

**KWAME NKURUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI**

**COLLEGE OF ARTS AND BUILT ENVIRONMENT
DEPARTMENT OF BUILDING TECHNOLOGY**

The Contribution of Building Clients to a Safer Ghanaian Building Industry

By

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Construction Management

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DECLARATION

I hereby declare that this submission is my own work towards the MSc and that, to the best of my knowledge it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text

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DEDICATION

This dissertation is dedicated to my wife, Constance Obenewa Williams, my father Mr. Samuel Ograh and my children Seyram Williams, Mawuena Williams and Aseye Williams for their support and prayers throughout the program am so grateful.



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ABSTRACT

The construction industry in Ghana has a long reputation of its poor safety records. However there has been significant improvement in its safety performance recently. These improvements are partly due to the concerted endeavours of different parties like clients. Even though there has been much participation from clients in helping reduce the number of accidents on project site, clients should start to understand their role in safety as an initiator, as well as the sponsor in most of the circumstances. Majority of the existing data supported the proposition that clients do not like involvement in safety. Therefore, this study aimed at investigating into the contributions of building clients in making the Ghanaian building industry safer in Accra, in the Greater Accra region. The role of clients from the public and private sectors in project safety performance is studied in this research. The relationship between project safety performance in terms of the clients and contractor is examined. Questionnaire were distributed to both private, public clients and contractors and interviews conducted when necessary. Construction practitioners were the primary source of data collected for this research. Based on the analysis of the result of this research, it was found that clients do not provide additional funds for safety in construction project. It was recommended that clients should enforce safety regulations at all times from the inception to the completion of projects.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Construction is an important sector worldwide, accounting for about 3.4 billion US Dollars (USD), which is about ten percent of the gross domestic product worldwide, various risk factors and costs of the construction affects work schedule, planning and completion internationally . (Bonn, 2001)

The industry is also one of the most important sectors in terms of the protection of the labor force of countries which have already been developed and regions whose development is lagging behind the world.

The construction industry has been considered as particularly dangerous (BOMEL 2001; McDonald, et al 2009). Approximately 4 % of the gross domestic product (GDP) of nations is affected economically due to accidents in the construction sector and, therefore, there is a matter of necessity for the improved performance in the area of safety.

Contractors are ordinarily responsible for safety. Overall, customers' do not contribute in the safety of projects because of the concerns over the legal implications. All interested parties should be able to participate to making the project sites a safe place.

Clients in most cases play a vital role on the industry, because of the financial responsibility they bare. In addition, the client needs to know that the cost of accidents that

occur at site is eventually transferred to the client. By the involvement of clients in the construction process, clients are able to make an impact on safety at the project sites.

In spite of the many studies in the field of construction in terms of safety, not many of such studies have considered the position of clients in the promotion of safety, such as how the public and private client identify safety and how they can help in making the building industry safer. The building sector is very essential to the environment social and economically. At the same time, the construction industry is also recognized as the most dangerous. Even though there have been incredible improvements in the last few decades, safety in the building sector still remains dangerous in terms of safety, where workers have direct exposure to the heights, forces and energy. In view of these risks, the workers are exposed every day of their working life.

The level of clients' contribution to making the building industry safer has been generally lower than expected or desired even though there has been much participation from clients in helping reduce the number of accidents on project site. There is still much to be accomplished though construction work has become safer. The involvement of clients in reducing fatalities and serious injuries which will bring about higher productivity and lessen the cost of projects due to strong concerns on making the construction industry safer.

1.2 PROBLEM STATEMENT

Construction has been in the increase in all parts of Ghana, due to the recent oil find in the country, one can hardly move in Accra without seeing a high rise building been put up in

the capital city. In all this one can see how safety issues has been left an attended to in the part of all the industry players. Although a considerable effort has been made over the years to reduce the number of injuries or people who suffer ill health as a result of construction, the problem still exist, in fact the numbers has increased. There has been limited success in the fight against the causes of safety on building sites, which will continue to be the cause of premature deaths and injuries of thousands of workers in the Ghanaian building industry. The nature and the methods employed in the building sector in Ghana are potentially dangerous and unsafe for the workers at building sites in relation to health and safety. The building industry in Ghana, is at a high risk of injuries and accidents, hence, the participation of the client in the industry is very essential in helping reduce the high rate of accident on projects. The researcher therefore, will examine the relevant data with the basic objective of finding ways through which this can be achieved.

1.3 AIM

The aim of this thesis is an investigation into the contribution of building client in making the Ghanaian building industry safer in Accra, in the Greater Accra Region.

1.4 OBJECTIVES

To achieve the purpose of this research, the researcher would like to rely on the following objectives,

1. To determine how building clients contribute in making the Ghanaian building industry a safe place.

2. To evaluate the impact of building clients in the area of safety.
3. To recommend means by which building clients can contribute in making the building industry a safe place.

1.5 RESEARCH QUESTIONS

The researcher is convinced that the following questions will help in achieving the objectives of this study:

- How involved are construction clients in the formulation of the policies with respect to safety from the inception of projects?
- What strategies are implored to enable the client contribute in making the site safer during the construction process?
- What difficulties doe's clients face in making the construction industry safer?

1.6 SIGNIFICANCE OF THE STUDY

This study is useful, because it will not only serve as a means of information through its discoveries in relation to building safety, but tragedies leading to loss in productivity as a result of injuries and the increase in the cost of projects, delays on the completion of the project, and loss of lives in some instances are caused by accidents in the building industry. The selection of this topic has been found essential to help intensified the participation of clients in making the building industry in and around Accra a safer place.

1.7 METHODOLOGY

The investigation adopted the mixed research design in conducting this study; the data was from primary sources and distribution of questionnaire to construction companies operating in the building industry in Accra. A critical review of literature was conducted to identify contribution of clients in making the building industry safer in Ghana. Reliable and scientific data from literature through existing journals, articles and books will be sourced.

Prior to the questionnaire survey to examine the importance of the factors identified in the Ghanaian context, interviews were carried out. Views of Project managers, civil engineers, architects, mechanical engineers, service engineers and quantity surveyors working with building contractors in Accra will be sorted.

Purposive Sampling was used for the sampling of companies operating in the building construction industry in the Greater Accra Region. The investigation depended on a large part of the questionnaire for the assembling of realistic data from the field. The questions were both close-ended and open. The statistical packages for the social sciences (spss) was used for analyzing the raw data. Relative Importance Index was used as the statistical tool to be considered for the analysis.

1.8 SCOPE OF THE STUDY

The research is limited to specific building constructors, registered with the Ministry of Water Resources, Works and Housing Class K1 D1, specifically those established in the Greater Accra Region.

The investigation covered the contribution of clients on safety performance of the numerous building projects without accessing issues related to health. Even though health and safety in most cases combined in most of the research works and are connected to each other, health is not included in this study.

1.9 STRUCTURE OF THE REPORT (CHAPTER ORGANIZATION)

This research was categorized into five independent but interrelated chapters. They are discussed as follows:

Chapter one entails the introduction which is subdivided into seven sections: Background of the Study, problem statement, research questions, aim and objectives, significance of the study, methodology and scope of study. Chapter two entails the literature review followed by chapter three which consist of three sections namely:

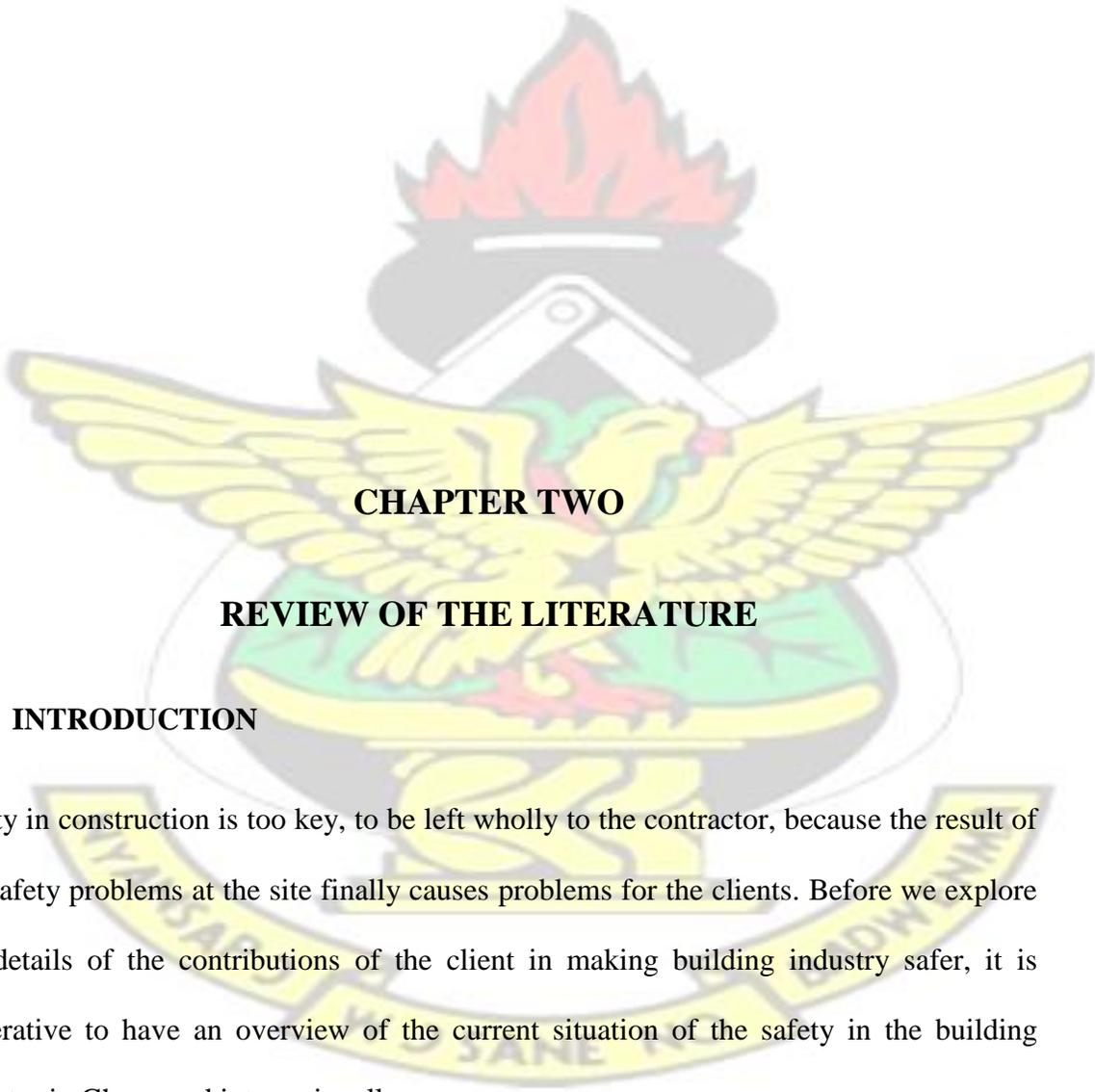
Research methodology, research design and data collection. Chapter four entails two sections: Data analysis and discussion of results. The last chapter is chapter five which entails three sections: findings, conclusion and recommendations.

1.10 CHAPTER SUMMARY

As stated in the preceded section, this chapter has discussed the general introduction of the research. In addition, it has presented the background of study and the problem statement of this research. This chapter has also presented the aim, objective, research question, and the scope of the research. In achieving the aims of the study, the objectives of the research were established, and a summary of the method for the study has been presented in this

chapter. Finally, the chapter discusses the justification of the study and the organization of the survey

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The logo of Kwame Nkrumah University of Science and Technology (KNUST) is centered in the background. It features a yellow eagle with its wings spread, perched on a green and red shield. Above the eagle is a black mortar and pestle with a red flame rising from it. The entire emblem is set against a white background with a yellow banner at the bottom containing the university's name in Akan and English.

CHAPTER TWO

REVIEW OF THE LITERATURE

2.1 INTRODUCTION

Safety in construction is too key, to be left wholly to the contractor, because the result of the safety problems at the site finally causes problems for the clients. Before we explore the details of the contributions of the client in making building industry safer, it is imperative to have an overview of the current situation of the safety in the building industry in Ghana and internationally.

The state of the construction industry is an indication of the state of a nation's economy. This is as a result of the connections of the forward and backward connections the sector forges with the rest of the economy (Drewer, 1980). The backward linkages, denotes for example, the construction materials and the service sectors of the economy, whereas the forward linkages refer to the economic activities that result from the use of already constructed buildings and facilities.

The construction industry is too important to be ignored as shown in this chapter with relation to the industrial sector. For this reason, the nature and characteristics of the construction industry will be examined. In the light of the contribution of the client in making the building industry a safer place is censoriously deliberated.

The safety performance of the construction industry has seen some improvement. Safety has been recognized as an important business subject (Wilson, 2000)

2.2 THE CONSTRUCTION INDUSTRY

The construction industry is defined as a group of companies with activities closely related to the construction of buildings, real estates, public and private infrastructures. (Anaman et al, 2007). The construction industry is typically in the majority of its products is exclusive, for example: Shape, size, and purpose (Porteous, 1999). Each building or facility may thus be described as been customized. The buildings cannot be isolated from the environment in which they are located. From a different perspective, Wells (1986) indicated that, construction products differ in terms of location, materials and production

techniques and the criterions of the finished products with regards to space, quality, durability and design consideration.

It is less recognized or different, such as identical with others when built to identical plans and specifications (Porteous, 1999).

The construction industry can be divided into two broad categories. They are; general building contractors and specialist contractors. Most of the construction contractors turn to concentrate on one of these categories, or even as a field of specialization. A third category of Contractors is a special trade contractor; usually they work as sub-contractors for a general or specialist contractor, responsible for the construction of the project as a whole.

The owner / client, the designer / engineer, and the contractor are the three key participants in the construction industry traditionally. The basic construction process begins when owner / the client, hires an architect/engineering firm to design the project and then places the project out for bids to the contractor (competitive bidding process) and then, the contractor performs the actual construction (Loushine et al, 2007).

The industry deals with all sectors of the economy in relation to creation, renewal, repair or extension of fixed assets in the form of buildings, improvements of land in the nature of engineering and other forms of engineering such as roads, bridges, railways, ports and dams. Civil engineering firms in Ghana, carry out some of the above mentioned projects which involve heavy engineering such as the construction of schools, hospitals, health centers, hotels and offices.

2.2.1 Fragmentation of the construction industry

The construction industry is very disjointed both in the workforce and professional disciplines. This fragmentation is evident in the large number of bodies of the representation of designers, contractors, project managers, project engineers, suppliers and trade unions (ONS, 2011).

There is not a single body, which encompasses all the bodies involved in the construction industry. And certain groups are not even represented in all the institutions that exists (HSE, 2009). The very disjointed nature of the industry coupled with considerable variations and the size of the project-base work and the momentary nature of works, impact on and act as a barrier in dealing with health and safety management (Brabazon et al 2000; HSE Construction Division, 2009). In addition, the HSE, from a regulatory point of view, cannot visit every site because of the multiplicity of sites (Bourn, 2004).

2.2.2 Lack of Integration in the Construction Industry

The construction industry suffers from the problem of the lack of cooperation and integration. Egan (1998) Egan reckoned that the industry is characterized by conflict and an antagonistic approach between all parties in the project.

Additionally, the construction industry has given between a recognized high performance and high costs and a less skilled lower cost sector. Performance has therefore been compromised due to the different outlooks and objectives of organizations.

In the construction sector there is little attention on other important issues, such as cooperation, integration and partnering which has led to improvements in other industries. The saying ‘Time is money’, is taken rather factually in the building sector (BOMEL 2001).

2.2.3 Ghanaian Construction Industry in Context

The contribution of the Ghanaian construction industry is of a higher economic boost due to the creation of jobs for the professional and non- professionals in the society. The various activities of the construction industry makes very dependent on the use of skilled, semi-skilled and unskilled, the use of light and heavy machines hence the industry very inclined to industrial accidents.

The Ghanaian building construction companies includes a large number of companies of varying size that have been registered and classified by the Ministry of Water Resources Work and Housing (MWRW&H) as D1K1, D2K2, D3K3 and D4K4. On the basis of factors such as yearly incomes, equipment holdings, Personnel, Larger firms are categorized in the D1K1 class of contractors, D2K2 construction firms are medium class and D3K3 and D4K4 falls under the Small firms (Edmonds et al, 1984)

Safety in the building industry in Ghana is in a poor state. The number of casualties keeps increasing with time; this is due to the marvelous growth in infrastructure projects. But building clients however, have not been able to keep up with safety issues in the building industry. Many safety issues are disregarded by the clients and contractors on projects due

to obliviousness. This is because their main worry has been how to finish projects on time to be able to recover investments made.

2.2.4 Construction Related Fatality Statistics in Ghana.

The Labor department's report in the year 2000, states that the construction industry in Ghana accounted for more injuries and work related deaths as associated to other industries. The records of Ghana's labor department (2000) report that, 46 out of 902 works related misfortunes happened in building sector were fatal. (Laryea et al, 2010) which amazingly increased to 50 in 2006. In 2007, it had picked up again from 46 to 64 in 2008. Due to the increasing infrastructure development in the country and the emerging of high rise building all over Ghana this statistics are likely to go very high.

2.3 DEFINITION OF THE CLIENTS

Largely the client is defined as the initiator or financier of a building or construction project. The client can also be a whole body of an organization sponsoring or stake holders of a building project. The owner or its representative is the party that starts the building process and procures the construction firms. Largely, the client profession is not building actually he is the initiator, and the originator building process Newcombe (1994) describes the client as someone with, the necessary experience in the building organization or not. He may be sophisticated with building skill and experience in the organization or not at all.

A construction project team will agree to recognize its client as the body that has the right to produce funding for the project, the method that the project has to take, its timing and

who pays the fees. According to (Walker 2002) the participation of the project owner is based on;

- Nature of organization of the sponsor;
- The awareness level and competence of the client in relation to building; and □
The authority due to the different levels of the organization of the client.

If the client builds frequently, most certainly there will be employees familiar with the body and among working team. This allows the client to always monitor the project.

2.3.1 Organization of Clients

Newcombe (1994) concentrated on two major sets of clients they are public authorities involved in project that are beneficial to these society, the other group is private organizations whose main interest is to maximize shareholders' benefits other than other objectives.

2.3.2 Clients' Purposes

The very distinguishing element of all construction ventures must be the owners aim in starting the execution of the project. The purpose for the project overall will commonly arise after the application of the client's organization, which is derived from its main area of business. The client is usually concerned with three areas namely, price, quality and time. Different client's priorities each of these influences differently as noted by (Walker et al 2002).

Basically, the role of the owner when it comes to selecting a contractor varies strategically.

The clients have different objectives, which includes proposals as follows;

- A suitable involvement of the owner in the selection procedure; and
- A specific evaluation, suitable for each client to know the significance of the cost, time, quality.

2.3.3 Obligation of Client in Building Safety

All clients' have the responsibility of safety at the building sites as well as using the appropriate approach in the prevention of injuries. Not merely must the client see that their involvement in safety can help in a reduction in the amount fatalities as well as the brutality at site, nonetheless similarly contribute to the entire amount of the obligations of the client. As a result, the client is admonished to set as an objective, zero injury in terms of building safety. Through the implementation of, measures to halting or minimizing misfortunes in the construction sector. It has been well-thought-out that, participation of clients is essential for this objective. For example Liska et al, (1993), has found in their study that the basic requirements that brings great performance in the field of safety has been with the participation of the client, not just in the planning of projects with financial support to the contractor's safety program, but also in the official activities of the project.

The European Union grants the following legal obligations on construction clients;

- As soon as the conclusion to progress with the project is reached, a safety planning manager must be employed;
- A capable main contractor must be employed as soon as possible;
- Pre-tender and construction point safety plan must be made;
- Competent designers must be appointed who will take safety into account not only in the construction process but also in the repair and maintenance of the finished structure;
- The client must ensure that resources to enable those appointed carry out their task is provided;
- The client must provide all information on safety to the contractors and consultants;
- The client can refuse payment in case the safety programs are not followed; and
- A project safety and health file must be prepared and this must remain in existence throughout the life of the structure, no matter who the future owner may be.

2.3.4 Impact of Clients in Construction Safety

Active participation of clients in matters on safety can impact architects, engineers and contractors in the choice of materials and structural integrity been inculcated in the designs. Clients may pose certain restraints which architects and engineers react to in the project design. These constraints, consecutively affects the result of the construction process. A chain of reaction, is not resolved, may have an effect on some causes of accidents. For example, the restrictions on the customers can be:

- Accelerated design program;

- Inadequate budget for the design; and
- Conflict of objectives or demands of other projects.

Clients in the past were reluctant in engaging in site safety issues because of the concern that there might be additional exposure to liability. Lately, there is a new trend with clients been more concern about occupational safety and health issues. However, the problems clients are faced with are how they can professionally impact safety. For example,

Stanford University, used studies of both promoters and builders to discover whatever safety desires building clients pushed on builders and the answers were set in declining sequence as follows.

- a. giving the builder a safety strategies that should adhered to;
- b. Deliberate on safety between stake holders of the project;
- c. Debate safety reviews of the builder in the course of the project;
- d. Ask instant records of builders accidents;
- e. insist on protection of the operative as part of the contractual obligations at prebid walk-around;
- f. Explore the builders accidents records;
- g. review data of builders' accidents;
- h. undertake intermittent safety reviews;
- i. establish safety division to regulate building safety;
- j. Fixed safety rules in the form of contract; and
- k. Take part in orienting the workers to safety dangers on the project.

Provide contractual agreement, in the form lump sum, similarly influences the nature in which protection of the workers should be done, because agreement is a major obligatory document between the project sponsor and the executer. Essentially the main contract determines the way owner does payments to the builder. This clarifies the type of agreement to be used in undertaking project site safety. (Dagostino and Feigenbaum2003)

2.3.5 The Owner's Statement towards Safety

All clients require a legal liability in making the construction industry a safer place. And do everything in their power to prevent the construction workers from accident at site. Customer or promoters should know that their participation in the implementation of safety regulations on the project does not only reduce accidents, but also reduce the responsibility of the promoter. The application of this would translate into lower cost of the project; improve quality of work, and, maintenance the schedule of work .Henze (1997) argued that, the promoter, whose goal is to prevent injury, is likely to play an active role in the construction process.

During the implementation of the project, the owners must express the willingness to safety to the building in deferent ways, including incentives for safety and through the application of sanctions for not supporting the safety incentives.

2.4 SAFETY MANAGERMENTS

The monitoring as well as control of safety and environmental impacts are most important issues in the construction sector. If we think of time, cost and technical performance as

objective optimized, or at least balanced, then we could think through work place safety and the impact of operations on the environment as constraints on the attainment of those objectives (Bennet, 2003). Organization as well as preparation is a method of mitigating accidental events. Because misfortunes are events that are not planned, operational safety supervision would lead to the reduction of accidents. (Al-Kilani, 2011)

2.4.1 Investment in Safety vs Cost of Accidents

Most clients in the construction industry are of the view that spending extra cash on safety program makes just a slight influence. Other disparagement is that, it does nothing at all. So it is very indispensable to quantify the expenses on safety investment. An investigation by Everett et al (1996) established that the total costs of building misfortunes amounts to 7.9%- 15% of the total costs of new building. Further valuations suggested that the exact expenses on safety may be up to 20 times or higher (Oxenburgh 1991) this is the additional hiding cost often face by the industry players. Rowlinson (2003) grouped some courses as follows:

- a. payment for the sick due to safety;
- b. Workers reward expenses;
- c. Community obligation claims;and
- d. Restoring damaged properties;

2.4.2 Investing In Safety

“Safety is commonly regarded as a non-productive expense required by legislation. Nonetheless, if it is part of the organization culture and being taken genuinely, it can help in generating more profit (Witter 1982)” venturing in good safe practices has paid in terms efficiency. “Safety is an essential element of sustainability, quality and liability”.

The concept of ‘good business management is good safety management’.

2.4.3 Safety Program

Fales (1990) established that, the best way for prevention of accident is to have a safety program or policy for the establishment. The aim of a safety program is to achieve longer periods of time without injury. One of the most important elements of a safety program is to develop a good attitude towards safety at the work place. Workers must be encouraged to follow general and specific rules concerning their personal safety when using tools and equipment. A company’s safety policy includes concern for the safety of the general public.

According to Peyton and Rubio (1991), the United States’ industrial health and safety Organization has listed six elementary principles of an active safety program. These are:

1. Safety arrangements must show the scope of the organization.
2. Administration must be devoted safety.
3. Satisfactory sources should be planned towards accident.

4. Written employee disciplinary programs must be in place.
5. Workers should be oriented in Safety.
6. The policy should be reviewed periodically.

2.4.4 Safety Policy

A major necessity for every good accident program is to leave no ambiguity in the mind of the employees. The Company's management safety policy statement outlines the company's philosophy on safety and sets the tone for management's obligation to the safety process. This policy must be a simple and brief statement of the overall objectives of the company on safety. This policy should assign overall responsibilities for safety in all departments of the company and should be realistic and enforceable (Peyton and Rubio, 1991). Statement should be written in clear and simple language so that it is easily understandable (Hughes et al., 2001).

2.4.5 Cost of Safety Policy

A company safety program does, of course cost money. The fact, conversely, remains that safety is just as essential for the conduct of a construction business as its estimating or purchasing. There is nonetheless, an essential difference between safety costs and other items of company expenses that must be accepted. The distinction is that, the spending of one dollar on safety can save the contractor two dollars. Although this ratio is only metaphorical, it has been well established that the costs of safety programs are more than rewarded for by savings on accidents that do not happen (Clough, 1981).

2.5 CHAPTER SUMMARY

This chapter explores the numerous dimensions that construction clients can contribute in making the Ghanaian construction industry a safer place. Primarily it defined the state of the construction industry as symptomatic of the state of its national economy. This is a significance of the forward and backward linkages the construction sector forges with the rest of the economy. It also observed the client in a legal perspective,

The chapter also looked at the highly disjointed nature of the construction industry couple with the significant distinction and size of project-base work and the transient nature of work impacts on and acts as a barrier to health and safety management and the cost of investing in safety verses cost of accident by clients. The literature review indicates that clients investing in safety would lead to a massive decrease of accidents on site, therefore, making the construction industry a safer place which is more of the reason that research into the contribution of clients to site safety be treated with all importance

CHAPTER THREE

METHODOLOGY OF RESEARCH

3.1 INTRODUCTION

A study by Cooper and Schindler (2003) showed that the next step in the process of research after the study of the literature, the management Dilemma deductions and determine the research questions are vital in most methodology approach. This chapter three tries to look at the concept used for the research. Is also examining the strategies and

procedures, used in the study which covers areas such as, the design and creation of questionnaires, perfect explanation of the population, determination of the sampling methods and the sample scope as well as research principles.

The following investigators (Fellows and Liu 2003; Naoum 1998; Saunders et al., 2003) has stated that the results of a study is directly tied to the methodology and, later, the success and originality of the research review is based on the right to choose the method to study Naoum (1998) explains, as soon as the goal of a study was identify and a comprehensive literature was supplemented, the investigators must be able to plan the research in detail.

The methodology brings forth, how the investigation was carried out, and strategizes in other to collect data. This method focuses on the questionnaire relating to investigation in order to identify the contribution of building client's in making the Ghanaian building industry a safe place. The characteristics of the research, explains the survey procedure used to acquire information from the various parties involved, explains how the information is collected and analyzed, shows how respondents were choosing and approached, and finally, such as analysis of the information received.

3.2 PHILOSOPHY OF RESEARCH

The study of the literature revealed that the philosophical questions of existence, value and knowledge have a significant impact for the planning of research (Christou, et al, 2008; koetting, 1996). Later, these problems of epistemology, philosophical level axiology methodology and assumptions must be tackled widely since they mark the choice of the

research instruments (Christou et al, 2008). Streubert and Carpenter (1999), said, epistemology is the subdivision of the philosophy of how people determine what is right; interpretivism and positivism. This study is based on positivists approach to knowledge. For the positivism checked by the accumulation of facts, scientific knowledge has been shown (Osei 2010; Bryman 1992). Investigation was objectivism at the ontological level. Ontology can be explained as questioning the reality of world that is sovereign of our knowledge; it is a philosophy of living beings (Marsh and Stoker, 2002). This is because, the contribution of building clients to making the Ghanaian building industry a safe place, exist as external facts that are outside the reach and influence of the researcher. Consequently, in answering the research question; how are building clients involved in formulating health and safety policy at the inception stages of projects? The ontological objectivism position was followed.

3.3 PURPOSE OF RESEARCH

Saunders et al, (2003) stated that, the greatest often use classified determination of research is descriptive, exploratory and explanatory. They claimed that exploratory research is of the type "the activities of passengers without Route" in this direction is adjustable during the process. According to Torsten and Wiedersheim (2001) descriptive is the identification and the allowance for that is, Record and document focuses on the choice of perspectives, the height of the depth and definitions. Explanatory study is to institute relations between the variables (Saunders et al 2003). This study is mainly descriptive as data is gathered in order to describe a specific subject.

3.4 METHOD OF RESEARCH

The theory behind this investigation is clear enough to serve as a guide for one of the two research approaches; Qualitative. Yin (1994) recommends that the method to be used in carrying out a study depends on the purpose of the research and its relation to the research questions. He presented a quantitative approach, such as the search for knowledge measure described and explained the phenomena of the reality. This process is generally well structured and formalized. Quantitative research tries to measure data by the typical application of statistical analysis (Malhotra, 2007). A quantitative investigation is a technique in which, real projective numerical and scientific data are statistically analyzed. It is also a concept that collects statistical data to explain, describe, predict and regulate phenomena of interest. This method can apply more data in view of the scale of the study.

On the account of Ghauri and Gronhaug (2002) qualitative methods are more flexible and can be used to exploit in depth different research questions. This investigation seeks to find information which is meant to interpret, examine, and comprehend the phenomena by means of an internal perspective. Qualitative Research, gives insight and a better knowledge of the research problem (Malhotra, 2007). It is used especially in case studies, where the goal is collecting information, and a thorough understanding of the problems of the research. Qualitative is very efficient if wishes to know the attitude of human behavior and may be conducted with "open ended" complete focus groups or detailed group discussions.

This study is available in the research quantitative like O'Leary (2004) describes quantitative research as producing quantitative data that can be represented through numbers and analyzed using statistics

3.5 RESEARCH STRATEGY

The research strategy is a master plan as to answer the questions of the research have been created (Saunders et al 2007). The determine these strategies as follows;

Survey; Malhotra and Peterson (2006) noted that, a structured questionnaire distributed to a sample of population and designed for the extraction of specific information from respondents. This strategy is routinely used in the research which Sanctions the collection of a large amount of data from an ample population which is cost effective.

Experiment: is a standard form of research which stresses on natural sciences and the social sciences, mainly psychology. Malhotra and Peterson (2006) placed it under casual research, and define the methods to control one or more independent variables and determine their impact on one or more dependent variables, while the control of variables, whereas regulating unnecessary variables, other than the independent variable.

Case study: The study puts more importance on full contextual examination of few events or conditions and how they interact (Cooper and Schindler, 2003). The condition which gives case studies a unique advantage occur, when a “how” or “why” question is being asked about a contemporary set of events over which the investigator has little or no control (Yin 1994).

Grounded theory: According to Miller and Fredericks (1999) grounded theory is to discovered, developed, and provisionally established through methodical information collection and analysis of data relating to the phenomenon. Stress at induction or deduction during this process will vary due to the different views of its founders, Glaser and Strauss (1967).

According to Oppenheim (2003) study research offer consistency and improve recovery comments because of their inherent normalization of evaluation and of sampling and that was what this research is based on.

3.6 RESEARCH PROCEDURE

Research technique addresses the method of sampling, instruments of data collection and procedures. This comprises clarification of each of the methods adopted to answer the aims, objectives, targets and research issues.

3.7 COLLECTION OF DATA AND INSTRUMENTATION

3.7.1 Data Sources

This part of the research study addresses the methods of data collection, instruments and procedures. This provides details of various methods, in the treatment of aims, objectives, and research questions. Collection of data is the key in the research, how the data will contribute to a better understanding of the theoretical basis (Bernard, 2002). Therefore it is essential that the selection of the nature of the achievement of the data and from whom

the data will be acquired must be done with good scale, in particular because no analysis can replace improperly harvested data (Bernard et Al - 1986; Tongco, 2007).

Data collected was done using both primary and secondary sources. The primary data dealt with the collection of practical data through survey questionnaires. Literature review has been conducted extensively and the study placed within a theoretical context, thus a Case Study Questionnaire was adopted for the study. The secondary data (revision of literature) was extracted from published or non-unpublished materials. The data removed from literature form the theoretical framework of the research. Direct and indirect sources formed the basis of the data. These sources yielded rich knowledge on the contribution of building clients in making the Ghanaian building industry a safe place. Building companies registered with Ministry of Water Resources works and housing with classification K1D1 are in existence for five years and above. The responses were the person responsible for the safety, project managers, engineers and some clients were contacted for the research.

3.8 INSTRUMENT FOR DATA COLLECTION

The key instrument used for the investigation is questionnaire. A questionnaire was designed well-structured to collect applicable information from industry stakeholders of the building industry. The respondents Read the Questions, interpret and answer them as required. In the case of the client who could not read or write, the researchers read it to them and complete the forms subsequently. The content of the questionnaire is simple and easy to understand. The design is very easy to read and at the same time pleasing to the eye, subsequently carefully designed, easy to follow. The content of the questionnaire

mainly open and closed ended with spaces for the respondents to indicate their preferred answer by ticking the space provided that matches against the item being measured.

3.8.1 Design of the Questionnaire

Close and open ended questionnaire was used. A closed ended has the advantage of easy to ask and quick to apply, and do not require writing by the respondents, and the analysis are straight forward (Naoum 1998). Same time, open ended questionnaire which provides the respondents an opportunity to contribute to the research per their experience was also used. The contribution of the building clients in making the Ghanaian building industry a safe place is explained by a comprehensive review of the literature. The contributing issues were then transformed into questions, easy to define, and void of any technical terms to reduce potential error from respondents.

Enquiries from correlated topics were adopted from precedent study and divided into categories to build the important areas of the draft questionnaire. A pilot study was undertaken which adds, very vital issues, to simplify certain issues and change the content of the other. Questionnaire is divided into four main parts. The first was the respondent's background and the second was to determine how building clients contribute in making the Ghanaian building industry a safe place? The third was the assessment of the influence of building clients in health and safety? And the last part has been to suggest the possible ways building clients contribute making the building industry a safe place.

The three sections of the questionnaire are the three most important specific objectives.

3.8.2 Format of Questionnaire

Literature suggests that the maximum length of questionnaire will vary from one page of A4 paper to eight pages of A4 paper (Naoum, 1998; Saunders et al, 2000). However, this research questionnaire consists of five pages, as in the appendix.

3.8.3 Contents of the Questionnaire

Donkor, (2011) showed that the quality of the answers and the response rate generally affected by the type of questions and the way in which there are submitted. To this background is therefore essential to ensure that the questions asked are correct, as well as easy to understand and asked in the correct way.

Section A-background questions (occupation, years in the business, length of existence of the company, type of jobs undertaken) was to establishment the level of experience of the respondent and alertness of adherence to factors.

- Section B is to identify how building clients contribute to making the Ghanaian building industry a safer place.
- Section C is to assess the influence of building clients on health and safety performance.
- Section D was to propose possible ways that building clients could contribute in making the industry a safer place.

The questions remain a single form and order. It must ensure that each question is asked the same way in the questionnaires and also easier to manage and relatively easy to analyze

and gather. As a result, in the context of the reference time relays for the answer and the possibility of good answers obtained are important for the research.

3.9 SAMPLING TECHNIQUES AND DETERMINE THE SIZE OF THE SAMPLE

This aspect of the examined the sampling technique employed as well as the grounds for its suitability of the study.

Importance of sampling stems on the fact that it delivered a concrete form of support for data collection, and the treatment of components for the investigation, ensuring that the sample provides a worthy representation of the people (Yankah, 2013).

According to Webster (1985) the term "sample" is a portion of the population completed, statistical properties, valid for information about the entire population. If the sample should be treated with persons, then it can be defined as a set of respondents (persons) proposes the candidacy of the population more for the purposes of a study (Mugo 2002).

Therefore, the submission of a method of selecting a quota of the population as an expression of the entire population (Polit et al, 1999) and is usually used in a large amount of research in the interest of the economy and accuracy (Weisberg and Bowen 1977). The term "public" is a group of people, individuals, things, or ingredients of samples selected for the measurement example of a population of engineers or workers, books, or students (Mgo, 2002). Population is the group as a whole, subjects that meets a selected number of criteria. Polit and Hungler (1999) distinguish between accessible population and target population. The target population includes all cases in which the researcher would like to

make generalizations, population accessible also implies all cases correspond to the criteria and are available for the researcher, as a group of subjects studied.

Purposive sampling method is a technique specified in the selection of the persons which denotes the choosing population used for the purposes of this investigation. Purposive sampling technique is a non-probability sampling which includes the conscious selection of certain subjects to be included in the research (Polit and Hungler, 1999). Purposive sampling technique was used to determination the key person responsible for safety, project managers, projects engineers, contractors, and clients. It is because the researchers requires certain categories of respondents who had been in a lot of building projects and had participation in health and safety on projects, for the purpose of answering the questionnaire. Purposive sampling resulted in the choice safety officers, and other professionals in the building companies with good standing in the Greater Accra Region, because the researchers believes that they were representative of the population of interest and can give practices and categorically answers to the questions posed.

However, non-probability samples designs and models are good in situations where the number of parts of the population is anonymous or cannot be identified individually (Kumar, 1996). This study was designed specifically for all building companies which have been in existence of more than 5 years and above because they have sufficient funds for the implementation of the health and safety procedures. In addition to the purposive sampling technique the researcher uses snowball sampling to identify the respondents. But Kumar (1999) describes the snowball sampling method as a process of selecting a sample

by using network. Atkinson and Flint (2001), states that, snowball sampling is an investigation technique use to uncovered research subject. A study conducted by De Vos et al (2002) shows that snowball sampling is valued in research as it focused at entities that are challenging to uncover. Snowballing Approach assist the researcher to collect data on the few participants of the target population he can find and then look for information from people who help him to locate other members of the population. This strategy according to Mensah (2013) is seen as a response to overcome the difficulties related to hidden or uncommon populations. Burns and Grove (2003) complements that, this sampling method permits the researcher to select specific subjects who can give the most accurate information about the phenomenon being looked at. With the adoption of this approach, some companies who are known and readily assessable were contacted and questionnaire administered to them. The already known companies were then asked to identify the remaining companies also become part of the sample space. These new companies were also asked to identify other companies, those identify also become the basis for the collection of data. This process continued until the saturation point, where the total available companies in the building industry, in the Greater Accra have been reached.

The benefit of this sampling method for research is due to way building companies run their businesses. It is extremely difficult to get information about the company or its activities. Fellows and Liu (2008) emphasize the fact that the snowball sampling evaluates data which are complex to assess, perhaps because the different data sources may not readily identify. In this situation, Fellows and Liu (2008) added that the researchers can find a very small number of sources (respondents) and after compiling data from each

individual, requests those sources to identify further sources thus steadily building an appropriate step-by-step creation of a sample. This is the criterion that was adopted.

3.10 PREPARATION OF STATISTICAL DATA AND VERIFICATION

3.10.1 Representation of the Data

Two stages will be supplemented, in the first place the raw data will be treated in an appropriate form for the analysis and after; a test procedure is defined, for the statistical instrument to be used for the data. After collecting the data they are package into a suitable format for analysis using statistical package for social sciences (16.0)

3.10.2 Statistics

The following procedure is to use statistics in this report:

- Descriptive Statistics with frequencies (questions such as in the questionnaire); and
- Relative important Index (RII)

From question one to six, no scoring was used since these consisted of general information related to the respondents companies.

3.11 CHAPTER SUMMARY

This chapter deals with the method of the search for this study, explained the way sample was collected, demarcates the methods used in designing the instrument and collecting the data, and provided the clarification of the statistical procedure used for the analyzing the data.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter of the research details the analysis and the discussion of the results attained after the administration of the research instrument; a well-structured survey questionnaire agitated data to provide the basis for this chapter. This chapter is divided into four sections. The first segment deals with respondent's background. The second section looked into the emphasis put on improving safety of the built environment industry in Ghana by client. The third section looked into client influence on health and safety performance. The final section also looked into the contribution of client to making the building industry safer.

The study saw the adoption of simple descriptive statistics and mean score ranking. Results have been presented in tables and construed accordingly.

In all, sixty-four (64) questionnaires were administered, using the purposive sampling technique. Out of the 64 questionnaires distributed, 53 questionnaires representing 82.8% were accomplished and recovered. The analysis of the result is based on these number of questionnaires retrieved and accordingly formed the basis of the findings of the research. The high rate of 82.8% can be endorsed to the fact that questionnaires were administered personally to respondents and continual follow-ups afterwards.

4.2 DESCRIPTIVE ANALYSIS OF DATA (DEMOGRAPHY)

This section of the questionnaire contained questions in quest of basic information and some connected concerns to ascertain the respondents' knowledge about the study in order to provide Detailed respondent characteristics, the imperative of this section is to establish the reliability or otherwise and produce sureness in the data composed.

Table 4.1 shows the summary of respondent's demographic information

From **table 4.1**, the data reveals that only 1 representing 1.9% of the entire respondents are Managing director. Further, 15% of the respondents are safety officers with Project engineers and others each 13.2% and 22.6% respectively. The bulk of the respondents that add value to the study classified themselves as Project managers representing 45.3% of the entire respondents.

The study sort to ascertain the working experience of respondents, this will give relevance to the kind and quality of information that will be given out. From the study the professional experience of respondents shows that, the bulk of the respondents have been in service for 6-10 years constituting 32.1%. Again, respondents who have had experience of less than 6 years constitute 15.1% of the total respondents. But, majority of the respondents ranges between 11-20 years constituting 35.9% (17.0+18.9) demonstrating that respondents have relative experience in the field of the study.

The years of existence of company has been seen as a critical factor in every business establishment life. A lot of empirical studies have been conducted to investigate the relationship between age of firm and real activities variable of the firm, including growth,

financing pattern and employment. These studies have addressed the question of what happens to a firm as it ages. For instance, Evans (1987) has shown that the growth rate of firms and the volatility of growth are both negatively associated with firm age. Cabral & Mata (2003) demonstrated that the firm size distribution moves towards the right hand side as firms' age. In this regard, Stinchcombe (1965) suggested that older firms are more experience; have learned more over time and are not liable to the accountabilities of newness and have the benefits of better performance. From **table 4.1**, 15.1% of the firm involved with the survey have, been in existence for a period between 5-10 years. For the time being, 22.6% of the firm has been in survival between the periods of 11-15 years. Further, between 16-20 years, 24.5% of the company have been in existence whilst, 37% of the firm have been in existence for over 20 years. The outcomes reveals to the fact that, firms have realistic experience looking at the existence of firm. Again, the existence of the firm determines the experience of its staffs in the acquisition of knowledge and improving safety in the building industry.

From the table, 83.0% of the firm engaged in undertaking the main work. Whilst, 5.7% of are sub-contracting companies. Further, 9.4% of the firms are nether sub-contracting or main contacting work. This shows that, majority of the firms are main contractors and for that matter, can affirm safety measures in their industry. The study revealed that, majority of the company engages in Industrial/Commercial, Residential, Public and Private Works representing 20.8% of population. 3.8% of the company engages in Industrial/Commercial, Residential and Public, with 15.1% of the company engaging

Industrial/Commercial, Public and Private. Few of the companies engage in single project constituting 30.2% of the respondent. Since bulk of the respondents is involved in multi projects, this means that, respondents' stands in a better position to give any information concerning safety in the building industry. For the reason been that, many public and Industrial/Commercial projects require safety records before you are been awarded of contract.

Table 4.1 Respondent's contextual information

S. No.	Variables	Frequency	Percentages (%)
A	<i>Job description in the company</i>		
	safety officer	8	15.1%
	Project engineer	7	13.2%
	Managing director	1	1.9%
	Project manager	24	45.3%
	Others	12	22.6%
B	<i>Years of experience in the company</i>		
	Less than 6 years	8	15.1%
	6-10 years	17	32.1%
	11-15 years	9	17.0%
	16-20 years	10	18.9%
	More than 20 years	9	17.0%
C	<i>The existence of the company</i>		
	5-10 years	8	15.1%
	11-15 years	12	22.6%
	16-20 years	13	24.5%
	More than 20 years	20	37%
D	<i>The nature of your company</i>		
	Main contractor	44	83.0%
	Sub-contractor	3	5.7%
	Others	5	9.4%

E	<i>Kind of project engage in</i>		
	Industrial/Commercial, Residential, Public, Private	11	20.8%
	Industrial/Commercial, Residential, Public	2	3.8%
	Industrial/Commercial, Public, Private	8	15.1%
	Industrial/Commercial, Residential	2	3.8%
	Industrial/Commercial, Residential	1	1.9%
	Residential, Private	1	1.9%
	Public, Private	6	11.3%
	Industrial/Commercial	3	5.7%
	Residential	1	1.9%
	Public	4	7.5%
	Private	8	15.1%
	Residential, Public, Private	6	11.3%

Source: Field survey 2015

4.3 EMPHASIS PUT ON IMPROVING SAFETY OF GHANAIAN BUILDING INDUSTRY CLIENTS

This section reveals the level of significance that the client, either the public or the private client places on safety in building industry of Ghana. The mean score ranking was used to compare the sample mean to the known population and study the relationship between the public client and the private client in the building industry. This is conveyed statistically bellow. The MSR was calculated for each item as follows,

$$MSR = \frac{(1\alpha_1)+(2\alpha_2)+(3\alpha_3)+(4\alpha_4)+(5\alpha_5)}{\Sigma\alpha}$$

Where;

- α_1 = number of respondents for low priority.....
- α_2 = number of respondents for less priority..... α_3
- = number of respondents for least priority..... α_4 =
- number of respondents for priority..... α_5 =
- number of respondents for top priority.....
- $\Sigma\alpha$ = Total number of respondents

From table 4.2, public client places a great emphasizes on the environmental safety in the face of the fact that, safe environment reflects the reliability and efficient operation measure of staff’s performance in the building industry. Environment was ranked first with a mean value of (4.09).many studies suggested that, well-organized advice on the environmental regulatory, procedures and guidelines requirement depicts best practices of safety in the building industry. Schedule was ranked second with a mean score value of (3.37) indicating how public client’s places emphasizes on the schedule of safety measures in the construction industry. According to, Musonda and Pretorius, (2015) stated that, understanding the broader economic context of safety is making use of economics in assessing the cost and benefits of its interventions. Further, understanding the combination of science advances, developing and demonstrating the safety and economic possibility is

likewise imperative. The mean score value for economic is (2.49) Again, Safety and Quality had a mean score value of (2.15) and (2.00) respectively.

For private client, Quality was ranked first with a mean score value of (4.09) indicating that, quality control in the safety plan will go a long way to affect the progress of the work and project success. Economic was ranked second with a mean score ranking of (2.96), while environment was ranked third with a mean score ranking of (2.60). Further, Schedule and Safety was ranked fourth and fifth with mean values of (2.11) and (1.94) respectively. This is consistent with literature as Ilias *et al.*, (2009) described.

Table 4.2 Mean score ranking of emphasis placed on safety

Client	Variables	Mean	Ranking
Public	Environment	4.09	<i>1st</i>
	Schedule	3.37	<i>2nd</i>
	Economic	2.49	<i>3rd</i>
	Safety	2.15	<i>4th</i>
	Quality	2.00	<i>5th</i>
Private	Quality	4.00	<i>1st</i>
	Economic	2.96	<i>2nd</i>
	Environment	2.60	<i>3rd</i>
	Schedule	2.11	<i>4th</i>
	Safety	1.94	<i>5th</i>

4.4 CLIENTS COMMITMENT TO A SAFER CONSTRUCTION INDUSTRY

Client commitment to a safer construction was measured in five folds which deal with the initial stage the client began to impress upon safety on the project, and concerns that the client has on safety responsibilities. From the survey, 24.5% of the public client reveals that, they have the responsibility to cooperate with the contractors in increasing construction safety before the start of bidding. 20.8% of the public client reveals that, they have the responsibility to cooperate with the contractors in increasing construction safety during the concept and feasibility phase whilst 22.6% of the public client reveals that, they have the responsibility to cooperate with the contractors in increasing construction safety after the start of site work. Further, 7.5% argues that, they have the responsibility to cooperate with the contractors in increasing construction safety during the design phase of the project. With 9.4% not very sure of when they cooperate with the contractors in increasing construction safety. From the public client point of view majority of the contractors believed that, clients take account of safety side as part of the project performance review and majority of clients voiced their concerns of imputing equivalent piece the responsibility for safety with the contractor and to collaborate with the contractor on safety difficulties. This is consistent with literature as Ilias *et al.*, (2009) opines

From **table 4.4**, 26.4% of the client incorporated safety requirement as part of their performance review during the concept and feasibility phase of project from the private client perspective. 22.6% argues that, they have the responsibility to cooperate with the contractors in increasing construction safety before the start of bidding process in the construction industry. Further, 26.4% reveals that, they have the responsibility to

cooperate with the contractors in increasing construction safety after the start of site work. With 5.7% and 7.5% stating that, they have the responsibility to cooperate with the contractors in increasing construction safety during the design phase and after bidding, before starting site work of project respectively. From the view point of both clients, the public client attaches greater concern to the safety of the industry. Thus greater enforcement must be in cooperated in the private client.

Table 4.3 Commitment of clients to a safer construction industry (Public client)

Commitment of clients	Frequency	Percent (%)
During the concept & feasibility phase	11	20.8%
During the design phase	4	7.5%
Before the start of bidding	13	24.5%
After bidding, before starting site work	8	15.1%
After the start of site work	12	22.6%
Others	5	9.4%
Total	53	100.0%

Table 4.4 Commitment of clients to a safer construction industry (Private client)

	Frequency	Percent (%)
During the concept & feasibility phase	14	26.4%
During the design phase	3	5.7%
Before the start of bidding	12	22.6%
During the bidding phase	2	3.8%
After bidding, before starting site work	4	7.5%

After the start of site work	14	26.4%
Others	4	7.5%
Total	53	100.0%

4.5 CLIENTS INFLUENCE ON HEALTH AND SAFETY PERFORMANCE

4.5.1 Influence of Client on Construction Safety Performance

From **table 4.5**, respondents were asked to determine whether or not the safety is the responsibilities of the client or the contractor. From the survey, 83% voted that, safety is the responsibility of the client and 17% opted for no. Again, 71.7% of the respondents argued that, Client should keep safety under control during construction with 28.3% arguing that, Client is not supposed to keep safety under control during construction. Further, 96.2% said that, Safety is the responsibility of both the client and the contractor while, 3.8% said no. other suggested that, the two parties should cooperate on safety matters, representing 96.2%. 48 respondents representing 90.6% argues that, Safety is the responsibility of the contractor, with 28.3% attesting that, there is no safety responsibility on the client. The findings from the survey showed that, there more room for advancement on the Ghanaian construction industry, since there involve a lot of contradiction as to who is responsible for influencing construction safety performances. **Table 4.5 client influence on construction safety performance**

Safety performance		Frequency	Percentage (%)
Safety is the responsibility of the client?	Yes	44	83%
	No	9	17%

Client should keep safety under control during construction?	Yes	38	71.7%
	No	15	28.3%
Safety is the responsibility of both the client and the contractor?	Yes	51	96.2%
	No	2	3.8%
The two parties should cooperate on safety matters?	Yes	51	96.2%
	No	2	3.8%
Safety is the responsibility of the contractor?	Yes	48	90.6%
	No	5	9.4%
There is no safety responsibility on the client?	Yes	15	28.3%
	No	38	71.7%

4.6 THE LEVEL OF IMPORTANCE CLIENT PLACES ON THE PAST SAFETY OF CONTRACTORS

From **table 4.6**, many of the clients places high level of significance on the past safety performance of their contractors, The study also reveals that; the client has principled viewpoint on construction safety and an inclination of choosing safe contractors for their projects. A total of 30 respondents representing 56.5% places very high significance on the past safety of the contractor. 20.8% of the respondents also argues that, it is relevant to place on the past safety performance of the contractor with 20.8% suggesting that the client places little importance on the past safety of the contractor. Though, the percentage of the response is comparatively minimal, but it serves as an imperative result to other regulars to correctly manage human capital in terms of safety as Ilias *et al.*, (2009) opines.

From **table 4.7**, respondent's views on client provision of funds for site safety reveals that, only 52.8% provide funds to support site safety, with 47.2% not providing any support for

site safety. The study reveals that, construction clients lack the drive to participate in safety matters in the construction industry regardless of the effort putting in the construction health and safety.

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Table 4.6The level of importance client places on the past safety of contractors

Level of importance	Frequency	Percent (%)
Most importance	11	20.8%
High importance	30	56.5%
Little importance	11	20.8%
No importance	1	1.9%
Total	53	100%

Table 4.7Client provision of funds for site safety

Clients provision of funds	Frequency	Percent (%)
Yes	28	52.8%
No	25	47.2%
Total	53	100%

4.7 CONTRIBUTION OF CLIENTS TO MAKING THE CONSTRUCTION

INDUSTRY SAFER

According to Ilias *et al.*, (2009), operating in accident-free construction sites are immense and a wide range of significance can be ensued by the client. A wide range of technology has been developed by various researchers to meet the minimum injury aim in the construction industry, and with these techniques, have prime equally shared factor. According to them, the client involvement of the selected technique is an attainment. It is clear now that, the imperative precondition element to quality safety performance is the involvement of client not only in pre-project planning together with financially supporting the contractor's safety program, but also in the day-to-day project safety activities (Ilias *et al.*, 2009).

4.7.1 Cross Tabulation of Min. Safety Requirements and How Effective the Rules and Regulation Imposed By the Client Are

From **table 4.7**, a total of 25 respondents representing 66.7% admitted that, clients establish minimum safety requirement and the rules and regulations imposed by the client is very effective in the building industry. 21.9% of the respondent admitted that, client also establishes safety requirement and the rules and regulations imposed by the client are effective. 33.3% established that, the client doesn't institute any minimum safety requirement in the construction industry.

Table 4.8 Cross tabulation of min. safety requirements and how effective the rules and regulation imposed by the client are

		Are the rules and regulations imposed by clients effective				Total	
		Very effective	Little effective	Quite effective	Not effective		
Do client establish minimum safety requirements in the contracts other than the legislation	No	Count	1	5	3	7	16
		% within minimum safety requirements in the contracts other than the legislation	6.2%	31.2%	18.8%	43.8%	100.0%
		% within are the rule and regulations imposed by clients effective	3.8%	83.3%	33.3%	100.0%	33.3%
	Yes	Count	25	1	6	0	32
		% within minimum safety requirements in the contracts other than the legislation	78.1%	3.1%	18.8%	.0%	100.0%
		% within are the rule and regulations imposed by clients effective	96.2%	16.7%	66.7%	.0%	66.7%
Total	Count	26	6	9	7	48	
	% within minimum safety requirements in the contracts other than the legislation	54.2%	12.5%	18.8%	14.6%	100.0%	
	% within are the rule and regulations imposed by clients effective	100.0%	100.0%	100.0%	100.0%	100.0%	

4.7.2 Safety Initiatives

In the analysis of the safety initiatives, both the Relative Importance Index (RII) and the mean score ranking was used. This was to separate the tie when two factors have the same mean. This was based on the principle that the one with the lowest standard deviation carries the highest weight and priority must be given to that. In the calculation of the Relative Importance Index (RII), the following formula was used (Badu *et al.*, 2013):

$$RII = \frac{\Sigma W}{A * N}$$

Where, W: weighting given to each statement by the respondents and ranges from 1 to 5; A Higher response integer (5), and N – total number of respondents.

From the results in **Table 4.6**, in the overall ranking, Clients dedicated funds to support the contractor's efforts in safety was ranked first among the safety initiatives by the client with an average RII of 0.804 and a mean score of 4.02, giving the indication that, constraints of funds in the building project on the part of the client will eventually affects the result of the construction process, and if a chain of reaction is not resolved, may have an effect on some causes of accidents as (Dagostino and Feigenbaum, 2003). Clients emphasizes safety in design was ranked second with an average RII of 0.619 and a mean score of 3.09. Further, Clients develop effective safety recognition and reward program during the whole life of the project was next ranked factor with an RII of 0.536 and a mean score ranking of 2.68. With Clients select safe contractors to carry out the work and Clients participates in and monitors safety during the whole life of the project been the next with

an RII of 0.476 and 0.445, and a mean score value of 2.38 and 2.23 respectively. The study is consistent with literature as Dagostino and Feigenbaum, (2003) and Ilias *et al.*, (2009) opines.

Table 4.9 Safety Initiatives

Safety Initiatives	Mean	RII	ΣW	Std. Deviation	Ranking
Clients dedicated funds to support the contractors efforts in safety	4.02	0.804	213	1.32	1 st
Clients emphasizes safety in design	3.09	0.619	164	1.36	2 nd
Clients develop an effective safety recognition and reward program during the whole life of the project	2.68	0.536	142	1.39	3 rd
Clients select safe contractors to carry out the work	2.38	0.476	126	1.20	4 th
Clients participates in and monitors safety during the whole life of the project	2.23	0.445	118	1.19	5 th

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND

RECOMMENDATIONS

5.1 INTRODUCTION

This chapter introduces summary of the main findings and discussions on the contractor perspective on the key contribution of building client in making the Ghanaian building industry safer in Accra, in the Greater Accra Region. In analyzing the subject matter, the motives of the contractors involved in the building sector of the building industry were pursued by the use of well-structured questionnaire guide. This section therefore present the conclusion and recommendation established on the findings from earlier sections.

5.2 SUMMARY OF FINDINGS

In pursuing the aim of this study, three objectives were set out. The achievement of the three study objectives is set out in the following subsections. Determining How Building Clients Contribute In Making The Ghanaian Building Industry A Safe Place. The contribution of the client in making the Ghanaian building industry a safer place, from the survey, shows that the building client contribute significantly in the building industry but majority of clients does not implement effectiveness of rules and regulation in the building industry. Again, majority of the client realized that dedication of funds in construction projects increasingly affect the result of the construction process, and believe that, to an extent, achieve the quality of the project.

5.2.1 To Evaluate the Impact of Building Clients in the Area of Safety

This objective was first of all desk-studied on and the salient factors were outlined in the literature review. The factors that were identified in the literature review were transferred unto a questionnaire where respondents were asked to indicate the impact of building clients in the area of safety. The findings show that, a wide range of significance is gained from the client in operating in accident-free construction sites. But, there are more room for improvement in the Ghanaian construction industry, since there involve a lot of contradiction as to who is responsible for influencing construction safety performances in the building industry.

5.2.2 To Recommend Means by Which Building Clients Can Contribute In Making the Building Industry A Safe Place

From the findings, there involve a lot of differences and there is a need to propose strategies that should be adopted by construction clients in making the building industry a safer place.

5.3 CONCLUSION AND RECOMMENDATION

5.3.1 Conclusions

The findings from the study reveals that, there are more room for advancement in the Ghanaian construction safety performance on all phases of construction project – from project beginning up until project accomplishment and hand over. The involvement of all parties in the building industry can contribute significantly into the management and

planning of safety on construction sites. Again, the client involvement in safety management can significantly influence project safety performance as Ilias *et al.*, (2009) argues that, the imperative precondition element to quality safety performance is the involvement of client not only in pre-project planning together with financially supporting the contractor's safety program, but also in the day-to-day project safety activities. Client may not always take the governance character for project safety managing, but the client's assertiveness on the road to safety and their bodily participation in safety will constructively move safety performance of general contractors and sub-contractors.

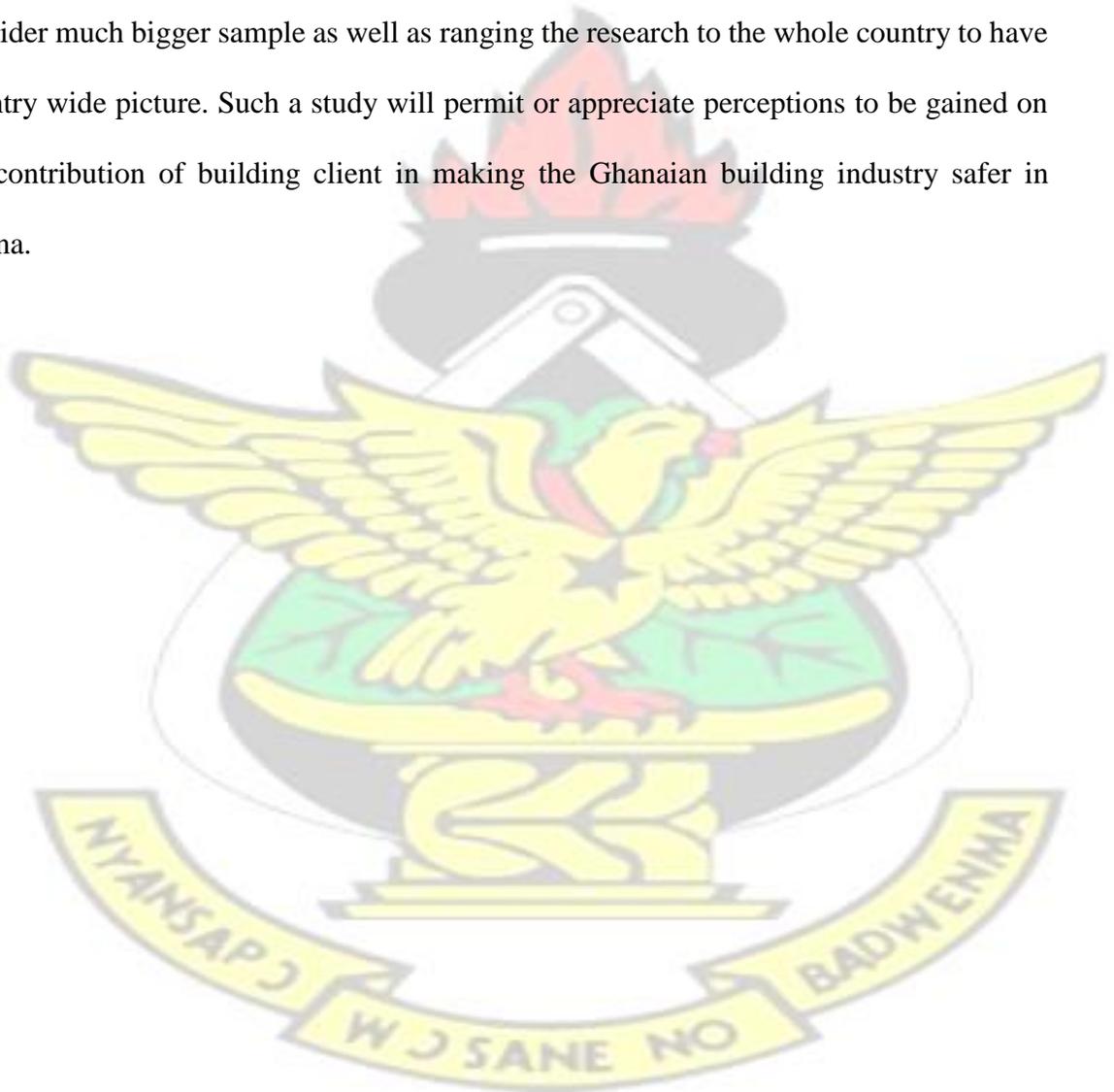
5.4 RECOMMENDATION

From the conclusion, the following recommendations are therefore proposed

- All building clients irrespective of size and type of their project should acknowledge that they have a responsibility for construction safety. Thus, safety must be incorporated into the complete project objective of the client.
- Ways to incentivize clients must be discovered, together with the viewpoint of implementing the safety performance agreement.
- Economic motivations should not be discounted in vexing to get clients involved and becoming responsible for safety implementation.
- Safety training and design has to be encouraged in the building industry of Ghana to help building or construction client address safety as timely as the design stage of a project.

5.5 RECOMMENDATIONS FOR FUTURE RESEARCH

The emphasis of this study is on investigating into the contribution of building client in making the Ghanaian building industry safer in Accra, in the Greater Accra Region. Time and other resource restrictions for the programmed were taken into description in determining on an applicable design to report the research objectives. Future research will consider much bigger sample as well as ranging the research to the whole country to have country wide picture. Such a study will permit or appreciate perceptions to be gained on the contribution of building client in making the Ghanaian building industry safer in Ghana.



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APPENDICES

5.6 APPENDIX A

5.6.1 SURVEY QUESTIONNAIRE

CONTRIBUTION OF BUILDING CLIENTS TO A SAFER GHANAIAN BUILDING

INDUSTRY

This researcher is a post-graduate student at the Kwame Nkrumah University of Science and Technology studying for a Master of Science degree in Construction Management. The researcher is conducting a research into the contribution of construction clients in making Ghanaian construction industry a safer place.

The aim is to study the contribution of construction clients to making the Ghanaian construction industry a safer place.

With this background, kindly answer the questions in this questionnaire as accurately as you possibly can. **Your response to this research will be confidential and will be used exclusively for academic purposes, names of individuals and organizations will not be disclosed in the final report.**

If you have any queries regarding to the following questions, please feel free to contact me via email: wjusticee30@gmail.com

STUDENT 0244915867

SUPERVISOR 0246753214

JUSTICE WILLIAMS

DR. E. ADINYIRA

The questionnaire is divided into four main sections, please check the appropriate options and give brief answers where necessary.

SECTION A: BACKGROUND INFORMATION

1. What is your job position in the company?

Safety Officer Project manager Managing director Project engineer

Others (specify).....

2. How many years' experience do you have in the industry?

Less than 6 years 6-10 years 11-15 years 16-20 years more than 20 years.

3. How long has your company been in existence?

5-10 years 11-15 years 16-20 years more than 20years

4. How many years have you been in construction business?

5-10 years 11-15 years 16-20 years more than 20 years

5. What is the nature of your company?

Main contractor Sub-contractor Specialized sub-contractor

Others (please specify).....

6. What kind of projects do you do? Please tick as many as apply.

Industrial/commercial Residential

public private

Others please specify.....

SECTION B: EMPHASIS PUT ON IMPROVING SAFETY OF GHANAIAAN BUILDING INDUSTRY BY CLIENTS.

1. Emphasis placed on safety

7. At the inception stage of projects, what level of importance do you think clients place on the following? Use {1} for top priority, {2} for second priority {3} for third priority {4} for fourth priority and {5} for low priority

Public clienteconomicenvironmentquality
safetyschedule

Private clienteconomicenvironmentquality
safetyschedule

2 Commitment of clients to a safer construction industry

8. As the contractor, when, at the earliest, do you think clients begin to contribute to safety on projects (*tick one*)

Public client

- During the concept & feasibility phase during the design phase
- Before the start of bidding during the bidding phase
- After bidding, before starting site work After the start of site work
- Others (please specify).....

Private client

- During the concept & feasibility phase During the design phase
- Before the start of bidding During the bidding phase
- After bidding, before starting site work After the start of site work
- Others (please specify).....

SECTION C: CLIENTS INFLUENCE ON HEALTH AND SAFETY PERFORMANCE.

1. Influence of clients on construction safety performance

Yes No

- Safety is the responsibility of the client?
- Client should keep safety under control during construction?
- Safety is the responsibility of both the client and the contractor?
- The two parties should cooperate on safety matters?
- Safety is the responsibility of the contractor?
- There is no safety responsibility on the client?

Others (please specify).....

9. By your experience does the client has any influence on site safety?.....

.....
.....
.....
.....
.....
.....
.....
.....

If yes why, and if no why?.....
.....
.....

2. Safety management practices of clients

10. When selecting contractors, what level of importance do clients place on the past safety performance of contractors. (Select one)

- The most important High importance Little importance
 No importance

11. Do clients provide funds to go beyond the contract sum for the promotion of site safety?

- Yes
 No

SECTION D: CONTRIBUTION OF CLIENTS TO MAKING THE CONSTRUCTION INDUSTRY SAFER.

1. Contribution of clients to safety

12. Do clients establish minimum safety requirements in the contracts other than the legislation?

- Yes
 No

13. From the contractor's view, are the rules and regulations concerning safety imposed by clients effective?

- Very effective
 Quite effective
 Little effective
 Not effective

14. From the contractor's point of view, how much discretion is exercised by clients in enforcing the rules and procedures concerning safety? (i.e. are they flexible in the way the rules are applied)

- Much discretion

[] Some discretion

[] Little discretion

[] No discretion

15. As the contractor, given the safety initiatives below, please rank the initiatives in terms of

Your preference use {1} for top preference {2} for second {3} for third {4} for fourth and {5} for Fifth preference.

.....Clients emphasizes safety in design.

.....Clients select safe contractors to carry out the work.

.....Clients participates in and monitors safety during the whole life of the project

.....Clients develop an effective safety recognition and reward program during the whole life of the project.

.....Clients dedicates funds to support the contractor's efforts in safety.

16. Provide any additional comments or suggestions you wish to share regarding clients contribution to site safety?.....

.....
.....
.....
.....
.....
.....

THE END. Thanks you much.