**UNIVERSITY OF EDUCATION, WINNEBA**

**COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

# THE IMPACT OF HEALTH AND SAFETY PRACTISES ON PRODUCTIVITY ON CONSTRUCTION SITES. A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY

**LARBI HANSON COLLINS**

**DECEMBER, 2016**

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**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 – Kumasi in Partial Fulfillment of the Requirements for the Award of Master of Technology Education (Construction) Degree.**

**DECEMBER, (2016)**

# DECLARATION

## STUDENT'S DECLARATION

I, LARBI HANSON COLLINS, declare that, this Dissertation with the exception of quotations and references contained in published works which have all been identified and acknowledged, is entirely my 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 Dissertation were supervised in accordance with the guidelines on supervision of Dissertation laid down by the University of Education, Winneba.

Name: MR. M. K. TSORGALI

Signature…….……

Date ……..……

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Last but not the least, I own my loving thanks to my wife, and the wider family. Without their encouragement and understanding would have been impossible for me to finish this work.

## DEDICATION

I dedicate this work to almighty God most glorious and merciful, to him the Glory forever and ever.

I also dedicate it to my children, Stephanie Oforiwaa Larbi, Janet Amponsah Larbi and Joel Nyinaku Larbi.

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## ABSTRACT

This research dealt with health and safety issues in construction industry in the Akuapem North Municipality in eastern region. The purpose of the study was to assess the impact of health and safety practices on construction site. To understand this concept, background of the study and the stated problems of the study were dealt with. This emphasized that health and safety issues have always been a major problem and concern in the Ghanaian construction industries. Efforts have been made to address this problem but the results have been far from satisfactory. The study used qualitative research approach for data gathering to obtain the needed information for the study. Random sampling procedure was used to select the sample size .The sample size was made up of 139 people who are directly affected by the health and safety issues in the construction site. Questionnaires were designed distributed to potential construction industry prayers such as contractors, consultants and health experts to determine the health and safety measures applied on construction sites. Other instruments like interviews and questionnaires were carried out with selected artisans and supervisors. This is specifically; it investigates the safety perceptions, attitudes and behaviour of construction workers and management safety practices. Based upon the results and discussions of the study, this study has demonstrated that the majorities of construction companies in Ghana have a poor degree of risk awareness and do not take health and safety as an important issue. From the study findings it was concluded among others that employees feel secured and protected when there is proper health and safety policies in the organisation by management. The study recommended among others that the management of the construction firms should organize in-service training programmes to educate the workers regarding health and safety issued and its impacts on workers productivity.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the Study

In a study conducted by Tawiah and Baah (2011), occupational health and safety is a process of ensuring that people stay safe and healthy in the workplace to increase workers capacity to perform. The workplace has become an integral part to the viability of business for employers, labour union, the society as well as the government. The quality of the workplace environment has an impact on the level of employees" motivation and performance. How well employees engage with the organisation, especially the immediate environment influences to a great extent of their error rate, level of innovation and collaboration with other employees as well as absenteeism and ultimately affect the number of years they stay on the job. Tawiah and Baah (2011) were of the view that, annual number of manufacturing fatal job-related accidents and sickness could be more than two million in the year 2012. To them, this number will continue to rise because of continuous industrialization.

One should not overlook that the fundamental human right permitting to natural justice is the right to life and to live in peace irrespective of injury or accident or chronic sickness. This means that life is very essential and it must be accomplished and secured well in all endeavours. However, human life is vital, yet each year about 2.2 million men and women are deprived of that right by job-related accidents and work connected illnesses and injuries. This means that it is necessary for these construction firms in Akuapem to put in place health and safety policies that will protect their employees from work- interrelated accidents and sicknesses.

Though most of these measures put in place by these companies are mandated by law, yet others are based on the fact that the employer wants to increase productivity by limiting man hours lost due to accidents and injuries that happen at the workplace. If man hours lost continue to increase despite the fact that these construction companies are spending huge sums of money promoting health and safety, then the impact of these measures can be seen in the negative direction and target set cannot be achieved since the employees performance will be affected based on man hours lost. The opposite is the case in a situation where health and safety policies put in place by these construction companies is impacting positively on the employees performance based on minimizing fatalities and aiding them to achieve their target based on increase number of employees contact hours with the organization.

Occupational health and safety policies put in place by companies involves cost, so it is necessary for one to assess the real impact on occupational health and safety policies on employees‟ performance. In doing this, selected construction firms in the Akuapem Municipality was used as the study area.

## 1.2 Statement of the Problem

The stated problems of the study are highlighted below;

The major problem that Construction firms face are „wasters‟ such as industrial accidents because, aside being avoidable its occurrence and the concomitant rippling effects are just too much to cost. Labour protection, that is prevention of occupational disease and reducing the occurrence of accidents, has always been a matter of major concern for all construction firms in Ghana.

Secondly, inadequate knowledge regarding industrial accidents also contributes to accidents at the workplace. The full analysis of an accident requires knowledge of many parameters such as location, time, type, cost of the accident, victim information, nature of injury, result of the accident etc. that can be obtained from a standard coded accident report form. Unfortunately, in developing countries like Ghana, the challenges related to health and safety is still unsolved causing high number of serious accidents and work-related diseases. Therefore, this study investigated the impact of health and safety practices on productivity on construction sites.

### 1.3 Purpose of the Study

The main purpose of the study is to assess the impact of health and safety practices on productivity on construction sites in the Akuapem North Municipality.

### 1.4 Objective of the study

The objectives of the study are to:

- Assess the health and safety issues in the selected construction companies in the Akuapem North Municipality.
- Identify the factors that influence health and safety practices in the construction companies.
- Devise strategies to enhance health and safety practices in the construction firms.

## 1.5 Research Questions

This study is guided by the following research questions,

- What are the health and safety issues in the selected construction companies in the Akuapem Municipality?
- What are the factors that influence health and safety practices in the construction companies?
- What are the strategies to enhance health and safety practices in the construction firms?

## 1.6 Scope of the Study

This study is focused on the impact of health and safety practices on employee‟s productivity using selected construction firms in the Akuapem Municipality as a case study. Therefore this study would be geographically limited to the selected construction companies in the Akuapem Municipality in the Eastern Region of Ghana .However, the study is conceptually, theoretically and empirically limited in scope to the impact of health and safety practices on employees productivity.

## 1.7 Significance of the Study

The study is significant for the following reasons:

1. The dissertation would provide useful information for the Civil engineers, entrepreneurs in the construction industry, construction workers, estate developers, artisans and labourers working in the building and construction industry.

2. This study would also add up to the existing research works in the field of health and safety and improve health and safety at construction sites.
3. Recommendations from the study will enhance health and safety in the firms and reduce accidents.
4. The study will empower employees of the construction firms to work independently with no or less supervision.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter seeks to review literature on topics relevant to the study. The chapter reviewed literature based on the theoretical, empirical and conceptual bases.

## 2.2 Health and Safety standards (the Ghanaian Perspective)

In Ghana, the Occupational Health and Safety Act was established under the Factory Offices and Shops 1970 (Act, 328). The main provisions of the Act are intended to bring it in line with internationally accepted standards on safety, health and welfare of employees. The occupational health and safety activities stated under the Act, include, creating safe work and work environment and promoting the safety, health and welfare of employees in order to ensure effective utilisation of human capabilities thereby promoting increased productivity.

Although Ghana does not have a national policy on Occupational Health and Safety, the Ghana Labour Act, 2003 (Act 651), has made provision for Occupational Health and Safety. Provisions made under Part XV Section 118 of the Act include placing a responsibility on employers to ensure a safe and healthy working environment and obligation on employees to use safety appliances provided by the employer in compliance of the employer‟s instructions. It is generally known that developing countries like Ghana lack relevant policies to adequately cater for the health and safety of employees (Quainoo, 2001). Thus in general Ghana like many other developing countries has a long way to go in designing and implementing occupational safety and health

policies and programmes that could enhance the welfare of its working force. The manufacturing and construction in developing countries are known to be at levels that are several times higher than in the industrialized countries (Clarke, 2005). In the case of Ghana, Quainoo (2001), noted that the Factories Inspectorate Division spanning a period between 1987 and 1996 showed that many accidents occur in Ghanaian factories that go unnoticed and are not reported in the media. Available statistics indicate that about 734 persons sustained various kinds of injury with 55 fatalities in 1997 at workplaces in Ghana. Another 898 work-related injuries and 54 deaths were recorded in 1998. In 1999 alone, 57 fatalities occurred with 1,190 injuries (Micah &Aikins, 2002).

Bavon, (2000), remarked that in Ghana, the current legislation (Labour regulation, 2007, L.I, 1833), does not meet the standards of a good compensation system for the modern worker. A draft policy jointly developed by the Ministries of Labour, Health and Mines and Energy as far back as 2000 is yet to be adopted. In the absence of a national occupational safety and health policy in Ghana, two main statutes have charted the cause for the provision of services over the years. These are the Factories, Offices and Shops Act, (328) of 1970 and the Mining regulations 1970 LI 665. These have driven the implementation in the labour and mining sectors respectively. Other statutes that have a bearing on health and safety are the Workmens" Compensation Law 1987, Environmental Protection Agency Act, (490) of 1994. (Bavon, 2000).

The vast majority of industries including the agriculture and most of the informal sector are not specifically covered. Besides, the provisions are very limited in scope for prevention. Preventive strategies like risk assessments, medical surveillance and control

hazards are not catered for. According to Clark, (2005), there is lack of specification of standards which should form the yardstick against which services are to be evaluated.

## 2.3 Theoretical Framework of the Study

This section reviewed literature regarding the theories that promotes safety at the workplace. This portion of the review examines the evolution of safety, health and environmental protection. Grimaldi and Simonds (1984) reminded us that one of the major hurdles to safety progress has been the inclination to rely on common opinions about it. As humanity progressed, people reasoned that whoever caused an injury should suffer an equal harm. Through the sixteenth – nineteenth century (Adams, 1995) the basic law for governing employer liability for worker injuries rested in common law. Three doctrines that were highly beneficial to the employer: fellow servant rule – the employer was not liable for employee injuries caused by the negligence of a fellow employee; contributory negligence – the employer was not liable for accidents due to an employee‟s negligence; assumption of the risk – the employer was not liable because the employee was aware of all the job risks.

Grimaldi and Simonds (1984) identified the first legislation to prevent industrial injury as the 1802, Health and Morals of Apprentices Act. Although directed to the Safety and health of children, it was the first legislation on behalf of safety. At the same time, punitive compensation for preventable injuries caused by unguarded mining equipment was provided in England. As a result of the inadequacies in the common law approach to paying injured workers, workers‟ compensation laws began in Germany1885 and in Great Britain in 1897.

Compulsory worker‟s compensation was established as a no-fault insurance system. It made the employer liable for work-related deaths and injuries, regardless of whether there had been employee negligence. In return for the right to these incontestable benefits, the employees and their families gave up the right to bring suit for damages under the common law. In 1908 (Heinrich, 1959), Congress passed a workers‟ compensation act providing benefits to federal employees. New Jersey passed the first workers‟ compensation law in 1911. In 1912 the first estimates of total industrial deaths were prepared. "The estimate was 35,000" (Heinrich, 1959, p. 431). Carriers of workers‟ compensation insurance, anxious to keep accidents at a minimum, initiated safety inspection services (Adams, 1995).

The role of the American government in the protection movement was exemplified by the number and variety of regulations and laws that have shaped the course of safety, health, and environmental protection concepts. Since 1887, the federal government, through the Interstate Commerce Commission, has exercised regulatory powers over the transportation of passengers as well as hazardous materials. According to Adams (1995), "the failure of safety professionals to gain universal acceptance of the role of accident prevention in traditional management practices has, finally, resulted in an evolving system of safety by government regulation" (p. 7). In 1970, Congress passed the Williams-Steiger Act more popularly known as the Occupational Safety and Health Act (OSHA). According to Grimaldi and Simonds (1984), this act authorized the federal government to set and enforce the safety and health standards for all places of employment affecting interstate commerce and to enforce the standards with criminal and civil penalties for violations. This law provided an additional impetus for management,

(Adams, 1995, p. 9), "maintaining compliance and thereby avoiding citations, fines, and even possible imprisonment."

### 2.3.1 Heinrich Safety Management Principles

According to Adams (1995), Waldo Heinrich is the "godfather" of the safety profession (p. 4). After reviewing seventy-five thousand industrial accident records from insurance companies and plant owners, Heinrich (1959) concluded that 88% of all injuries were caused by unsafe acts. In 1955, Heinrich (1959) analysed accident cases reported by the State of Pennsylvania, analysis showed unsafe acts for "82.6 % of the cases and mechanical causes for 89 % of all accidents" (p. 21). Heinrich"s (1959) basic philosophy of accident prevention was based on 10 axioms. They were as follows:

1. The occurrence of an injury invariably results from a completed sequence of factors-the last one of these being the accident itself. The accident in turn is invariably caused or permitted directly by the unsafe act of a person and/or a mechanical or physical hazard.
2. The unsafe acts of persons are responsible for a majority of accidents.
3. The person who suffers a disabling injury caused by an unsafe act, in the average case has had over 300 narrow escapes from serious injury as a result of committing the very same unsafe act. Likewise, persons are exposed to mechanical hazards hundreds of times before they suffer injury.
4. The severity of an injury is largely fortuitous-the occurrence of the accident that results in injury is largely preventable.

5. The four basic motives or reasons for the occurrence of unsafe acts provide guide to the selection of appropriate corrective measures.
6. Four basic methods are available for preventing accidents-engineering revisions, persuasion and appeal, personnel adjustment, and discipline.
7. Methods of most value in accident prevention are analogous with the required for the control of the quality, cost, and quantity of production.
8. Management has the best opportunity and ability to initiate the work of prevention; therefore it should assume the responsibility.
9. The supervisor or foreman is the key person in industrial accident prevention. His application of the art of supervision to the control of worker performance is the factor of greatest influence in successful accident prevention. It can be expressed and taught as a simple four-step formula.
10. The humanitarian incentive for preventing accidental injury is supplemented by two powerful economic factors: (1) the safe establishment is efficient productively and the unsafe establishment is inefficient; (2) the direct employer cost of industrial injuries for compensation claims and for medical treatment is but one-fifth of the total cost which the employer must pay. (p. 13 –14)

Heinrich (1959) considered the occurrence of an injury to be the result of a series of events. Several factors in the "accident-occurrence sequence is given in chronological order in the following list: ancestry and social environment, fault of person, unsafe act and/or physical hazard, accident, and injury." (p. 15). Goetsch (1993) believed the theory has two major points: "Injuries are caused by the action of preceding factors; and removal of the central factor (unsafe act/hazardous condition) negates the action of the preceding

factors and in so doing, prevents accidents and injuries" (p. 35). Adams (1995) described Heinrich's 1st Axiom as the "theory of accident causation" (p. 15).

In 1959, H.W. Heinrich in *Industrial accident prevention* wrote that management was responsible for the "safe mechanical and physical conditions in the workplace" (p. 45). However, it was a "moral obligation of the employer, to his employee, and to society requires that a reasonably safe working environment be maintained" (p. 45). Heinrich felt that it was "a most difficult task to be practical and fair in any attempt by law to achieve wholly safe employee working conditions" (p. 43). Petersen (2001), in *Safety management: A human approach,* described the development of safety as a series of eras. In chronological order they include, "inspection unsafe act and condition industrial hygiene noise safety management OSHA accountability behaviour based and human." (p. 3 – 7)

Heinrich's publication of *Industrial accident prevention* in 1931 ushered in the unsafe act and condition era. Petersen (1989) updated Heinrich's Axioms and called them "new principles of safety management. (p. 15)

Petersen's principles are:

1. An unsafe act, an unsafe condition: all these are symptoms of something wrong in the management system.
2. Certain sets of circumstances can be predicted to produce severe injuries. These circumstances can be identified and controlled: unusual and routine; high-energy sources, non-productive activities, and certain construction situations.

3. Safety should be managed like any other company function. Management should direct the safety effect by setting achievable goals, by planning, organizing, and controlling to achieve them.
4. The key to effective line safety performance is management procedures that fix accountability.
5. The function of safety is to locate and define the operational errors that allow accidents to occur. This function can be carried out in two ways: (1) by asking why searching for root causes of accidents, and (2) by asking whether certain known, effective controls are being utilized.
6. The causes of unsafe behaviour can be identified and classified. Some of the classifications are overload (improper matching of a person‟s capacity with the load), traps, and the worker‟s decision to err. Each cause is one which can be controlled.
7. In most cases, unsafe behaviour is normal human behaviour; it is the result of normal people reacting to their environment. Management‟s job is to change the environment that leads to the unsafe behaviour.
8. There are three major subsystems that must be dealt with in building an effective safety system; the physical, the managerial, and the behavioural. The safety system should fit the culture of the organization.
9. There is no one right way to achieve safety in an organization; however, for a safety system to be effective, it must meet certain criteria. The system must:
    - Force supervisory performance
    - Involve middle management

- Have top management visibly showing their commitment.
- Have employee participation
- Be flexible
- Be perceived as positive. (p. 15)

According to Adams (1995), Shewart‟s control chart revealed that 85% or more of the variations in an operating system have their origins in the characteristics of the system. In addition, Dr. Juran (Breyfogle et al., 2001) found that 80% of problems were attributable to defects in the work processes.

After reviewing the development of safety theory, it can be concluded of the importance that management plays in the attainment of a successful safety program. Grimaldi and Simmonds (1984) make the following point: that while everyone has a role, "Safety is an acknowledged management responsibility" (p. 6). Heinrich (1959) agrees, **"**the initiative and the chief burden of activity in accident prevention rest upon the employer; however, the practical field of effort for prevention through psychology is directed largely to the employee, but through management and supervision" (P.73).

### 2.3.2 The Importance of establishing Safety measures

Webster‟s New Collegiate Dictionary defined a workshop as a small establishment where manufacturing or handicrafts are carried on. Sackey (1999), states that a workshop is a place or building where facilities such as machines, tools and work benches are provided to enable a worker or student to carry out his or her practical activities in a satisfactory manner. The workshop must be designed to allow employees to

work without injures. Machines in the workshop should be placed with enough space around it to enable students observe the instructor during demonstration.

In the view of Burrows (1998), an unobstructed working area is fundamental to the safe operation of machines. The layout of the machine shop should be given careful attention so that machines are positioned to make maximum use of available space and to make account of the usual production cycle. Machines should be positioned where the operator cannot be pushed, bumped into or easily distracted. Where possible, cutting machines should be separated from assembling or packing areas and areas used by forklifts, trucks or other transport vehicles. The production process should be arranged so that materials follow a logical path from delivering and storage, through the production process and on the dispatch area.

According to Tolpin (1992), before setting down any machinery, think about layout, because proper placement of the major stationary tools and work surface is critical to the creation of a shop that works well. A good layout will maximize production, reduce operator fatigue and facilitate the smooth of materials throughout the shop to prevent accident. Bayliss (1963), states that it is very difficult to get a perfect layout for the machines and benches in a workshop because of the varying nature of the work they are sued for. It is a good plan, however, to arrange the machines in the of production flow to avoid unnecessary waste of time when work is carried between operations. The working space is necessary to allow free-line of work in the workshop and safe to work in, and in the event of an accident, there will be clear emergency procedures.

The layout and size of a workshop is determined by the mechanical engineering workshop needs. Make safety the number one concern when planning for work shop.

Make aisles wide enough for passage and leave plenty of room around each machine. Sharp edges on machines should be either padded or placed in a position that will not interfere with persons moving around the shop. A fire extinguisher should be placed at each end of the shop preferable by the entrance or exit. Temperature extremes and humidity will make the shop in comfortable and stress, tools and machines (Bayliss, 1963).

A skylight or two would be nice to have for natural lighting and paint the ceiling to reflect the maximum light. Idealistically, a shop should have two exits, one at each end of the shop for emergency evacuation. Install a large door that will be large enough for bringing in sheet material and large tools and that will also allow exiting the shop with finished product. Natural light is still the best lighting and windows high up in wall will provide natural light and ventilation without taking up lots of space, skylight should be put in each working area. Concrete floors be made to eliminate much of the dust and also provide a surface that is easy to sweep and mop. Planning the placement of tools and machines will help identify locations for electrical outlets and don‟t forget to place an outlet or two in the ceiling for air cleaners. Lighting should be on a separate circuit from tools, break up the shop lighting into grids that way, if one circuit develops trouble there will be another circuit to use when fixing the problem (Books 1994).

## 2.4 Empirical Literature

### 2.4.1 The impact of health and safety practices on employees' productivity

There is no accepted definition for safety, many authors tried to define it in their own ways. Walton (1999), defined safety as measure that prevents a mechanism from being operated accidentally or dangerously. According to Walton (1999), safety is a term

used when planned measures are taken to control situations and acts in an endeavor to prevent injury to person concerned, injury to others, and damage to the workshops, its equipment and materials.

In the view of Moern (1999), workshop safety are up to workers themselves, developing a safe way to use a machine or tool is the best attitude one should develop while working in order not to put everyone at the workplace in danger It is important to know all the safety measures and understand the steps for operating each machine and tool in the workshop and make sure to do the steps in the right order. Majority of workshop accidents are not due to equipment failure or improper workshop design, simply, it is a work attitude issue, not being alert or interruption by someone may have consequences and experience causes some accidents. Hamly (1997), stated that consider personal safety within the workshop; sharp edged tool can easily slip and cut very badly. Machines and power tools can remove fingers faster than the speed of light.

Always consider how an accident of this nature would be dealt with. Most of the machines, tools used in the workshop if not properly used or handled may result or damaged the machine tools and the operator. It is essential to observe safety measures and develop a safe working attitude and adopting safe methods and techniques are surest way of avoiding unnecessary accidents and dangers in the workshops. According to Book (1994), hand tools and power driven machine tools have been developed to save time and perform accurate repeatable work. Hand and power tools consistently perform the same operation hundreds of time if they are properly used, cared for and understood. In nearly all cases, mistakes and or injuries are due to operator error, not the machine to prevent

accident in the workshop. Develop a good attitude towards safety and pay close attention to the instructions and demonstrations given to the work.

The importance of safety and one willing to give time and attention to learning in the safest way is to perform the task. Be certain to work carefully and follow the rules even when no one is watching. A safe attitude will protect the operator, the others, not only in the shop but also in activities outside. Real (1997), is of the view that when realizing (making) designs it is most important to make them safely, using safe working practices in a safe working environment.

The single most common cause of accidents in workshops is human carelessness, and the most effective way of creating a safe working environment is to behave in a mature and responsible manner. One must always think about safety and that could change one‟s life or somebody else life forever. Before starting work with any tool or equipment, especially machines, remove or tuck in ties, take off jewelry and tie back long hair. Always wear the safety items provided and make sure they are put back for others to use. Wear aprons or overalls to protect clothes as well as stout shades and put on special protective clothing and eye vent injuries (Real, 1997).

Safety is regarded as an important of the total operation for at least two reasons. One is the natural concern for people‟s welfare and another is financial injuries to workers are costly since they reduce the efficiency of the working force and may result in expensive medical bills and lawsuits. Safety is of prime importance in the work places operation, therefore one should not just read but really learn the safe rules for any job to be done, and put the rules into practice. Do this for each piece of equipment and learn to make safety a habit. With common sense and an understanding of basic safety

precautions, one has a good chance of avoiding injury on the job. Some injuries are not obvious because they develop over a long period of time. Repeated contact with chemicals or dust is one example, some chemicals take long time to affect a worker‟s health, when a worker finally realizes the problems the health may already have been damaged (Real, 1997).

This is why it is important to wear protective clothing, including a goggles or respirator when appropriate. A dust mask can filter out particles, but cannot protect against fumes. To protect against chemical fumes one should wear a respirator. Many tools can also be equipped with dust collection to protect the health of the worker (Feirerer all 1993).

### 2.4.2 The Factors that Influence Health and Safety Practices

Safety management is the identification and implementation of actions intended to control the threats of harm. Safety management promotes two major concepts; the safe place and safe person concepts. The safe place concept seeks to enjoin the manager to ensure that the material elements of work (equipment, machinery, working environment, etc) are safe and without risk of injury having regard to acceptable safety standards. The safe person concept encourages the implementer to adopt strategies to protect persons from excessive exposure to risks by providing personal protective equipment (Melomey and Tetteh, 2011).

Accidents can occur everywhere and a non-existent or even inferior system of ensuring safety leads to unavoidable, undesirable and unwarranted accidents. There is a perception that high levels of automation has led to a corresponding increase in accidents.

Those who hold the perception explain that automation has increased the reliability of machines which has led to some amount of operator and maintenance staff carelessness. This in turn has generated complacency which resulting in accidents. Before an accident takes place some forewarnings are available. These forewarnings, when heeded and taken care of, can help to prevent avoidable accidents. Failure to report incidents for thorough investigation to prevent these accidents can be extremely expensive (Gopalakrishnan and Banerji, 2004).

Accidents involve people or the machines and often result in injury, loss and or damage. In the case of persons involved, apart from the loss, disability or pain, the psychological suffering he or she feels cannot be quantified in monetary terms. For the employer, the damage, medical, legal and compensation cost can be huge. Other costs the employer can incur include repair and or replacement costs and sometimes recruitment and training costs especially in cases where the injured worker has to be replaced (Gopalakrishnan and Banerji, 2004).

Several studies show that there is a close correlation between asset reliability and safety of workers in a company. Safety management therefore has become one of the important factors in industrial management today. Though current paradigm makes safety a shared responsibility of all employees the maintenance department has a direct responsibility for the implementation of the programme (Dabbs, 2008).

Breakdown of equipment place employees in awkward positions and especially when the maintenance strategy adopted by the company is reactive in nature, maintenance personnel often like to take short cuts in an effort to get the equipment running. This action exposes them to and increases the likelihood of injury (Franklin,

2008). While undertaking maintenance workers are also exposed to wide variety of hazards which can be physical, biological and even psychosocial. Safety management is therefore an important factor in industrial management to both the employer and employees. It is the responsibility of management to ensure that a safety policy exists and is adhered to. To ensure that the company benefits fully from safety activities, it is august for the top management to initiate a safety culture and also set up an internal safety department to sustain the activities of the culture. It is reported that the culture of safety is most effective when it emanates from the top hierarchy and percolates down to one and all within the organization (Gopalakrishnan and Banerji, 2004). It has become imperative for industries to develop safety management systems and train safety professionals to prevent and control accidents, injuries, illnesses and other similarly caused harmful events in industries (Melomey and Tetteh, 2011).

Currently, some of the tools used to develop safety management systems in industries include the six sigma, ILO: 2000, ISO9000:2000, ISO 14001:2004, the most current being BS OHSAS 18001:2007 (Williamsen, 2008; Aniagyei, 2011). Another way of ensuring safety is in regular training of employees in safety practices. To facilitate training some institutions utilize simulators. This equipment is increasingly being used for basic training and retraining. Simulators possess the advantage of being able to simulate different types of crises a worker may face while handling a familiar or complex piece of machinery, takes away the edge of complacency, and sharpens the senses of the worker, making him aware of the dangers he would face in the field (Gopalakrishnan and Banerji, 2004).

Ensuring good safety management practices have benefits to both the employer and the employee. Some of the benefits the employer receives include reduction in insurance costs and compensation liabilities, prevention of replacement of expensive machines and or components of the machine and improvement in the working climate within the firm among others. On the other hand, adherence to good safety practices boosts employee confidence and allows him to enjoy his work and also protects him from injury which could destroy his earning power and further protects him from losing his earning capacity for the future (Gopalakrishnan and Banerji, 2004).

### 2.4.3 Challenges faced by employees in their attempt to enhance Safety Standards and Health Problems Faced by Employees

In most accidents, managers and supervisors almost instantaneously point fingers at human efforts and unsafe actions as the ultimate cause without probing deeper into the root cause of the accident. Such incidents occur due to multifaceted factors. Human errors and unsafe actions caused by illiteracy, lack of training, poor supervision, technical flaws relating to design, layout, machine guarding and arrangement of work (Krishnan, 1999). Very often it is found out that accidents occur in activities ancillary to the main purpose of the organization, and these activities are given less safety focus by the management. Safety standards is an orderly arrangement of interdependent activities and related procedures that drives on organization health and safety performance. According to Bryan, (1999), it can be defined as the plan to reduce and eliminate hazards and risk at workplace.

According to occupational Health and Safety Act 651, health and safety means the conditions or factors that affect the well-being of employees, temporary workers, contractors, personnel, visitors and any other person at the workplaces. It is a part of the overall management system that facilitates the management of the occupational health and safety risk that are associated with the business of the organization. This includes the organization structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and managing the organizations‟ health and safety policy. From the view point of Wayne, (2002), each employer has a general duty to provide a place of employment free from recognized hazards; they also have the special duty to comply with all health and safety standards. The Occupational Health and Safety Act to date, has issued a large number of detailed standards covering numerical environmental hazards. The occupational health and safety standard governs potentially unsafe work condition that employees may be exposed to, for example, the Act states that the employer must provide suitable protective clothing‟s such as safety shoes, cap, aprons and appropriate tools and equipment for their employees to carry out task. The Act also states that suitable first aid facilities must be provided or be available at the workplace as well as safety signs placed at specific risk and hazardous points to warn employees as well as to ensure that the employer provides the maximum level of comfort at the workplace.

The Act also charges the employers and employees to report incidents and accident in the workplace for at least three years. Majority of such standards were acknowledged as helpful and important by all organizations‟. The health and safety at work defines the duties and obligations of both employers and employees in ensuring that

the workplace is maintained as a save working environment. This Act consolidated many previous enacted safety requirements and made employees responsible for their own safety. Employers are obliged to avoid health and safety hazards and secure a safe working plan and implement code of practice for safety and emergency evacuation. Employers have the duty of issuing a written statement of general policy with respect to health and safety matters in their organization and implementation for the revision with the organization and also to provide for the appointment of safety representatives (Labour Act, 651).

In accordance with the Factory, offices and shops Act, (1970), employees have the duty to take reasonable care for their own health and safety and that of other persons who may be affected by their operations. Again they are to co-operate with the employer or any other person who has a duty to carry out under the same Act. In the view of Pantry (1995), work – related illness and injuries have been a feature of employment since industrialization begun. Such illness and injuries clearly have important physical, emotional and financial consequence for workers and their families, society and the nation as a whole. Occupational health means keeping oneself free from illness associated with conditions at work. Work-related illnesses are major health problem in industries. Hazards at work may or may not be obvious such as exposure limits in which many substances and environments established under cost regulations, exposure limits maybe exceeded accidentally.

According to Cole, (2002), the highest numbers of accidents occurring in organizations‟ (manufacturing) premises was due to persons falling, slipping or tripping. Therefore, floor surfaces must be of a suitable construction to reduce this risk. A major

reason for the high incidence of this kind of accident is that water and grease are likely to be spilt, and the combination of these substances is treacherous and makes the floor surface slippery. For this reason any spillage must be cleaned immediately and warning notices put in place, where appropriate, highlighting the danger of the slippery surface.

### 2.4.4 The importance of implementing health and safety policies

Pantry, (1995), observed that every worker has the right to work in a healthy and secure environment. It is the prime duty of the employers to give their labour force with an environment that is safe, healthy and friendly. Workers health and safety should be the prime concern of all the employers. A worker of an industry or organisation is liable to work in an environment where his safety and health are properly taken care off. The workplace is the setting in which many people spend the largest proportion of their time. Indeed, for many people, particularly in developing countries, the boundary between their home and workplace environments is blurred, since they often undertake agricultural or cottage industry activities within the home. Growth of the latter has often been spurred by population growth and rapid urbanization, in combination with economic development, and in parallel with larger, more conspicuous industrial development (Pantry, 1995). In favourable circumstances, work contributes to good health and economic achievements. However, the work environment exposes many workers to health hazards that contribute to injuries, respiratory diseases, cancer, musculoskeletal disorders, reproductive disorders, cardiovascular diseases, mental and neurological illnesses, eye damage and hearing loss, as well as to communicable diseases (Weeks, et al, 1991).

In an article presented by the World Health Organisation, the current global labour force stands at about 2600 million and is growing continuously. Approximately 75% of these working people are in developing countries. The officially registered working population constitutes 60–70% of the world's adult male and 30–60% of the world's adult female population. Each year, another 40 million people join the labour force, most of them in developing countries. Workplace environmental hazards are therefore a threat to a large proportion of the world population (World Health Organisation, 1999).

Workplace design and processes may promote organisational success by creating environments that support work quantity, quality, and style, while improving turnover and absentee rates (Mohr, 1992). Over the years, many organisations have been trying new designs and techniques to construct office buildings, which can increase productivity, and attract more employees. Many authors have noted that, the physical layout of the workspace, along with efficient management processes, is playing a major role in boosting employees‟ productivity and improving organizational performance (Vancevich, 1995). According to Cole (2002), the key factors that affect employee‟s productivity and performance fall into two categories:

Management driven factors which include the development of organisational plans such as the allocation of responsibilities at all levels of the organisation, definition of job descriptions and the degree of access to the management and administrative support needed to complete their tasks, working patterns, shift-working, break times, absence or holiday cover and health and safety policies, including the provision of

training, development of safe working practices and the adequate supply of protective clothing and equipment.

The other factors that affect performance and productivity arise from the work premises, office or factory design, machinery and workshop tools, workspace availability, light intensity, weather, temperature ventilation, humidity, noise, vibration, hygiene and welfare facilities. A factory, workshop, production floor design, function often follows from when an office is configured to maximize employee interaction, then collaboration becomes an integral part of every workday. Office designs based on setting up work areas wherever they are needed in the production floor can raise satisfaction while boosting density. In recent times the organisations design is a critical ingredient to the success of any business operation. However, most companies have a remote or mobile workforce, diverse employee demographics, specific corporate and branding objectives, an international workforce and global clients. According to Neal, (2000) an employee's workplace is responsible for 24 per cent of their job satisfaction level and this can affect staff performance by five per cent for individuals and 11 per cent for teams.

The workforce is the most valuable asset of any business and as such serious attention should be given to the physical environment of the office which is more likely to increase staff productivity. Poor workplace design, by contrast, is linked to lower business performance and higher level of stress experienced by employees‟ physical, psychological, and social well-being and consequently work performance.

Clark (2005) observed that the costs of unhealthy and unsafe workplaces have been well documented and are calculated in terms of absenteeism. According to the World Health Organisation Report, (2002), one person in four suffers from a mental health problem at

some point in their life. A 2006 report commissioned by five leading mental health charities states that at least one million adults in the UK are out of work with mental health problems. Work-related stress is the root cause of a significant degree of mental ill health. Stress can manifest itself in absenteeism, reduced productivity, and increased staff turnover. Excessive stress can lead to fatigue, impaired judgment and decision-making and the onset of both mental and physical health problems. The impact of health on performance is demonstrated by a study of employees at the US banking giant Wachovia, which found that employees who are put through an energy renewal program outperformed a control group by 15% to 20% in achieving bottom line targets for sales and business growth (Phillips, 1995).

Productivity is generally seen as a measure of the amount of output generated per unit of input. In many countries, public sector productivity has been assumed to be zero in the national accounts. According to Boyle (2006), output of the government sector has been measured as equal in value to the total value of inputs. This output one-fourth input convention has increasingly come under scrutiny in recent years. The challenge is to devise alternative estimates based on output measurement in a public sector context where collective services are provided and where there is, in most instances, no market transaction in services provided to individuals (Boyle, 2006).

Putnam, (1993) rejects the idea of including outcomes in productivity measurement. He opined that productivity should focus on outcomes (changes in health rather than patients treated; changes in educational status rather than numbers of lessons taught) includes changes over which the government has no control. Holzer and Seok-Hwan, (2004) argue that although the concept of productivity has been utilized for many

years, it is often simplified, misinterpreted and misapplied. According to them, the concept of performance may represent a more attractive conceptual path toward improvement. Still, both concepts are underlying premises of public administration and the core of an ongoing effort that persists because it addresses a fundamental linkage: a productive society is dependent upon a high-performing government. In fact, the use of the concept of productivity has been intermingled with the concept of performance (Jackson, 1999).

According to Holzer&Seok-Hwan, (2004) productivity and performance are functions of many factors ranging from top management support, committed personnel at all levels, a performance measurement system, employee training, reward structures, community. Involvement and feedback to correction of budget-management decisions. It is thus important to build up capacities for productivity improvement. Productivity at organisational and process levels has focused on manufacturing industry; it is based on an assumption of an organisational core process as an industrial production process (Gummesson, 1992). McCunney (2001) intimated that productivity is also often linked to discussions concerning general efficiency. Productivity is understood in a wider sense and combined to rationalisation of work and improvement of wellbeing in the work community. McCunney (2001), views productivity as a conceptual phenomenon and widening the concept weakens its characteristics as a tool for research and development.

At the core of the healthy organisation perspective is the relationship between healthy work contexts and organizational, rather than individual, outcomes. Productivity or organisational performance is one set of outcomes. Most research linking employee health to productivity takes a conventional health promotion perspective. This reflects the

expansion in the United States of workplace wellness programs in a drive to reduce employer medical care costs (Baker and Green, 1991).

Muchemedzi and Charamba, (2006), view occupational health and safety as a science concerned with health in its relation to work or working environment. Oxenburgh et al., (2004), intimated that the health and safety of all employees is closely linked to the companys productivity in all workplaces. In most cases, occupational health safety is largely measured by negative outcomes such as workplace injury and illness but these measures have a shortfall, for instance, a low incidence of injury does not necessarily mean that adequate safety systems and controls are in place (Health and Safety Executives, 2006).

### 2.4.5 Implementation of Health and Safety Practices and Productivity

According to Gunderson (2002) a number of researchers have been developing performance indicators to measure the impacts of a range of workplace practices on firm-level performance. Examples include gross or net sales per worker, the ratio of physical input to output, and the scrap rate and uptime for production equipment. The choice of the outcome variable is constrained by the data available for the firms or industries under study (Stainer and Stainer, 2000). In studies of workplace innovation, such as job redesign, teams, reduced hierarchy, or the delegation of responsibility, it is difficult to measure productivity accurately and consistently (Stainer and Stainer, 2000). According to Brinkerhoff and Dressler (1990), understanding how healthy work environments affect productivity also requires more detailed analysis of individual worker‟s job performance than presently available. Brinkerhoff and Dressler (1990), opined that productivity

reflects results as a function of effort. They however intimated that efficiency (input to output) and 4effectiveness (the process of getting a task done) do not necessarily equate with productivity, because the latter takes into account the end cost of the product or service. For example, working harder may not have the same productivity payoffs as working smarter, which may not require more time or effort. Both kinds of effort may vary in their effects depending on the specific organisational context. Productivity depends on an individual‟s job performance (Jex, 1998).

In assessing how work environments contribute to worker well-being, it is important to distinguish between task and „ contextual performance (Parker and Wall, 1998). The latter refers to helpful coworkers, communication, „entrepreneurship, innovative activities, initiative, adaptation to change, and flexibility. These reflect workplace social relationships and are critical as more organisations depend on team work for their success (Yeatts and Hyten, 1998). Duxbury and Higgins, (1997), stress that, supportive managers are a key ingredient of effective teams, just as they are crucial to employee well-being. The healthy organisation model draws on the population health literature dealing with environmental influences. This mirrors organisational performance research which tries to situate individual workers in their workplace context.

As Demmin, (1986), argues, most variance in worker performance is due to the attributes of work systems, not individuals.

Furthermore, in organizational behaviour research, there are many unanswered questions about how job designs affect contextual features of performance (Parker and Wall 1998). Yet at the same time, workplace innovation studies suggest that greater employee participation and autonomy affect learning and skill development, which in

turn may contribute to productivity (Bélanger, 2000; Black and Lynch 2000). One point of convergence is that many innovative work organisation practices and job designs are documented to make jobs less stressful and healthier (Karasek and Theorell, 1990).

Muchemedzi and Charamba, (2006) explain that accidents do not arise from a single cause but from a combination of factors which act simultaneously. A potentially unsafe situation does not cause an accident until someone is exposed to it. Accidents are caused by the result of unsafe acts or practices (the human element that results from poor attitudes, physical conditions and lack of knowledge or skills to enable one to work safely). They are also caused by the result of unsafe conditions of equipment or materials.

Koopman, (2001) states that accidents bring pain and suffering to the worker and his family. When it results in permanent disability, the consequences are disastrous for both the victim and the company. The victim loses his earning capacity and ability to enjoy a normal active life, and the society and company are deprived of his/her skill and contribution to production. The 1969 Frank Bird Accident Ratio study on causes of accidents found out that 88% of accidents are caused by unsafe acts of persons, 10% are caused by unsafe mechanical or physical conditions and the remaining 2% are unpreventable. According to McCunney, (2001) the primary beneficial impact of occupational health and safety on productivity is reduced absenteeism.

McCunney, (2001), demonstrates that the health risks and failure of employees to participate in fitness and health promotion programmes are associated with higher rates of employee absenteeism. There is need for much emphasis on the employers‟ participation in ensuring that health and safety programmes and policies are existent. If these health and safety practices are set, it is more likely that the worker participates in

order to preserve his/her life. However, absenteeism may be encountered but may be completely neither unjustified on medical grounds nor attributable to unsafe conditions or hazardous events in the workplace. It is difficult to demonstrate conclusively the extent to which business prosperity benefits from good health and safety or on the contrary, to say that prosperous businesses have good health and safety because they are able to afford it (Health and Safety Executive, 2006).

The Health and Safety Executive, (2006) argue that there is clearly a vicious circle in that, a healthy and happy workforce is more productive, leading to increased investment in organizational health and safety to reduce accidents, which in turn leads to further productivity gains. The Health and Safety Executive, (2006) further explains that genuine productivity gains can be realized by those businesses that invest in high performance health and safety practices. However, the Health and Safety Executive, (2006) also recognizes the need to have a positive attitude by many organisations if they are to move on from simply attaining minimum legal compliance toward implementing the best practice of health and safety. For those organisations that make the transition, the rewards are well worth the effort. In other words, when an organisation is committed to health and safety best practice and implements it in a properly managed manner, safety at workplaces and to put in place safety programs for workers. Other occupational safety professionals include engineers who can make assessments in the workplace. Along with industrial hygienists, they can address such issues as ventilation or other protective measures (Weeks, et al 1991).

The Trade Union"s position on occupational health and safety is to ensure that work is made safer by modifying the workplace and any unsafe work processes. This

means that the solution is to remove the hazards, not to try to get workers to adapt to unsafe conditions. Requiring workers to wear protective clothing which may not be suited or designed for the climate of the organisation is an example of forcing workers to try to adapt themselves to unsafe conditions which is also shifting the responsibility from management to the worker. This implies that work can be made safer if workers change their behavior or if employers only hire workers who never make mistakes. (Weeks, et al 1991).

### 2.4.6 Management commitment to Safety Practices

According to Jorma,(2004) management is responsible for most of the safety issues within organizations because they control the assignment of resources, establish and implement the methods of work as well as develop the policies. From the view point of Beach (2000), safety improvement of an organisation is the responsibility of top management, though an important role is played by workers and team members in order to achieve the overall objectives of the company. Beach (2000) also revealed that management's commitment to safety is a major factor affecting the success of safety programmes in industries and this parameter is capable of discriminating between high and low accident rate organisations. Management commitment remains a key component of contemporary safety climate research (Lees, 2002).

According to Less (2002), this commitment can manifest itself through management participation in safety committees, consideration of safety in job design, review of pace of work, accident and near-miss incident investigation and follow up actions, priority assigned for safety, occupational health programmes etc. Investment by

organisations in these areas fosters perceptions of the company‟s‟ commitment and builds worker loyalty in areas such as safety behaviour (Mearns, et al, 2003). Employee‟s perceptions will reflect how employees believe that safety is valued in the organisation (Neal, 2000).

The motivation to perform a job in a safe manner is a function of both the individual‟s own commitment concern for safety as well as management's expressed concern for safety. Safety commitment of the management must result in an observable activity on the part of the management and must be demonstrated in their behaviour as well as their words (Mearns, et al, 2003). In order to develop a successful health and safety programme, it is essential that there be strong management commitment and strong worker participation in the effort to cease and maintain a safe and healthy workplace. Management commitment determines the phase and the direction of safety and health activities and it portrays the values that are placed on health and safety management as preserved by the employees. Without employees "involvement health and safety performance would never be achieved. There would be high result of achievement of health and safety when both management commitment and employees" involvement are in joint hands in pursuit for a safe and healthy working environment.

### 2.4.7 Employees' commitment to Health and Safety Practices

Workers involvement may be termed as willingness of employee to accept responsibility for their behavior in creating accident free workplace. From a management perspective, workers involvement refers to the ability of workers to directly influence or form the management and work process in an enterprise (Cohen and Michael, 1999). The

term employee refers to every employee in the organization at every level and in every department. Workers involvement is a process involving behavior that is dynamic, action oriented and problem solving that continuously seeks for improvement in a safety conscious environment (Cohen and Michael, 1999).

According to Schein, (1992) there is the need to increase safety for individuals if they are to feel secure and capable of changing behaviors and adapting to new policies and procedures. Thus, employees involvement means that employees have a substantial voice in health and safety decisions and also have the leverage to initiate and achieve health and safety improvement as well as hold themselves and others accountable for their actions as well as taking pride in the health and safety performance record of the organisation. Contrary to workers involvement, employee pessimism could paralyze problem solving activities of individuals and workgroups because employee pessimism behavior carries enormous negative consequences for individual and for the organisation where they work.

From the view of Oyan (2000), employee pessimism was found to correlate with poor safety performance. He also viewed workers involvement as a means of improving both the overall health and safety conditions at the workplace. When employees are aware of management‟s sincere interest in them, they will respond in kind. In this type of an environment on the one hand, employee innovation, thinking, suggestion and decision making evolve to the benefit of the employee and the organisation alike. High employee morale and commitment decreases absenteeism and turnover. High employee morale and commitment are associated with high safety performance.

According to Alazab (2003), based on the studies of the United Kingdoms health and safety executive found out that companies that promoted employee involvement in health and safety issues frequently saw a reduction in accidents and injuries and there were improvement in hazards awareness and productivity. From the study on safety by Costigan (2001), it was revealed that the highest scores of six variables was management commitment and employees involvement followed by workplace analysis as (Inspection, audits and hazards correction) and the third on the rank was safety and health training.

## 2.5 Conceptual Framework of the Study

In the study conducted by Weeks et al, (1991), the area of safety seeks to make workplaces safe for workers within organisations. The concept of safety is that of occupational health, where the goal is to prevent the occurrence of illnesses among workers because of exposures at their place of work. The greatest numbers of injuries seen at work, most of which are preventable involve hearing loss, musculoskeletal disorders, and cumulative trauma problems such as carpal tunnel syndrome. He stated that equipment and motor vehicle injuries specifically, make up the largest number of fatalities related to the workplace. In addition, there are always thousands of cases of broken bones, machine cutting –off parts of the body, materials getting into the eyes, burns, and similar injuries that occur each year(Weeks et al, 1991).

The nature of these problems varies by work environment, age, gender, and other factors, but hundreds of thousands of individuals suffer from workplace-related injuries each year. Many of those who get injured go on to have a permanent disability that may threaten their livelihoods. A variety of professionals specialize in issues of occupational

safety. For example, certified industrial hygienists are the most experienced at assessing workplaces and monitoring workers to see what kinds of exposures are actually taking place. With regard to safety issues, certified safety professionals constitute a group well qualified to assess (Weeks et al, 1991).

# CHAPTER THREE

# METHODOLOGY

## 3.1 Introduction

This chapter contains the research design used, target population of the study, sample size, sampling procedure and data collection techniques.

## 3.2 Research Design

The study used qualitative research approach for data gathering to obtain the needed information for the study.

## 3.3 Population

The population of the study consists of building contractors, site supervisors, health experts, consultants and general artisans in the Akuapem North Municipality. Thus construction workers who are directly influenced by health and safety practices on the site were considered as the population for the study.

## 3.4 Sampling Techniques and Sample Size

Random sampling procedure was used to select the sample size. The researcher used this sampling technique because; every item of the population had an equal chance of being selected. From five weeks survey of construction firms and sites, it was possible for the researcher to identify the population that would assist in addressing the issues regarding health and safety practices. The sample size was made up of 139 people who are directly affected by the health and safety issues in the construction site. A set of

structured questionnaire consisting of items based on the research questions was used to collect data from the population.

### 3.5 Data Collection Techniques

Data collection for the study were in two broad areas. The primary sources such as structured interviews, observations and questionnaires while the secondary sources were articles, journals, construction books and the internet.

### 3.6 Data Collection Instruments

The study used questionnaire, interview and observations to gather information for the study.

#### 3.6.1 Questionnaire

Questionnaires were administered to contractors, consultants and health experts. In all a total of 139 respondents who were distributed with the questionnaires. These experts were selected based on their functions and roles in construction so far as health and safety practices on construction sites are concerned. The issues in the questionnaires involved the following:

- Demographic data of respondents
- The Knowledge on health and safety risk,
- The factors that influence health and safety practices in the selected construction companies,
- The impact of implementing health and safety policies and

- The challenges that affect health and safety policies in the construction firms.

These questionnaires were developed to allow the respondents to select the responses from options.

### 3.6.2 Interview

Structured interviews were personally conducted face to face with interviewees. The structured interview was designed to gather specific information from artisans and supervisors. The respondents interviewed include carpenters, masons, electricians, painters etc and their supervisors. The interviews conducted were based on issues related to health and safety in construction sites. The researcher used tape recorder to record what interviewee said and later coded the responses and analyze.

### 3.6.3 Observations

A visit was paid to some selected construction site in the Akuapem North municipality undertaken by local construction firms. Some of the project visited included the following:

Construction of girls‟ dormitory at Nifa Senior High School Adukrom, construction of classroom block for Nifa Basic School, construction of a warehouse for Nana Takyi local gin company off of the Adukrom-Apirede road. It was observed critically how construction workers used health and safety instruments like gloves, safety boots and helmets to protect themselves from injury.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter presents the results and discussion of data collected.

## 4.2 Results and Discussion of Questionnaire

Questionnaires were obtained from the contractors, health experts and consultants making a total of one hundred and thirty nine (139). A total of one hundred and fifteen (115) were retrieved from the respondents representing 82% and the remaining twenty four (24) representing 18% could not be retrieved since respondents could not produce the questionnaire items at the time of collection. There were also, forty six (46) questionnaire items distributed to contractors, only thirty seven (37) were received representing 80%. Health experts were also given a total of forty three (43) questionnaire items only thirty seven (37) representing 86% were retrieved while fifty (50) questionnaire items were given to consultants and forty one (41) representing 82% were retrieved. Table 4.1 represents the statistics.

**Table 4.1: Response Rate of the Respondents**

| Description | Number of Respondent | Number of Items Distributed | Number Retrieved | Percentage Retrieved |
|---|---|---|---|---|
| Contractors | 46 | 46 | 37 | 80 |
| Consultants | 43 | 43 | 37 | 86 |
| Health experts | 50 | 50 | 41 | 82 |
| **Total** | **139** | **139** | **115** | **82** |

### 4.2.1 Results of Questionnaires from Contractors

**Demographic of contractors**

Table 4.2 represents the summary of the demographic results of contractors and it was clearly shown that men in construction are the majority representing 70.6% while their female counterparts were seen at the minority side with 29.4%. This means that men are stronger physically in terms of hard work than women. Table 4.2 also revealed that most of the contractors sampled were between 40-50 years of ages representing 48.6% which was the highest percentage score. This means that such people are experienced enough in the construction industry because they have worked for some years to attain that level of experience. Result from the table also showed that 30-40 years were the second highest and this also explains that they would soon take the positions of the older ones in future. From table 4.2 it was revealed that in construction most workers were working as part time which represents the highest percentage score (37.8%) while the second highest in terms of employment belongs to full time representing 29.7%.

Table 4.2 continued to revealed that in terms of experience so far as construction is concerned, between 15 and 20 years is the highest period where a lot of contractors in construction gain experiences representing as high as 41.2%. it was also realized that, those contractors with above 20 years was the second highest representing 20.6%, this means that the higher the age in experience, the lower the number because a lot of people with so many years of experience also getting near to retirement. From table 4.2 it was revealed that, less than 5 years of experience was the lowest representing as low as 5.9% and this means that only few people work in construction sector below 5 years.

**Table 4.2: Demographic of contractors**

| Description | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 24 | 70.6 |
| Female | 10 | 29.4 |
| Missing | 3 | 8.1 |
| **Total** | **37** | **100** |
| | | |
| **Age group** | | |
| Below 20 | 3 | 8.8 |
| 20-30 | 4 | 10.8 |
| 30-40 | 7 | 18.9 |
| 40-50 | 18 | 48.6 |
| 50-60 | 2 | 5.4 |
| missing | **3** | **8.1** |
| **Total** | **37** | **100** |
| | | |
| **Type of employment** | | |
| Part time | 14 | 37.8 |
| Full time | 11 | 29.7 |
| Temporal | **9** | **24.3** |
| Missing | **3** | **8.1** |
| **Total** | 37 | 100 |
| | | |
| **Job title** | | |
| contractor | 2 | 5.4 |
| site supervisor | **2** | **5.4** |
| masonry | **15** | 40.5 |
| carpenter | 7 | 18.9 |
| steel bender | **5** | 13.5 |
| electrician | 3 | 8.1 |
| missing | 3 | 8.1 |
| **Total** | 37 | 100 |
| | | |
| **Experience on sites** | | |
| Less than 5 | 2 | 5.9 |
| 5-10 years | 4 | 11.8 |
| 10-15 years | 7 | **20.6** |
| 15-20 years | **14** | **41.2** |
| 20 years and above | **7** | **20.6** |
| **Total** | **37** | **100** |

**Factors that influence health and safety practices**

The questionnaire administered on the factors that influence health and safety practices from the view point of contractors was analyzed as shown in Table 4.3. In order to come out with the real issue so far as health and safety practices are concerned, calculation on the rank of effects of health and safety practices was done, data was analyzed by calculating mean and standard deviation. The Table presents the ranking of analysis.

**Table 4.3: Factors that influence health and safety practices**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Working and falling from height | 34 | 4.12 | .913 |
| Working and falling from height | 34 | 4.21 | 1.008 |
| Handling heavy load and falling down | 34 | 3.76 | 1.208 |
| Factors that influence health and safety practices (manual handling) | 34 | 4.00 | 1.128 |
| Noise (using block/brick cutting machine) which cause hearing loss | 34 | 3.12 | 1.149 |
| Dust (morta/cement) | 34 | 3.62 | .739 |
| Bending, twisting while laying blocks/bricks | 34 | 4.15 | .958 |
| Falling object (blocks, bricks, debris) heating head body including feet | 34 | 4.03 | .870 |
| Workers crushed or stacked by moving vehicles, focal lift | 34 | 3.71 | 1.219 |
| Inhalation of dust from cement causing cancer, respiratory system | 34 | 4.38 | 1.596 |
| Valid N (list wise) | 34 | | |

Table 4.3 shows that a mean mark of 4.38 which happens to be the highest mean score of the respondents said they are not safe as they inhale dust from cement because it can cause cancer and problem to respiration system. This action exposes them to and increases the likelihood of injury (Franklin, 2008). While undertaking maintenance,

workers are also exposed to wide variety of hazards which can be physical, biological and even psychosocial. Safety management is therefore an important factor in industrial management to both the employer and employees. Also, the table revealed that the calculation based on the mean score of the respondents (mean mark = 4.21) affirmed that they are not safe when working and falling from height causing serious or fatal injury and even death.

According to table 4.3, bending, twisting while laying bricks or blocks was the third ranking of the mean score (4.15) from the calculation of the respondents viewpoints affirmed that they experience body pains and waist pains all the time because of the nature of their work and as a result, a lot of people quit employment due to the tiredness of work. Again, table 3.4 also revealed that, a mean mark of 4.03 of the respondents said that they are not safe when falling objects like blocks, bricks, debris heat their head and body including feet causing injuries and landing them in hospitals making them spend a lot monies for treatment. Last but not least, a mean score of 3.12 from the respondents affirmed that they are not safe when there is noise in the construction site, for example when using block/brick cutting machine which causes hearing loss to most of the workers.

**The impact of implementing health and safety policies**

This brings the result that was obtained from the various contractors on impact of implementing health and safety policies.

Table 4.4 brings the results of impact of implementation and safety policies.

**Table 4.4 The impact of implementing health and safety policies**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Impact of implementing health and safety policies-Proper health and safety management can minimize accidents at the construction sites | 34 | 4.24 | .663 |
| Impact of implementing health and safety policies-Employees work harder | 34 | 1.91 | 1.147 |
| Impact of implementing health and safety policies-Employees feel secured and protected | 34 | 3.68 | 1.138 |
| Impact of implementing health and safety policies-. Increases productivity at the construction sites | 34 | 1.50 | .955 |
| Impact of implementing health and safety policies-Promotes a peaceful and safe environment free from hazards | 34 | 1.91 | 1.254 |
| Impact of implementing health and safety policies-Enhances the quality of output | 34 | 1.85 | .925 |
| Impact of implementing health and safety policies-The construction firm gains a good reputation for health and safety management | 34 | 2.06 | .900 |
| Valid N (listwise) | 34 | | |

Table 4.4 shows that a mean mark of 4.24 representing the highest mean mark of the respondents agreed that proper health and safety management can minimise accident at the construction site and it will go a long way to reduce cost of hospital bill increased by the various companies.

The result from the table also showed that, from the mean score of 3.68 which was the second highest, it was clear that respondents agreed that employees feel secured and protected when there is proper health and safety police in the organisation by management because it has become imperative for industries to develop safety management systems and train safety professionals to prevent and control accidents, injuries, illnesses and other similarly caused harmful events in industries (Melomey and Tetteh, 2011). The result from table 4.4 also revealed a third ranking of mean score of

2.06 showed the construction firm gains a good reputation for health and safety management. This means that the construction firm gains a good reputation regarding strong management commitment to safety. This agrees with Mearns, et al, (2003), in order to develop a successful health and safety programme, it is essential that there be strong management commitment and strong worker participation in the effort to cease and maintain a safe and healthy workplace. Management commitment determines the phase and the direction of safety and health activities and it portrays the values that are placed on health and safety management as preserved by the employees. Without employees‟ involvement health and safety performance would never be achieved. There would be high result of achievement of health and safety when both management commitment and employees‟ involvement are in joint hands in pursuit for a safe and healthy working environment.

**The challenges that affect health and safety policies in the firm**

In order to ascertain the impact of challenges that affect health and safety policies in construction firms, a ranking of calculation was done using mean score. Table 4.5 brings the results of respondents‟ views on challenges that affect health and safety policies.

**Table 4.5 Results of challenges of health and safety policies**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| financial constraints | 34 | 2.09 | .830 |
| inadequate equipment and facilities | 34 | 1.76 | .890 |
| management unwillingness to invest in health and safety | 34 | 2.53 | 1.308 |
| employees' negative perception/or attitude maintenance and safety | 34 | 2.24 | 1.156 |
| lack of training and sensitization | 34 | 2.06 | 1.127 |
| Valid N (listwise) | 34 | | |

Table 4.5 shows that a mean work of 2.53 representing the highest mean record of the respondents agreed that management unwillingness to invest more in health and safety is a challenge that affect health and safety policies in the firms.

The second highest mean value of 2.24 which considers employees negative perception/or attitude to maintenance and safety policies. They are of the view that, employees negative perception and/or attitude towards maintenance and safety are challenges that affect health and safety policies in the firms. One must always think about safety and that could change one‟s life or somebody else life forever. The result from the table also depicts that a mean mark of 2.09 which correspond to financial constraints in whichthe respondents agreed that Financial Constraints are challenges that affect health and safety policies in the firms. This happens when the firms find it difficult pay hospital bills for workers who obtain injuries or various accidents. This problem retards the progress of work since most workers will not be healthy enough to come to work.

### 4.2.2 Results of Questionnaires from Consultants

Demographic of consultants

Table 4.6 brings simple results of demographic of consultants.

It was clearly evident from Table 4.6 that men are the dominating gender in construction representing as high as 61.1%. Out of a total of 41 respondents, 22 of them are men while 14 of them are women. This clearly indicates that men prefer to work in the construction industry more than women. Also, men are stronger with physical activities than women. From the Table, it was also evident that more people in the position of consultants are young and energetic in construction which falls between 31-35 years representing 47.2%. The second highest among the age group of the consultants was between 41-46 years representing 27.8%. Though this age group have some experience in the field, they are approaching old age which means that greater numbers of them are giving ways for the young and energetic ones to take over. Results from Table 4.6 indicate that 61.1% of the respondents were Bachelor‟s degree holders, this means that more people continue to attain higher qualifications in the area of construction. 16.7% were HND certificate holders while 6% fall in other levels of education and this category of certificates holders are employed as laborers. Results from Table 4.6 showed that 33.3% of consultants which is the highest percentage, falling between 16-20 years of experience in field of construction. They have a lot of experience in terms of the various schedules of activities so far as health and safety policies are concerned in construction and at the same time from the Table, it was evident that only few of the consultants fall within 6 and 10 years of experience in health and safety issues representing as low as 8.3%.

**Table 4.6 Demographics of consultants**

| Description | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 22 | 61.1 |
| Female | 14 | 38.9 |
| Missing | | |
| **Total** | **41** | **100** |
| | | |
| **Age group** | | |
| 31-35 | 17 | 47.2 |
| 36-40 | 9 | 25.0 |
| 41-46 | 10 | 27.8 |
| missing | | |
| **Total** | 41 | 100 |
| | | |
| **Level of education** | | |
| First degree | **22** | 61.1 |
| Masters | 6 | 16.7 |
| PHD | 0 | 0 |
| Others | 8 | 22.2 |
| Missing | | |
| **Total** | **41** | **100** |
| | | |
| **Experience on sites** | | |
| 6-10 | | |
| 11-15 | 3 | 8.3 |
| 16-20 | **4** | **11.1** |
| More than 20 years | **12** | 33.3 |
| Missing | 11 | 30.6 |
| **Total** | | **100** |

**The Key Factors Considered in Performance Evaluation of health and safety of contractors**

In order to ascertain the key factor considered in performance evaluation of health and safety consultants. A ranking of mean value was done based on the outcomes of the respondents" view. Table 4.7 brings the results of respondents" **views.**

Table 4.7 indicates the Key Factors Considered in Performance Evaluation of health and safety of consultants.

**Table 4.7 key factors of performance evaluation**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Factors In Performance (Equipment Holding) | 36 | 3.47 | 1.444 |
| Factors In Performance (Financial Standing) | 36 | 4.31 | 1.037 |
| Factors In Performance (Quality Service) | 36 | 3.61 | 1.293 |
| Factors In Performance (Technical Personnel) | 36 | 2.83 | 1.134 |
| Factors In Performance (Good Business Relationship) | 36 | 3.89 | 1.369 |
| Factors In Performance (Health And Safety Performance) | 36 | 3.53 | .971 |
| Factors In Performance (Environmental Requirement) | 36 | 3.53 | .941 |
| Factors In Performance (Value Of Various Work Executed) | 36 | 3.81 | 1.091 |
| Factors In Performance (Procurement Related Issues) | 36 | 3.17 | 775 |
| Factors In Performance (Class Of License) | 36 | 4.00 | 1.069 |
| Factors In Performance (Assessment Of Project Cost) | 36 | 4.06 | 1.170 |
| Factors In Performance (Timely Completion Of Building Projects) | 36 | 3.33 | .894 |
| Factors In Performance (Adequacy Of Contraction's Health And Safety Assurance For Workers) | 36 | 2.72 | 1.111 |
| Valid N (Listwise) | 36 | | |

Table 4.7 shows that a mean mark of 4.31 representing the highest mean record of the respondents agreed that financial standing of the consultants is the Key Factor Considered in Performance Evaluation of health and safety. Safety is regarded as an important operation for at least two reasons. One is the natural concern for people‟s welfare and another is financial injuries to workers are costly since they reduce the efficiency of the working force and may result in expensive medical bills and lawsuits. Safety is of prime importance in the work places operation, therefore one should not just read but really learn the safe rules for any job to be done, and put the rules into practice. The second highest mean value of 4.06 which considers Factors in Performance

(Assessment of Project Cost). This will enable consultants work within budget schedule and cut down unnecessary spending leading to over budget.

### 4.2.3 Results of questionnaire from health Experts

**The benefits of health and safety training**

In order to ascertain the benefits of health and safety training, a ranking of mean value was done using mean score. Table 4.8 brings the results of respondents‟ views on benefits of health and safety training.

**Table 4.8 The Benefits Of Health And Safety Training**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Benefits Of Health And Safety Training -Reduction In Level Of Supervision | 30 | 3.43 | 1.135 |
| Benefits Of Health And Safety Training -Improved Work Efficiency | 30 | 3.73 | 1.094 |
| Benefits Of Health And Safety Training -Improvement In Equipment Availability And Reliability | 30 | 3.77 | 1.223 |
| Benefits Of Health And Safety Training -Reduction In Unexpected Downtimes | 30 | 3.73 | 1.048 |
| Benefits Of Health And Safety Training -Reduction In Maintenance Costs | 30 | 3.80 | 1.117 |
| Benefits Of Health And Safety Training -Reduction In Incidence Of Accidents | 30 | 3.90 | 1.258 |
| Benefits Of Health And Safety Training -Assurance Of Employee‟ Safety | 30 | 3.50 | 1.253 |
| Benefits Of Health And Safety Training -Improved Worker Confidence And Motivation | 30 | 3.83 | 1.126 |
| Valid N (Listwise) | 30 | | |

Results from table 4.8 revealed that benefit of health and safety training reduces incidence of employee accidents with as high as a mean value of 3.90. This explains that Pantry, (1995), observed that every worker has the right to work in a healthy and secure

environment. It is the prime duty of the employers to give their labor force with an environment that is safe, healthy and friendly. Workers health and safety should be the prime concern of all the employers. A worker of an industry or organization is liable to work in an environment where his safety and health are properly taken care off. The table also indicated that second highest of the mean (3.83) value which talks about improved worker confidence and motivation. It means that workplace design and processes may promote organizational success by creating environments that support work quantity, quality, and style, while improving turnover and absentee rates (Mohr, 1992). Over the years, many organizations have been trying new designs and techniques to construct office buildings, which can increase productivity, and attract more employees. Many authors have noted that, the physical layout of the workspace, along with efficient management processes, is playing a major role in boosting employees‟ productivity and improving organizational performance (Vancevich, 1995). Again, from the results of table 4.8 indicated that, a mean value of 3.80 which corresponds to reduction in equipment cost became third on the ranking of the mean values. This helps firms to carry out periodic maintenance activities to prevent damage to facilities.

**The factors that influence health and safety practices in the selected construction companies.**

In order to ascertain the influence of health and safety practices, a ranking of mean value was done based on the outcomes of the respondents‟ views. Table 4.9 brings the results of analysis.

**Table 4.9 : Factors That Influence Health And Safety Practices**

| | N | Mean | Std. Deviation |
|---|---|---|---|
| Working And Falling From Height | 30 | 4.03 | 1.066 |
| Overcrowded Sites | 30 | 3.87 | 1.167 |
| Handling Heavy Load And Falling Down | 30 | 3.80 | .961 |
| Factors That Influence Health And Safety Practices(Manual Handling) | 30 | 3.77 | 1.278 |
| Noise (Using Block/Brick Cutting Machine) Which Cause Hearing Loss | 30 | 3.80 | .887 |
| Dust (Morta/Cement) | 30 | 3.47 | 1.224 |
| Bending, Twisting While Laying Blocks/Bricks | 30 | 3.77 | .971 |
| Falling Object (Blocks, Bricks, Debris) Heating Head Body Including Feet | 30 | 3.93 | 1.081 |
| Workers Crushed Or Stucked By Moving Vehicles, Focal Lift | 30 | 3.57 | 1.524 |
| Inhalation Of Dust From Cement Causing Cancer, Respiratory System | 30 | 3.87 | 1.042 |
| Muscular Skeleton Disorder, Back Pain Due To Bending, Twisting While Laying Blocks/ Bricks | 30 | 3.93 | .907 |
| Valid N (Listwise) | 30 | | |

Results from table 4.9 shows that a mean mark of 4.03 representing the highest mean mark of the respondents affirmed that they are not safe when working and falling from height. The second highest mean value of 3.93 which agrees that the respondents experience skeleton disorder, back pain due to bending, twisting while laying blocks/ bricks. In addition, the study results hold a mean mark of 3.47 shows that they are not safe when there is dust in the construction site from mortal or cement. This action exposes them to and increases the likelihood of injury (Frankling, 2008). Safety management is therefore an important factor in industrial management to both the employer and employee. It is the responsibility of management to ensure that a safety policy exists and is adhered to.

### 4.3 Results and Discussion of Interview

In an attempt to find out the most effects, causes and strategies of minimizing the impact of health and safety at construction site, the researcher conducted face to face interview with artisans and supervisors. Various results from the interview are summarized below.

#### 4.3.1 Results of interview from the artisan

It was revealed that, most of the artisans had training of health and safety risk in construction sites. This means that the artisans had health and safety knowledge regarding the use of protective clothing and equipment like helmet, wellington boots, nose mask, goggles and gloves. However, the respondents affirmed that they need more training on how to handle equipment in the construction sites. It was asserted that the firm had a health and safety policy. Adding that the health and safety policy states that every employee must wear protective equipment before they start work on the construction site. They said that measures to enforce the policy is not strict enough. Because of that most employees do not wear protective clothing before they start the day‟s work.

It was asserted that most of the constructions firms do not have first aid box to deal with emergency pains and injuries that may occur. Most of the respondents affirmed that equipment to deal with health and safety risks were inadequate. This eventually affected efficient management of health and safety risks at the construction sites. The artisans recommended that, management of the construction firms must provide adequate protective equipment to improve health and safety management at the construction sites.

### 4.3.2 Results of interview from the Supervisors

The interview with the supervisors revealed that most of the supervisors had formal training on health and safety risk management in construction sites. The supervisors affirmed that their role is to advise the construction workers to wear protective clothing and equipment to ensure that the workers are protected and safe from fatal injuries.

The supervisors said that the firm had a health and safety policy. Adding that the health and safety policy states that every employee must wear protective equipment before they start work on the construction site. They said that most workers are willing to wear protective equipment however, the protective gadgets were not adequate enough to enhance safety and the construction sites.

It was asserted that most of the constructions firms do not have first aid box to deal with emergency pains and injuries that may occur. Most of the respondents affirmed that equipment to deal with health and safety risks were inadequate. This eventually affected efficient management of health and safety risks at the construction sites.

The supervisors recommended that, management of the construction firms must provide adequate protective equipment to improve health and safety management at the construction sites.

## 4.4 Results and Discussions of Observation

This presents visit to some construction sites in Akuapem North municipality

The following observations were made:

### 4.4.1 Results of observation at Nifa senior high school, Adukrom-Akuapem.

An observation made at the girls dormitory project site of Nifa Senior High School Adukrom-Akuapem, revealed that most of construction workers were not wearing protective equipment while working on the construction site. Very few of artisans especially the painter were wearing helmet and nose mask to protect them from falling and harmful chemicals.

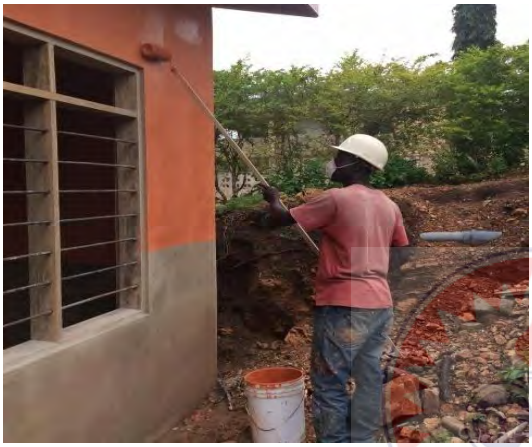

**Figure 4.1: A painter wearing helmet and nose mask for protection.**

### 4.4.2 Results of observation at Nifa Basic School, Adukrom-Akuapem.

It was observed at Nifa basic school project site, that most construction workers were not wearing protects equipment while working on a construction site. Moreover the constructors, supervisors and foremen were wearing helmet. Few of the artisans were wearing wellington boots and those who were not wearing Wellington boot were wearing shoes that are not strong enough to protect them from foot injury. Moreover no artisan wore hand gloves.

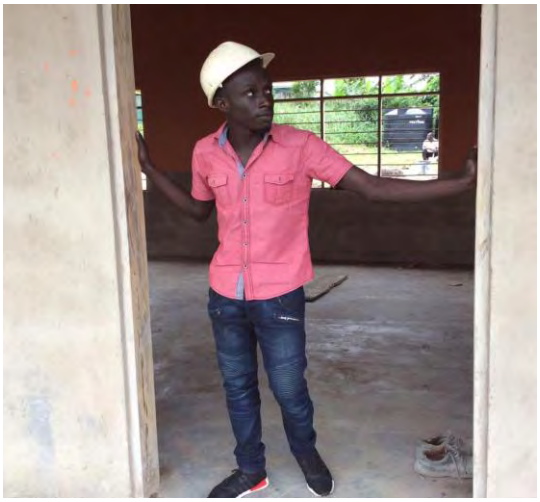

**Figure 4.2: A contractor wearing helmet at the construction site to protect the head from falling objects**.

### 4.4.3 Results of observation at Nana Takyi Bitters warehouse construction site.

It was observed at the construction site at Nana Takyi Bitters warehouse that most of the workers were not wearing safety boots. Only few of them were wearing the safety boots and helmet that are strong enough to protect them from foot injury and falling objects.

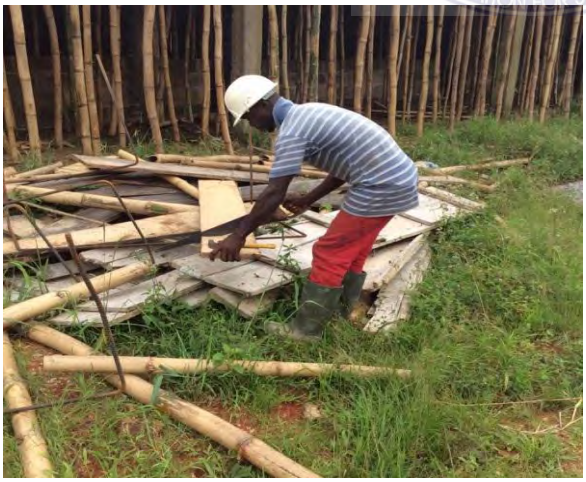

**Figure 4.3: A construction worker wearing a helmet and wellington boots for protection.**

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

Chapter five presents the summary of findings, conclusion and recommendations of the study.

## 5.2 Summary of Findings

These are the summary of the findings:

- It was revealed that workers working with the cement without protective equipment run the risk of contracting respiratory tract infection.
- The study also showed that, falling object from height in construction sites caused serious or fatal injury and even death to the workers.
- It was revealed that due to the tedious nature of the construction work, the workers experience bodily pains.
- The study revealed that proper health and safety measures helped minimise illnesses and accident at the construction site.
- The study showed that due to the absence of proper health and safety policies, the construction workers do not feel secured and protected on construction sites.
- The study showed that Management‟s unwillingness to invest more in health and safety has resulted in non-maintenance of safety and health rules on sites.
- The study further revealed that health and safety training scheme help construction workers to observe health and safety rules on sites.

- It was revealed from the study that most of the constructions firms do not have first aid box to deal with emergency pains and injuries that may occur.

## 5.3 Conclusion

This research, through the key objectives that was carried out, has shown that very little work has been undertaken concerning health as safety in the construction firms. According to the research, in developing countries like Ghana, the challenges related to health and safety on the construction sites are still unsolved causing high number of serious accidents and work related diseases. For example when employees use block/brick cutting machine which produces excessive noise can cause hearing loss. This research has also shown that most of the construction firms tend to ignore proper health and safety policies thereby reducing their ability to deal with potential problems. It is appropriate to suggest that construction firms should organise health and safety training to help the workers feel better in their jobs.

## 5.4 Recommendations

The following Recommendations are made to address the findings of the study:

- To overcome the problem of workers contracting respiratory tract infection due to the exposure to dust at construction site, it is recommended that nose mask must be available for workers to use.
- To prevent accident or injury to workers‟ head it is recommended that helmet must be available to all workers.

- The management of the construction firms should ensure that workers at the construction site are provided with appropriate tools and equipment to carry out their work with ease in other to minimise the bodily pains problems.
- To prevent ill health and accident it is recommended that health and safety measures should be put in place at the construction site.
- It is recommended that the institution and enforcement of health and safety policies should be ensured at all time to provide adequate health and safety at construction site.
- The management of the construction firms should organize in-service training programs to educate the workers regarding the health and safety rules and its impact on workers" productivity.
- It is recommended that firms should organise health and safety training for employees on regular basis because there is the need for workers to be abreast of safety rules to be observed at the construction site.
- It is also recommended that firms should be provided with a first-aid box to deal with emergency pains and injuries that may occur.

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# APPENDIX 1

## UNIVERSITY OF EDUCATION, WINNEBA

## COLLEGE OF TECHNOLOGY EDUCATION –KUMASI

## FACULTY OF TECHNICAL EDUCATION

**Questionnaires for the Contractors**

This questionnaire is intended to solicit views for a research work on the topic "THE IMPACT OF HEALTH AND SAFETY PRACTICES ON PRODUCTIVITY ON CONSTRUCTION SITES- A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY. Please note that this is for pure academic purposes only. I would be grateful if you could spend just about 10 minutes of your time to complete it.

Thanks for your cooperation

Section A: Demographic Information of the Respondents

1) Are you Male [ ] Female [ ]

2) Your age

Below 20 years [ ] 20-30 years [ ] 30-40 years [ ] 40-50 years [ ] 50-60 years more than 60 years [ ]

3. Are you employed on the basis of: Part Time [ ] Full Time [ ] Temporary (daily?) [ ]

4. Job title (trade/description) Building contractor [ ] Site Supervisor [ ] Masonry (block layers) [ ] Carpenters [ ] steel bender [ ] Electrician [ ] concrete others (specify).....

5) Experience on construction site with employer

Less than 5 years [ ] 5-10 years [ ] 10-15 years [ ] 15-20 years [ ] above 20 years [ ]

6. Education background; Primary education

Primary education with vocation skills [ ] Secondary education [ ] Tertiary [ ]

**Section B: Knowledge on health and safety risk**

7) Do you have any information about health and safety in the workplaces?

Yes [ ] No [ ] Don't Know [ ]

8) If yes where did you get information?

From study [ ] from organization [ ] in-service training [ ] My co-workers [ ] My supervisor [ ]

**Section C: The factors that influence health and safety practices in the selected construction companies.**

How safe are you feeling when you are working with your task (1=very safe, 2 =safe, 3=moderate safe 4 =not safe, 5= not safe at all)

| **Type of hazard** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| 9. Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury | | | | | |
| 10. Working and Falling from height ( Serious injury of fatal injury) | | | | | |
| 11. Overcrowded site | | | | | |
| 12. Handling heavy load and falling down | | | | | |
| 13. Noise (using block/brick cutting machine) which cause hearing loss | | | | | |
| 14. Dust (mortal/ cement) | | | | | |
| 15. Bending, twisting while laying blocks/ bricks | | | | | |
| 16. Falling object (blocks, bricks, debris) heating head body including feet | | | | | |
| 17.Workers crushed or stucked by moving vehicles, focal lift | | | | | |
| 18. Inhalation of dust from cement causing cancer, respiratory system | | | | | |
| 19. Muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks | | | | | |

**SECTION D: The impact of implementing health and safety policies**

**Please use the following likert scale to assess the impact of implementing health and safety policies in the construction sites.** SA- Strongly agree, A-agree, N-Neutral, D-Disagree [ ], SD-Strongly disagree.

| The impact of implementing health and safety policies | SA | A | N | D | SD |
|---|---|---|---|---|---|
| 20. Proper health and safety management can minimize accidents at the construction sites | | | | | |
| 21. Employees work harder | | | | | |
| 22. Employees feel secured and protected | | | | | |
| 23. Increases productivity at the construction sites | | | | | |
| 24 Promotes a peaceful and safe environment free from hazards | | | | | |
| 25. Enhances the quality of output | | | | | |
| 26. The construction firm gains a good reputation for health and safety management | | | | | |

**SECTION E: The challenges that affect health and safety policies in the firm**

Please use the following likert scale to identify the challenges that your face in their attempt to implement health and safety practices. SA- Strongly agree, A-agree, N-Neutral, D-Disagree [ ], SD-Strongly disagree.

| **The challenges that affect health and safety policies in the firm** | SA | A | N | D | SD |
|---|---|---|---|---|---|
| 27. Financial Constraints | | | | | |
| 28. Inadequate Equipment and Facilities | | | | | |
| 29. Management‟s unwillingness to invest more in health and safety. | | | | | |
| 30. Employees‟ negative perception and/or attitude maintenance and safety | | | | | |
| 31. Lack of training and sensitization | | | | | |
| 32. Any others (*specify*) | | | | | |

33. What suggestions would you want to make to improve the situation in the construction sites in terms of health and safety?

.....

.....

## APPENDIX 2:

### Interview Guides for the Artisans

This interview guide is intended to solicit views for a research work on the topic "THE IMPACT OF HEALTH AND SAFETY PRACTICES ON PRODUCTIVITY ON CONSTRUCTION SITES- A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY. Please note that this is for pure academic purposes only. I would be grateful if you could spend just about 10 minutes of your time to complete it.

1. What your educational background?
2. What is your experience in construction industry?
3. How did you learn to perform your construction activities?
4. Do you have any training of health and safety risk in construction sites?
5. What is your role in ensuring health and safety are managed in construction sites?
6. Does your firm has a health and safety policy, how does it state?
7. How does your firm manage health and safety risk in the sites?
8. What are the challenges you are facing on managing health and safety risks?
9. How do you involve workers in risk communication, what methods used for communication, what message are communicated?
10. What are the challenges on managing health and safety risks?
11. How can you improve situation

## APPENDIX 3:

### Interview Guides for the Supervisors

This interview guide is intended to solicit views for a research work on the topic "THE IMPACT OF HEALTH AND SAFETY PRACTICES ON PRODUCTIVITY ON CONSTRUCTION SITES- A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY. Please note that this is for pure academic purposes only. I would be grateful if you could spend just about 10 minutes of your time to complete it.

1. What your educational background?
2. What is your experience in construction industry?
3. How did you learn to perform your supervisory activities?
4. Do you have any training of health and safety risk in construction sites?
5. What is your role in supervising health and safety in construction sites?
6. Does your firm has a health and safety policy?
7. How does your firm manage health and safety risk in the sites?
8. What are the challenges you are facing on managing health and safety risks?
9. How do you involve workers in risk communication, what methods used for communication, what message are communicated?
10. What are the challenges on supervising health and safety risks?

C 11. How can you improve health and safety on construction sites?

## APPENDIX 4:

### Questionnaires for the Consultants

This questionnaire is intended to solicit views for a research work on the topic "THE IMPACT OF HEALTH AND SAFETY PRACTICES ON PRODUCTIVITY ON CONSTRUCTION SITES- A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY. Please note that this is for pure academic purposes only. I would be grateful if you could spend just about 10 minutes of your time to complete it.

**Section 1: Demographic Information of the Respondents**

1. Gender

Male [ ] Female [ ]

2. Age

**25-30yrs [ ] 31-35yrs [ ] 36-40yrs [ ]41-46yrs [ ]46yrs and above [ ]**

**3. Educational Level**

HND [ ] 1st Degree [ ] Masters [ ] PHD [ ] Others [ ]

**4. Position**

Architect [ ] Quantity Surveyors [ ] Structural Engineers [ ] Electrical Engineers [ ] Geomatics Engineers [ ] Mechanical Engineers [ ] Land Economy [ ] Geotechnical Engineers [ ] Planning Engineers [ ]

**5. Work experience**

6-10 years [ ] 11-15 years [ ]

16-20 years [ ] More than 20 years [ ]

**Section 2: The Key Factors Considered in Performance Evaluation of health and safety of contractors**

Please use the following scale to assess the key factors by which contractors‟ performance could be evaluated. Please tick in appropriate box below.

1=Bad, 2= Average, 3= Good, 4= Very good, 5= Excellent

| No. | ITEM | Bad | Average | Good | Very Good | Excellent |
|---|---|---|---|---|---|---|
| 1. | Equipment Holding | | | | | |
| 2. | Financial Standing | | | | | |
| 3. | Quality Service | | | | | |
| 4. | Technical personnel | | | | | |
| 5. | Good Business Relationship | | | | | |
| 6. | Health and safety Performance | | | | | |
| 7. | Environmental requirement | | | | | |
| 8. | Value of Previous Work Executed | | | | | |
| 9. | Procurement Related Issues | | | | | |
| 10. | Class of License | | | | | |
| 11. | Assessment of Project Cost | | | | | |
| 12. | Timely completion of building projects | | | | | |
| 13. | Adequacy of contraction‟s health and safety quality assurance for workers | | | | | |

**Section 3: The factors that influence health and safety practices in the selected construction companies.**

In your opinion as a consultant, how safe are employees when they are working with their task (1=very safe, 2 =safe, 3=moderate safe 4 =not safe, 5= not safe at all)

| **Type of hazard** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| 14. Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury | | | | | |
| 15. Working and Falling from height ( Serious injury of fatal injury) | | | | | |
| 16. Overcrowded site | | | | | |
| 17. Handling heavy load and falling down | | | | | |
| 18. Noise (using block/brick cutting machine) which cause hearing loss | | | | | |
| 19. Dust (mortal/ cement) | | | | | |
| 20. Bending, twisting while laying blocks/ bricks | | | | | |
| 21. Falling object (blocks, bricks, debris) heating head body including feet | | | | | |
| 22.Workers crushed or stucked by moving vehicles, focal lift | | | | | |
| 23. Inhalation of dust from cement causing cancer, respiratory system | | | | | |
| 24. Muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks | | | | | |

**SECTION 4: The impact of implementing health and safety policies**

**Please use the following likert scale to assess the impact of implementing health and safety policies in the construction sites.**

SA- Strongly agree, A-agree, N-Neutral, D-Disagree [ ], SD-Strongly disagree.

| **The impact of implementing health and safety policies** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| 25. Proper health and safety management can minimize accidents at the construction sites | | | | | |
| 25. Employees work harder | | | | | |
| 26. Employees feel secured and protected | | | | | |
| 27. Increases productivity at the construction sites | | | | | |
| 28Promotes a peaceful and safe environment free from hazards | | | | | |
| 29. Enhances the quality of output | | | | | |
| 30. The construction firm gains a good reputation for health and safety management | | | | | |

## APPENDIX 5

### Questionnaires for Health Experts

This questionnaire is intended to solicit views for a research work on the topic "THE IMPACT OF HEALTH AND SAFETY PRACTICES ON PRODUCTIVITY ON CONSTRUCTION SITES- A CASE STUDY OF SELECTED CONSTRUCTION FIRMS IN THE AKUAPEM NORTH MUNICIPALITY. Please note that this is for pure academic purposes only. I would be grateful if you could spend just about 10 minutes of your time to complete it.

**Section 1: Demographic Information of the Respondents**

1. Gender

Male [ ] Female [ ]

2. Age

**25-30yrs [ ] 31-35yrs [ ] 36-40yrs [ ]41-46yrs [ ]46yrs and above [ ]**

**3. Educational Level**

HND [ ] 1st Degree [ ] Masters [ ] PHD [ ] Others [ ]

**4. Work experience**

6-10 years [ ] 11-15 years [ ] 16-20 years [ ] More than 20 years [ ]

**Section 2: The benefits of health and safety training**

How do health and safety training in your organization contribute to realizing each of the following benefits?

| | Excel-lent | Good | Ave-rage | Poor | Not Applicable |
|---|---|---|---|---|---|
| 5.Reduction in level of supervision | | | | | |
| 6.Improved work Efficiency | | | | | |
| 7.Improvement in equipment availability and reliability | | | | | |
| 8.Reduction in unexpected downtimes | | | | | |
| 9.Reduction in Maintenance costs | | | | | |
| 10.Reduction in incidence of accidents | | | | | |
| 11.Assurance of employee‟ safety | | | | | |
| 12.Improved worker confidence and motivation | | | | | |

**Section 3: The factors that influence health and safety practices in the selected construction companies.**

In your opinion as a health expert, how safe are employees when they are working with their task (1=very safe, 2 =safe, 3=moderate safe 4 =not safe, 5= not safe at all)

| **Type of hazard** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| 13. Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury | | | | | |
| 14. Working and Falling from height ( Serious injury of fatal injury) | | | | | |
| 15. Overcrowded site | | | | | |
| 16. Handling heavy load and falling down | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 17. Noise (using block/brick cutting machine) which cause hearing loss | | | | | |
| 18. Dust (mortal/ cement) | | | | | |
| 19. Bending, twisting while laying blocks/ bricks | | | | | |
| 20. Falling object (blocks, bricks, debris) heating head body including feet | | | | | |
| 21.Workers crushed or stucked by moving vehicles, focal lift | | | | | |
| 23. Inhalation of dust from cement causing cancer, respiratory system | | | | | |
| 24. Muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks | | | | | |

**SECTION 4: The impact of implementing health and safety policies**

**Please use the following likert scale to assess the impact of implementing health and safety policies in the construction sites.**

SA- Strongly agree, A-agree, N-Neutral, D-Disagree [ ], SD-Strongly disagree.

| **The impact of implementing health and safety policies** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| 25. Proper health and safety management can minimize accidents at the construction sites | | | | | |
| 26. Employees work harder | | | | | |
| 27. Employees feel secured and protected | | | | | |
| 28. Increases productivity at the construction sites | | | | | |
| 29Promotes a peaceful and safe environment free from hazards | | | | | |
| 30. Enhances the quality of output | | | | | |
| 31. The construction firm gains a good reputation for health and safety management | | | | | |

32. Do you recommend intensifying health and safety activities as a means of increasing productivity? (a) Yes [ ] (b) No [ ]

    Why?

    ……

33. In your view, what negative effects does strict adherence to safety regulations have on productivity?

    ……

    ……

    ……..