

**UNIVERSITY OF EDUCATION, WINNEBA**  
**COLLEGE OF TECHNOLOGY EDUCATION, WINNEBA**

**AN EVALUATION OF THE INFLUENCE OF SAFETY PRACTICES ON  
CONSTRUCTION SITE WORKERS PERFORMANCE: A CASE STUDY OF  
SELECTED PROJECT SITES IN WA.**



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**BY**  
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**An dissertation to the department of construction and wood technology education,  
faculty of technical education submitted to the school of graduate studies, university  
of education, Winneba in partial fulfilment of the requirement for award of the  
Master Of Technology (Construction) Degree**

**SEPTEMBER,**

## DECLARATION

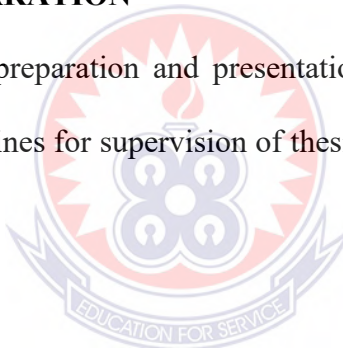
### STUDENT'S DECLARATION

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

SIGNATURE..... DATE .....

### SUPERVISOR'S DECLARATION

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



NAME OF SUPERVISOR...ENGR. M.K. TSORGALI

SIGNATURE..... DATE .....

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God bless you all.

Finally, I say thank you to everybody who in diverse ways help me in getting this work done. May the Lord Almighty God richly bless you all?

## **DEDICATION**

I dedicate this thesis to my dear “daddy”, Mr. S.B Kangberee who nurtured in me the unwavering interest in the value of education. Also to my wife Mrs. Jane Kangberee who provided the support and encouragement.

Thank you all from the bottom of my heart.



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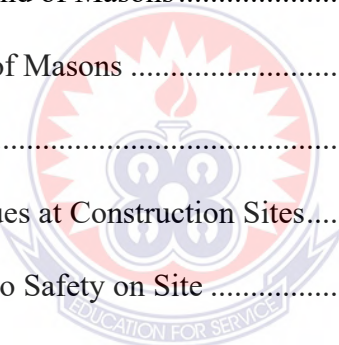




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## ABSTRACT

The construction industry contributes immensely on the development of every nation. Despite its crucial role that it plays in the socio-economic development of a nation, it is also considered as one of the accident prone industries recording higher deaths and all forms of injuries in many sites. In this view, a study was conducted to evaluate the influence of safety practices on construction sites workers performance in the Wa municipality. In all ninety six (96) respondents participated in the study which includes eighty (80) workers, four (4) contractor, four (4) site foremen and eight (8) masons in the selected sites. The researcher employed the use of questionnaires, interviews and observations in collecting data from the population. In the analysis, tables and narrative descriptions were used. The study revealed that some employers do not provide protective clothing and equipment to workers thereby exposing them to danger. It was also revealed that some construction companies do not sanction their workers when they

flout safety rules and regulations due to lack of safety officers to enforce safety issues. Aside that, the study also revealed that majority of the construction firms in the municipality do not incorporate insurance policies on safety issues for their employees. The study also revealed that due to the lack of the implementation of safety precaution at the construction site decrease productivity at site and also exposed higher risk of danger. It is recommended that, the Municipal Assembly should ensure that construction companies that operate within the municipality should have a policy framework that will govern their operations in the construction sites.



## CHAPTER ONE

### INRODUCTION

#### 1.1 Background of the Study

Health and safety is important as part of employment duties (MBE & Ferret, 2009). Article 5 Section 24 (1) of the 1992 Constitution of the Republic of Ghana states that “Every person has the right to work under satisfactory, safe and healthy conditions...” The National Building Regulation of 1996 stipulates the need to ensure safety precaution measures at the construction site. According to Center for Disease Control and Prevention, (2009) Construction workers build our roads, houses, workplaces, repair and maintain of our nation's physical infrastructure, these works includes many hazardous tasks and conditions such as work at height, excavations, noise, dust, power tools and equipment, confined spaces and electricity. According to ILO Enclyopaedia of occupational health and hazards in construction industry (2011) Construction projects, especially large ones, are complex and dynamic thus the need for good safety measures.

Accident do terminate life or cause permanent and temporary disabilities to workers and users, and these result in reduced productivity, non-conformance to quality standards, time overruns and cost overruns of the projects. Improving safety practice in Ghana will not be achieved without the concern and involvement of the government. Construction accidents, which of then occur, are due to neglecting certain safety regulation despite the presence of Government regulation regarding safety. These cases have been going on since the early development of the construction industry. Every case of construction accident involving casualty of an individual or to a number of workers

had never been investigated thoroughly and ironically the matters are finally resolved with conclusion of careless conduct (Danso, 2010) and (Kheni et al., 2008).

Moreover, Safety remains an ongoing concern for the construction manager. Construction by nature is inherently dangerous, with a high degree of hazard and risk. The toll of construction accidents is high in terms of both costs and human suffering. Accidents add a tremendous burden of needless and avoidable expense. Financial losses pale when compared to bodily injury and death, and the resulting human, social impacts. Construction accidents add \$10 billion annually to construction cost. Insurance (such as workmen' compensation) protects the contractor from certain direct expenses, but accidents also involve substantial costs that are not insurable, referred to as hidden or indirect cost (Bob Muir, 2005).

## **1.2 Statement of the Problem**

The Department of labour reports that the highest number of work related fatalities occurs among construction workers. In Ghana the state of safety practices violation on construction site are very rampant and glaring. The labour Department in Ghana in the year 2016 reported that the country's construction industry accounted for the highest rate of occupational accidents in comparison to other industrial sectors .According to the Department report 56 out of a total of 902 occupational accidents that occurred on construction site were fatal.

Workers in the construction industry have little control over safety practices on their job sites. Construction safety should be of primary concern to employers, employees, government and project participant. Thus the main parties responsible for



safety on site are the client, main contractor, regulatory agencies and employees. Safety duties and regulatory agencies, Government regulatory agencies should not neglect safety practices on site but this has become the norm. They are not ensuring that project is safe to build and use, and safe to maintain. Construction project are awarded to the lowest bidder, while this practice might promote cost effectiveness, it does not prevent contractors cutting corners on safety.

Although workers compensation on a few occasion compensate injured construction workers, it does not cover all the costs and losses an injured worker may experience. “Every fatality is a tragic event that should not happen. “While we are encouraged by this improvement on the previous year, we continue unwaveringly on our mission to prevent injury, death and ill health by protecting people and reducing risks.”

According to Armstrong, (2006), thousands of people are killed at work every year and several hundred thousand more are injured or suffering ill health. Apart from the pain and suffering caused to those directly and indirectly concerned, the total cost to employers of work related injury and illness exceeded four billion pounds a year. It is for this reason that the researcher is undertaking the study to evaluate the influence of safety practices on construction site workers performance in the construction industry in the Wa Municipality and Ghana as a whole.

### **1.3 Purpose of the Study**

The study is to evaluate the influence of safety practices on construction sites workers performance in the Wa Municipality in the Upper West region.

#### **1.4 Objectives of the Study**

The objectives of the study are to:

1. examine safety practices on construction site workers at a selected building construction sites.
2. identify the factors that influence safety practices on construction site workers performance
3. devise reliable ways of ensuring safety practices on construction site workers performances at a selected building construction site in the Wa municipality.

#### **1.5 Research Questions**

The following questions are posed to solicit information for the study of the topic at hand.

1. What are the safety practices on construction site workers performance?
2. What are the factors influencing the safety practices on construction sites workers?
3. What strategies can be devised to ensure effective safety practices on construction site performance?

#### **1.6 Significance of the Study**

The study is significance of the following reasons:

- The study will provide relevant information with regards to safety precaution on construction sites to workers, contractors, site foremen and masons in the construction industry.

- Furthermore, it will serve as a record for the construction industry, the researcher and the university in the sense that it can be referred to anytime needed.
- Currently, the findings this research will let employers and law enforcement bodies to ensure that workers strictly adhered to safety rules and regulations on site.

### **1.7 Scope of the Study**

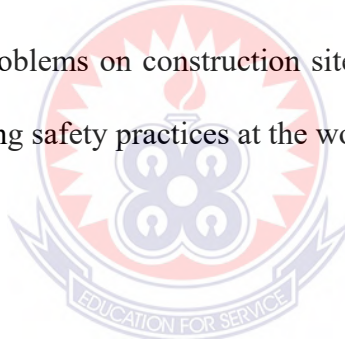
The study was limited to selected construction sites in the Wa Municipality area in order to complete this work on schedule. The scope of the study include the definition of safety, the theoretical framework of safety at the work place, decisions-to-err-in occupational safety, impacts of behaviors on safety at the workplace, safety practices on construction site, safety policies, safety organization, critical safety practices, basic personal protective equipment and clothing to ensure safety at work place, Though there are several challenges confronting the construction industry, the researcher focus on an evaluation of the influence of safety practices on construction sites workers performance in the Wa Municipality in Upper West Region.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The chapter discusses the relevant literature review in relation to safety practices on construction site workers performance. It involved the definition of safety, the theoretical framework of safety at the work place, decisions-to-err-in occupational safety, impacts of behaviors on safety at the workplace, safety practices on construction site, safety policies, safety organization, critical safety practices, basic personal protective equipment and clothing to ensure safety at work place, approaches to construction safety, health and safety management within the construction industry, causes of accidents on construction site, safety problems on construction site, the impact of safety practices on construction sites, improving safety practices at the work place.



#### **2.2 Definitions of Safety**

There are important key words that are used throughout the thesis, words such as ‘Safety’, ‘Practice’, and ‘Accident’. The definition of each term is given here; The American Heritage Dictionary of the English Language, Fourth Edition, defines safety’ as the condition of being safe; freedom from danger, risk, or injury or state of being safe; freedom from danger or hazard; exemption from hurt, injury, or loss freedom from whatever exposes one to danger or from liability to cause danger or harm; safeness; hence, the quality of making safe or secure, or of giving confidence, justifying trust, insuring against harm or loss. The concept of “safety” can also mean as freedom from danger and risks (Huang, 2003).

According to Accident Work Information Government of New Zealand (2003), defines “ practice “as a customary way of operation or behavior referring to human action; human activity accomplishment; achievement; deed; feat; effort; exploit; implementation; effectuation, or translating an idea into action, the exercise of a profession and knowledge of how something is usually done. It also defined as all practicable steps in relation to achieving any result in any circumstances.

### **2.3 The Theoretical Framework of Safety at the Workplace**

The construction industry has long been regarded as one of the most dangerous industries. The construction industry has a history of poor safety performance. This is despite the fact that dramatic improvements have been made in the safety performance of the construction industry in the past decade (Huang, 2003). The improvements are due, in part, to the concerted efforts of owners, contractors, subcontractors, and designers. The owners of projects are the primary consumers of construction services, the sources of project finances, and, in many cases, the end users of the facilities. They are often at the pivotal position of the projects. Traditionally, owners have not been directly involved in construction safety, often in order to avoid economic losses and legal entanglements resulting from injuries. With the increase of accident costs and legal cases involving owners as the third-party defendants, owners have come to realize the importance of safety (Huang, 2003).

## **2.4 Decisions-to-Err in Occupational Safety**

(Petersen, 1971), proposed a causation model which explains that the decisions of workers to err are due to four main causes. These causes of decision-to-err in occupational safety are, personal factors, job factors, management factors and working group factors.

- **Personal Factors**

### *Laziness*

**Hall (1995)**, stated that most workers prefer to take shortcuts to save time because they want to avoid supportive activities. Workers oftentimes prefer to work with the wrong tools because they feel that it is too much trouble getting the right one, e.g. workers could climb or stand on rears (an inadequate working platform) instead of using proper ladder.

### *Past Experience*

Some workers, having performed a job in a familiar way for many years are very reluctant to give up their old way of doing things. However, these old habits could prevent them from noticing the prevailing hazards, thereby increasing the possibility of accidents occurrence (Kittleson, 1995).

### *Being in a Hurry*

Since (1995), stated that pressure from supervisors to get jobs done quickly can cause the workers to work in hurry. As result of such pressures, workers may disregard good safety practices to save time for completing the jobs.

### *Showing Off*

"Watch me" is usually heard from workers who like to display their manhood in order to gain the admiration of their colleagues. (Kittleson, 1995), stated that some "macho" types

of workers like to show off their capability to their peer improperly. This "show-off" behaviour can, and often does, result in accidents.

### ***Being Angry***

(Kittleson, 1995), that being angry can lead to accidents because anger nearly always rules over caution. When someone gets angry, he or she will start to sweat, tremble, get knots in the stomach, or grind his/her teeth. Unresolved anger could cause distraction, proneness to accidents, anxiety, violence and rage.

### ***Being Uncomfortable***

The International Labour Organization (ILO, undated) revealed that PPE can be uncomfortable, can decrease work performance and can create new health and safety hazards. Some workers for instance, reject the wearing of earmuff because it makes them feel hot, especially when it is used in hot regions.

### ***Effects of Using Drugs and Alcohol***

Michaud (1995), stated that workers who use drugs and alcohol have the tendency to distort or block their decision-making capability. In general, experimental research has shown that alcohol has a delirious effect on performance due to its effects on judgment, reasoning and memory. Drugs users and drinkers often experience reduced levels of awareness, a situation which could lead to decision errors and unsafe working. When the influence of the drug or alcohol is over, a worker might wonder why he did the unsafe act.

### ***Supervisor's and Co-workers' Acceptance***

In order to gain the acceptance of supervisors or co-workers, a worker could choose to perform a job unsafely. For example, a worker could decide to unload some materials faster so as to save time for completing the job and thereby gain the acceptance, approval or the admiration of his/her supervisor or co-workers.

### ***Overconfidence***

Confidence is a good thing, but overconfidence would oftentimes do more harm than good. "It will never happen to me" attitude could lead to improper procedures or methods that could cause injury (Hirsch, 1998).

- **Job Factors**

Stress has been defined as human's reaction against threatening situation (Goetsch, n.d.). Schermerhorn (2001), further defined stress as "the state of tension experienced by individuals who are facing extraordinary demands, constraints, or opportunities." Some potential factors that could contribute to job stress in the construction industry are (Aksorn & Hadikusumo, 2007).

### ***Too Much Work (Work Overload)***

Asking workers to do more than they could handle may result in the workers developing high Greenberg and Baron (2000), stress, especially when deadline pressures are put on them. According to

there are two different forms of work overload: quantitative overload, which occurs when individuals are asked to do more and qualitative overload, which refers to employees' belief that they lack of the required skills or abilities to perform the work (Aksorn & Hadikusumo, 2007).



### ***Too Little Work (Work Under load)***

Similarly, being asked to do too little could also be as stressful as being asked to do too much. Greenberg and Baron (2000), proposed that there are two types of work under load: quantitative under load, which refers to the boredom arising from having too little work to do, and qualitative under load, which is the lack of mental stimulation, such as routines, and repetitive jobs (Aksorn & Hadikusumo, 2007).

### ***Time Pressure***

When workers are unable to meet deadlines, they instantly get overwhelmed and begin to worry (Timm & Peterson, 1986; Stranks, 2000). In addition, when the work process is changed and the workers are not given enough time to complete the job, they easily become stressed (Aksorn & Hadikusumo, 2007).

- **Management Factors**

### ***Management Pressure***

Stranks (1994), stated that supervisors who are in charge of low-producing units normally tend to spend more time with their subordinates. These supervisors usually divide job times into many short periods to give specific instructions such as, "do this", "do that", or "do it this way", to their subordinates, hoping to increase productivity.

However, supervisors' pressure may cause subordinates to work unsafely while trying to satisfy the supervisors' objectives, such as completing the work within unreasonable time schedule (Aksorn & Hadikusumo, 2007).

### ***Management Support***

Hammer and Price (2001), proposed that in order to ensure construction site safety, management should fully support and ensure that safety devices and temporary structures are in good conditions, allocate sufficient budgets for establishing safe works, and establish an effective program to monitor and audit operational activities for their safety (Aksorn & Hadikusumo, 2007).

### ***Supervision***

LaDou (1994), stated that it is very obvious that any successful safety program must necessary involve the supervisors. Supervisors should closely control all the workers activities. If supervisors could convince workers that safety has to be considered all the time, then the workers will do everything to prevent accidents (Aksorn & Hadikusumo, 2007).

### ***Reward and Penalty***

Motivational factors from the management could have negative impact on inspiring workers to work safely as inappropriate ways of giving rewards and penalties could motivate workers to work unsafely. For example, a worker may decide to work unsafely because he/she thinks that doing this can speed up the work, which would mean getting more reward such as bonus. Penalty could also motivate workers to work unsafely, e.g. a worker who is physically unfit could force himself/herself to go to work, out of the fear of being penalized (Aksorn & Hadikusumo, 2007).

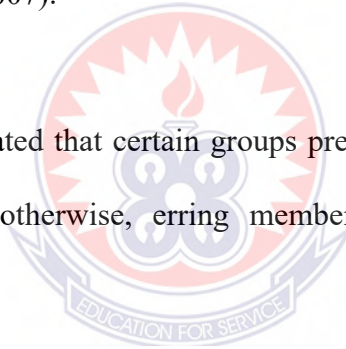
- **Workgroup Factors**

***Group Norms***

Each employee is not just an individual, but a member of a group as well (Stranks, 1994; Gibson et al., 2000). Each group has its own norms, sets its own work goals, moral standards, and makes its own decisions. The norms also incorporate the behaviour of workers towards their boss, and how workers react towards safety regulations. (Kittleson, 1995), stated that it is easier for the workers to base their behaviour on others than to do the right thing. For example, a worker may hear, "everyone else does it that way" and therefore follow the group in working in a similar way even though it is an unsafe method (Aksorn & Hadikusumo, 2007).

***Group Pressure***

Ellis and Fisher (1994), stated that certain groups pressure their members to conform to their established norms; otherwise, erring members will be penalized (Aksorn & Hadikusumo, 2007).



## **2.5 Impacts of Behaviors on Safety at the Workplace**

Almost construction companies have spent a lot of time, money and effort to set up a safety management system. Over a long period, these efforts tend to reduce dramatically in accident rates. However, these rates are considered too high and caused many unfortunate consequences. Approximately 80 to 95 percent of all accidents are triggered by deeply ingrained unsafe behaviour (Deneve et al., 1998). Consequently, researches about behaviour related to safety were carried out. The safety behaviour

concept is considered one of the significant causes affect safety performance in construction site.

It can be measured and improved to achieve better safety performance at construction site

(Duff et al., 1994). Zhou (2008), explored factors influencing safety behaviour and identifies strategies to control the factors that have the most impact on safety behaviour in complex construction scenarios. There are some other studies about safety behaviour were made such as Cox (2004), Prussia et al. (2003), Lingard and Steve (1998), (Dejoy, 1996), and Duff et al. (1994). But these researches focus on worker level only, they tried to identify the factors can affect the worker behaviour to change worker behaviour more positive safety as Brown et al. (2000), Langford et al. (2000), and Lingard (1995).

Looking to the construction parties' roles, it could be pointed that supervisor is vital to organizational success. Dan Petersen had pointed that "Safety excellence only occurs when supervisors, managers and executives demonstrate their values through actions, and their credibility by asking hourly workers to improve the system"<sup>3</sup>. The owners, top executives, and middle managers must be committed to safety. However, supervisor is one of management representatives who daily contact with the employees.

The supervisors claimed as the key person for implementing safety program. Even though in construction have a safety engineer or a safety director, the supervisor is still responsible for ensuring that the safety directives are carried out. The supervisor should be assured that employees can perform work safely. In addition, the supervisor should shape the employees' attitude toward safety (Ludden & Capozzoli, 2000). A supervisor

behaviour on safety action is found as important attributes to influence worker, control the hazards and prevent accident at the site (Nguyen & Peansupap, 2010).

## **2.6 Safety Practices on Construction Site**

Safety practices generally implemented comply with safety statutory in the develop countries. Safety regulations are strictly applied, and it is everyone's obligation involved in hazardous work place to implement it. This may be true in advanced industrial countries where safety programs are taken seriously and programs are maintained as a priority before commencing high risk jobs. Safety practices which are identical to the techniques of accident prevention .Accident prevention in the construction industry is not just a matter of setting up list of rules and making safety inspections, although both have their place. What is required is a system for managing health and safety which meets the needs of the business and complies with the law (St & Holt, 2001).

Generally, in the Gaza Strip, it is observed that most of construction organizations do not have formal safety training. This will lead to absence of safety application and will contribute to occurrence of many accidents and problems in the site. Construction projects in the Gaza Strip are recommended to have formal safety training in order to improve performance of construction projects. (Cheung et al., 2004), remarked that safety factors affect strongly on performance of construction projects (Samir et al., 2008).

The contractor is responsible to use proper material when building hoarding (e.g. lumber, plywood, scaffold frames, tarps). All hoarding must be designed to sustain loads that it is likely to be subjected to such as wind and snow loads and falling debris.

Hoarding must meet permit conditions and be constructed in accordance with all local regulatory requirements. Site fencing must be adequately braced and/or secured to withstand site conditions including wind. Consider securing bases and avoid base details that create a tripping hazard. Jersey barriers can be utilized at strategic points around a construction site to protect the public and construction workers from high incident traffic intersections that are in close proximity to the entrance gates of work sites. Jersey barriers may also be used to protect fire hydrants, gas valves and main power distribution equipment. The location of Jersey barriers would be at the discretion of the jurisdiction having authority. Consider having viewing cut-outs in solid fencing, complete with protection, to allow for public viewing. Light duty scaffold, although designed of sufficient strength to provide the minimum building code or OHS Code standard for an overhead protection system, has restricted width due to the arch frame. It should only be used in the event that the exterior public walkway or sidewalk is too narrow to provide a wider frame work system. Considerations should be made to the width for ease of access and travel for the handicapped, snow removal and maintenance. Heavy duty scaffold is the preferred system if a contractor is planning to utilize the space on top of the hoarding for storage of materials or for locating their field office. This system must be engineered to comply with the building code and OHS Code and have a height of not less than 2.5 meters (8'- 3") and a clear width of not less than 1.5 meters (5' – 0"). The roofing system must be designed and constructed to safely support a minimum of 2.4 kPa (50 PSF). The roofing system must also be watertight and sloped towards the construction site. Splash boards with a minimum height of 300 mm (12") must be installed on the street side. A railing of 1070 mm (42") is required on the street side where the covered way is

supported by posts. The structure must also be totally enclosed on the street side with a smooth surface. Consider the use of pre-engineered structures such as modified containers. When heating equipment is used within a hoarding, adequate fire protection must be used. Air quality monitoring may be required for enclosed hoarding. A minimum of a 20lb. ABC fire extinguisher must be placed outside the hoarding in an easily accessible location in the vicinity of propane/gas heaters (Krsek, 2012)(Krsek, 2012).

At the construction site planning and carrying out an assessment of the works including selection of appropriate methods of carrying out such works. Ensuring that the training and experience of all team members are commensurate with the assigned task and providing training if necessary; ensuring that necessary tools, plant and equipment are properly maintained and are available for immediate use and that a plant/equipment register is kept up-to-date containing maintenance records and test and examination certificates; providing necessary information, drawings, manuals, instructions and training to the workers on all aspects related to the works including the use of tools, plant/ equipment, safe practices and emergency procedures; ensuring that adequate number of persons trained in first aid are included in the site working personnel and that necessary first aid equipment such as the first aid box, etc. are provided and maintained in accordance with the requirements under the Construction Sites, ensuring that the work is carried out in a suitable and safe place with the consent of persons having control of that place; and ensuring that effective communication exists between the place at which the work is being carried out, the persons having control of that place, and the emergency services including police, fire and ambulance service (Safety & Branch, 1997).

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

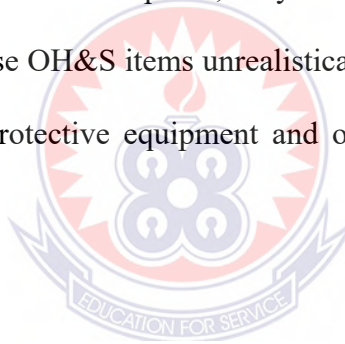
On safety provisions, hard hats or helmet emerged within the first three rankings of the employers and casual workers. This is also an indication that hard hats or helmet is important safety material in addressing the occupational health and safety issues of casual workers on Ghanaian construction site. Again, for employers, the training of casual workers in safety norms and appointment of safety officer on sites is a kind of proactive measures for preventing accident on site. Acting proactively requires one to anticipate problems before they occur and take steps to make sure accidents don't happen.

Therefore the employers were demonstrating the proactive kind of preventing accident on site. To react proactively, casual workers think that wearing of safety boots and helmet couple with safety signs is the best option and this is to the fact that they are directly involved in the actual construction work (Danso, 2010).

When asked about their OH&S procedures, over three-quarters of the respondents said they had instituted measures in respect of first aid, portable drinking water, personal protective equipment and labour certificate on their sites. The rather high response to this



question is in line with the responses to the question on whether their procedures met the requirements of OH&S provisions in conditions of contract. Public contracts contain clauses in respect of these OH&S items and, in a few cases; they are covered by provisional sums. Two-thirds (65%) also cited insurance cover for project sites as a measure they implemented. Insurance of workers against injury is not compulsory by law although employers are required to take all necessary measures to indemnify the employer against damages resulting from accidents. Site safety inspections within the businesses surveyed was informal and very common (83%). Notwithstanding the impressive responses on these OH&S practices, contractors under the pressures of competition and desire to maximise profit, may tend to undermine these practices on project sites by pricing these OH&S items unrealistically. Thus, the amounts and types of first aid items, personal protective equipment and other measures may be insufficient (Kheni et al., 2010).



## **2.7 Safety policies**

Safe and healthy working conditions do not happen by chance. Employers need to have a written safety policy for their enterprise setting out the safety and health standards which it is their objective to achieve. The policy should name the senior executive who is responsible for see that the standards are achieved, and who has authority to allocate responsibilities to management and supervisors at all levels and to see they are carried out (ILO, 1995).

**The safety policy should deal with the following matters:**

- a) Arrangements for training at all levels. Particular attention needs to be given to key workers such as scaffolds and crane operators whose mistakes can be especially dangerous to other workers;
- b) Safe methods or systems of work for hazardous operations: the workers carrying out these operations should be involved in their preparation;
- c) The duties and responsibilities of supervisors and key workers;
- d) Arrangements by which information on safety and health is to be made known;
- e) Arrangements for setting up safety committees;
- f) The selection and control of subcontractors (ILO, 1995).

**2.8 Safety organization**

The organization of safety on the construction site will be determined by the size of the work site, the system of employment and the way in which the project is being organized. Safety and health records should be kept which facilitate the identification and resolution of safety and health problems on the site (ILO, 1995). In construction projects where subcontractors are used, the contract should set out the responsibilities, duties and safety measures that are expected of the subcontractor's workforce. These measures may include the provision and use of specific safety equipment, methods of carrying out specific tasks safely, and the inspection and appropriate use of tools. The person in charge of the site should also assure that materials, equipment and tools brought on to the site meet minimum safety standards. Training should be conducted at all levels, including managers, supervisors and workers. Subcontractors and their workers may also

need to be trained in site safety procedures, because teams of specialist workers may mutually affect each other's safety. There should also be a system so that site management has information quickly about unsafe practices and defective equipment (ILO, 1995).

## **2.9 Critical Safety Practices**

After reviewing the Safety Practices described earlier, there are crucial factors that ought to be considered prior to conducting the practices. These factors may be determined as the critical safety practices. The critical items that will be discovered through this research are priorities that will be implemented in the construction industry in Ghana. Construction companies with serious concern on safety as observed by (St & Holt, 2001), will establish a Safety Management System which relate to Good Financial Establishment, Good Commitment, Adequate Policy, Adequate standard, Adequate Knowledge and Information, Good Training and Good Quality Control. These factors are critical in achieving safety Practices.

Based Clough's study (1986), critical safety practices depend very much on workers practical habits and their working environment. Therefore, he stated that there are two critical matters towards safety practices which will be explained below:

The main health and safety site requirements in construction relate to tidy sites and decent welfare, falls from height, manual handling, and transport on site. Site operatives are normally required to plan and organise their operations, ensure that they are trained and competent and know the special risks of their trade and raise problems with their site supervisor or safety representative (Hse, 2009). The main personal protective equipment

(PPE) in construction (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or safety. PPE should be regarded as a „last resort“ when considering control measures. Other methods should be considered and used that will reduce or eliminate risk to injury. However, where PPE is the only effective means of controlling the risks of injury or ill health, then employers must ensure that PPE is available. PPE should be worn at all construction sites. A typical construction site may require workers to wear a hard hat, coveralls, safety footwear, gloves, eye protection and high visibility vest. These must be provided to all employees (Estate, 2010).

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

Hislop (1999), has observed that safety violation and injuries occurred because of three factors: personal factor, work factors, and those factors out of workers control.

Therefore, evaluating these factors is most critical to achieve safety practices. In his study, when we talk about construction safety, our first thought is generally that this is a responsibility of the contractor. The focus reflects the contractor's control over their work place and their work practices. There are, however, many more characters that should be involved in establishing a safe job site than just the contractor. All participants in the construction process, from the client commissioning the work to the constructor and to

the men and women who perform the work, are integral to the process of establishing a safe work place. Therefore, throughout the construction process we must have means in place by which hazards can be identified and effectively controlled, and safe work practices promoted. Safety practices are effective in controlling hazard by eliminating major symptoms of accident to minimize loss. The key to critical safety practices is very much influenced by the behavior of the construction workers. The behavior of construction workers varies all over the world despite complying with the global safety regulation standard of safety practices.

## **2.10 Basic personal protective equipment and clothing to ensure safety at the Workplace**

All workers must equip themselves with suitable clothing, shirts, and long pants for protection against both the weather and workplace hazards. Unless otherwise agreed upon, workers are also responsible for providing their own work gloves, safety headgear, and safety footwear. However, if a product requires specified gloves to protect the user against hand injuries such as slivers and cuts, the employer must provide those gloves.

Employers are responsible for providing and enforcing the use of personal protective clothing and equipment (Enns et al., 2005). This includes fall, respiratory, eye, and hearing protection and any other specialized protective equipment required by the Occupational Health and Safety Regulation.

Employers need to make sure that the appropriate personal protective equipment is identified for various phases of construction and is being used by workers. Employers must ensure that workers are trained in the use of specialized protective equipment prior

to use; this includes fall protection equipment. Where there is a danger of making contact with moving parts of machinery, equipment, or tools (Enns et al., 2005):

- Avoid loose fitting or frayed clothing, which may get caught.
- Remove accessories such as rings, dangling neckwear, loose-fitting bracelets, and watch bands.
- Confine long hair.
- Wear a short-sleeved shirt and long pants (Enns et al., 2005).

Footwear must protect the ankle, sole, and toes. Safety footwear with a CSA green triangle symbol meets these requirements. It is the worker's responsibility to keep personal safety footwear in good repair. For example, exposed metal toe caps could be hazardous near electricity. Keep laces tied up at all times to avoid snagging or tripping (Enns et al., 2005).

Residential construction workers are often exposed to on-the-job noise that can permanently damage hearing. It's important that workers wear hearing protection when exposed to noise from loud equipment such as air nailers, chop saws, chainsaws, circular saws, routers, screw guns, drills, and power planers. Employers are responsible for providing the required hearing protection. To monitor the effectiveness of hearing protection, construction workers must have their hearing tested every year. Where communications with co-workers may be critical, hearing protectors that do not block out too much noise should be worn, for example, custom-molded earplugs with vents, earplugs with a connecting cord, Class B earplugs or earmuffs, and electronic earmuffs or earplugs (Enns et al., 2005).

Before beginning to excavate, locate and identify all utility services, such as electrical, gas, steam, water, and sewer in the area. Any danger to workers from these utility services must be eliminated or controlled. Pointed tools cannot be used to probe for underground gas and electrical services. If possible, blunt shovels should be used to expose the facility. Caution should be taken, especially if newer, sharper spade shovels are used. Trees, utility poles, rocks, or similar objects near the edge of an excavation must be removed or secured to prevent workers from being injured (Enns et al., 2005).

Safety Gloves to protect the hands obtained an Average Index of 86.11 for the

Contractors and 80.77 for the Developers. Both group has different point of view regarding to safety program whereby the contractors indicated that the program was placed third in the level of the importance while the developers marked it fifth. Using hand tools such as nailing, hammering, crushing rocks, cutting metals, cutting woods is a common task, therefore workers is obligated to work with safety gloves. Based on research conducted by Salim (1999), data obtain from PT. ASTEK shows injuries cause by accidental hitting reaches 37.75 % which shows that the type of accident has a high percentage, this is also apparent that workers are not aware of the importance of safety gloves to protect their hand and to reduce the risk of injuries (Permana, 2007).

The use of safety mask or goggles to protect the eyes has an Average Index of 81.56 for the contractors and 81.73 for the developers. Safety Mask or goggles can protect the eyes from debris, hazardous chemicals and reducing the risk of high radiations during welding, or places that may harm the eyes. Workers can work safely with safety masks or goggles especially those often involve in working with hazardous chemicals like antirust proofing agents and solvents, welding, grinding and powered sanding. This

concur with the study conducted by Fitri (2000), that accident due to negligence to wear safety mask or goggle has reach 7% of the total amount of construction accident (Permana, 2007).

Safety Shoes to protect the feet from stepping and kicking an object has an Average Index of 74.07 for the contractors and 81.73 for the developers. At construction site where hazardous object scattered all over the floor e.g. Pieces of steel, wood, nail, rock, construction tools and other building materials, safety shoes is a necessity.

According to research conducted by Salim (1999), 18.28 %of accidents is cause by falling or slipping from slippery floor, these occur when workers are not aware of what type of shoes they need to wear or sometimes they ignored to wear. Beside the slippery workplace, safety shoes may prevent the foot from injuries cause by nail puncture, sharp metals, and other sharp objects lying all over the work floor or ground, (Conference & Session, 2010), expressed that workers is obligated to wear safety shoes as danger lurks everywhere around the construction site whether it may be due to falling objects or objects lying all over the ground, wet and slippery floor (Permana, 2007).

## **2.11 Approaches to Construction Safety**

In spite of all the efforts to improve the poor safety record of the construction industry, the rate of fatalities in the construction industry has forced researchers to look for new approaches for construction safety. Attempts have been made to introduce behaviour-based safety approaches for construction projects. Salem et al. provided a decision support system to assist construction companies (especially small and medium sized) in implementing behaviour based safety. Although behaviour-based safety has been widely



accepted in other industries, it cannot be exactly replicated in the construction industry and it also involves a huge amount of money to implement full-fledged behaviour based safety. Another approach of identifying contributing factors of accidents, other than human errors and machine malfunction, is to look into organizational factors through resilience engineering. Resilience engineering emphasizes how organizations manage unexpected events and how people in these organizations become prepared to cope with unplanned and unforeseen events (Ghosh et al., 2009).

#### Cognitive systems engineering approach

Thus far, most efforts to understand the accident process have failed to recognize the dynamic and dependent nature of construction work. Rasmussen's model of „migration to accidents“ within the paradigm of cognitive systems engineering offers a broader and more powerful view of the relationship between individual and work environment, and of the factors that lead to incidents. In this model, labourers work away from the organization's boundary of economic failure and individual's boundary of excessive effort. Accidents occur when workers migrate towards the boundary of functionally acceptable behaviour and lose control. „Migration to accidents“ model contradicts current practices by recognizing that both individual tendencies and organizational factors push people to work in risky circumstances. The ideas of Rasmussen have been advocated both in construction as well as in other industries as an effective basis for designing adaptive work systems that take into account the inevitable migration of workers towards the boundary of loss of control (Ghosh et al., 2009).

#### Human Error Theories

The approach of this theory is pointed to the worker as the main factor of the accident. This approach as mentioned by (Abdelhamid, 2015), studies the tendency of humans to make error under various conditions and situations, with the blame mostly fall on human (unsafe) characteristics only. But this theory does not blame the workers as the main problem for accident, other factors such as design of workplace and tasks that do not consider worker (human) limitation also take part as the reason why accident happened (Abdel Hamid & Everett, 2000). In general, the overall objective of human error theory is to create a better design workplace, tasks, and tools that suitable with human limitation. There are some theory that related to the human error theory such as behaviour model, human factor model, and Ferrel theory. Most of these theories address the human (worker) as the main problem that makes an accident happen such as permanent characteristic of human, the combination of extreme environment and overload of human capability and conditions that make human tends to make mistake (Abdel Hamid & Everett, 2000) (Engineering, 2008).

## **2.12 Health and Safety Management within the Construction Industry in**

### **Developing Countries**

Construction processes in developing countries share similar characteristics in terms of the adoption of technology, construction methods, cultural environments and regulations (Hillebrandt, 1999); Ofori 1999; Thomas, 2002). For instance, in Ghana infrastructure like feeder roads, wells for water, small dams, small-scale irrigation, buildings are constructed using labour based methods (European Commission, 1994).

From OH & S perspective, it may be argued that construction SMEs which dominate the construction sector in Ghana are likely to share similar characteristics with their counterparts in other developing countries. Arguably, the findings of this study are of relevance to other developing countries (cited in Kheni et al., 2010).

More recently, LaDou (2003), reports that OH&S laws cover 10% of working population in developing countries, omitting many high risk sectors such as agriculture, fishing, forestry and construction (cited in Kheni et al., 2010).

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

OH&S management within developing countries to economic conditions, methods of working, attitudes and physical environment. With the exception of the first study, implementation of OH&S programs is rarely documented (cited in Kheni et al., 2010).

Health and safety management in the construction industry is influenced by cultures including; organizational culture, industry culture, existing legislation and institutions with responsibility for occupational health and safety. Research solely devoted to such influences is scarce. Lingard and Rawlinson (2005), have shown the significance of these influences on proactive health and safety management in the construction industry. Peckitt et al. (2002, 2004), studied the construction industries of Britain and the Caribbean.

Construction workers of the latter country, which has a culture similar to and originating from West Africa, were found to view values of freedom, love and social interactions as having impact on site safety, whereas British workers rated these values as having a lower impact. Other religions have been similarly linked to health and safety. The study therefore highlights the importance of national culture in the management of health and safety (Kheni et al., 2008).

### **2.13 Causes of Accidents on Construction Site**

The Department for Work and Pensions in the UK commissioned a research into construction health and safety practices to ascertain the underlying causes of construction fatal accidents in the UK. The underlying causes of construction accidents identified were categorized under societal and industry wide influences (macro); project and process factors (mezzo) and worker/supervisor/workplace cause, (Brace et al., 2009).

The causes of construction accidents at the macro level were identified to include immature corporate systems, inappropriate enforcement, lack of proper accident data, and lack of leadership from „Government“ as a key client and a lack of influence of trades unions in practice on most sites, especially for smaller projects. Mezzo factors were identified as immature project systems and processes, inappropriate procurement and supply chain arrangements, lack of understanding and engagement by some of the design community, lack of proper accident investigation/data and consequently, a lack of organizational learning. Micro factors included a shortage of competent supervisors; a lack of individual competency and understanding of workers and supervisors; the ineffectiveness or lack of training and certification of competence; a lack of ownership, engagement and empowerment of, communication with and responsibility for workers and supervisors. These factors were also exacerbated by poor behavior, cost pressures; poor equipment or misuse of equipment, including personal protective equipment; site hazards; poor employment practices; an itinerant workforce and inadequate management of and provision for vulnerable workers such as younger, older or migrant workers. The study was based on an international consultation with 15 overseas construction industry expert stakeholders; phone/email interviews/consultation with 27 UK senior construction industry expert stakeholders; in-depth face to face interviews with 15 practitioners from the UK construction industry; and phone interviews with 15 workers representing the UK’s smaller organizations/sole-traders (Brace et al., 2009) (Estate, 2010).

Falling has been identified as the leading cause of fatalities in construction operations. In order to minimise fall-related accidents and injuries, the international

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

Major symptoms such as unsafe practices and unsafe conditions, Clough (1986), stated that it would be impossible to eliminate as humans are not perfect. Having the knowledge to act safe can be considered as a good safety practice. Suggestions for establishing a safe workplace and avoiding accident also mention in various priority according to several researcher as a result to their different point of view in safety practices as observed by Niskanen and Lauttalammi (1989), wide variety of machinery and equipment for materials handling should be available on site. Bradford (1993), suggests that employees required to enter confined spaces should be instructed concerning potential hazards, precautions to be taken, and the use of protective equipment. According to OSHA, high technology, such as radio remote control, that may

improve the safety and the maneuvering ability of construction machinery and equipment should be used, if applicable. Normile and Skibniewski (1989), suggest that Robots should be used as much as possible to improve safety.

It is commonly known that accidents have serious implications to the construction industry both in financial and humanitarian terms. Construction accidents may cause many problems, such as demonization of workers; disruption of site activities; delay of project progress; and adversely affecting the overall cost, productivity and reputation of the construction industry (Mohamed, 1999). In Hong Kong, the cost of accidents accounts 8.5% of the total tender price (Rowlinson, 2003). Considering the adverse impacts of accidents, construction safety management is of genuine concern to all stakeholders in the construction industry. Government, unions and insurers have spent a great deal of time and effort attempting to evolve legislation, rules and regulations to help reduce the large loss of life and limbs, and the high number of "lost-work days" (Goldsmith, 1987). In USA, the practice of safety in construction is regulated by governmental agencies such as the Occupational Safety and Health Administration (OSHA), which provides strict rules and regulations to enforce safety and health standards on job sites. However, legislation alone cannot reduce accident rates unless craftsmen and management take positive actions to integrate these rules into their everyday activities by implementing a safety management programme. Safety management is an approach aimed at removing or minimizing the forces which cause losses through injured workers, or damaged equipment and facilities (Dorji & Hadikusumo, 2006).

According to Howell et al. (1998), unsafe practices are often seen in every construction project all over the world. Unlike countries with strict regulation on safety, Ghana as well as other third world countries often contravenes safety, despite having its own regulations and law. Some examples of common unsafe practices are given below:

- Working without authority;
- Failure to warn others of danger;
- Using equipment inadequately;
- Disconnecting safety devices such as guards;
- Using defective equipment;
- Smoking in areas where this is not allowed; and
- Failure to use or wear personal protective equipment.

(St & Holt, 2001), state that unsafe practices and unsafe conditions are deviation from required safe practices, but they must be seen as symptoms or more basic underlying indirect or secondary cause which allow these deviations to exist and persist. Akhmad Suraji, et al. (2001), reveals that a deviation to unsafe practices and unsafe conditions is liable to cause accident.

Many accidents in the construction industry are due to bad planning, lack of organization and poor co-ordination on construction sites. According to the European Agency for Safety and Health at Work, in the European Union, construction work leads to most serious accidents at places of work, with more than 1300 people being killed in construction accidents every year. Worldwide, construction workers are three times more likely to be killed and twice as likely to be injured as workers in other occupations. As is evident in this Code of Practice, the costs of these accidents are not borne by workers and



employers only, but are also usually shouldered by the owner or owners of the project, legally known as the “client”. These costs can amount to a considerable share of the contract price. In Malta, most occupational fatalities occur in construction sites, and most of these fatalities are due to falls from heights. Moreover, the construction sector claims the second highest rate of occupational accidents each year, reaching 16.5% of all reported accidents in 2005 (Occupational Health and Safety Authority, 2006).

#### **2.14 Safety Problems on Construction Sites**

There are safety problems on almost all construction sites which relate to reporting accidents, employing and subcontracting. Employing: all personnel who are employed to carry out construction work on site must be trained, competent and fit to do the job safely and without putting their own or others’ health and safety at risk; properly supervised and given clear instructions; have access to washing and toilet facilities; have the right tools, equipment, plant and protective clothing; educated about health and safety issues with them (or their representatives); have arrangements for employees’ health surveillance where required. Accidents: all accidents or work-related illness should be reported to the appropriate authorities within a reasonable or stipulated timeframe.

Subcontracting: main contractors should ensure that they check the safety performance of the subcontractors they plan to use; give subcontractors safety information they need for the work; talk about the work with them before they start; make sure that you have provided everything agreed (e.g. Safe scaffolds, the right plant, access to welfare, etc); and check their performance and remedy shortcomings (Estate, 2010).

The state of health and safety on construction sites in Ghana was investigated by

Department of Building Technology, Kumasi Polytechnic, using first hand observation of fourteen construction project sites in 2009 and 2010. At each site, the construction project, workers and the physical environment of the site were inspected and evaluated against health and safety indicators taken from the literature. The results reveal a poor state of health and safety on Ghanaian construction sites. The primary reasons are a lack of strong institutional framework for governing construction activities and poor enforcement of health and safety policies and procedures. Also, Ghanaian society does not place a high premium on health and safety of construction workers on site. Interviews with workers indicated that injuries and accidents are common on sites. However, compensation for injury is often at the discretion of the contractor although collective bargaining agreements between Labour unions and employers prescribe obligations for the contractor in the event of injury to a worker.

The study by (Kheni et al., 2008), on health and safety practices among construction SMEs in Ghana revealed serious problems. The main problems identified by Kheni included lack of skilled human resources, inadequate government support for regulatory institutions and inefficiency in institutional frameworks responsible for health and safety standards. Another problem highlighted was the significance of the Ghanaian sociocultural value systems particularly, the extended family system and traditional religious value systems in health and safety management within Ghanaian construction SMEs. The research also provided insights into difficulties posed by the internal environment of

SMEs to the effective management of health and safety (Kheni et al., 2008), provides a broad understanding of health and safety in the construction sector in Ghana (Estate, 2010).

There are two Acts in Ghana (the Labour Act, 2003 and the Factories, Offices and Shops Act, 1970), that provide some form of regulatory instruments for ensuring health and safety on construction sites. However these are not strongly enforced and many contractors are not even aware of their Health and Safety obligations under these Acts.

Regulatory bodies responsible for ensuring compliance are not properly resourced to carry out their statutory responsibilities under the two legislations. Hence there is a big problem with construction health and safety in Ghana. Most workers interviewed in the course of the study indicated that injuries and accidents are common on sites and often they have to go through a long period of frustration and pleading with employers before they are provided with some form of compensation for injuries and accidents. The parties responsible for ensuring internationally acceptable standards of health and safety on construction sites in Ghana are Government, clients, consultants, contractors, workers and civil society. Government should take the lead in enacting appropriate legislation and enforcing this by resourcing the appropriate Ministries, Agencies and Departments of Government to do their jobs well. Clients, contractors and consultants of the construction sector in Ghana should ensure that every construction contract takes comprehensive account of health and safety requirements for the project, environment and the workers. Workers and civil society should ensure and demand the provision of adequate health and safety policies, procedures and provisions to govern construction work (Estate, 2010).

## 2.15 The Impact of Safety Practices on Construction Sites

In examining the impact of worker safety attitudes on construction safety outcomes, McCabe et al. (2005), surveyed construction workers and supervisors. The research revealed that employee demographics influence safety attitudes. Siu et al. (2003), observed similar results in their study into the impact of age differences in safety attitudes and performance among Hong Kong construction workers. It was found that older workers exhibit more positive attitudes to safety than younger workers and that an impetus exists for safety programs to reflect this trend. Conversely, Gun and Ryan (1994), observed that risk of injury was unrelated to operator age or experience. Keeping within this theme of worker demographics and accident causes, (Union et al., 2005), examined the relationship between individual characteristics and OHS injuries in the French construction sector. Their case-control study involved surveying 880 male workers who had experienced one or more workplace injuries within a two-year period. (Union et al., 2005), observed that, although young age, sleep disorders, smoking, disabilities, sporting activities and experience influenced the likelihood of occupational injuries, the risk for individual workers was dependent on their specific position within the construction supply chain. In addition, Ringen et al. (1995), noted that, where a large proportion of the construction labour force in an Anglophone nation is comprised of immigrants with limited language capabilities, the inability of workers to understand English also has the capacity to increase the risks of injury (cited in Charles et al., 2004).

Poor safety records lead to increases in insurance premiums which in turn lead to increases in construction project costs. Contractors with poor safety records pay approximately twice the amount of insurance premiums of those with good safety

records. In the United States, the construction industry accounts for 20 percent of traumatic occupational injuries and 12 percent of disabling injuries, but only represents 5 percent of the nation's employed workforce (Liska, 1993). Construction projects that have successful safety programs were found to also have management commitment, hazard control, safety training and meetings, employee support, safety inspections, internal communications, accident investigation procedures and record keeping, emergency procedures and services, and a safety coordinator (Liska, 1993). Many of these items go hand in hand with the type of objectives that effective teams focus on (cited in Sykes, 1998).

### **2.16 Improving Safety Practices at the Workplace**

Appropriate safety material must be produced in such a way as to be understood and followed by the industry parties themselves. Everyone within the industry has a duty to protect themselves and others who may be affected by their own work or process. The role of Workplace Health and Safety Officers, Workplace Health and Safety

Representatives and Workplace Health and Safety Committees are extremely important in providing the information and support necessary where informed decisions can be made to minimize risk. Greater workplace consultation requires further consideration and will cut across all industry boundaries for development and resolution. The consultative process is essential in providing avenues where genuine health and safety concerns can be raised and resolved in an atmosphere of cooperation and trust (Australia Department of Employment, 2001).

Identifying and assessing the hazards and risks is an essential step in safety management (Ann, 1976); (Goetsch, n.d.); (St & Holt, 2001). Job Safety Analysis (JSA), also known as Job Hazard Analysis (JHA), is a practical method for identifying, evaluating and controlling risks in industrial procedures (Chao & Henshaw, 2002). However, the differences between construction sites and manufacturing facilities give rise to the need for a specialized method for construction. Construction projects are dynamic (Bobick, 2004). They are characterized by many unique factors – such as frequent work team rotations, exposure to weather conditions, high proportions of unskilled and temporary workers. Construction sites, unlike other production facilities, undergo changes in topography, topology and work conditions throughout the duration of the projects. These features make managing construction site-safety more difficult than managing safety in manufacturing plants. Particularly in construction, a different approach is needed to identify hazards and risks, increase safety and prevent accidents (Rozenfeld et al., n.d.).

Eliminating or reducing accidents and injuries at the place of work will not only save a great deal of pain and suffering to workers but will also help to reduce the many direct and indirect financial costs related to these accidents and injuries. Furthermore, owners of projects (clients), client appointed supervisors, employers, directors, managers and other supervisors can be held responsible for failing to have effective occupational health and safety control measures in place (Occupational Health and Safety Authority, 2006).

A successful corporate safety programme should include a clear statement of policy by the client or owner, expressly showing management support for meeting safety objectives and the involvement of different stakeholders in the management system.

Contractors who have experience of undertaking public sector projects should be quite familiar with concepts of a site safety plan, risk assessment, safe working method statement and other safety management arrangements, but private sector clients and contractors may not have the same experience and exposure, particularly for the smaller developers and contractors (Kong, n.d.).

Establish a clear position on safety. The owner's position on safety should be clearly communicated to the project team at the beginning of the project and to all team members joining the project as part of the construction phase. The position can be written in the project documents and contracts, and verbally communicated in project team meetings during design and construction. The actions of all members of the owner's organization during the course of the project must reflect and reinforce the established position. Ensure that safety is addressed in project planning and design. Thus, owners must provide the initial impetus, by requesting or even requiring, by contract terms, that designers consider construction site safety in their designs (Huang, 2003).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter is based on how the study was conducted. It explains in details the method used in gathering data and information. It was also identify the population and sampling techniques. Research methodology on the other hand is inclusive of the research methods and encompasses the overall approach to the research process.

#### **3.2 Research Design**

The academic purpose of the study was effectively communicated to the authorities and the respondents before and during the process of the data gathering. Case study research generate large amount of information from multiple sources. Systematic organization of the data is important to prevent the researcher from becoming overwhelmed by the amount of data and also to prevent the researcher from losing sight of the original research purpose and questions.

In view of this, the researcher adopted quantitative approach using discussions of data from questionnaires and interviews, descriptive reports which sought to gather data so that a description of what is going on can be made.

According to Glaser, and Strauss, (1990), qualitative research method is recommended for better understanding of such phenomenon about which is little known. It is for this reason that the researcher is of the view that quantitative researcher is more appropriate for the study because he identified some variables that might not be adequately describe



### **3.3 Population**

The population of the study involved contraction site workers in the construction industries. It also involved some selected construction firms currently undertaking construction projects in the Wa Municipality. Some of these projects located at Wapaani, Wa-Sombo, Bamahu, and Dobile.

### **3.4 Sampling Techniques and sampling size**

The researcher employed the used of convenience sampling technique in selecting the sample size. The respondents were chosen by the researcher during his visit to the construction firms in the Wa Municipality and the selected respondents were the ones who had the chance to respond to the questionnaires and the interviews. The technique was preferable to other alternatives such as simple random sampling and purposive sampling techniques since the population was infinite.

The study were confined to construction sites in the Wa Municipality Ninty Six (96) respondents participated in the study of which eighty (80) workers, four contractors (4), four (4) site foremen and eight (8) masons in the selected sites. Most of the sampled population were males due to the nature of the construction work. Some of the workers have been in the construction industry for less than five and between 16-20 years.

### **3.5 Data collection Techniques**

The techniques used for the collection of data for the study, involved questionnaires, interviews and observation of the construction sites under study.

#### **3.5.1 Questionnaires**

Preliminary contacts with potential respondents based on information from the literature review served as a basis for questionnaires design for the different respondents. The study was conducted by administering a structured questionnaire to the contractors, site foremen, and masons of some selected site in the Wa municipality in the upper west region. The questionnaires were used to solicit information with regards to the influence of safety practices on construction site worker performances. Various visits and observation were made, and few vary persons were interviewed at some selected areas and the questionnaires were given out and collected back in persons.

The questionnaires for the constructor and site foremen were to enable the researcher to assess the capacity of these departments to evaluate safety practices on construction site workers performances of their respective firm and the type of safety activities that go on in these construction firm. The questions covered the variables necessary to measure efficient of safety practice to improve workers performance at a construction site. This included the quality of job, the components that decay and the design of the buildings and its effect on maintenance.

### **3.5.2 Interviews**

Interviews were conducted to the contractors, site foremen, and masons to find out whether there was any safety practices policy in the construction industry in a specific period of time and how does safety practices improve the performance of workers at the construction sites. The interview were a structured one. This method involved personal interviews and focused interviews. Personal interviews involved administering three different questions, to different respondents, depending on their respective roles and status. The questionnaires was administered to workers at a particular construction firm.

### **3.5.3 Observations**

The researcher visited most of the construction site in the Wa municipality which are under study. With this method, the researcher looked at various types of construction site in order to identify safety practices on construction site workers performances in their respective solution. This gave a rightful idea and the necessary safety practices to be carried out while the construction was on going.

- **Observation at Wapaani**

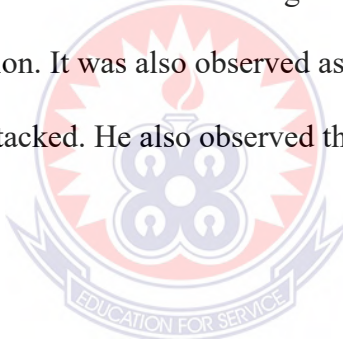
At Wapaani, the researcher observed how construction operations were carried out with regard to the process involved in forming roof trusses. He also observed the quality of timber in term of whether the timber is well seasoned and has defects such as knots, slabs etc. The type of timber was also considered whether it was softwood or hardwood and the usage of personal protective clothing by workers whilst at work.

- **Observation at Wa-Sombo**

The researcher conducted a visit at Wa-Sombo to observe how construction operations were being carried out with respect to the processes involved in decking. The size and quality of the reinforcement is considered in terms of the strength to carry the above load of the building. The type of timber was also considered whether it was softwood or hardwood and the usage of personal protective clothing by workers whilst at work.

- **Observation at Bamahu**

The researcher observed how the site is organized in order to ensure free flow of work without any interruption. It was also observed as to how materials such as sand, chippings, and blocks are stacked. He also observed that safety precaution on site were not considered.



- **Observation at Dobile**

The researcher observed how construction operations were being carried out with regard to the process involved in mixing concrete mechanically and whether the fine and course aggregates were free from impurities. The transportation of the concrete and whether the workers were using protection clothing's were considered.

### **3.5.4 Pilot Study**

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

### **3.6 Data Analysis**

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

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This section of the chapter deals with the presentation of results and discussions obtained from questionnaires, interviews and observation.

#### 4.2 Results and Discussion of Questionnaires

The results and discussion were obtained from eighty (80) workers, four (4) contractors, four (4) site foremen and eight (8) masons. Eighty –eight (88) questionnaires were issued to workers and eighty (80) questionnaires were received. With the contractors and site foremen four (4) questionnaires were issued to each and all were retrieved, while that of masons eighty (8) questionnaires were issued and all were retrieved. The breakdown of the questionnaires issued and retrieved in percentages was presented in Table 4.1.

**Table 4.1: Responses to Questionnaires**

	Workers	Contractors	Site Foremen	Masons	Total
Issued	88	4	4	8	104
Received	80	4	4	8	96
Percentage	84.6	100	100	100	92.3%

#### 4.2.1 Results and Discussion of Questionnaires from Workers

The sex distribution of the workers showed that the males were sixty-five representing 67.5%, while the females were twenty –six representing 32.5%. The result is an indication that there were more males employed in the construction firms than the females in the study area as can be seen in Table 4.2. The high percentage of the male respondents demonstrate that construction work has to do with physical and the perception that the skilled labour are for males such as building, carpentry, steel bending, plumbing, electrical and among others.

**Table 4.2: Sex Distribution of Workers**

Sex	Frequency	Percentage
Male	65	81.25
Female	15	18.75
<b>Total</b>	<b>80</b>	<b>100</b>

Source: Field Survey, May 2021

**Table 4.3: Age Grouping of Workers**

Years in Age	Frequency	Percentage
18–20	16	20
21–30	22	27.5
31–40	34	42.5
41–50	8	10
51 and above	–	–
<b>Total</b>	<b>80</b>	<b>100</b>

**Source: Field Survey, May, 2021**

The data on Table 4.3 showed that, majority of the workers were between the age brackets of 31-40 years representing 42.5%. The least representation of the respondents' age grouping was 10% of workers thus ages ranging from 41 to 50 years. The remaining 47.5% is ages with ranges from 18 to 20 years. The larger number of workers in this age brackets explains the strenuous of work in the construction sector and therefore the need for stronger people. However, there was no worker with age 51 and above and this buttresses the earlier assertion that stronger people are in the construction industry than the aged. The result suggests that over 90% of the workers were within the active age. This is an indication that construction firms do employ energetic people for work.

**Table 4.4: Educational Background of Workers**

Level of Education	Frequency	Percentage
Tertiary	4	5
SHS,TECH/VOC.	16	20
JHS	22	27.5
Primary Education	6	7.5
Non-Formal Education	30	37.5
Others	2	2.5
<b>Total</b>	<b>80</b>	<b>100</b>

**Source: Field Survey, May, 2021**

The data on level of education of the workers, showed that majority of the workers had attained non- formal education. However, some of the workers have Basic



Education Certificate. As in table 4.4, those educated at Tertiary level are 5%, those with basic Education Certificate are 27.5%, and those with SHS/TECH /VOC. are 20%.

The result indicates that education in Northern Ghana, especially the Upper West Region remains an issue to be tackled by all well-meaning professionals in Ghana and beyond.

**Table 4.5: Working Experience of Workers**

<b>Experience in Years</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 5	22	27.5
5–10	28	35
11–15	26	32.5
16–20	4	5
20 and above	–	–
<b>Total</b>	<b>80</b>	<b>100</b>

**Source: Field Survey, May, 2021**

The results presented on Table 4.5, showed that 35% of the workers served in the construction firm within a range of 5-10 years, workers who served the construction firm within a range of 11-15 years were second in majority with a representation of 32.5%. The results had also revealed that 5% of the workers served in construction firm between 16-20 years while 27.5% of workers worked in construction firm for less than five years. This is an indication that, majority of the workers have worked in the construction industry over 11 years and not greater than 20 years and might have gain experience relating to safety issues on site.

**Table 4.6: Safety Awareness of workers on site**

Respondents' Awareness of Safety on Site	SA.	A.	SD.	D.	NI.	Total
	Freq.	Freq.	Freq.	Freq.	Freq.	Freq.
	%	%	%	%	%	%
Construction firms have health and safety rules	25	8	14	30	3	80
	31.3	10	17.5	37.5	3.7	100
Workers are very much aware of health and safety rules at site	30	8	38	4	–	80
	37.5	10	47.5	5	–	100
Employers provide protective clothing and safety equipment	11	13	36	16	4	80
	13.7	16.3	45	20	5	100
Management prepare health and safety plans for each project	15	20	3	4	38	80
	18.8	25	3.7	5	47.5	100
A worker that fails to abide by safety rules is sanctioned	2	25	5	35	13	80
	2.5	31.3	6.2	43.7	16.3	100
There is a legislation that ensures safety of workers on site	26	3	30	14	7	80
	32.5	3.7	37.5	17.5	8.7	100
Health and safety officers often visit workers on site	5	19	40	4	12	80
	6.2	3.8	50	5	15	100

**Source: Field Survey, May 2021**

Table 4.6, illustrates workers awareness of safety regulation signs and symbols at site. Over 33 of the workers representing 41.3% of them attested construction firms have health and safety rules. A majority of 55% of the workers did not confirm contractors policy of having among their documents safety regulation signs and symbols at site. A total of 3 individual workers representing 3.7% could not tell whether construction firms had health and safety signs and symbols at site. This is an evident that contractors in

study work contrary to Construction Industry Advisory Committee, Manual, 1995 which emphasises a prepared standard document be enable component designer or contractor perform effectively in refurbishing or altering the structure of a later data.

On the item workers awareness of health and safety rules at site, 38 of the workers representing 47.5% confirmed awareness of health and safety regulations or measures are duly practiced by the construction firm. However, the remaining 52% of the workers went contrary. The result confirms Timings (1995) argument that it is essential to observe working practices to safeguard all those involved and property. The results is also an indication that workers in construction industry do try as much as possible to preventing themselves form been harmed in the course of work, this, they know and follow right precautionary measures and providing a satisfactory working environment (Health and Safety Executives 2004).

The study further revealed that 24 of the workers representing 30% did support the statement, employers provide protective clothing and safety equipment for workers on site, but a sum of 52 of them representing 65% vehemently disagreed while 4 of the workers representing (5%) could neither agree nor disagree on the provision of safety clothing for workers on site by the employers. The result is contrary to Timings and Wilkinson (2000), where employers must all at cost ensure that in safe conditions including plant and equipment are maintained as well as training and supervision in safe working practices are provided.

There was also interesting revelation where a huge percentage of 47.5 of the workers could not disagree or confirm management preparation of health and safety plans for each project. However, some respondents made plain 35 of the workers representing

43.8% while a few conflicted 7 of the workers representing 8.7% as showed on Table 4.6. Also, 44 of the workers representing 55% of respondents did not confirm management with legislation to ensuring workers safety on site while 29 of the workers representing 36.2% participants were certain about management legislative instrument to safety on site.

The remaining 8.8% was undecided. This is a clear indication that the Health and Safety Act 1975 which concerns the provision of powers and sanctions for the enforcement of safety laws, that is health and safety at work has not been strictly taken by some groups of construction firms. Health and safety officers often visit workers on site as management contribution to safety on site. This, 24 of the workers representing 10% and 44 of the workers representing 55% agreed and disagreed respectively with the 15% in doubt, all on Table 4.6. This is also against Nash, (1998) view the safety officer has the responsibility of ensuring that the requirements of the Health and Safety at Work Act are fully understood and applied to the site. Timings & Wilkinson, (2002), a successful organization integrates occupational health and safety into its day-to-day management, recognizing a management system to providing the procedures and instructions to the employee for the maintenance of its occupational health and safety management programmes seems not practicing in these organizations.

There were some others items that required the worker responses on the contribution of law enforcing agency on health and safety in a given construction firm. It was revealed by 40 of the workers representing 49.9% respondents, to them, workers that failed to abide by safety rules while on site were not sanctioned. However, 27 of the workers representing 33.3% confirmed that offenders of the law were sanctioned, while

13 of the workers representing 16.3% participants could not confirm or disallow as demonstrated on Table 4.6.

**Table 4.7: Workers' Knowledge in Safety Precautions**

Respondents' knowledge in safety precautions	SA. Freq. %	A. Freq. %	SD. Freq. %	D. Freq. %	NI. Freq. %	Total Freq. %
Management put down safety precautions	17 21.3	40 50	5 6.3	15 18.7	3 3.7	80 100
Management ensure that safety precautions work on site	24 30	11 13.7	29 36.3	16 20	– –	80 100
Operators of machines read manuals or guidelines before operations	18 22.5	38 47.5	19 23.8	3 3.7	2 2.5	80 100
Operator in a construction firm need not read manual	19 23.8	20 25	13 16.3	22 27.5	6 7.5	80 100
In-service training on health and safety precaution is often given workers	22 27.5	30 37.5	12 15	10 12.5	6 7.5	80 100

**Source: Field Survey, May 2021.**

The respondents' knowledge in safety precautions was examined and presented on Table 4.7, where management laid down safety precautions to some, thus 57 of the workers representing 71.3% confirmed having knowledge while 20 of the workers representing 25% had a contrary view, meanwhile 3 of the workers representing 3.7% had no idea regarding management laid down safety precautions. As whether operators of machines read manuals or guidelines before operation was investigated. The results were that 70% of the workers confirmed operators red manuals upon operation of machines as found in Table 4.7.

The remaining 30% was shared between respondents not in confirmation and those with no knowledge on operators of machine following instructions by reading manuals, thus, 27.5% and 2.5% respectively. Table 4.7 also illustrated management ensuring safety precautions of workers on site. This was confirmed by 35 of the workers representing 43.7%, but 45 of the workers representing 56.3% did not see that true. Six-five percent of the respondents asserted in-service training on health and safety precaution is often given to workers by management. About 27.5% workers, however, had different view while 7.5% of the workers had no idea. The result goes to confirm Timings and Wilkinson (2000), they had indicated that, every employer must ensure that plant and equipment are maintained in safe conditions, training and supervision in safe working practices are provided and that require equal responsibility of each and every employee to cooperate in making proper and full use of the facilities.

#### **4.2.2 Results and Discussion of Questionnaires from contractors**

The sex distribution of the contractors in Table 4.8 showed that all the four contractors representing 100%, were men. The result is an indication that there are more males into constructions in the study area as it shown in Table 4.8. This demonstrate the fact that females perceived that engineering courses are meant for males, for that matter contract works are for men hence males dominating in the construction industry.

**Table 4.8: Sex Distribution of Contractors**

Sex	Frequency	Percentage
Male	4	100
Female	0	0
<b>Total</b>	<b>4</b>	<b>100</b>

Source: Field Survey, May 2021

**Table 4.9: Age grouping of Contractors**

Years in Age	Frequency	Percentage
18–20	–	–
21–30	–	–
31–40	1	25
41–50	2	50
Above 51	1	25
<b>Total</b>	<b>4</b>	<b>100</b>

Source: Field Survey, May 2021

Table 4.9 shows 50% of contractors were between the ages brackets of 41-50 years representing half of the contractors involved in the survey. The age's brackets of 31-40 years and 51-60 years shared remaining 50% equally. This shows that both the young and old are into contract works specifically construction which is good for the municipality and the nation as a whole.

**Table 4.10: Educational Background of Contractors**

Level of Education	Frequency	Percentage
Tertiary	3	75
SHS/TECH/VOC	1	25
JHS	–	–
Primary Education	–	–
Non–Formal Education	–	–
Others	–	–
Total	4	100

**Source: Field Survey, May 2021**

The data on level of education of the contractors showed, that 3 out of the 4 had attained higher education up to the tertiary level representing 75%. The remaining 25% had Senior High School or Technical/Vocational education certificate. The entire result on contractors' education is presented in Table 4.10. It demonstrate the fact that, it is not only when you attain higher education is the requirement of becoming a contractor but you can become a contract after second cycle institution as indicated in Table 4.10.

**Table 4.13: Safety Precaution in use at Sites**

Statement	Yes. %	No. %	Total. %
Company provides safety equipment	100.0	0.0	100.0
company provides quality safety clothing	100.0	0.0	100.0
company owns safety officer on site	25.0	75.0	100.0

**Source: Field Survey, May 2021**



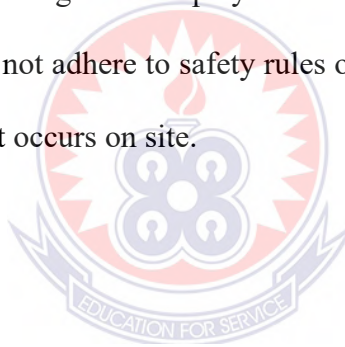
There was a 100% confirmation on Table 4.13 of contractors on the study that Companies provide protective clothing and equipment for workers. It was further confirmed that protective clothing and equipment provided by the companies had been 100% in both quality and quantity. It buttresses the International Labour Organization's Code of Practice (1992), all stake holders in the construction industry were enjoined to help curb down site accidents to the barest minimum. Also on Table 4.13, 3 of the contractors representing 75% attested companies did not have company's own safety officers on site for the enforcement of health and safety issues. This goes against the provision in the Health and Safety Act, 1974 which requires that all firms have a safety officer when employed more than twenty workers. However, 25% of the contractors confirmed that their companies did have company's own safety officers. This shows clearly that majority of the firms / companies in the municipality operate without safety officers to ensure the observance of safety issues at site.

**Table 4.14: Employers Contribution to Safety on Site**

Statement	Responses				Total
	SA %	A %	SD %	D %	
Management gives orientation to workers on safety	50.0	25.0	0.0	25.0	100.0
Employers are concerned about safety issues at site	50.0	50.0	0.0	0.0	100.0
contractors provide protective clothing for workers	25.0	50.0	25.0	0.0	100.0
Artisans and unskilled labour adhere to safety matters	25.0	0.0	75.0	0.0	100.0
Employees health and safety is important in construction	50.0	25.0	0.0	25.0	100.0

**Source: Field Survey, May 2021**

Table 4.14; illustrate that, 3 out of contractors representing 75% confirmed management gives orientation to workers on safety while 25% disagreed. Employers are concerned about safety issues at site were confirmed by 100% of the contractors. For contractors providing protective clothing for workers, 75% of the contractors agreed while 25% disagreed. Act 1974, cited in Timings (1995), the health and Safety at Work place responsibility for safe working environment and require management's role in ensuring Health and Safety at site. Artisans and unskilled labour adhere to safety matters were also agreed by 25% of contractors and 75% disagreed. Employees health and safety is important in construction firms, 75%, of the contractors confirmed and 25% did not agreed. All mentioned percentages are displayed on Table 4.14. This is an indication that majority of the workers do not adhere to safety rules on site forgetting that they are direct recipients when an accident occurs on site.



Statement	Responses				Total
	SA %	A %	SD %	D %	
Healthy and Safety improves economic situation of the firm	00.0	100.0	00.0	00.0	100.0
Safety precautions enhance productivity	00.0	100.0	00.0	00.0	100.0
Safety precautions makes tools and equipment last longer	00.0	100.0	00.0	00.0	100.0

**Table 4.15: Benefits of Safety Practices at a Construction Site****Source: Field Survey, May 2021**

Table 4.15 showed that 4 contractors representing 100% confirmed that Healthy and Safety precaution improves economic situation of the firm, enhance productivity and also makes tools and equipment last longer. This demonstrates that contractors are aware that their firm economic situation will improve when their employees abide by safety rules since no worker will sustain injury and taken to hospital for treatment and as such the company will not spend. With regards to their firms productivity will be enhance, the contractors are of the view that since work will continue to flow without any interruption due to worker abiding by safety rules and regulations it will actually increase productivity. Contractors also think that when the right tool is used for the right work couple with proper handling, the possibility of the tools lasting longer is very high. Apart from that proper storage and arrangement of tools and equipment on site can either contribute or reduce the rate of site accident.

**4.2.3 Results and Discussion of Questionnaires from Site Foremen**

The sex distribution of the foremen in Table 4.16 showed that there were no female foremen. The result is an indication that there are more men that pursued engineering and its related courses at the tertiary institutions than the women. It is therefore important that the authorities should encourage females to pursue engineering courses at the tertiary institutions.

**Table 4.16: Sex Distribution of Foremen**

Sex	Frequency	Percentage
Male	4	100
Female	0	0
<b>Total</b>	<b>4</b>	<b>100</b>

Source: Field Survey, May 2021

**Table 4.17: Age Grouping of Foremen**

Years in Age	Frequency	Percentage
18–25	–	–
21–30	–	–
31–40	–	–
41–50	3	75
Above 51	1	25
<b>Total</b>	<b>4</b>	<b>100</b>

Source: Field Survey, May 2021

The data in Table 4.17 show that majority of the foremen were between the age brackets of 41-50 years representing 75%. The least representation of the foremen' age grouping was 25% thus ages ranging from 51 years.

**Table 4.18: Educational Background of Foremen**

<b>Level of Education</b>	<b>Frequency</b>	<b>Percentage</b>
Tertiary	2	50
SHS/TECH	2	50
JHS	–	–
Primary Education	–	–
Non-Formal Education	–	–
Others	–	–
<b>Total</b>	<b>4</b>	<b>100</b>

**Source: Field Survey, May 2021**

The data on level of education of the foremen showed that 2 of the foremen representing 50% had attained tertiary education while the remaining 2 representing 50% have SHS/TECH Certificates as it is showed in Table 4.18. Their backgrounds therefore give them the opportunity to at least reason from broader perspective which will in turn reflect in their responses to the questions. It also shows, that they have an in-depth knowledge in the construction industry with regards to matters relating to health and safety issues.

**Table 4.19: Working Experience of Site Foremen**

<b>Experience in Years</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 5	–	–
5–10	–	–
11–15	–	–
16–20	2	50
20 and above	2	50
<b>Total</b>	<b>4</b>	<b>100</b>

**Source: Field Survey, May 2021**

The result presented in Table 4.19, shows that 50% of the foremen served in the construction firm within a range of 16-20 years, foremen who served the construction firm for range of twenty years and above, were also represented by 50%. It is therefore clear that construction firms in the study area employed experienced and qualified persons for the position of foremen. The study also revealed that 100% of the foremen of the age bracket of 16 years to 20 years and above have working experience in the construction sector.

**Table 4.21: Law Enforcing officials ensure Safety on site**

**Workers**

	<b>Most</b>		<b>Not At</b>		<b>No</b>	<b>Total</b>
	<b>often.</b>	<b>Often</b>	<b>All</b>	<b>Idea.</b>		
<b>Means by which safety precautions get to workers</b>	<b>Freq.</b>	<b>Freq.</b>	<b>Freq.</b>	<b>Freq.</b>	<b>Freq.</b>	<b>Freq.</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
Workers get information on safety precautions during staff meetings	20	12	44	4		80
Information on safety precautions is usually pasted on the notice board	25	15	55	5		100
Through seminars, workers get information on safety precautions	34	20	26	–		80
Safety precaution information get to workers during in-service training	42.5	25	32.5	–		100
	36	15	27	2		80
	45	18.8	33.7	2.5		100
	40	20	16	4		80
	50	25	20	5		100

**Source: Field Survey, May 2021**

The study, therefore, indicated that, the construction firms under study adhered to the labour Act of 2003. The Act spells out explicitly the duties, sanctions or penalties thereof, of an employer or employee who fails to conform to the Health and Safety rules. They further emphasized the obligation of every worker to use the safety appliances, fire-fighting equipment and the personal protective equipment provided by the employer.

Over 40% of foremen were of the view that, workers get information on safety precautions during staff meetings, while 55%, the majority went in the negative. The 5% left were not able to tell whether workers do get information on safety precautions during

staff meetings. It was realized that 67.5% of the foremen in affirmative on the item workers had information on safety precautions being usually pasted on the notice board. The remaining 32.5% of the foremen were on the opposite with none being indecisive. But for seminars, 63.8% of foremen were very certain that workers get information on safety precautions through it. The study revealed that 33.7% of the foremen saw seminars not a source and 2.5% of them were unable to make up the mind. The study also revealed that majority, 75% of the foremen responded safety precaution information get to workers during in-service training, while 20% of the foremen were in the positive with only 5% uncertain. Table 4.21 further explained the means by which safety precautions get to workers. Law enforcement adopts a unique document or powerful tool which is used to communicate the practice and procedures developed by an organization in the health and safety policy Allan St John Holt, (2001). Also, is a confirmation by Jacob, F. and Kenneth, L.C. (1997), enforcement of safety rules by law enforcement agencies had had positive impact on lives and properties in the construction industries in the early 1970s.

### **Results and Discussion of Questionnaires from Masons**

Table 4.22 shows sex distribution of the engineers in which the male masons were 100%, while the female were 0%. This demonstrates that all the males are into masons work at the construction site while their female counterparts are into other courses and should be encouraged to pursue block laying and its related courses at the higher institutions.



**Table 4.22: Sex Distribution of masons**

Sex	Frequency	Percentage
Male	8	100
Female	-	-
<b>Total</b>	<b>8</b>	<b>100</b>

Source: Field Survey, May 2021

**Table 4.23: Age Grouping of Masons**

Years in Age	Frequency	Percentage
18–20	1	12.5
21–30	2	25
31–40	2	25
41–50	2	25
51 and above	1	12.5
<b>Total</b>	<b>8</b>	<b>100</b>

Source: Field Survey, May 2021

The data on Table 4.23 shows that majority of the masons were between the ages brackets of 21-50 years representing 75%. The least representation of the respondents' age grouping was 12.5% thus ages ranging from 51 and above years. The remaining 12.5% of masons are of ages with ranges between 18-20 years. This shows that there are young, middle age and old masons who are into the construction industry.

**Table 4.24: Educational Background of Masons**

<b>Level of Education</b>	<b>Frequency</b>	<b>Percentage</b>
Tertiary	1	12.5
SHS/TECH/VOC	5	62.5
Primary education	1	12.5
Non-Formal Education	1	12.5
Others	–	–
<b>Total</b>	<b>8</b>	<b>100</b>

**Source: Field Survey, May 2021**

The data on level of education of masons show on table; 4.24 shows that majority of the masons were between the brackets of SHS/TECH/VOC which represents 62.5%. The least representation of the respondents in the levels for mason are tertiary education which represent 12.5%, primary education represent 12.5%, and non- formal education represents 12.5%. The background of SHS/TECH/VOC gives the opportunity to have an in-depth knowledge in the construction industry.

**Table 4.25: Working Experience of Masons**

<b>Experience in Years</b>	<b>Frequency</b>	<b>Percentage</b>
3-5	1	12.5
6-10	1	12.5
11-15	2	25
16-20	2	25
20 and above	2	25
<b>Total</b>	<b>8</b>	<b>100</b>

**Source: Field Survey, May 2021**

The result presented in Table 4.25, shows that 3 of the masons representing 75% served in the construction firm within a range of 11-20 years. However, 2 masons representing 25% served the construction firm for 3-10 years. This illustrates that masons within the municipality have been in the construction industry over eleven (11) years and have gained an in-depth practical knowledge relating to health and safety precautions on site.

**Table 4.26: Company Profile**

<b>Years served</b>	<b>Respondents</b>	<b>Percentage</b>
1-5yrs	1	12.5.0
6-10yrs	1	12.5.0
11-15yrs	4	50.0
16-20yrs	2	25.0
21yrs and above	0	00.0
<b>Total</b>	<b>8</b>	<b>100.0</b>
<b>Years in existence</b>		
1-5yrs	0	0
6-10yrs	0	0
11-15yrs	0	0
16-20yrs	8	100.0
21yrs and above	0	0
<b>Total</b>	<b>8</b>	<b>100.0</b>

**Source: Field Survey, May 2021.**

Table 4.26 showed that 4 of the masons representing 50% served in the construction firms within the year brackets of 11-15 years while 2 of them representing 25% served for 16 years and above in their firms, meanwhile only 12.5% of the masons worked for years between 1-5 and 6-10 respectively. It was also confirmed by the 8 masons representing 100% that the firms under study have been in existence not less than 16 years, but also not greater than 20 years as found on Table 4.26.

**Table 4.27: Health and Safety Issues at Construction Sites**

Statement	Responses				
	SA %	A %	SD %	D %	Total
Companies had safety signs and symbols displayed on site	25.0	50.0	.0	25.0	100.0
Respondents understanding of accidents occurrence on site.	75.0	15.5	0.0	9.5	100.0
Present of site layout planning techniques of projects	25.0	40.5	25.0	9.5	100.0
How often does site layout planning techniques of projects is done	37.5	8.5	14.0	40.0	100.0
Site layout ensures easy flow of work.					
Do your company have insurance policies on safety issues	31.0	62.5	0.0	6.5	100.0
	46.0	12.5	7.5	34.0	100.0

**Source: Field Survey, May 2021**

Six of the masons representing 75% as demonstrated in Table 4.27 were involved in the study were certain that their companies had safety signs and symbols displayed on site. Thirty percent said construction companies do not often have safety signs and symbols displayed on site. The results revealed that 90.5% of the masons had clear understanding of accidents occurrence on site while the remaining 19.5% of the masons did not have clear understanding of accidents occurrence on site Also, was site layout planning techniques of projects where 65.5% of the masons confirmed that site layout

planning techniques of projects is in use while 34.5% said companies did not have it in use. The result confirms Foster, G. (1992), proper distribution of labour and material is the most economically laid out site that enables fast and optimum work at site. As to how often site layout planning techniques of projects done, 46% of the masons said it was done frequently while 54% said it was not frequently done. Ninety three and half masons agreed that site arrangement or layout ensures easy flow of work. For insurance policies on safety issues, 58.5% of the masons did think construction companies have such policies, while the remaining 41.5% had contrary view.

Statement	Responses				Total
	SA %	A %	SD %	D %	
Management gives orientation to workers on safety.	25.0	50.0	0.0	25.0	100.0
Employers are concerned about safety issues at site.	75.0	12.5	0.0	12.5	100.0
Contractors provide protective clothing for workers.	37.5	25.0	25.0	12.5	100.0
Artisans and unskilled labour adhere to safety matters.	25.0	12.5	25.0	37.5	100.0
Employees health safety is important in construction.	62.5	12.5	12.5	12.5	100.0

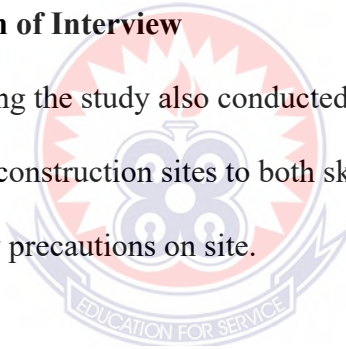
**Table 4.28: masons Contribution to Safety on Site**

**Source: Field Survey, May 2021**

Seventy-five of the masons confirmed management gives orientation to workers on safety while 25% disagreed. The results on Table 4.28 shows employers are concerned about safety issues at site were confirmed by 87.5% of masons, a percentage of 12.5% of the masons were, however, disagreed. For contractors providing protective clothing for workers, 62.5% of masons agreed while 37.5% of masons disagreed. For Artisans and unskilled labours adhere to safety matters, it revealed 37.5% of respondents in confirmation while the remaining 62.5% disagreed. The employees' health and safety is important in construction firms, 75%, confirmed while 25% of engineers disagreed as shown on Table 4.28.

#### **4.3 Results and Discussion of Interview**

The researcher during the study also conducted face to face interactions (interview) to a number of construction sites to both skilled and unskilled workers to solicit their views on safety precautions on site.



##### **4.3.1 Results and Discussion of Interview from workers at Wapaani**

At Wapaani where DONA Possibility Company Ltd is constructing market stores in the Wa municipality, the information gathered revealed that:

- The company provide protective safety clothing such as helmets to their workers on site.
- Management in the construction industry do not give orientation to newly recruit workers with regards to safety precautions.

- Majority of the workers agree that it is their responsibility to observe safety rules and regulations at work site.
- It was also revealed that the company do not provide first aid kits to workers on site.

#### **4.3.2 Results and Discussions of Interview from workers at Wa-Sombo**

Where John Dought Construction Company Ltd. is constructing a two storey administration block and a market stores respectively. During the interactions with workers, it was revealed that:

- The company provides protective safety clothing's to workers on site but they are not of good quality.
- Employers provide first aid kits to workers on site.
- Management provides orientation to newly recruit workers and also gives training and retraining on safety precautions.
- The company do not have its own safety officer on site to enforce safety rules and regulations.
- Majority of the workers abide by safety rules and regulations.

#### **4.3.3 Results and Discussion of Interview from workers at Bamahu**

At Bamahu where Dawud Mark & Brothers Ltd Construction Company is constructing chips compound and library.

These were some of the information realized for discussion:

- The companies provide protective safety clothing to workers such as helmets

- Most of the interviewees interacted with, during the visit indicated that there are no safety procedures and standards that exist in the company.
- Workers do not even know that it is the responsibility of their employers to bear the cost when they sustain injuries at work place.
- It was also revealed that employees do not observe safety rules and regulations.

#### **4.3.4 Results and Discussion of Interview from workers at Dobile**

At Dobile where Buk Empire Ghana Company Ltd is constructing a teachers quarters block to be build.

It was revealed that:

- Management provides personal protective safety clothing to their workers on site.
- Workers abide by safety rules and regulations and also give orientation to newly recruits and as well provide in-service training to workers.
- Employers ensure that site layout / arrangement are done properly for easy flow of work.
- The company do not have its own safety officer on site for the enforcement of safety rules and regulations.
- Management provides first aid kits to workers and ensures that their employees are insured.
- Employees always seek permission before using tools and machines / equipment.
- Sign and symbols are always displayed on site.



#### **4.4 Results and Discussion of Observation**

The researcher conducted a visit to a number of construction sites to have first-hand information with regards to the selected areas within Wa Municipality in the Upper West Region. During the visit, a number of revelations were made and these are some related ones.

##### **4.4.1 Results and Discussion of Observation at Wapaani**

At Wapaani, the carpenters were forming roof trusses and purling on the building. It was observed that the distance of the span was taken and half of the span was determine to obtain the rise. Intermediate members were used to brace the truss to ensure its rigidity before it is being fixed in positioned. It was also observed that the timber use was well seasoned, however some of the wood were having knots that can easily break and cause injuries to the workers. The timber used for the work were softwood. It was further observed that the workers were not using any protective clothing, as shown in figure 4.1.



Figure 4.1: Observation at Wapaani where carpenters are positioning trusses and purlins without the use of safety boot, helmet and hand gloves.

#### 4.4.2 Results and Discussion of Observation at Wa-Sombo

As at the time of the visit, the workers were batching fine and coarse aggregates. It was observed that small quantity of water were poured initially into the mixing drum and the machine was put on and allowed to be rotating while the sand and cement was added and they added water gradually before the coarse aggregate too was added. The researcher also observed that more water was added till the mixture was workable. The researcher further observed that the aggregates were free of impurities however, the water was not clean and the workers were not using any protective clothing, as shown in figure 4.2



Figure 4.2: Observation at Wa-Sombo where the operator of the concrete mixing machine can slip and fall since he is not wearing wellington boot and helmet.

#### 4.4.3 Results and discussion of observation at Bamahu

At Bamahu, they were decking and the researcher observed that the height of the props or vertical supports were not up to the height of the columns, this is to allow for the necessary adjustment of the wedge on the sole plate. It was observed that the beam plate running from one column to another was resting on the heads of the props and the necessary adjustment were done to ensure that they are level before the steel bender forms the mat and concrete is then casted .

The size of the props and the beam plates were 2” x 4” and 1” x 12” of softwood respectively and were all seasoned. However the props were of good quality devoid of

defects but some of the beam plates were having defects such as twisting, slabs, and cracks which has a potential of breaking and causing danger to the workers.



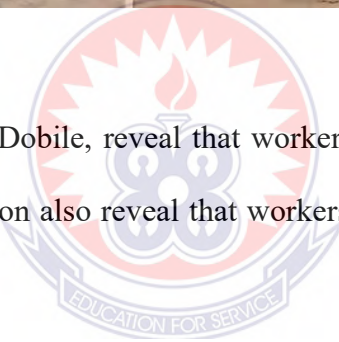
Figure 4.3: Observation at Bamahu, it was revealed that workers does no wear helmet, overall, safety boot and hand gloves which exposed them to danger.

#### 4.4.4 Results and Discussion of Observation at Dobile

At Dobile, it was revealed that the firm is well organised because the structure under construction were being hoarded to about 15ft to prevent noise, dust and unauthorised person(s) form gaining access to the site. It was observed that the various type of materials such as sand, chippings, mild steel, cement among others were stacked at advantage points to ensure easy flow of work, while signs and symbols were displayed where machines and equipment are packed as a means of preventing accidents on site. The observation also revealed that majority of the workers were not abiding by safety precautions on site.



Figure 4.4: Observation at Dobile, reveal that workers were not using the right scaffold for the work. The observation also reveal that workers were not wearing safety boot and helmet.



## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter entails the summary of findings, conclusion and recommendation of the study.

#### 5.2 Summary of Findings

The following are the summary of findings of the study:

- The study revealed that, some employers do not provide protective clothing and equipment for the workers on site, thereby exposing them to danger which lead to low productivity.
- It was also revealed that, most construction firms operate without safety procedures and policies governing their operation because the companies do not have its own safety officer on site for the enforcement of safety rules and regulations.
- The study revealed that management of some construction companies do not attach seriousness to health and safety issues of their employees because they do not provide first aid kits to workers and ensures that their employees are insured at the site.
- The study also revealed that, some construction companies do not sanction workers when they flout safety rules and regulations on site due to lack of safety officers to enforce safety issues.

- The study also revealed that most of the construction companies do not have their own safety officers on site for the enforcement of safety rules.
- It was also revealed that, majority of the construction firms in the municipality do not incorporate insurance policies on safety issues for their employees.

### **5.3 Conclusion**

The construction industry offers a numerous employment opportunities to the people, but however it is faced with problems, one of it is poor safety practices on site.

In addressing this constrain, most of the construction companies in the Municipality do not observe safety rules and regulations due to lack of safety officers which should ensure that both the employers and the employees observe safety rules and regulations on site.

It was also made known that majority of the contractors do not insure their companies against health and safety related issues. Employers should acknowledge the contributions of their employees by ensuring that they are saved at work.

Employees on the other hand should also note that, they are the direct recipient when an accident occurs on site if they contravene safety rules and should always abide by safety rules on site.

#### 5.4 Recommendations

The following recommendations were made to address the findings:

- This study recommends that efforts should be made by the Municipal Assembly to ensure that the employers provide protective safety clothing and equipment to workers.
- The Municipal Assembly should ensure that construction companies that operate within the municipality should have a policy framework that will govern their operations in the municipality.
- The study recommends that much emphasis should be made by the Municipal Assembly to engaged safety officers to pay regular visit to site and to monitor workers and sanction those who flout safety rules and regulations at the sites.
- The study recommends that, authorities of the Assembly should put appropriate sanctions and punitive measures to ensure that management of construction companies show concern to the issues of health and safety of their workers by providing first aid kits at site.
- The law enforcing agencies should enact a law indicating that a contract should only be awarded to a construction firm that has an insurance policy for its employers.



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## **QUESTIONNAIRE**

**UNIVERSITY OF EDUCATION, WINNEBA**

**COLLEGE OF TECHNOLOGY EDUCATION, KUMASI**

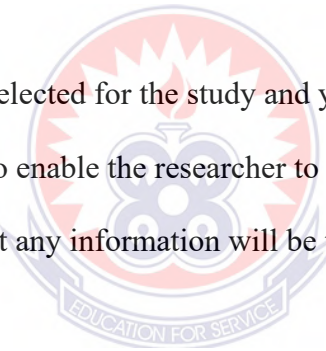
**DEPARTMENT OF CONSTRUCTION AND WOOD TECHNOLOGY**

### **PREAMBLE**

This questionnaire is design to solicit information on an evaluation of the influence of safety practices on construction site workers performance in the construction industry.

This research work is being carried out by a Master of Technology (M. Tech Construction) student of the above mentioned department of the University of Education, Winneba Kumasi Campus.

Wa municipality has been selected for the study and you are kindly requested to provide responses to the questions to enable the researcher to contribute knowledge in the field of study. Please be assured that any information will be treated with utmost confidentiality.



**APPENDIX A**

**QUESTIONNAIRE FOR WORKERS**

**Personal Data**

Please tick in the appropriate box below or you may express your opinion.

1. Gender:      M (   )      F (   )
2. How old are you?      Below 20 years (   )      21-30years(   )  
31-40 years (   )      41-50 years (   )      Above 51yrs (   )
3. What is your level of education? No formal education (   )      Primary  
education(   )      Middle/ JHS education (   )      Secondary / tech. education (   )  
Tertiary education(   )  
Other specify.....
4. Number of years in the firm? Less than one year (   )      1-2 years (   )      3-5  
years (   )      6-10 years (   )      11-15 years(   )      16-20 years(   )  
20 years and above(   )
5. What is your schedule? Contractor (   )      Site foreman (   )      Mason (   )  
Labourer (   )      Other specify .....
6. Employment status? Casual (   )      Permanent (   )

**Safety Awareness of Workers**

7. Do you have health and safety rules in your firm?      Yes (   )      No (   )
8. Are workers aware of health and safety regulation signs and symbols at site?  
Very well (   )      Somehow (   )      Not at all (   )
9. There are safety rules and regulations governing construction site?  
Strongly agree (   )      Agree (   )      Not sure (   )      Disagree (   )

**Employers Contribution to Safety on Site**

10. Employers provide safety equipment's and clothing?

Strongly agree ( ) Agree ( ) Disagree ( ) strongly disagree ( )

11. Management prepares health and safety plans for projects? Yes ( ) No ( )

12. How often is this done?

Monthly ( ) Quarterly ( ) Every six months ( ) Not at all ( )

**Law Enforcing Officials Ensure Safety on Site**

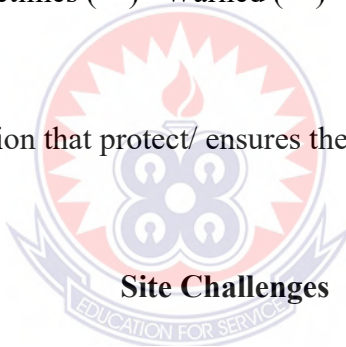
13. Workers who fail to observe safety rules are sanctioned?

Always ( ) Sometimes ( ) Warned ( ) other specify

.....

14. Is there any legislation that protect/ ensures the safety of employers on site?

Yes ( ) No ( )



15. Does the company have health and safety officer on site? Yes ( ) No ( )

16. Employers do not provide safety clothing to workers? Yes ( ) No ( )

**Safety Precautions in Use**

17. Employers prepare health and safety plans for projects? Yes ( ) No ( )

18. Management always ensures that workers abide by safety rules?

Too sure ( ) Sure ( ) Not sure ( ) Other specify

.....

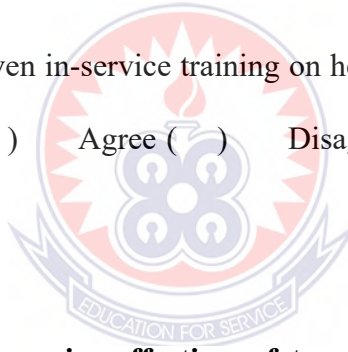
19. Management conduct follows up visits after health and safety talks? Strongly Agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )  
Not sure ( )

### Causes of Accidents at Site

20. Employers do not provide manuals of equipment's/ machines to operatives to study before usage? Strongly agree ( ) Agree ( ) Disagree ( )  
Strongly disagree ( )

21. Operatives of machines do not sought permission before using them?  
Strongly agree ( ) Agree ( ) Disagree ( ) strongly disagree ( ) Not  
sure ( )

22. Workers are not given in-service training on health and safety precaution on site?  
Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )  
Not sure ( )



### Ensuring effective safety precaution

23. Employers always ensure that information on health and safety is passed on to its employees through? Staff meeting ( ) Notice board ( ) Seminars ( )  
Other specify .....

24. Employers organize in service training for workers on health and safety practice issues? Strongly agree ( ) Agree ( ) Disagree ( ) Strongly disagree ( )  
) Not sure ( )

25. Workers who fail to observe safety rules are sanctioned?  
Always ( ) Sometimes ( ) Warned ( ) Not sure ( )

**Benefits of Safety practices at a Construction Site**

26. The economic situation of the company/firm would be improved. Yes ( ) No ( )

27. Productivity will be enhanced when safety precautions are observed?

Strongly agree ( ) Strongly disagree ( ) Agree ( ) Disagree ( ) Neutral ( )

28. Tools and equipment will last longer?

Strongly agree ( ) Strongly disagree ( ) Agree ( ) Disagree ( ) Neutral ( )

**OBSERVATION OF SAFETY MEASURES BY PERSONNEL ON SITE**

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

NO	Statement	Strongly disagree [1]	Disagree [2]	Not sure [3]	Agree [4]	Strongly agree [5]
29	Personnel on site normally use helmet during working period					
30	Personnel on site always wear safety boot during working time					
31	Operator's wear goggles before operating					
32	Operator's use protective clothing					



	other than those mentioned above.					
33	Operators ask for permission before using any equipment and machine at the site					
34	Personnel always use first aid kits when injured.					
35	Official visitor use safety clothing's					
36	Inspection of tools and equipment are done before usage.					
37	Site layout dimension is properly arrange to all department					

38. In what can the safety practices of construction firms be improved the performances of construction workers in the Wa Municipality?

.....

.....

.....

.....

**APPENDIX B****INTERVIEW SCHEDULE**

This interview is conducted for employees/workers of construction firms who cannot read and write regarding to assessing the impact of safety precautions in the Wa Municipality.

Below is the interview schedule for conducting the interview from the respondents.

<i>DAY</i>	<i>DATE</i>	<i>TIME</i>	<i>LOCATION</i>	<i>FIRM</i>	<i>ACTIVITY</i>
<i>Monday</i>	24-07-21	10:00 – 12:30	Wapaani	A	Interview
<i>Tuesday</i>	25-07-21	10:00 – 12:30	Wa-Sombo	B	Interview
		1:00 – 3:30PM	Bamahu	C	Interview
<i>Wednesday</i>	26-07-21	10:00 – 12:30	Dobile	E	Interview

Date ..... Interview No:.....

Please, KANGBEREE DONATUS is my name, I am conducting a study on an evaluation of the influence of safety practices on construction site workers performance in the construction industry. I would be most grateful if you will not mind to provide answers to a few questions on the subject matter above.

Thanks.

### INTERVIEW QUESTIONS

#### Personal Data

1. Gender .....?
2. What is your Educational level .....?
3. What is your marital status .....?
4. What is your occupation.....?
5. How long have you been working with company/firm.....?
6. What specific task do you perform at site.....?

#### Factors that affect the performance of workers at construction site regarding to employees /workers in the construction industry.

7. As an employee, are you given orientation with regards to safety precaution by your employers.....?
8. Does your employer informed you the important of providing you with protective clothing and equipment to be use on site.....?
9. If Yes to question 8, are they of good quality.....?

10. Does your company/firm have its own safety officer on site.....?
11. Does your company/firm attaches seriousness to issue regarding to health and safety at site construction site.....?
12. Is the site layout/arrangement done properly to ensure easy flow of work without destruction .....
13. Do you have first aid kit on site.....?
14. As an employee do you think that it is your responsibility to abide by health and safety precautions at the construction sites.....?
15. Is it the responsibility of you the employee or the employer to bear the cost when an employee is injured while at work.....?
16. As employees are you paid insurance any time there is an accident at site.....?
17. Is health and safety important to you as an employee at the workplace.....?
18. After management provide all the safety precauses before the start of days' work, what is always your confident level.....?
19. What Suggestion will you give to any effective ways that will lead to compliance of safety regulations at construction site?.....

## APPENDIX C

### OBSERVATION PROCEDURE

1. Identify the firm and site to observe.
2. Introduce yourself with an introductory letter issued by the University; explain the purpose and process (e.g. time, schedule for the observation to the company's management and employees of the various sections.
3. Seek their approval and cooperation.
4. Describe what will be observed using narrative statements or checklist.
5. Staying close to the activity being observe, but carry out observation as unobtrusively as possible.
6. Restrict activity to watching the work force. Observation should not interfere with the daily flow of the work activities.
7. A detailed summary of observation activities, including time, dates, and locations, the outcomes of the observations and the identities of the observers should be recorded.
8. Assess the reliability of data. Two or more observations at similar times and under similar circumstances should have coinciding ratings. When more than one observer is used, agreement among raters is the basis for determining the reliability of the data.
9. Compare recall performance with existing standards.
10. Share the results of the observation with members of the group observed before data becomes part of a needs analysis report
11. Prepare a report.

**OBSERVATION GUIDE**

<i>DAY</i>	<i>DATE</i>	<i>TIME</i>	<i>LOCATION</i>	<i>ACTIVITY</i>	<i>NAME OF FIRM</i>
<i>Monday</i>	01-08-21	10:30 – 3:30pm	Wapaani	Observation	1
<i>Tuesday</i>	04-08-21	10:30 – 3:30pm	Wa-Sombo	Observation	2
<i>Thursday</i>	05-08-21	10:30 – 3:30pm	Bamahu	Observation	3
<i>Monday</i>	07-08-21	10:30 – 3:30pm	Dobile	Observation	4

**THINGS TO BE OBSERVED**

1. Organization of the site with respect to safety.
2. Technical know how about safety issues.
3. Safety requirement on the use of materials.
4. Safety requirement on the use of machines, tools and equipment.
5. Wearing protective safety clothing's and equipment on site.
6. Issues bordering on how safety is handled.
7. General safety precautions on site.

## APPENDIX D

PHOTOGRAPHS OF SOME CONSTRUCTION PROJECT SITES IN THE WA MUNICIPALITY;



Ongoing construction at Wa-Sombo





Ongoing construction at Bamahu in the Wa municipality

