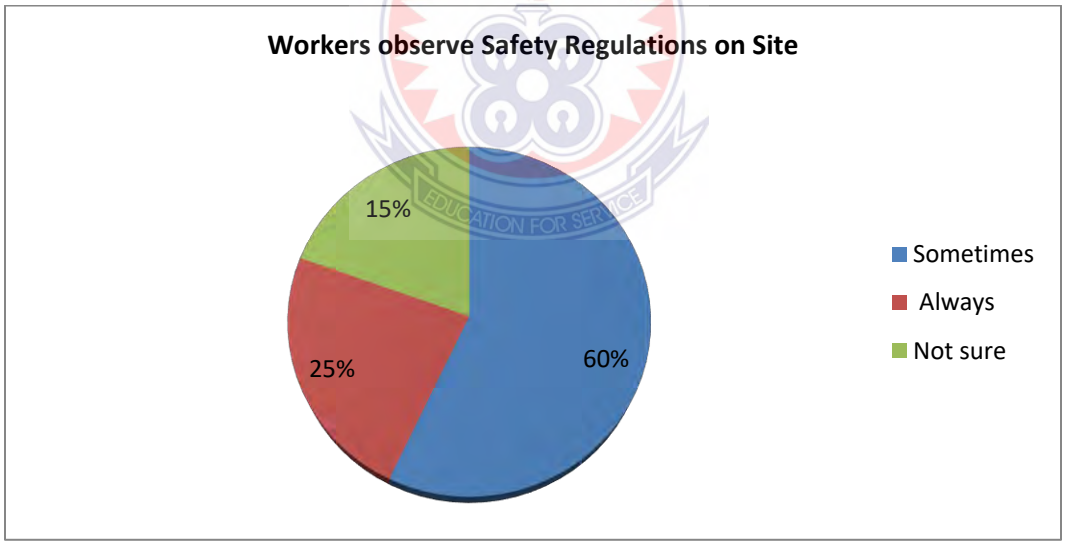


**Figure 4.8: Workers Observe Safety Regulations on Site**

On the issue of whether workers observe safety regulations on site, it was found that 60% of respondents were with view that workers sometimes observe safety regulations on site. Moreover, 25% of respondents noted that workers always abide by or adhere to safety

rules on construction sites. In addition to these, 15% held the position that they were not sure as to whether workers observe safety regulations on site or not. These can be partly be attributed to poor enforcement of safety regulations by institutions tasked by law to undertake such operational and supervisory roles.

### 4.8 Consequences of Accidents on Site

The views and comments of the respondents in relation to the consequences of accidents on construction sites have been presented in Table 4.3.

**Table 4.3: Consequences of Accidents on Site**

| Consequences of Accidents on site | Frequency | Percent |
|---|---|---|
| It can lead to injuries | 29 | 37 |
| Loss of lives | 19 | 24 |
| Delay of projects | 13 | 16 |
| Reduce productivity levels | 10 | 13 |
| It tarnishes the image of construction firms | 5 | 6 |
| Does not promote good working relations | 3 | 4 |
| **Total** | **79** | **100** |

Source: Field Survey, 2016

From Table 4.3, it was established that one of the most common consequence of accidents on construction sites was injuries. This claim was backed with 37%. The failure to comply and enforce safety rules and regulations on construction sites have led to several injuries to affected victims. These injuries could be minor or fatal depending on the magnitude of situation which influenced the accident. Charles et al (2004) held the

position that accidents on construction sites lead to accidents which could be fatal. Moreover, severe accidents on construction sites can be deadly or cause loss of lives either from the angle of workers or visitors (24%). There can be situations where accidents on site may be severe to the extent of a victim losing his/her life. These are sometimes caused by accidents through falls, negligence and poor layout on site. Danso (2010) in his submission emphasised that accidents could lead to loss of lives on site. Aside first two mentioned, accidents can lead to loss of lives either from the workers or visitors. Thus when the nature of the accident is so severe the effect may be death. This supports Hinze (2008) that accidents leads to loss of lives.

Some of the respondents (16%) held the view that accidents leads to delays on projects. When accidents occur on construction sites, it slows the pace of work since the victims must be attended to. This situation does not enhance progress of work on site. Delays on projects can also have repercussion on time and cost aspect of projects which reduce profitability margins of contractors. Accidents were found to decrease productivity with 13%. Productivity levels on projects are highly affected when accidents occur on sites. Some respondents also indicated that accidents on construction sites tarnish the image of the affected firms (6%). Accidents at the construction sites do not promote good industrial relations within the firms (4%). Employment relations on construction projects are negatively affected due to accidents. Workers do not feel comfortable with employers when they are prone to accidents. This leads to conflicts at the workplace. Projects are delayed when accidents occur at the workplace. Thus the firm must attend to the victim and do the appropriate action so that the affected person would be catered for. This does

not encourage and build trust among parties on projects. This slows the pace of working activities which at the end affect performance as well. This supports Mohammed (1999) that accidents leads to disruption of site activities.

### 4.9 Challenges facing Construction Firms and Workers in practicing Building Safety

**Table 4.4: Challenges facing Construction Firms and Workers in practicing Building Safety**

| Challenge | Frequency | Percentage |
|---|---|---|
| Lack of professionals to handle the area of safety | 23 | 29 |
| Lack of training for workers and management | 19 | 24 |
| The attitude of workers towards the observation of safety at the workplace | 13 | 16 |
| Lack of adequate and proper supervision of projects in relation to safety | 10 | 13 |
| Unplanned and complex Sub-contracting | 8 | 10 |
| Low education on existing laws governing safety practices on site | 6 | 8 |
| **Total** | **79** | **100** |

Source: Survey data, 2016

From Table 4.4, respondents enumerated the major factors that hinder the observation of safety on construction site was due to lack of professionals to deal with safety issues on site (29%). In most cases the availability of safety professionals for construction activities

have been difficult to reach. The few ones in the system are also overburdened with lots of consultations leading to little time for their clients. Our school systems offering technical courses have also not done enough in providing adequate courses to train more professionals on safety to save the dire situation on the ground. This is in line with the findings of Dadzie (2013), Kheni (2008) and Danso (2005) who alluded that that inadequate safety professionals is was a contributing factor that has affected the enforcement and compliance of safety issues on construction sites.

Another crucial challenge affecting compliance and enforcement of safety practice was lack of training facilities for both management and workers on construction projects (24%). Most construction in the Assin-North Municipality have not prioritized the need to organize training for workers on safety practices on construction sites. This does not promote the needed awareness creation on safety measures on site. Moreover, the skills of employees on safety are not improved and this affects the level of compliance on site. Kheni (2008) in his submission reiterated that lack of adequate training for employees on safety measures has contributed largely to the enormous rate of non-compliance which impedes safety standards on most Ghanaian construction sites. Dadzie (2013) noted that that lack of safety training for workers is a major challenge to the adherence of safety on construction sites.

The attitude towards safety compliance and enforcement was a big problem confronting most construction firms. The apathy towards adherence and enforcement of safety rules and regulations on site has been a major concern which ought to be addressed by concerned stakeholders in the construction industry of Ghana. The failure cut across between both workers and contractors and supervisors on site. This supports the work of

Dadzie (2013) emphasized that workers apathy towards compliance of safety have not helped in promoting acceptable standards on some construction sites in Ghana. Aside this, one of the major problems facing the construction firms is lack of adequate and proper supervision of projects. The failure of supervisors to carry out their duties effectively have rendered some projects prone to accidents. Poor supervision on site activities donot auger well in ensuring safety rules and regulations are observed on site. Laryea and Mensah (2010) submitted that construction firms are confronted with poor supervision and vague instructions.

### 4.10 Effects of building safety regulations compliance and enforcement on Construction projects

**Table 4.5: Effects of building safety regulations compliance and enforcement on Construction projects**

| Effect | Frequency | Percentage |
|---|---|---|
| Direct costs associated with accidents, including workers compensation claims, insurance costs and legal fees are minimized in a safe working environment | 21 | 26 |
| Indirect costs such as reduced productivity which occurs as a result of workmen turning their attention to deal with an accident are also minimized if safety is treated as key. | 17 | 21 |
| Safety when adhered to effectively on the construction sites leads to fewer schedule interruptions which will minimize your production cost and maximize productivity in the long run. | 14 | 18 |
| Safe work environment boosts employee morale, which, in turn, increases productivity, efficiency and profit margins. | 10 | 13 |
| When workers know they have a good, safe working environment, they work hard and make a difference. | 10 | 13 |
| A solid safety program can help protect a company's reputation | 7 | 9 |
| **Total** | **79** | **100** |

Source: Survey data, 2016

From Table 4.5, it was evidenced that good enforcement and compliance of building safety regulations on construction sites would help in minimizing accidents and its related costs (26%). The amount of funds that ought to be channeled into payments of insurance, legal fees and other compensation packages would minimize with practice of good safety on construction sites. These funds could be invested into more profitable ventures for the benefits of construction firms or contractors. Moreover, indirect costs such as decreased in performance and productivity which can emanates from delays due to accidents can be minimized through effective compliance and enforcement of building safety regulations on construction sites. In view of this, adherence to safety practices is a pre-requisite to enhance productivity on construction sites. Safety when adhered to effectively on the construction sites leads to fewer schedule interruptions which will minimize your production cost and maximize (13%). Work in progress are not interrupted and halted when effective enforcement and compliance of safety exist on construction sites. It is likely for work to be halted when there exist unfortunate incidence due to poor safe practices.

Adopting good safety practices ensures smooth construction activities on sites. Safe work environment boosts employee morale, which, in turn, increases productivity, efficiency and profit margins (13%). Workers are able to deliver effectively on the job due to positive morale for workers due to safety practices. The existence of good safety gadgets on sites motivates workers intrinsically to improve on their performance which increase productivity in the long run. A company's image is enhanced with high reputation when

there exist effective measures on safety practices. It also attracts competent workers to be with the companies.

# CHAPTER FIVE

## SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Introduction

This chapter summarises the specific findings of the study, thus the views and comments of the respondents on the issues pertaining to the study. The conclusions drawn from the findings of the study was captured in the Chapter Five as well as the recommendations given based on the findings of the study.

### 5.1 Summary of Findings

Workers were found to wear helmet on site to protect them from sustaining injuries on sites and purposely for protecting being hurt on the head. Workers were not in the habit wearing goggles on site in the course of their duties. Permissions are normally sought before equipment can be put to use by operators or any worker who may need them in their activities. First kits were given to injured persons by the construction firms before the victim would be sent to the hospital for treatment. Tools and equipments were found normally not inspected before and after use by the most of the firms in the Assin North Municipality. However, the site layouts were designed to ensure that each worker knows his/her boundaries to work.

The findings from the study presented that some of the key challenging factors affecting safety practices by the construction firms are related to lack safety professionals to educate or handle safety matters on site. It was noticed that poor equipment procurement

and poor safety enforcement by the responsible agencies were also key factors undermining the observation of safety practices on site. Lack of training programmes on safety measures as well as poor creation of awareness on safety issues on site has been a major setback to the construction industry. Sub-contracting without given the needed instruction by main contractors was found to be a problem affecting the practice of work safety on construction sites. Majority of the workers were not conversant with the existing laws and the penalties involved. The few ones who had knowledge of the laws were not prepared to voice them out to their employers for fear of losing their jobs.

Accidents were found to have resulted in decrease in the productivity of the construction firms and increasing the cost of work such as operational and maintenance cost. Injuries were found to be as a result of accidents on sites. Project delays were major factor when there was an accident at the site and the most unfortunate thing that can happen is the victim losing his/her life. The firms that records high number of accidents has their image tarnished and this affect their recruitment of competent staffs because they are perceived as 'careless' firm that does not consider the welfare of its workers as a major priority. Huge sums of compensations are paid to the victims and this sometimes affects the financial position of the firm.

In order to address the challenges facing the practice of safety on site, it was found from that adequate training programmes should be organised for employees on safety measures. Competent professionals should be attracted to the industry to handle building

safety practices. The enforcement agencies should be adequately resourced to carry out their task. There should be enforcement of laws concerning safety measures on site.

### 5.3 Conclusions

The construction firms and workers in the Assin North Municipality do not offer adequate training facilities for their workers on safety measures coupled with inadequate skilled personnel to undertake the training programmes for the firms. Majority of the workers are not conversant with the safety rules and regulations that are supposed to be observed by all parties on construction sites. The existing laws such as the Labour Act 2003, (Act 651) and the Offices, Shops and Factories Act 1970 have not been enforced by the requisite state institutions mandated to ensure that construction firms at the municipality operate within safety precautions had not been effective. Awareness on safety practice has not dominated the construction firms in the municipality. Accidents at the construction site decrease the productivity of the firms, cause injuries, delay of projects and can lead to loss of lives of the affected parties. The issue of poor safety measures observed by some of the workers has been a major issue that hinder the effective utilisation of safety practices on site. Some workers due to their negligence and unwillingness to comply with certain safety directives do not comply with orders and other laid down procedures.

### 5.4 Recommendations

The construction firms must put in place measures that encourage the organisation of safety programmes to their employees. Awareness should be created effectively so that

the employees would become sensitive and concerned about the practices of good building safety at the workplace. The enforcement agencies should be resourced by the government to undertake their operations and should enforce the laws by sanctioning offenders.

The management of construction firms should ensure that there are adequate training facilities on safety practices organised for all concerned parties in the firms ranging from senior members to the junior ranked employees. The professional bodies and state institutions like Environmental Protection Agency should be equipped well to train more personnel who would in turn educate and monitor the construction firms in maintaining safety standards in their operations to minimise or prevent accidents. When the trained are given on regular basis and becomes effective, the stakeholders in the construction firms would be abreast with laws governing safety practices.

The existing laws such as the Labour Act 2003, (Act 651) and the Offices, Shops and Factories Act 1970 should be enforced in a manner that construction firms that break the rules and regulations on safety should be brought to book and appropriate sanctions should be acted to serve as symbol of deterrence to other potential culprits. This would improve the safety practices by construction firms and prevent possible dangers that can be caused by accidents due to negligence and the inertia of state machineries to punish offenders.

The employees and other stakeholders at the construction site should also make it a point to observe the safety practices because the willingness to adhere to the rules and regulations themselves would help them from getting involved in accidents. Thus the employees should cultivate the habit of abiding by the laws to enhance conformity to safety practices. It is expected of the construction firms to provide the needed and adequate safety equipments/tools and materials to help prevent possible accidents likely to emanate from the absence of such materials.

To achieve better results from the enforcement agencies, it is appropriate for the government and other stakeholders to provide adequate resources for the agencies to run their operations. The agencies cannot function properly when they continue to lack basic logistics to run their operational activities. Thus for example, how can the inspectorate officers go outside and monitor the adherence of safety practices by the firms when they cannot fuel their institution vehicle? However, proper control mechanisms should be institute to check the usage of the resources so that they are not wasted on the private interest of the employees of the supervision agencies.

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# APPENDIX

## UNIVERSITY OF EDUCATION, WINNEBA

## COLLEGE OF TECHNOLOGY EDUCATION – KUMASI CAMPUS

## DEPARTMENT OF DESIGN ADN TECHNOLOGY EDUCATION

## QUESTIONNAIRE FOR ASSESSING EFFECTS OF ENFORCING BUILDING SAFETY REGULATIONS ON CONSTRUCTION SITE'S IN THE ASSIN NORTH MUNICIPALITY

**This questionnaire is prepared by a final year Master of Technology (Construction Management) student to solicit information for the writing of thesis for the award of Master of Technology Degree from UEW-K.**

**Please your confidentiality is assured, so feel free to express your views.**

**Thank you for participation in this survey.**

## SECTION A

## PERSONAL-DATA

**Please read and tick [√] the appropriate box**

1. Gender

   [ ] [1] Male

   [ ] [2] Female

2. Age

   [ ] [1] 20- 30

   [ ] [2] 31-41

   [ ] [3] 50-60

   [ ] [4] 60+

   others (specify)……..

3. Level of education (highest certificate)

   [ ] [1] Basic

   [ ] [2] Senior High School

   [ ] [3] Higher National Diploma

   [ ] [4] University Graduate

   [ ] [5] Post- Graduate

   [ ] [6] Doctorate

   [ ] [7] No formal education

   Others (specify)……

4. Nationality

[ ] [1] Ghanaian

[ ] [2] Non Ghanaian

5. Type of job on site

[ ] [1] Management

[ ] [2] Supervisor/Foremen

[ ] [3] Artisan

[ ] [4] Labourer

Others (specify)……

**SECTION B**

6. Please indicate your reaction to each statement by ticketing the appropriate cell

**Provision of Safety Tools, Equipments and Materials on Construction Sites**

**Please tick [√] to indicate your level of agreement or disagreement in the following statement**

| **Safety Gadgets** | **Strongly disagree [1]** | **Disagree [2]** | **Not sure [3]** | **Agree [4]** | **Strongly agree [5]** |
|---|---|---|---|---|---|
| Safety signs | | | | | |
| Hard hats or helmets | | | | | |
| Shields | | | | | |
| Safety glasses or goggles | | | | | |
| Safety boots | | | | | |
| Rain gear | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Hearing protection | | | | | |
| Knee pads | | | | | |
| Gloves | | | | | |
| Safety nets | | | | | |
| Flashlights | | | | | |
| Ladder/scaffold/platforms | | | | | |
| Hoisting equipment | | | | | |

**7. Observation of Safety Practices by Workers on Site**

**Please tick [√] to indicate your level of agreement or disagreement in the following statement**

| **Statement** | **Strongly disagree [1]** | **Disagree [2]** | **Not sure [3]** | **Agree [4]** | **Strongly agree [5]** |
|---|---|---|---|---|---|
| Personnel on site normally use helmet | | | | | |
| Personnel on site always wear safety boot. | | | | | |
| Operator's wear goggles | | | | | |
| Operator's use protective clothing other than those mentioned above. | | | | | |
| Operators ask for permission before using any equipment and machine. | | | | | |
| Personnel always use first aid kits when injured. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Official visitor use safety clothing's | | | | | |
| Inspection of tools and equipment are done before usage. | | | | | |
| Site layout dimension is properly arrange to all department | | | | | |

**SECTION C**

**Building Safety Laws and Regulations**

9. Do workers observe safety regulations on site?

[ ] [1] Sometimes

[ ] [2] Always

[ ] [3] Not sure

10. Do operatives abide by the signs and symbols displayed on the site?

[ ] [1] Sometimes

[ ] [2] Always

[ ] [3] Not sure

11. How do you expect safety practices to be addressed at the construction site?.....

.....

12. Does the company provide any kind of insurance for its workers?

[ ] [1] Yes

[ ] [2] No

13. Is there any agency or government organizations that inspect construction site's safety?

[ ] [1] NGO

[ ] [2] EPA

[ ] [3] AFMA

Others (specify)……..

**SECTION D**

14. Do accidents affect the company's reputation?

[ ] [1] Yes

[ ] [2] No

15. What are the consequences of accidents at the site?

a) Increase the total cost of your output

b) Reduce the productivity

c) Delay the project

d) It can lead to injuries

f) It can lead to loss of lives

g) It tarnishes the image of the firm

h) Does not promote good industrial relations

I) Leads to huge sums of compensation to victims that may affect the firms.

[ ] [1] All of the above

[ ] [2] None of the above

Others (specify)……

**SECTION E**

16. What are the building safety practices and enforcement problems facing the construction firms?

……

……..;……

……

……..

17. What are the effects of building safety regulations compliance and enforcement on Construction projects?

……

……..;……

……

18. What measures can be put in place to ensure that building safety regulation standards are improved in the construction industry.

……

……