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AN EXPLORATORY STUDY INTO PROMOTING CONSTRUCTION HEALTH AND SAFETY IN GHANA THROUGH PUBLIC WORKS PROCUREMENT

BY

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A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR A DEGREE OF MASTER OF PHILOSOPHY IN PROCUREMENT MANAGEMENT

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DECLARATION

I hereby declare that this work is the result of my own original research and this thesis has neither in whole nor in part been prescribed by another degree elsewhere.

References to other people's work have been duly cited.

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ABSTRACT

Procurement has been found to be a tool that can help to promote social objectives and policies. Studies have shown that procurement can further help promote good occupational health and safety practice as it occurs throughout the life cycle of a project. However, the use of procurement as an instrument to promote health and safety practices in construction has received little attention till date. For this reason, this research explores the promotion of construction H&S in Ghana through public works procurement. The research employed the qualitative research method to achieve the research aim which is to explore practical measures to improve construction health and safety through public works procurement in Ghana. Data were collected using semi-structured interviews. In all, seven individuals (procurement managers, consultants and Quantity surveyors) were interviewed and thematic matrix analysis was used as the method for data analysis. A case study of the health and safety management of a project procured using the Public Procurement Act, Act 663 was also carried out. This was done to ascertain how public works is carried out in the Ghanaian public sector setting by determining the various stakeholders involved, the processes the project underwent and the various considerations looked at especially under H&S. The results however indicated that the Act 663 has no clause that addresses construction H&S. The paper also finds that, H&S does not form part of the criteria for evaluating tenders. To address the constraints so as to improve upon construction H&S, certain recommendations are offered. These include the inclusion of non-ambiguous H&S requirements as criteria for evaluating tenders and the pricing of H&S items in bills of quantities. The study also recommends the carrying out of risk assessment at the planning stage to determine the risks involved in the project. Additionally, practical measures to improving construction H&S in Ghana at the key stages of works procurement are also provided. The study also recommends potential contractor‘s participation in the design process to bring their expertise to bear on the project. It also includes other specific roles and involvements of other stakeholders in the procurement process.

Keywords: Construction, Health and Safety, Ghana, Public Procurement, Act 663

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LIST OF ABBREVIATIONS

DoFI……Department of Factories Inspectorate

FIDIC ……...…International Federation of Consulting Engineers (Contract Form)

FOSA…….....Factories, Offices and Shops Act

GDP……...……Gross Domestic Product

GCI……..Ghanaian Construction Industry

GIA…….…….…….Ghana Institution of Architects

GhIE……..……Ghana Institution of Engineers

GhIS……..……Ghana Institution of Surveyors

H&S……Health and Safety

IFC……International Finance Corporation

ILO……...International Labour Organisation

ITC.....International Trade Centre

MDBs……Multi-lateral Development Banks

MoESW…….…… Ministry of Employment and Social Welfare

MOWWH……..…….Ministry of Water, Works and Housing

OHS…….Occupational Health and Safety

PFSS……..Pay for Safety Scheme

PPA……..Public Procurement Act

PPB……..Public Procurement Board

PURFMARP……Public Financial Management Reform Programme

QS…….…….Quantity Surveyor

STD…….Standard Tender Document

TDS……Tender Data Sheet

UK……United Kingdom

USA……United States of America

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Lastly, as errors are found in all human endeavours, I accept full responsibility for any error of fact or interpretation in this study.

DEDICATION

This study is dedicated to my parents, Prof. Armstrong Donkoh and Mrs Comfort Donkoh.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Health and safety in most instances, refers to regulations and procedures to prevent accident or injury in workplaces or public environments. It is a cross-disciplinary area dealing with the safety, health and the welfare of people engaged in employment or work.

Health and safety is a very important issue for moral, legal and financial reasons: Legally because every employer owes his employees and the public a duty of care to protect them from things or situations that can cause harm to them both physically and mentally. Breaches in health and safety law can result in high compensation. It is important financially as accidents can result in direct costs (claims, damage to building and loss in productivity) and indirect costs (cost involved in recruiting new staff, loss of goodwill and company‘s image), and are considered morally because diseases and accident rates keep rising each year resulting in injuries and at times loss of human lives. Mr Kofi Annan, former UN Secretary General said that, ―Safety and health at work is not only a sound economic policy-it is a basic human right‖ (Amponsah-Tawiah & Dartey-Baah, 2012 pg119).

According to the International Labour Organisation, globally, 6300 people die every day as a result of occupational accidents or work related diseases which is more than 2.3 million deaths per year. 317 million accidents occur on the job annually: many of these resulting in extended absences from work (ILO, 2013). The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practices is estimated at 4% of global gross domestic product each year. The health and

safety conditions at work are very different between countries, economic sectors and social groups. Death and injuries take a particularly heavy toll in developing countries where a large part of the population is engaged in hazardous activities such as agriculture, construction, fishing and mining (ILO, 2013).

Hislop (1999), explained that safety issues have always been a major problem and concern in the construction industry. Safety is far more than workers wearing hard hats on construction sites. It is a philosophy that identifies and eliminates job site hazards throughout the life cycle of a project. He further explained that, safety is a philosophy that discourages work practices which put individuals at risk of injury. It is the integration of safety into daily work and the promotion of an environment where each person in the projects construction hierarchy has a responsibility and role for safety.

The selection of the right contractor for a particular job is probably the most important element in ensuring that the risks to the health and safety of everybody involved in the activity and people in the vicinity are reduced as far as possible. A contractor who meets the client‘s requirements must be selected. Cost, of course, will have to be part of the judgement but may not provide any indication of which contractor is likely to give the best performance in terms of health and safety (Hughes & Ferrett, 2007).

The Ghanaian construction industry like many other construction economies, holds the key to the development of the nation by contributing to the socio-economic development of the nation. This is done through the provision of significant employment opportunities at non skilled and skilled levels (Ahadzie, 2009). The African Economic Outlook (2012) report notes that the construction industry contributes 8.6% to the total gross domestic product (GDP) of Ghana and employs over 1.4% of the country‘s labour force.

Procurement of construction contracts in Ghana alone consumes over 60% of the National Budget Expenditure according to the Public Procurement Authority in 2010. Therefore, an efficient system could ensure value for money in government expenditure which is essential to a country facing enormous developmental challenges (Ameyaw *et al.*, 2012). The government of Ghana launched the Public Financial Management Reform Programme (PURFMARP) in 1996 to ensure sanity and value for money in public procurement. Its main purpose was to improve financial management in Ghana. The group identified some weaknesses in the procurement system of Ghana which includes a lack of comprehensive public procurement policy, lack of central body with technical expertise and absence of clearly defined roles and responsibilities for procurement entities amongst many others.

These findings led to the establishment of the Public Procurement Oversight Group in 1999. The aim of this group was to steer the design of a comprehensive public procurement reform programme which led to the drafting of a public procurement bill in September 2002 that was passed into law on 31st December, 2003 (Ameyaw *et al*., 2012).

Value for money is enhanced by the objectives of the Act 663. Cost alone is not a reliable indicator of value for money. The government of Australia (2006) published in their Guide on occupational health and safety in government procurement that, value for money does not mean that cheapest is best. In a procurement process, this principle requires a comparative analysis of all relevant costs and benefits of each proposal throughout the whole procurement cycle (whole-of-life costing) including those associated with health and safety at work.

Why is health and safety an issue for procurement to consider? According to Hawkins and Wells (2011), procurement procedures can further promote or inhibit good Occupational Health and Safety (OHS) practice. The government of Ghana is the largest client for the GCI. Since the government is a major employer, policy maker, regulator and procurer of construction works, it can play a crucial role in the prevention of accidents, diseases and also enhance the welfare of the people. This can be done through promoting, legislating and enforcing health and safety requirements through a wide range of mechanisms. If the government at all levels, integrates health and safety into all the stages of the procurement process (since the procurement Act 663 outlines the procurement processes in Ghana), contractors will need to demonstrate their abilities to meet those requirements.

1.2 PROBLEM STATEMENT

In many developing countries, accurate statistics of injuries and fatalities in the construction industry are hard to come by because many of these accidents go unreported (Boakye et *al.*, 2010). However, statistics from the National Labour Department in Ghana indicate that, the rates of accidents have been increasing steadily every year. The number of fatal construction accidents that occurred between year 2004 and 2009 are shown in the table and chart below. In 2004, the number of accidents was 8 and this rose to 28 in 2009 (250%).

Table 1.1: Number of Construction Accidents occurring between years 2004 to 2009

YEAR	Number of accidents Per Year	Index(percentage)
2004	8	100
2005	21	262.5
2006	29	362.5
2007	20	250
2008	30	375

2009	28	350

Source: National Labour Department (2010); Boakye *et al.* (2010)

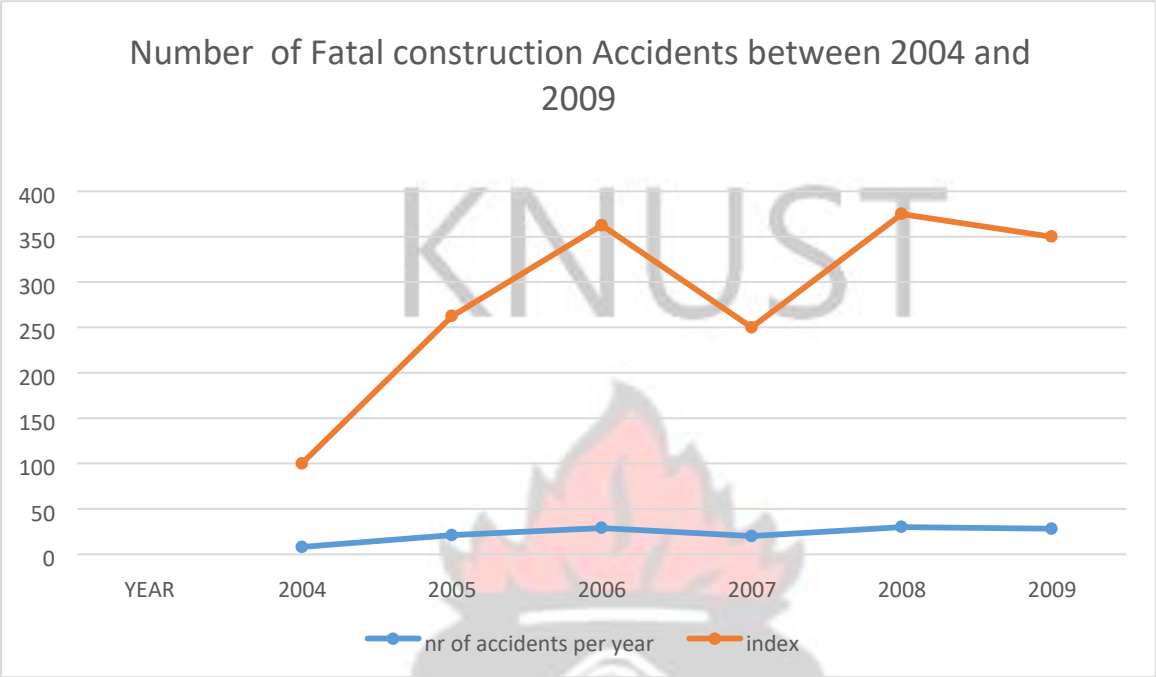

Figure 1.1: Trend of construction industry accidents

Source: Author

Workers are valuable assets to any organisation and by providing them with safe and healthy working conditions, employers or investors can enhance the efficiency and productivity of their operations. Though a number of international agencies, researchers and internal organisations for example, International Finance Corporation (IFC) and the ILO have been working to improve health and safety in the workplace, the use of procurement procedures for improving health and safety has however received very little attention.

In the developed countries, there are efficient, independent bodies in charge of health and safety at the workplace, for example, the Health and Safety Executives in the United Kingdom. These bodies do not only enforce health and safety laws, but also prosecute employers or companies when the laws are breached. Sadly, that is not the case in

Ghana. Ghana, like many African countries, cannot boast of any comprehensive national Health and Safety policy. A report by the Ghana Health

Service in 2007 indicates that, Ghana's challenge of mainstreaming Occupational Health and Safety (OHS) practices in its national developmental agenda is certainly mitigated by lack of national OHS policy. Though the nation has different agencies under different jurisdictions which monitor different industries for workplace and employee health and safety, there is no national body, policy nor process that govern occupational health and safety in Ghana. The problem is not so much as the lack of H&S laws or policies. In the absence of these laws, the existing laws should deal with the situation. One of such laws that can greatly help improve H&S standards in the country is the Public Procurement Act, Act 663.

To address the issue of health and safety in the procurement of works in Ghana, it is imperative to look at how the procurement Act addresses issues of H&S in the procurement of works and to explore the changes necessary to improve the present situation.

1.3 AIM AND OBJECTIVES

The aim and objectives for the study have been presented in this section.

1.3.1 Aim

The aim of this research is to explore the practical measures to improve construction H&S through public works procurement in Ghana.

1.3.2 Objectives

To achieve the above aim, the following research objectives were set:

1. To outline the limitations of Act 663 with respect to construction H&S management.

2. To outline practical measures to improve construction H&S management at the key stages of works procurement.
3. To recommend specific provisions and/or amendments to the Act 663 to improve construction H&S in Ghana.

1.4 JUSTIFICATION OF THE STUDY

It is important to consider health and safety during the procurement process because the monitoring and enforcement of health and safety has often been argued to be the responsibility of regulatory authorities. However, the large number and wide spread of construction sites makes it rather impossible to inspect them all. Therefore the procurement process and the terms and conditions of contract can be seen as complementary mechanisms for ensuring compliance to health safety regulations and practices (Wells and Hawkins, 2011).

Again, health and safety has been taught to be the responsibility of the contractor which may, to some extent, be passed on to consultants and other parties involved practices (Wells and Hawkins, 2011). In some other cases, clients are also being held responsible for health and safety of the workers on their sites. It is therefore expedient to critically look at the way and manner in which works are procured by ensuring that all parties involved in the construction process are protected. Health and safety is not the responsibility of one person, but the responsibility of all persons involved in the process.

The study is also very relevant since workers' health and safety are not only the concerns of workers and their families but also of enterprises and even national and global economies whose productivity and competitiveness depend on keeping workplaces safe.

Katsoulakos and Katsoulakos (2007) stated that, most countries and industries scarcely recognize occupational health and safety practices as a crucial determinant of national development. Therefore, mainstreaming occupational health and safety into national agenda becomes an important consideration for not only developed countries but also for the developing countries as well.

1.5 METHODOLOGY

The study basically involved a:

- Desk study of Act 663 and other legislations on H&S in Ghana and other advanced countries.
- Semi-structured interview of stakeholders on the adequacy or otherwise of Act 663 and other H&S legislations with managing the H&S situation with procurement of public works in Ghana.
- Case study of the H&S management of a project procured using the Act 663

1.6 SCOPE

The research focused on the procurement of works under the Public Procurement Act (Act 663) and involved relevant stakeholders such as procurement and construction professionals in Ghana. The government of Ghana is the major client or procurer of works in the country and by addressing health and safety in public works procurement, a large portion of the construction sector will be taken care of in terms of health and safety. Hence the focus on public works.

The study was delimited to health, safety and welfare issues thus does not cover issues of environmental management.

1.7 STRUCTURE OF THESIS REPORT

The composition of the research is divided into five interdependent chapters, in the following outline:

Chapter One includes introduction, statement of problem, research aim, objectives, justification and scope of the study.

Chapter Two highlights the literature review. It provided an extensive coverage and critique of previous research on the central themes in the study.

Chapter Three highlights the research methodology. Detailed discussions are provided on the data collection and analytical tools that were employed. **Chapter Four** presents the analysis and interpretation of data collected.

Chapter Five presents the conclusion and recommendations from the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the literature on integrating health and safety with public procurement works. The chapter begins by defining the concept of procurement. It also highlights on public procurement in Ghana and in the world at large. The laws regulating the procurement of works in Ghana and other countries of the world are also identified. The chapter also gives an overview of the construction industry, the Ghanaian construction industry, and its significance to the development of the economy. The health and safety practices in the Ghanaian construction industry and other construction economies of the world are also reviewed. Ghana's Procurement Act, Act 663 and other laws regarding construction H&S are reviewed and juxtaposed with best practice.

2.2 CONCEPT OF PROCUREMENT

Gershon (1999) refers to procurement as the total process of acquiring goods, services, supplies, engineering and construction works, the hiring of anything, disposal and granting of any rights and concessions. It also comprises logistical aspects. The Commonwealth Procurement Guidelines according to the Government of Australia (2010) describes procurement as ―the whole process of acquiring property and services. It begins when an agency has identified a need and decided on its procurement requirement. Procurement continues through the processes of risk assessment, seeking and evaluating alternative solutions, contract award, delivery of and payment for property or services and, where relevant, the on-going management of a contract and consideration of options related to the contract. An integral part of the procurement cycle is the on-going monitoring and assessment of the procurement, including the property or services procured and the tasks related to procurement.‖ Procurement also extends to the ultimate disposal of property at the end of its useful life (Waters, 2004). In construction, procurement refers to the process of establishing the most appropriate method of managing the construction project and selecting the best team to design, deliver and sometimes operate the required facility (SECBE, n.d.). In a broader sense, procurement simply refers to the acquisition of works, goods and service. General contracting, develop and construct, design and build, construction management, public private partnerships (PPP) and performance-based contracting are some of the major procurement methods that exist in construction (Hackett *et al*., 2007 as cited in Honu *et al*., 2013).

According to Shaw (2010) as cited in Musanzikwa (2013), procurement is characterized by the following processes:

a) Needs analysis: Needs analysis involves the determination of need and whether procurement provides the optimal solution;
b) Funding approval: Funding approval is when the scope of the project is defined and also the approval of budget;
c) Project procurement plan: This is the stage whereby the strategy for entering the market is determined. The strategy must ensure that the desired objectives set is achieved;
d) Contractor selection: The contractor selection stage involves the invitation of eligible tenderers to tender for the project, evaluation of tenders received and contract awarding;
e) Contract management. Contract management refers to the period between a contracts and its implementation and;
f) Evaluation. The last process, which is procurement evaluation, assesses service provider performance and value for money.

Honu *et al.* (2013) opined that the impact of these activities or processes on construction outcomes suggests that procurement can be applied as a major tool to promoting health and safety in construction.

Procurement can either be private or public. However, for the purpose of this study, the focus is on procurement made by or on behalf of the government and specifically the procurement of public works. This type of procurement, also known as public procurement or government procurement is described in the next section.

2.2.1 Public Procurement

Public procurement generally refers to the use of public or state funds to purchase goods, services and works. It may also be referred to as ―the acquisition of goods and services at the best possible total cost of ownership, in the right quantity and quality, at the right time, in the right place for the direct benefit or use of government, corporation or individuals, generally via a contract‖ (Ghana Integrity Initiative, 2007).

In the last decade, the public procurement environment has experienced a lot of changes. These changes have led to the development of new approaches to procurement and service delivery as a whole. The changes include education and skills development, cost savings, the increased expectations of the populace on governance, achievement of integrity and transparency in the procurement process and the a greater consideration on work-related health and safety, and environmental issues (Watermeyer *et al.*, 2003). Brammer and Walker (2007) pointed out that public procurement is a significant phenomenon which is understudied.

2.2.1.1 Significance of Public Procurement

Effective public procurement is essential for good public services and governance. High professionalism standard must be exhibited by the government in the use of state funds to ensure that goods and services procurement are of the right quality and quantity, right price and also meet the needs of the users (Office of Government Commerce, n.d.). Procurement should be effectively managed to obtain optimal value for money as it represents a very large quota of total expenditure in most countries of the world (Musanzikwa, 2013). The world‘s public procurement spend is estimated at 18.42% (Mahmood, 2010). The contributions to GDP by procurement functions in developed

countries cannot be underestimated. Public procurement accounts for 16% of GDP in the European Union (Mathew, 2010). The government sector in the United States acquires between $1.4 and $1.6 trillion of goods and services annually. In Turkey, US $25 billion is spent by the government to purchase goods, services and construction works each year (Thai, 2001). The International Trade Centre (ITC) upon realising the value of the procurement function explains that, public procurement contributes about 50% to 70% of imports in in the developing countries (Dza *et al.*, 2013). Furthermore, public procurement is deemed to account for 9% to 13% of the GDP of developing countries. In 2003, public procurement surpassed $ 1 billion in Botswana (Lionjanga, 2003). Government expenditure on public procurement in South Africa accounts for 13% of GDP equals $14 billion. Enterprises owned by the state also have an additional $5 billion in procurement, making 17% of GDP in total (Woolcock, 2008). About 43.8% of Ghana's national budget is spent on public procurement. Furthermore, 90% of all development partners' inflows are spent through procurement related activities (World Bank, 2003).

Procurement is not only important because of its contribution to GDP and financial management, but can also be used as a policy tool to achieve desired social outcomes since it occurs at the earliest stage of a project (Brammer and Walker, 2007; Thai, 2001).

2.2.1.2 Challenges facing Public Procurement in Ghana

A number of challenges face public procurement although it is a key function of government (Shaw, 2010).

Public procurement has been perceived as an area of waste and corruption (Shaw, 2010). Transparency International (2012) ranked Ghana 69th out of 183 countries when

it comes to corruption. It becomes difficult to distinguish between gifts and bribes when the norm of a country is gift-giving. Government contracts are characterised by corruptions and bribes (Musanzikwa, 2013). Otieno (2004) notes that the irregular procurement activities in public institutions provide the biggest loophole through which public resources are misappropriated.

Secondly, according to Anvuur *et al*. (2006), delays flaw contracts for both works and consultancy. These delays, according to Westring (1997) are caused by extensive post-award negotiations, delays in the preparation of technical specifications and drawings, and evaluation, an extensive system of controls, reviews and approvals, and land ownership disputes.

Thirdly, political interference with the procurement process is also a big challenge to the successful implementation of public procurement reforms. A good number of politicians deem it a right to intervene in the procurement procedures and this interference leads to capricious procurement decisions. It is a common practice in most African countries of which Ghana is a culprit, for politicians to influence the tender process, insisting that particular contracts are awarded to individuals or companies of their choosing (World Bank, 2004).

2.2.2 Public Procurement Reform in Ghana

The public procurement system in Ghana has developed to an orderly and legally regulated system governed by the PPA, Act 663, 2003. The reform in Ghana‘s procurement system can be traced to 1996 when the government of Ghana (GoG) embarked upon an exercise to reform the Public Procurement System as an integral part of a wider Public Financial Management Reform Programme (PUFMARP). The exercise was to improve the overall public financial management in the country. That

is, to ensure sanity and value for money in public procurement. The weaknesses identified by PUFMARP in the procurement system of Ghana included a lack of transparency in the award of contract, over and under-invoicing, lack of competition, one-man showmanship and unfair practices resulting in the manipulation of the procurement process(Affotey-Walters,2007). It was also seen that there was no independent appeal to address complaints from aggrieved tenderers and provide corrective remedies (Public Procurement Authority, 2014).

In 1999, the Public Procurement Oversight Group (PPOG) was formed as a result of these findings. The group's objective was to direct the design of a comprehensive public procurement reform programme. A public procurement bill was drafted in September 2002. In 2003, the draft bill was passed into law on 31st December, 2003 by an Act of parliament (Osei-Tutu *et al*., 2011).

The Public Procurement Act (PPA), Act 663, 2003 seeks to specifically harmonize public procurement processes in the public service, secure judicious, economic and efficient use of state resources and also ensure that public procurement is fair, transparent and non-discriminatory. The Act 663 also presents a comprehensive legislative framework designed to eliminate the shortcomings and organizational weaknesses, which were intrinsic in public procurement in Ghana. The Act rests on four pillars namely: transparency, fairness, economy and sanctions (Affotey-Walters, 2007; World Bank, 2003). The Act was enacted to correct the flaws (corruption and other malfeasance) that compromised the integrity and sanctity of the existing procurement system (Osei-Tutu *et al*., 2011; Affotey-Walters, 2007).

2.2.2.1 Public Procurement Act 663, 2003

The Act 663 is made up of ninety-nine (99) sections which is divided into nine (9) parts. Part I and II establishes the Public Procurement Board, Tender Committee and Tender Review Board. The procurement board oversees to the procurement process and is also the central board for policy formulation. The composition of the board is as follows: chairperson, vice-chairperson, chief executive and four persons each from both the public and private sectors as stated in clause 4. Members of the board are appointed by the president acting in consultation with the council of state. Clauses 17 and 18 are on tender committees. There are about eight (8) tender committees whose membership, functions, quorum and voting are provided for in schedule one (1) of the Act. Clause 20 establishes the 4 tender review boards namely; central tender review board, ministerial review boards, regional tender review boards and district tender review boards. Part III and IV deal with procurement rules and the methods of procurement respectively. Clause 21 spells out in detail the qualifications of tenderers. Clause 22 deals with pre-qualification proceedings. A proposal, quotation or tender may be rejected by a procurement entity at any time prior to economic grounds (clause 28). The methods of procurement stated by the Act are competitive tendering, two-stage tendering, restricted tendering, single source procurement and request for quotations. Part V deals with tendering procedures, and this section is sub-divided into three parts: invitation of tenders and application to qualify, submission of tenders and, evaluation and comparison of tenders. Part VII deals with the methods and procedures to engage the services of consultants. A notice of invitation for expression of interest is to be prepared and candidates shortlisted. Clause 68 spells out the criteria for the evaluation of proposals. Clause 73 spells out how the evaluation of proposals must be carried out. It is in two stages; quality first and then price (cost). Selection procedure may depend

on whether price is a factor or not (clause 74 to 75). Confidentiality is to be respected (clause 76). Part VII is on review. Review deals with appeals by tenderers. Clause 79 grants an aggrieved tenderer in connection to procurement procedures, to seek a review which must be done in writing within 21 days. Part VIII deals with the disposal of stores, plants and equipment. It spells out disposal procedures and the authority to dispose. Part IX deals with miscellaneous provisions of the Act. It defines offences and applicable penalties, and authorizes the issue of regulations which are enforceable under the Act.

No clause or section in the Act 663 however explicitly addresses construction health and safety.

2.2.3 Procurement of Works under Act 663(2003)

The Public Procurement Act, Act 663 (2003) Manual describes works procurement as work associated with the construction, reconstruction, demolition, repair or renovation of a building or structure or surface and includes site preparation, excavation, erection, assembly, installation of plant, fixing of equipment and laying out of materials, decoration and finishing, and any incidental activity under a procurement contract.

The main procurement method used for public works in Ghana is the traditional method, with design split from construction (Anvuur *et al*., 2006; GyaduAsiedu,2009). Guidelines administered by the Ministry of Works and Housing makes a provision for mandatory registration and classification of contractors. The Ministries, Departments and Agencies (MDAs) and many District Assemblies (DAs) however maintain separate lists for the pre-qualification of contractors. These bodies use different standard conditions of contract for works procurement. World Bankadministered projects use

the FIDIC conditions of contract for works contracts and shortlists for the selection of consultants (Anvuur *et al*., 2006).

Public works are organized essentially as a tripartite arrangement between the client, professional consultant(s) and the contractor. The client after taking the decision to build or construct, informs the chief consultant who is usually the architect and the other consultants. They provide professional advice during the briefing stage. They further proceed provide design, appoint a qualified contractor, supervise the execution and advice for payment and finally, conclude the project (Gyadu-Asiedu, 2009).

There are various methods involved in the procurement of works which are presented in section 2.2.4.

2.2.4 Methods of Works Procurement

Kwakye (1997) points out that, the procurement method adopted will depend on: complexity and scale of the project; expectation of specific performance requirements; necessity for competition on price and time; necessity for accountability on the part of those concerned in its administration and pre-commitments and existing relationships. The following methods are used in the procurement of works in Ghana. Competitive Tendering also known as open tendering refers to those procedures under which all interested suppliers or contractors are given notification of contract requirements and all such tenderers are given equal opportunity to submit a tender. It provides the greatest opportunity for competition and satisfies the needs for economy and efficiency. The client must give sufficient advance public notification of open tendering

opportunities for potential tenderers to determine their interest and to prepare and submit their bids (Public Procurement Act Manual, 2003).

- Two-Stage Tendering. In this method, tenderers are invited by the

procurement entity at the initial stage to contribute to the detailed specification of the works. New detailed specifications are prepared for work after review and consultations. A restricted tender is then issued for all participants who qualified at the initial stage. This method is rarely used. It is appropriate for works subject to rapid technological changes or works with complex designs which cannot be done by the procuring entity (ibid).

- Sole Sourcing. It is where a supplier is chosen without any competition and is subject to approval from the Public Procurement Board. It is appropriate for works that are urgently needed or works with only one supplier in the market (ibid).
- Request for quotations (RFQ). This is also known as ―shopping‖ and is based on comparing price quotations obtained from several suppliers, usually at least three, to ensure competitive prices. Shopping procedures may be agreed for contracts of a small value for (a) readily available off-the-shelf items; (b) standard specification of goods; and (c) routine and other minor works.
- Restrictive Tendering. Refers to a tendering process whereby a shortlist of preregistered or known contractors are given a direct invitation to partake in a tender. It is subject to a specific approval by the Public Procurement Board. It is an appropriate method of procurement where: the requirement is of a specialised nature or has requirements of public safety, or public security which make an open competitive tender inappropriate, and where due, to the urgent nature of the requirement, an open competitive tender is not practical (Public Procurement Act Manual, 2003).

2.3. OVERVIEW AND SIGNIFICANCE OF THE GHANAIAN CONSTRUCTION INDUSTRY

The construction industry in Ghana is pivotal in economic development. No matter what one does, there is construction, as it cuts across all sectors. The industry is found amongst the top drivers in the Ghanaian economy. (Ghana National Commision for UNESCO, n.d.).

The Ghanaian construction industry derives its practice from the British construction industry which is a common practice among many commonwealth countries. Thus, a key feature of the Ghanaian construction environment is the separation between design and construction (Ahadzie, 2007).

According to Ashiboe-Mensah (2012) and Agbojah (2008), the stakeholders in the Ghanaian construction industry are as follows:

- The client: the initiator of the construction process, the individual or group financing the project is the client. In Ghana, the client can be classified into three main groups namely: Government of Ghana Agencies and ministries, corporate organisations and individuals. The motivation of the government as a client is not profit but to achieve value for money.
- The project execution team which involves the design and construction teams
- End-users
- Financiers

Government of Ghana agencies and ministries may be seen as public sector clients and in Ghana, the government is the major construction client (Laryea, 2010). The Ministry of Works, Water and Housing (MOWWH) is the body responsible for the registration and classification of contractors wishing to execute public projects. The ministry does

this in collaboration with the Registrar General‘s Department under Act 179 (1963) of the companies‘ registration code. The MOWWH has two main classifications for contractors: Category 'D' for general building works and category 'K' for civil works. Though the inclusion of contractor's name in the Ministry's classification register may not be compulsory according to MOWWH bulletin, however it is only those who are duly registered who can tender for government contracts (Amoah *et al.*, 2011). The Ministry of Works and Housing classifies building engineering contractors as financial class D1, D2, D3 or D4 whereas civil engineering contractors are classified as K1, K2, K3 or K4. The Ministry of Roads and Highways classifies contractors into categories A, B, C and S. Contractors in each category are further grouped into financial classes 1, 2, 3 and 4 based on their technical and managerial expertise, financial standing, previous performance, and equipment and plant holding (ibid). Class D3/D4 and K3/K4 contractors are commonly referred to as the small-scale building contractors (SSBCs) and D1/D2 and

K1/K2 are typically referred to as big firms. Contractors with class D3/D4 and K3/K4 currently represent over 95% of contractors operating in the country (Amoah *et al*., 2011).

The government and other clients also engage the services of professional consultants such as architects, quantity surveyors and engineers (structural, electrical and services engineers) who make up the professional body in the construction industry. The architects are regulated by the Ghana Institution of Architects (GIA) whilst the Quantity Surveyors are regulated by the Ghana Institution of Surveyors. The Ghana institution of Engineers regulates the engineers in the construction industry (GyaduAsiedu, 2009).

The industry is characterized by a collection of small firms (Ayarkwa *et al*., 2010). Local firms dominate housing construction, while international companies deal with

the larger transport projects. Taylor Woodrow – the market leader – Bilfinger Berger and Sogea-Satom are some the international construction groups operating in Ghana (Nexus, 2013). The construction industry is led by governmental development projects, dominating in terms of contracts offered and funds allocated. Donor funded projects and foreign direct investment are also a significant part of the industry. There has been growing foreign investment in the sector since 2009, particularly from the United States. In 2012, the building and construction industry had 14 American projects with a total estimated value of US$59.3million (ibid).

The African Economic Outlook (2012) report notes that the construction industry contributes 8.6% to the total gross domestic product (GDP) of Ghana and employs over 1.4% of the country‘s labour force. The sector has grown significantly from around 4.5% of GDP in the 1980s to become one of Ghana‘s most important industries. The Economic Outlook Report (2013) described the construction sector as one of the sectors that have sustained the industrial sector of Ghana.

In Ghana, the construction industry is noted as one of the fastest growing industries and can be seen as the vehicle which provides the infrastructure that enables the operations and development of other sectors of the economy (Honu *et al*., 2013).

Despite the benefits derived from the industry, the industry is however flawed with some challenges which are outlined below.

Ofori (2012) asserts that with regards to environmental considerations, the construction industry performs poorly as it involves excessive resource consumption, which causes land degradation, loss of habitat, air and water pollution, and involve high energy usage. According to the CSIR Building and Construction Technology (2002) as cited in

Ayarkwa *et al.* (2010), the environmental impact of the construction industry is probably larger in developing countries than it is in developed ones, because developing countries are virtually still under construction, therefore, they have a relatively low degree of industrialization, making the construction industry one of the biggest sectors impacting on the biophysical environment.

Egmond *et al.*(2007) as cited in Danso (2010) reported that, the large and medium Ghanaian construction firms forms about 10% of the total number of construction firms registered with the Ministry of Water Resources, Works and Housing. These firms, according to Egmond *et al*. (2007), do not have the appropriate technological capabilities, plant and equipment and key personnel to handle awarded projects properly and the evidence is due to the fact that the nation's major construction projects are awarded to the very few large foreign contractors.

The industry is also faced with occupational health and safety issues. The physical nature of the construction process, the attitudes of the employees, the culture of the industry, the uncertain production environment and a myriad of other factors make the industry unique and presents a number of safety challenges (Boakye *et al.*, 2010). Kheni *et al.* (2008) emphasized on the fact that severity of risks has increased on construction sites due to the growth of construction in Ghana. Kheni (2008) also found out that, owners or managers of most construction firms have little or no knowledge of the legal frame work governing OHS. In a similar vein, Danso (2005) indicated that, most firms in the construction sector in Ghana do not have safety policy thereby having poor safety awareness. Fugar (2009) also asserted that, most of

the construction firms do not have Human Resource Management (HRM)

departments together with its associated health and safety personnel to also deal with safety issues. This has led the owners, managers and operational managers to perform health and safety personnel functions without any specialist input.

The research thus focused on health and safety in Ghana‘s construction industry.

2.4 CONCEPT OF HEALTH AND SAFETY MANAGEMENT

Health, according to World Health Organisation (WHO), is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1986). However, this definition of health has since not been amended by WHO. Safety on the other hand refers to the protection of people from physical injury. The borderline between health and safety is ill-defined and these words are normally used together to indicate concern for the physical and mental well-being of the individual at the place of work (Hughes & Ferrett, 2007). According to the ILO (2014), health issues at work are often given less attention than safety issues because the former are generally more difficult to confront. However, when health is addressed, so is safety, because a healthy workplace is by definition also a safe workplace. The converse, though, may not be true -a so-called safe workplace is not necessarily also a healthy workplace. The important point is that issues of both health and safety must be addressed in every workplace (ibid). Health and safety does not only emcompass the physical well-being of workers but emcompasses the social, mental and physical well-being of a person, that is the _whole person‘(ILO,2014).

In global policy circles, health and safety is increasingly gaining a high profile. However, very little is known about the degree to which health and safety policies and practices are entrenched within the practice of public procurement professionals globally.

2.4.1 Health and Safety Management in the Construction Industry

The construction industry plays a vital role in the economy. However, the industry performance on quality, health and safety and environmental issues is far from impressive. The ILO estimates that 60,000 fatalities occur every year in construction sites around the world (Wells & Hawkins, 2011; ILO,2003). The ILO (2003) revealed that hundreds of thousands more suffer serious injuries and ill-health but these estimates are conventional as less than 20% of construction injuries are reported. Also little account is taken of the longer term impact of occupational diseases. In 2010, the Bureau of Labour Statistics in the United States reported that nearly 800 workers in construction-related fields lost their lives at work. The construction industry also continued to face an injury and illness rate of 4 reported cases per 100 workers (CPWR Symposium Report, 2012). Holt (2001) claims that the primary cause of construction accidents is the inability of safety legislation to specify the safety requirements of materials and contracting parties. He also attributed the secondary causes of accidents to management system pressures such as financial restrictions, lack of commitment, inadequate policy and standards, deficient knowledge and information, restricted training and task selection, and poor quality control systems resulting from these restrictions and deficiencies.

In Ghana, the growth of construction has led to the increasing severity of risks on construction sites (Kheni *et al*., 2008). Laryea and Mensah (2010) reported on the current state of health and safety on construction sites in Ghana and revealed a serious lack of structures and procedures at all levels of the construction chain. The study revealed that there is a lack of strong and appropriate health and safety legislation for governing construction work and site operations in construction. The research identified two(2) 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. This depicts that 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 long periods of frustration and pleading with employers before they are provided with some form of compensation for injuries and accidents (Laryea and Mensah, 2010).

Accident statistics show that, construction accounted for 1,108 out of a total of 6,064 accidents reported to the Labour Department in 1975. This translates into 18% of accidents in the country‘s occupational setting and over 1,500 accidents per 100,000 workers. Again, out of the claims reported, only 10% were settled, amounting to 150,000 US Dollars (Kheni *et al*., 2010).

2.5 LEGISLATIONS AND POLICIES ON OCCUPATIONAL HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

The purpose of any law is to ensure that members of a society live and behave according to a set of acceptable rules. Lingard and Rowlinson (2005) state that the aims of OHS law are threefold: to prevent occupational injury and ill-health; to ensure compensation for those who are injured or become ill as a result of their employment; and to rehabilitate workers who suffer injury or ill-health as a result of their work in order that, so far as is possible, they can return to work and resume participation in the community.

This section acknowledges international health and safety policies in the construction industry and also review the health and safety legislation in Ghana. The international legislations and polices are important because most of the National laws and regulations on labour are often based on international conventions, agreements, declarations. To this end, the legislations and policies of occupational health and safety (OHS) on labour from the International Labour Organization (ILO) set the tone to review Ghana's health and safety legislation.

2.5.1 The Code of Practice on Health and Safety on Construction Sites (ILO 1992)

Generally, a code of practice is a set of rules according to which people in a particular profession are expected to behave or practise. The ILO's Code of Practice on Health and Safety on construction site provides guidelines in the implementation of the Health and Safety practise on construction sites for all workers including casual workers. The document outlines the steps that have to be taken, among others, to provide adequate welfare facilities, personal protective equipment appropriate for a job and provision and maintenance of safe working environment to all workers on site. Employers are required by law to provide all workers including casual workers with the following

- Welfare Facilities
- Sanitary Facilities
- Washing facilities
- Cloakrooms
- Drinking Water
- Facilities for Food and Drink
- Living Accommodation
- Personal Protective Equipment and Protective Clothing

It can be concluded that, the legal framework (i.e. the ILO's Code of Practice on Health and Safety on Construction site) for construction workers in general is adequate to protect them. This legal framework covers both permanent and casual workers.

2.5.2 Health and safety Legislation in Ghana

In spite of the numerous investments that the country attracts with its accompanying OHS related issues, Ghana as at now has no national policy on occupational health and safety. A draft policy prepared in 2004 has not been processed for adoption even though article 4 of the ILO convention 155- occupational Safety and Health

Convention, 1981 requires the nation to give effect to the provisions of this convention (Clarke, 2005). A study by Amponsah-Tawiah and Dartey-Baah (2012) revealed that the governments of Ghana, past and present, have not shown any political will, commitment and support for bold occupational health and safety policies. The study further revealed that, out of over 70 conventions or recommendations of the ILO that are OHS related, only ten have been ratified by the government of Ghana (i.e., Conventions 45, 81, 89, 90, 103, 115, 119, 120, 147 &

148). Surprisingly the four core conventions on occupational health and safety (i.e., Conventions 155, 161, 170 and 174) have all not been ratified. Mock *et al.* (2005) stated that, Ghana does not have an official data for fatal occupational accidents.

Though Ghana has no comprehensive OHS policy, according to Bruce (2009), there exist fragmented safety and health laws used by various ministries, departments and agencies for enforcement and complementary roles.

The Department of Factories Inspectorate (DoFI) under the Ministry of Employment and Labour Relations (formerly Ministry of Employment and Social Welfare,

MoESW) promotes health and safety of persons through the Factories, Offices and Shops Act, 1970 (Act 328) (MoESW, 2011).The Inspectorate is responsible for the promotion and enforcement of regulatory measures to give effect to the provisions of the Factories, Offices and Shops Act (FOSA) 1970, Act 328. Other agencies such as the Ministry of Health, the Minerals commission (which contains some guidelines in occupational health and safety but restricted to the mining industry alone) play a complementary role in the promotion of health and safety at work but not the enforcement of the measures. There is also the Workmen's Compensation Act 1987 (PNDCL 187).

As concluded in section 2.5.1.8.1, Ghana has not been able to develop a comprehensive separate occupational health and safety policy for her construction workers, but rather, depends on three main laws. A review of these laws, that is, the
National Labour Act 651 of 2003, Factories, Offices and Shop Act of 1970 and Workmen Compensation Act 1987 will be carried out in section 2.5.2.1, 2.5.2.2 and
2.5.2.3.

2.5.2.1 The Factories, Offices and Shops Act, Act 328, 1970

The main provisions of the Factories Offices and Shops Act 1970 concern improvements necessary to attain internationally accepted standards of providing for the safety, health and welfare of persons employed in factories, offices, shops, dock work and construction. The Act 328 charges the Chief Inspector (appointed by the Minister) to keep a record of all factories, offices and shops in Ghana. It stipulates that written notices of accidents, industrial diseases and dangerous occurrences should be served to the Chief Inspector by the occupier. The Act also charges every office, shop and factory to be kept clean and not be overcrowded to cause injury. Effective

provisions must also be made for ventilation, first aid, washing facilities, drinking water, personnel protective clothing and sanitary conveniences. The Act also makes provisions for fire which repealed by the Ghana National Fire Service Act, 1979(Act 537), section 33(b). An inspector may complain to a district court in violation to any factory, shop or office of dangerous conditions and practices. All offences under this Act shall be prosecuted in a district court under section 68. Inspectors under this act have the duty of entering to inspect and examine any office, factory or shop if it is believed to be unsafe. Appointment of inspectors must be published in the Gazette.

Section 57 of the Act addresses building operations and works of engineering construction and states sections 6 to 8, 10 to 12,19,20,25 to 31, 33 to 40, 43 to 54 and 60 to 87 as sections that apply to building operations and works of engineering construction. Any person undertaking construction activities must serve a written notice to the inspector stating name, address, location and nature of work to be done.

The Act 328 has 88 sections which are outlined in the table 2.1.

Table 2. 1: Sections of Act 328

Section 1-26	Section 27-48	Section 49-69	Section 70-88
Section 1:Register of Factories **Section 2**: Registration of Existing Factories **Section 3:** Registration of New Factories **Section 4**:Renewal of certificate of registration **Section 5**:Offences **Section 6**:General registers **Section 7:** Preservation of registers and records **Section 8**:Prescribed abstract, regulations and notices **Section 9**:Particulars to be given on request **Section 10**:Notification of accidents **Section 11**:Notification of dangerous occurrences **Section 12**: Notification of industrial diseases **Section 13**: cleanliness **Section 14**: Overcrowding **Section 15**:Ventilation **Section 16**: Washing facilities **Section 17**: Lighting Section **18**:Drainage of floors **Section 19**:Sanitary conveniences **Section 20**:Drinking water **Section 21**: accommodation for clothing **Section 22**:Sitting facilities **Section 23**:Removal of dust or fumes **Section 24**:Taking of meals **Section 25**: Protective clothing and appliances **Section 26**:Noise and vibrations	**Section 27**: Prohibition of lifting excessive weights **Section 28**:First aid **Section 29**:Power to require medical supervision **Section 30**:Health and welfare regulations **Section 31**: Prevention of fire **Section 32** :Fire alarms **Section 33**:Safety provisions in case of fire **Section 34**:Safe means of access and safe place of employment **Section 35**:Floors, passages and stairs **Section 36**:Training and supervision **Section 37**:Cleaning of machinery **Section 38**:Fencing of dangerous machinery **Section 39**: Safeguards for transmission machinery **Section 40**: Construction and maintenance of fencing **Section 41**: Construction and sale of machinery **Section 42**:Vessels containing dangerous liquids **Section 43**:Self-acting machines **Section 44:**Hoists and lifts **Section 45**:Chains, ropes and lifting tackle **Section 46**:Cranes and other lifting machines **Section 47**: Register of chains, ropes, lifting tackle and machines **Section 48**: Dangerous fumes and lack of oxygen	**Section 49** : Explosive or inflammable substances **Section 50**:Steam boilers, receivers and containers, and air receivers **Section 51**:Safety regulations **Section 52** : Dangerous conditions and practices **Section 53:** Dangerous premises **Section 54**:Appeal to high court **Section 55**:Part of building as Separate Factory or Shop **Section 56**:Docks, wharves, quays and warehouses **Section 57**:Building operations and works of engineering **Section 58** : Premises in which steam boilers are used **Section 59** : Institutions **Section 60**:Liability for contravention **Section 61**:Liability of actual offender **Section 62**:Liability of owner of machine **Section 63**:General penalty **Section 64** : Offences continued after conviction **Section 65**:Court order to remedy **Section 66**:Penalty for death or injury **Section 67**: Forgery, uttering and personation **Section 68:** Prosecution of offences **Section 69**:Special provisions as to evidence	**Section 70**:Service of Documents, etc **Section 71**:Power to modify agreement **Section 72**:Power to apportion expenses **Section 73**:Inspector may conduct court proceedings **Section 74:** Appointment of inspectors **Section 75**:Powers of inspectors **Section 76**: Obstruction to inspector **Section 77**:Power to take samples **Section 78**:Duties of persons employed **Section 79**:Notices and certificates **Section 80** : Deductions from wages prohibited **Section 81**: Exemption **Section 82**: Application **Section 83**: Definition of office **Section 84**: Definition of office **Section 85**: Definition of shop **Section 86**: Interpretation **Section 87**: Repeal and savings **Section 88** : Commencement

Source: Author's construct According to Amponsah-Tawiah and Dartey-Baah (2012), the Act is flawed by the following:

- Preventive strategies like risk assessments, medical surveillance and control of hazards are not for instance catered for in the Act.
- Lack of uniform standards against which organisations could be evaluated resulting in factory inspectors assuming a lot of discretionary powers and falling to the temptation of abuse of power.
- Vast majority of industries and most of the organisations under the informal sector are not covered in the act.

2.5.2.2 The Labour Act 2003, Act 651

Following the need to codify the then existing laws on labour which were scattered in various pieces of legislation into one common statute, the Labour Act 2003, Act 651 was developed. The main aim was to develop a law which conforms to the 1992 Constitution of the Republic of Ghana, and the International Labour Organization (ILO) Conventions to which Ghana is a signatory. The part XV of the Labour Act 2003, Act 651 deals with issues of Occupational Health, Safety and Environment in Ghana.

This Act applies to all workers and to all employers except the Armed Forces, the Police Service, the Prison Service and the Security and Intelligence Agencies specified under the Security and Intelligence Agencies Act 1996 (Act 526).

The Act 651 consists of four sections under occupational health, safety and environment. The sections concerning workers or employee safety are;

Section 118 - General Health and Safety Conditions.

Section 119 - Exposure to imminent hazards

Section 120 - Employer to Report Occupational Accidents and Diseases.

Section 121 -Specific Measures

Section 118 places responsibility on the employer to provide a safe environment for the worker, to maintain workplace plant and system of work, information, training and supervision. It also charges the employer to provide Personal Protective Equipment (PPE) to the employees at no cost. Section 119 entitles workers to remove themselves from exposure to imminent hazards, without risk of termination. Section 120 requires employers to report, not later than 7 days from the occurrence, occupational accidents or diseases occurring in the workplace.

Clarke (2005) argued that though the Labour law, Act 651 section 15, covers occupational health, safety and environment, the very tenets on which the section is built (i.e., ILO Conventions 155 and 161) have not been ratified by the government as yet. Whilst the Act 651 emphasizes on occupational health and safety, the administration and the enforcement of the regulations is very weak. Akorsu (2013) stated that, ―*we tend to have fine laws, we tend to ratify labour standards as quickly as they are adopted by the ILO but we hardly enforce these*.‖

Research carried out by Akorsu (2013) show statistics of an inspection carried out by the Labour Department in 2008. It indicates that a total of 106 inspections were conducted nationwide whereas there are about 26,088 firms in Ghana's manufacturing sector alone (of which construction is part). The Ashanti and Greater Accra regions were oddly among the regions with no inspections at all though these regions have the largest cities and largest number of manufacturing activities. Furthermore, enforcement of health and safety regulations remains a problem due to lack of adequate resources

available to government institutions responsible for occupational health and safety administration (Kheni *et al.*, 2008).

The law in its entirety is a _good law‘ and has what it takes to provide the necessary protection of employees from harm. An _effective enforcement‘ of the law is therefore required by the stakeholders involved.

2.5.2.3 Workman’s Compensation Act 1987 (PNDCL 187)

This Act was enacted to provide compensation for employees who get injured in the course of their employment. It applies to both public and private employees except persons in the Armed forces. The law prescribes the compensation payable by an employer depending on the nature of injury sustained by the worker and the degree of incapacity resulting. Employers are not however liable to pay compensation where the accident causing the injury to the worker is attributable to the workman having been at the time thereof under the influence of drugs or alcohol or in respect of any incapacity or death resulting from a deliberate self-injury in section 2. Sections 14 and 28 charge an employer to arrange for the medical examination of the employee free of charge. It also charges the employer to report any death of an employee. Claims for compensation are determined by the court under section 16. The Act has 39 sections which are outlined in the table below.

Table 2. 2: Sections of Workman’s Compensation Act 1987 (PNDCL 187)

Section 1-18	**Section 19-39**

Section 1:Application to employees employed by the Republic **Section 2**:Employer's liability for compensation **Section 3**:Compensation in fatal cases **Section 4**:Employer to pay medical expenses **Section 5**:Compensation for permanent total incapacity **Section 6**:Compensation for permanent partial incapacity **Section 7**:Compensation for temporary incapacity **Section 8**:Compensation for desfiguring injuries **Section 9**:Method of calculating earnings **Section 10**:Persons entitled to compensation **Section 11**:Distribution of compensation **Section 12**:Requirements as to notice of accident and application for compensation **Section 13**:Employer to report the death of an employee **Section 14**:Medical examination and treatment **Section 15**:Agreement as to compensation **Section 16**:Determination of claims **Section 17**:Review **Section 18**:Limitation on employer to end or decrease periodical payments **Section 19**:Jurisdiction of the Court	**Section 20**:Submission of questions of law **Section 21**:Appeals **Section 22**:Liability where employee employed by contractors **Section 23**:Remedies against employer and stranger **Section 24**:Proceedings independently of this Act **Section 25**:Company going into liquidation **Section 26**:Contracting out **Section 27**:Compensation not to be assigned, charged or attached **Section 28**:Medical expenses **Section 29**:Decision of Court in regard to medical aid **Section 30**:Fees for medical aid **Section 31**:Occupational diseases **Section 32**:Returns by employer and insurer **Section 33**: Regulations and rules. **Section 34**:Transfer of funds **Section 35**:Payment of compensation within specified period **Section 36**:Calculation of compensation **Section 37**: Offence and penalty **Section 38**: Interpretation **Section 39**:Repeal and saving

Source: Author‘s construct

Amponsah-Tawiah and Dartey-Baah (2012) pointed out the following about the Workmen‘s Compensation Act in their study:

- Compensations bear no relation to the level of risk to which workers are exposed and
- Court processes and prosecution associated with compensation cases are laborious and time consuming for the meager amounts the law prescribes.

2.6 BEST PRACTICE HEALTH AND SAFETY LEGISLATION

The South East Centre for the Built Environment (SECBE) defines best practice as the knowledge that underpins examples of excellence. It is a technique that consistently

shows results superior to those achieved with other means. The Health and Safety Executive in the UK came up with an indication of what best practice is.

The best practice module for construction health and safety revealed are;

i. Quality of communication
ii. Team Working
iii. Motivation or morale
iv. Individual competence
v. Quality of inspection and maintenance
vi. Training and education
vii. Incident management and feedback
viii. Availability of information or advice
ix. Availability of suitable human resource
x. Health and safety culture

Recent studies show that China, Australia, South Africa and others have developed separate legislation for their construction workers (Danso, 2010). For example, the UK has introduced the Construction Design and Management (CDM) 2007. The construction health and safety laws of the UK and US will be reviewed in sections 2.4.3.1 and 2.4.3.2 respectively.

2.6.1 The United Kingdom's Health and Safety at Work Act (ACT 1974)

In the UK, health and safety at work is governed by the Health and Safety at Work Act (ACT 1974) which is an example of criminal law. This law is enforced either by the Health and Safety Executive (HSE), which is the executive arm of the Act or Local Authority Environmental Health Officers. The Health and Safety at Work Act resulted from the findings of the Robens Report, published in 1972 (Hughes & Ferrett, 2007).

An outline of the sections of the Health and Safety at Work Act is given below.

- Section 2 Duties of employers to employees

- Section 3 Duties of employers to others affected by their undertaking
- Section 4 Duties of landlords or owners
- Section 6 Duties of suppliers
- Section 7 Duties of Employees
- Section 8 prohibits anyone to misuse or interfere with safety regulations.
- Section 9 requires employers not to charge employees for Personal Protective Equipment (PPE).
- Section 37 Personal liability of directors

The Act places responsibility upon the employer to ensure the health and safety of the employees and the general public who might be affected by the activities of the employer in section 2.

The Act does not absolve employees from their own personal responsibilities. The employer is charged with the responsibility of providing information, instruction, training and supervision to the workers and also provides information on the use of articles and substances, and guarantee through tests and examinations. The Act requires that a written safety policy be provided if there are more than five (5) employees.

The Health and Safety at Work Act, and general duties in the Management Regulations, aim to help employers to set goals, but they have the freewill to decide how to control hazards and risks which they identify.

2.6.2 The United Kingdom's Construction Design and Management Regulations, 2007

When talking about construction health and safety laws in the UK, it is pragmatic to bring up the CDM 2007. The Construction Design and Management (CDM) Regulations was introduced in April 2007 to make it easier for those involved in construction projects to comply with health and safety duties. The CDM 2007 is aimed at improving the overall management and co-ordination of health, safety and welfare

throughout all stages of a construction project in order to reduce fatal accidents and ill-health which happens in the industry.

The regulation places duties on all those who can contribute to health and safety of a construction project. Duties are placed upon clients, designers and contractors with more authority given to the CDM coordinator in what is considered a more authoritative and policing role. It applies to common building, civil engineering and engineering construction work. The CDM 2007 does not apply to putting tents, maintenance of fixed plant, tree planting, surveying, and general horticultural work. Though clients already have duties under Health and Safety at Work Act, 1974, the CDM 2007 instructs clients explicitly to put in welfare arrangements and that construction risks are carried out without risk to health and safety.

The Regulations are divided into five parts:

- Part 1 – application of the Regulations and definitions.
- Part 2 – general duties that apply to all construction projects.
- Part 3 – additional duties that only apply to notifiable construction projects, that is, those lasting more than 30 days, or involving more than 500 person days of construction work.
- Part 4 – practical requirements that apply to all construction sites.
- Part 5 – transitional arrangements and revocations.

The authorities responsible for enforcing health and safety legislation are the HSE and local authorities. These authorities have a wide range of tools to ensure compliance with the law and appropriate response to offences (HSE, 2014). In situations where serious offences occur, the perpetrator may be served an improvement notice or may even be

prosecuted. Statistics by HSE for 2012/2013 show 597 cases prosecuted, with at least one conviction achieved in 568 cases (95%). Out of 109 cases presented by the local authorities, there was at least one conviction achieved in 104 cases (95%). HSE and local authorities issued 13,503 notices (HSE, 2014).

2.6.3 The United States of America's Occupational Health and Safety Act (OSHA) of 1970

In the United States of America, the Occupational Health and Safety Act (OSHA) of 1970 enacted by the Senate and House of Representatives of the United States of America in congress is used to regulate and enforce health and safety. The Act was enacted on December 29, 1970 with amendments through January 1, 2004. The Act was enacted to assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes. The OSH Act of 1970 created both the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA). OSHA, in the U.S.

Department of Labour, is responsible for developing and enforcing workplace safety and health regulations. NIOSH, in the U.S. Department of Health and Human Services, is focused on research, information, education, and training in occupational health and safety. The US Department of Labour regulates health and safety in the construction industry through the OSH Act of 1970. To develop a set of rules specifically for the construction industry and also protect the construction workforce, the Act was enacted (Reese and Eidons, 2006). The regulations, found in Title 29 of the Code of Federal Regulations part 26, are divided into 26 parts ranging from A to Z

(ibid). Other regulations that pertain to the construction industry are found in Parts of Title 29, which is on General Industry Standards. Others are also found in the American National Standards Institute (ANSI). The developing, implementation, and enforcement of these standards or regulations are the responsibilities of OSHA. A contractor is mandated by OSHA to follow the intent of these rules (Reese and Eidons, 2006). In a review carried out by Charles *et al*. (2007), OSHA has inspectors who conduct site visits to check whether H&S regulations are being complied with on site. Contractors are also encouraged by OSHA to undertake ―voluntary protection‖ procedures. A number of programs and services have also been introduced by OSHA to help educate construction workers. All these measures put in place for contractors and workers are part of OSHA's enforcement strategies (Charles *et al*., 2007). The Part 1926 standards include 26 subparts (Subpart A through Subpart Z), but Subparts A and B apply only to determining the scope of Section 107 of the Construction Safety Act, 40 USC 333. That act applies only to employers who are engaged in construction under contract with the U.S. government (Reese & Eidons, 2006). OSHA does not base citations upon either Subpart A or B. Consequently, no further consideration will be given to them in this book. The remaining 24 subparts are listed below:

Subpart C General Health and Safety provisions

OSHA's Construction Industry Standards Simplified

- Subpart D Occupational health and environmental controls
- Subpart E Personal protective and lifesaving equipment
- Subpart F Fire protection and prevention
- Subpart G Signs, signals, and barricades
- Subpart H Materials handling, storage, use, and disposal

- Subpart I Tools—hand and power
- Subpart J Welding and cutting
- Subpart K Electrical
- Subpart L Scaffolding
- Subpart M Fall protection
- Subpart N Cranes, derricks, hoists, elevators, and conveyors
- Subpart O Motor vehicles, mechanized equipment, and marine operations
- Subpart P Excavations
- Subpart Q Concrete and masonry construction
- Subpart R Steel erection
- Subpart S Underground construction, caissons, cofferdams, and compressed air
- Subpart T Demolition
- Subpart U Blasting and the use of explosives
- Subpart V Power transmission and distribution
- Subpart W Rollover protective structures and overhead protection
- Subpart X Stairways and ladders
- Subpart Y Commercial diving operations
- Subpart Z Toxic and hazardous substances

The Act does not cover self-employed, immediate family members of farm employers that do not employ outside employees and workplace hazards regulated by another Federal agency (for example, the Mine Safety and Health Administration, the Federal Aviation Administration, the Coast Guard).

2.7 HEALTH AND SAFETY IMPROVEMENT THROUGH PROCUREMENT

Though the use of procurement to promote H&S in the construction industry has received little attention as asserted by Wells and Hawkins (2011), Honu *et al*. (2013)

however identified at least four studies that have been conducted on the link between procurement and health and safety in construction.

A briefing note for developing countries on promoting construction health and safety through procurement has been published on behalf of the UK group called Engineers against Poverty (EAP) by Wells and Hawkins (2011). It demonstrates the possibility of preserving the benefits of competitive tendering while ensuring that adequate provision is made for the health, safety and welfare of the workforce. It also provides guidance for action to raise OHS profile at each stage of the project cycle.

A guidance on occupational health and safety in government procurement has also been published by the Australian Safety and Compensation Council on behalf of the Australian government (2006).

The Victorian government (2010), edition 1, has published a Handbook for the public sector on health and safety in construction management. The guide provides guidelines on integrating health and safety into the main stages of the construction procurement process. It is meant to assist governmental departments to fulfil their
H&S obligations under the Occupational Health and Safety Act 2004.
The Olympic Delivery Authority (ODA) in London published in 2011 a Learning Legacy, Lessons Learned from the London 2012 Games Construction Project. The ODA used procurement to enable delivery on its policy objectives and ambitions such as sustainability and inclusion and health and safety. They employed the use of balanced score cards which is an evaluation approach where _hard' criteria such as cost are balanced by the evaluation of _soft' criteria such as sustainability, health and safety etc. The score cards were used against the bidders to test them throughout the procurement process and the policy objectives and reporting regimes were built into the

resulting contracts. Specialist resources, e-procurement system and methodology, and evaluation system were employed. Pre-qualification questionnaires (PQQ) which tests the experience of bidders were used to shortlist the bidders (Fernau, 2011).

The above mentioned studies focused on developed countries. There is still a knowledge gap on how procurement can help to improve H&S in developing countries more specifically Ghana.

2.8 INTEGRATING HEALTH AND SAFETY INTO WORKS PROCUREMENT

According to the Victorian government (2010), there are a number of profitable benefits associated with including H&S principles into procurement. The advantages include:

- Improved productivity,
- Reduced costs. Based on a selected compensation system, the ILO has estimated that 4% of GDP (one of the most-used measurements of national wealth) is lost due to accidents and work-related diseases (ILO, 2003),
- Innovation in design and construction,
- Better estimation and management of production and operational costs over the lifecycle of the project.

Wells and Hawkins (2011) assert that many measures are needed to improve OHS, including an appropriate legal framework, an effective inspectorate, training of workers and supervisors, restrictions on working hours and wide availability of occupational health services. If these other measures are in place, procurement procedures and contract documents have the potential to act as important mechanisms to remind the parties to the contract of their obligations under the law. When these other measures are lacking, an appropriate use of procurement procedures and contract documentation has the potential to raise the standard of OHS on individual projects. Hence procurement is

a direct way for clients and donors to make a real difference to OHS in their area of influence (ibid). Wells and Hawkins (2011) argued two reasons why OHS is a serious issue to consider during the process of works procurement. First, health and safety legislation is increasingly holding clients responsible for the health and safety of the workforce on their construction projects. They further elaborated that, this responsibility may to some extent be passed on to consultants and to contractors and subcontractors. Hence the terms on which these services are procured are critical in ensuring that the responsibility is taken seriously by all parties and that the interests of the client are safeguarded. Secondly, while it is often argued that the monitoring and enforcement of health and safety regulations is the responsibility of regulatory authorities, the large number and wide dispersion of construction sites means that it is practically impossible to inspect all. In this context the procurement process and the terms and conditions of the contract can be seen as complementary mechanisms for ensuring compliance with existing legislation and/or the terms and conditions of project finance.

The Government of Australia (2006) revealed that certain considerations are required to integrate health and safety into procurement. The considerations needed are principles, processes and application.

2.8.1 Principles of Procurement

Principles refer to the reasons for considering health and safety in procurement. Thai (2001) points out that, good procurement principles are accountability, transparency, fair competition, consistency and value for money. Value for money does not mean that cheapest is best. In a procurement process this principle requires a comparative analysis of all relevant costs and benefits of each proposal throughout the whole procurement

cycle (whole-of-life costing) including those associated with H&S at work (Government of Australia, 2006). Brammer and Walker(2007) asserts that, the focus on whole life costing, the definition of best value for money gives scope to public bodies to take social and environmental policy objectives into account in procurement activities.

However, too many contracts are awarded on the basis of lowest price tenders, only to see the final price increase significantly through contract variations, failure to meet quality standards or time deadlines (Haywood, 2004). Contracts need to be awarded on value for money grounds, not lowest price tenders. Value for money means achieving, at the end of the construction project, something that is fit for purpose, fulfils user needs, and achieves a balance between quality and costs throughout its life (ibid).

2.8.2 Processes

Processes refer to the steps to take in order to consider health and safety in procurement. It is the commonly accepted stages of procurement. For the purpose of this study, planning, design, tender, contract, construction and evaluation will be used though there is a wide range of stages of procurement.

i. Planning and Design stage: The principles of eliminating hazards at the design stage (safe design) are an important consideration where design is part of a procurement. Many H&S challenges encountered at the construction stage could be avoided if due consideration and effort was put into the planning and design stage (Charles *et al*., 2007; Hawkins & Wells, 2011). Charles *et al*. (2007) asserts that 50% of H&S issues are related to inadequate design. decisions arising out of procurement must consider the safe design of products,

systems and buildings so that potential hazards can be eliminated workers enter the workplace (The Government of Australia, 2006).

ii. Tendering stage: Traditional criteria for contractor selection have generally focussed on tender cost (Tookey *et al.*, 2001). In cases where the selection of the contractor is based on principles of cheapest price or lowest cost, poor health and safety performance is likely to occur (Charles *et al*., 2007). Research shows that both tenders and contracts fail to consider health and safety costs adequately (Charles *et al*., 2007).

iii. Contract stage: According to the Australian Government (2006), it is the stage where H&S requirements are discussed with the contractor and, responsibilities and procedures for dealing with non-compliance are identified. Best practice with regard to health and safety involves contracts that clearly outline the contractual obligations of all parties involved. A potential contract must be prepared to outline the following: identify specific published H&S standards and hazard prevention requirements, health and

safety records of the potential contractor and define supervision and employee training.

iv. Construction stage

According to Holt (2001) as cited in Charles *et al*. (2007), accident prevention at the construction stage extends beyond mere rules and safety inspections. He suggests that a system for managing health and safety that satisfies business and legislative requirements is needed. Worker attitudes and work conditions on site heavily impact the implementation of OHS at the jobsite (Kartam *et al*., 2000). According to the Government of Australia (2006), agencies must also monitor the contactor‘s OHS performance to ensure that OHS duties and

responsibilities are met for the duration of the contract.

v. Evaluation stage: The record of OHS during construction should be an issue to be addressed in the final evaluation of the project (Wells & Hawkins, 2011).

2.8.3 Applications

Applications refer to the specific tools that can be used as part of the processes. The Victorian Government (2010) developed a model for integrating health and safety into construction procurement shown in table 2.3. As stated earlier, though a range of models exist for use in procurement, standard set of key stages were highlighted for the purposes of the document. The stages were planning, design, tender, contract, construction and evaluation.

Table 2. 3: Model for integrating health and safety into procurement

Procurement Phase	Health and Safety considerations
Phase 1: Planning • Scope the project • Risk management • Develop a procurement plan or business case	Identify general health and safety issues in the project Identify specific health and safety issues from prior experience Identify health and safety issues that could be designed out of the project
Phase 2: Design • Design the project • Include health and safety risks in project governance. • Identify key risks for response from tenderers.	Establish risk management practices Consider options to eliminate or minimise health and safety risks Prepare a final list of health and safety risks for response from tenderers
Phase 3: Tender • Prepare tender documentation. • Evaluate tender submissions against safety criteria.	Identify general safety health and requirements safety for response Identify specific health and requirements for response Evaluate the tender submissions
Phase 4: Contract Draft and execute the contract	Include an OHS general clause. Develop a schedule of OHS matters.

Phase 5:Construction • Carry out construction work • Monitor site safety	Require regular health and safety reports Require regular meetings Carry out audits Develop a process for commissioning and final inspection
Phase 6:Evaluation Evaluate the project.	Develop a health and safety evaluation report

Source: The Government of Australia (2006); the Government of Victoria (2010)

2.8.4 Role of Stakeholders

Charles *et al*. (2007) suggest that, to enhance construction OHS performance, collaboration between those involved in concept, design, construction planning, construction work, maintenance and demolition are essential. Hislop (1999) opined that construction health and safety is not the responsibility of the contractor alone. This means that all parties involved in a construction project should be accountable for its health and safety.

The Role of the Government

Governments are major employers, policy makers, and regulators and have a leadership role in preventing work-related death, injury and disease through promoting, legislating and enforcing H&S requirements (The Government of Australia, 2006). The starting points for government‘s activities are policy outcomes. Procurement is often only one of a number of mechanisms which could be used to deliver government policy (Office of Government Commerce, 2008.). The Government of Australia (2006) advised that governments can help promote better health and safety by requiring projects to include a range of safety measures, such as specifying the safety budget, building layout or the use of certain construction materials.

The Role of the Contractor

According to Hare *et al*. (2006), health and safety has traditionally been the obligation of the contractor. Most often, contractors are blamed for the accidents and other illhealth that occur on their construction sites. Contractors have the duty to provide a work environment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to their employees. The contractor is to ensure that employees comply with the health and safety regulations on the site.

The Role of the Client (Employer)

Masterman (2002) defines the client as ―the organisation, or individual, who commissions the activities necessary to implement and complete a project in order to satisfy its or his needs and then enters into a contract with the commissioned parties.‖ The client is referred to as the head of the procurement chain and has the most influence in establishing and monitoring health and safety. This influence can be exercised through the setting of criteria to promote a positive health and safety culture throughout the life of a project. Clients should focus on the end result of the project and bear in mind that a project that is difficult to build and difficult to maintain is not a good design (CCG Health and Safety Working Group, 2007). Haywood (2004) in agreement also believes that, the decisions made by the client who procures the work helps in ensuring good standards of safety and health on a construction project.

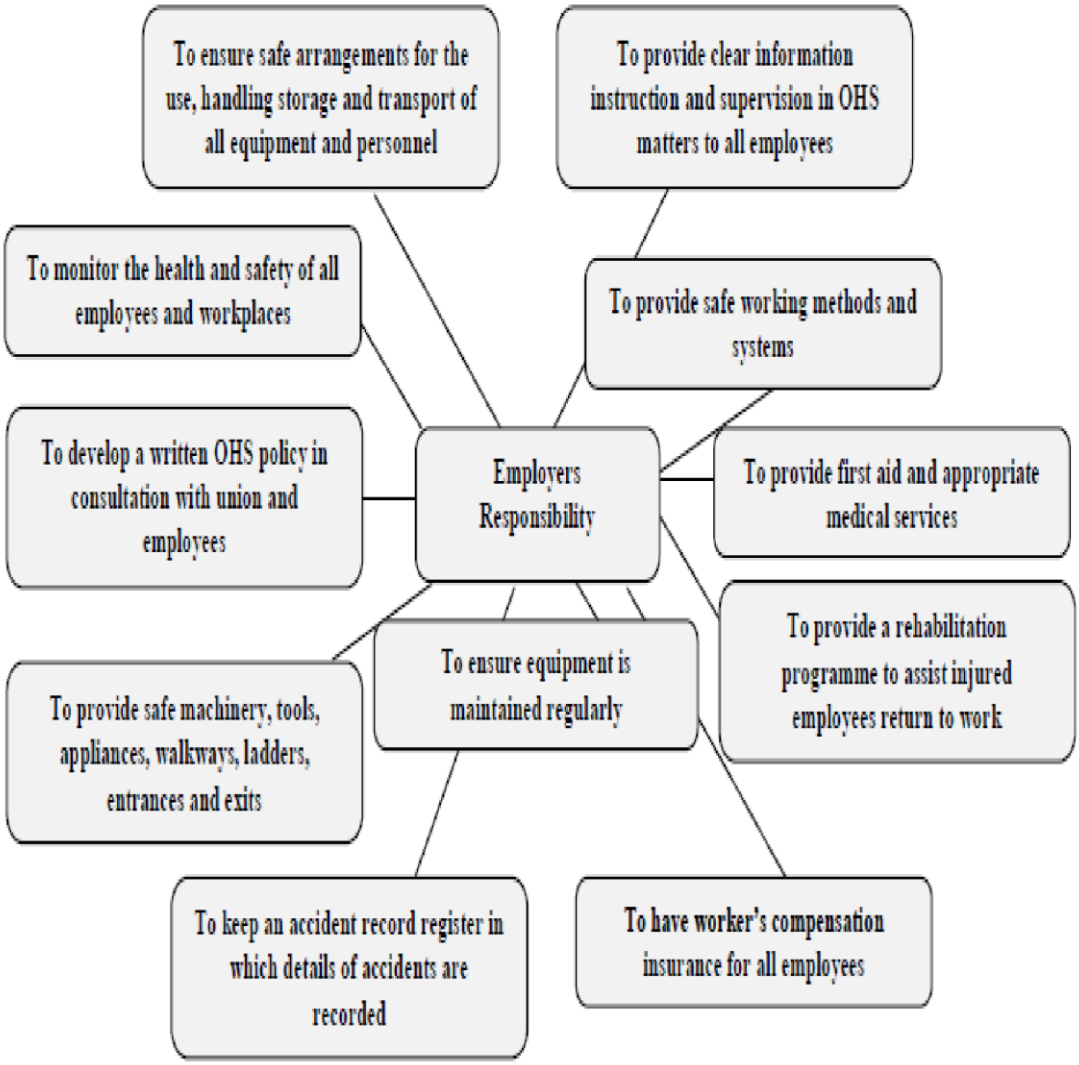

Figure 2. 1: The role of the employer in occupational health and safety

Source: Clewett (2008)

The Role of the Employees

Employees are to ensure that they put on the appropriate Personal Protective Equipment (PPE) for every work. They are also to adhere to the health and safety rules on the site and not do things which can put themselves and others in danger.

2.9 EXAMPLES OF SIMILAR INITIATIVES

Singapore

Singapore is one of the smallest countries in Asia; only five million people live within its territory of 700 square kilometres. The country also has one of the highest per capita GDPs of Asia: US$ 46,368 in 2009. Singapore stands out as an example of what can be done to promote health and safety through procurement. In 2005, the Government of Singapore introduced a number of measures in its procurement procedures to improve work H&S in public works projects following a fatal construction site accident. The country moved to a quality or cost (two envelope) system for evaluating contractors' tenders, with the contractor's record on health and safety included in the quality assessment (technical bid). This reform emphasizes on reducing the priority given to price in tender evaluation by the use of a price or quality method for the selection of contractors. Weights ranging between 20% and 40%, with H&S measures accounting for not less than 10% are assigned to the quality proposal by the procuring government entities. This compels contractors to specify work H&S practices in their tender proposals (Jones, 2007 as cited by Wells & Hawkins, 2011).

Hong Kong

Hong Kong is a country situated on China's south coast and has a total area of 1,104 square kilometres. In 2013, the country's population was estimated at 7,184,000. The country's GDP for the year 2014 is projected at $404.892 billion. In 1996, the Government of the Hong Kong Special Administrative Region (HKSAR) introduced the Pay for Safety Scheme (PFSS) to improve the health and safety performance in public works construction contracts (Wells & Hawkins, 2011;Choi *et al*., 2011). The cost of safety is detached from competitive tendering by paying for safety measures based on an agreed schedule of items and prices under the scheme. Costs of items such as personal protective equipment (PPE), temporary works, site meetings and safety committees are included as a fixed sum in the bill of quantities and paid for in interim

valuations when the surveyor or engineer checks that they are provided (Wells & Hawkins, 2011). The pay for safety scheme recognizes that there is a cost associated with improved health and safety, but the cost is estimated to be less than the cost of lost time due to accidents. Research revealed that, the frequency for an accident which involves loss of time is reduced considerably when health and safety costs are included in a tender and accepted by the client (Wells & Hawkins, 2011).

A research carried out by Choi *et al.* (2011) indicate that the number of both fatal and non-fatal accidents in the Hong Kong construction industry between the years 2000 to 2009 have taken a downward trend due to the introduction of the PFSS. Statistics from the Hong Kong Labour Department (2010) show that, the number of non-fatal accident rate has decreased from 149.8 accidents per 1,000 workers in 2000 to 54.6 accidents per 1,000 workers in 2009, equivalent to a reduction of 63.6%. The number of fatal accidents has reduced progressively from 29 in 2000 to 19 in 2009, equivalent to a drop of 34.5% (Choi *et al.*, 2011).

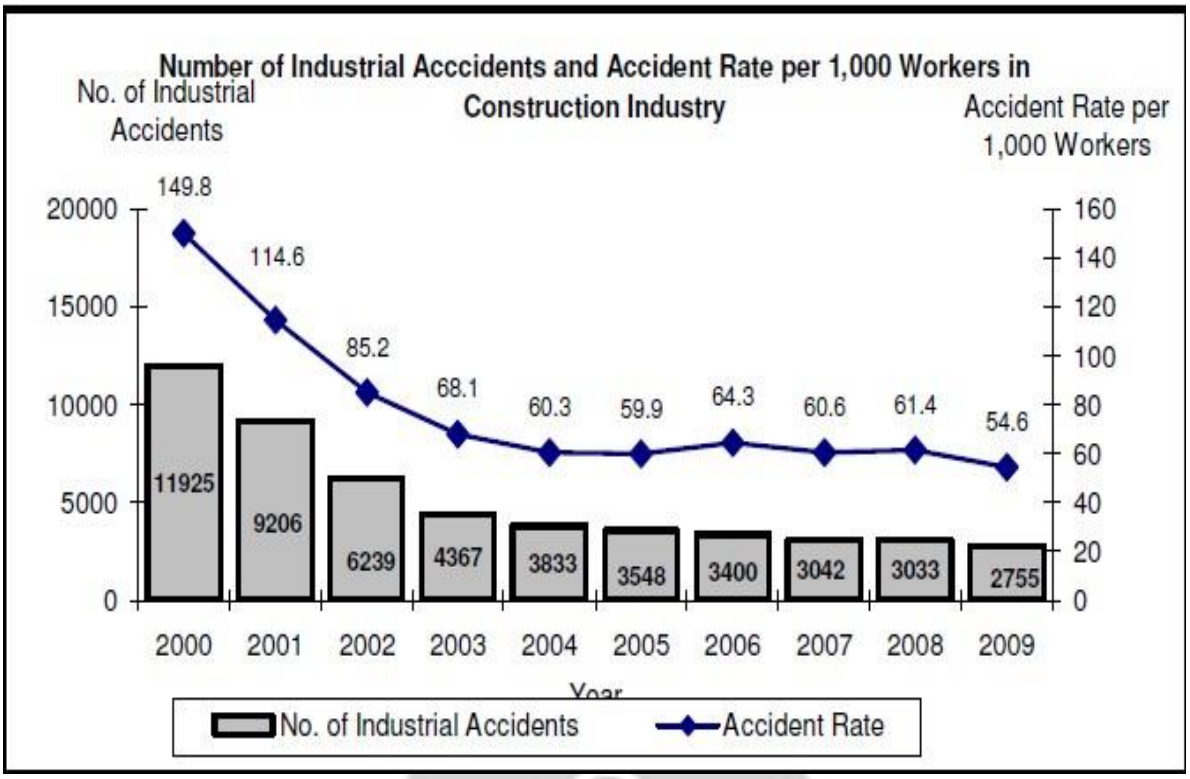

Figure 2.2: Number of industrial accidents and accident rate per 1,000 workers in the construction industry from 2000 to 2009 (Labour Department, 2010)

Source: Choi *et al.* (2011)

Before the introduction of PFSS, the promotion of safety and health highly depends on the willingness of contractors. By monitoring and control system under this scheme, those tenderers have absorbed the safety amount in the overall tender price to be paid back after the contract is awarded (Choi *et al.*, 2011).

2.10 SUMMARY OF CHAPTER

To help put the study into perspective; literature was reviewed from both published and unpublished secondary sources on the various concepts and issues contained in the research topic. The main purpose was to provide enough and necessary background information to validate the relevance of the study, to ascertain the exclusive knowledge gaps associated with using procurement to enhance health and safety in the Ghanaian construction industry and to present current concepts, theories and data related to the

subject matter of the study. From the review of Ghana's health and safety legislation, it was seen that the Ghana has not been able to develop a comprehensive separate H&S policy for her construction workers but rather depended on the National Labour Act, Factories, Offices and Shops Act of 1970 and Workmen Compensation Act. It was also seen that certain problems were related with H&S legislation in Ghana as indicated in table 2.4.

Table 2. 4: A Summary of problems/constraints related with H&S legislation, Ghana

AUTHORS	***CONSTRAINTS***
Bruce, 2009; Laryea and Mensah,2010	*No comprehensive health and safety policy,*
Akorsu,2013	*Inadequate inspection*
Laryea and Mensah, 2010	*Low or lack of awareness of the laws. Contractors are not even aware of their obligations under the laws*
Akorsu, 2013; Laryea and Mensah, 2010. Kheni et al, 2008	*Issues with enforcement due to inadequate resources for the institutions responsible for health and safety at work.*
Fugar et al.,2010	*Accurate statistics of injuries and fatalities are hard to come by, Under reporting of work related accidents and diseases*
Author	*Low /inadequate research into health and safety*

From the review of the Act, it was revealed that no clause or section in the Act 663 explicitly addresses construction health and safety. The review also showed the stakeholders, namely the government, client, employees and contractor, involved in the construction procurement activities and their various roles in promoting construction health and safety. The processes or steps to take in order to consider health and safety in procurement were also reviewed. Planning, design, tender, contract, construction and evaluation (post) were the main process adopted for this study as they are the commonly accepted stages of procurement.

Having reviewed literature, the next chapter presents the methodology for the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses how the research was carried out in order to meet the study's aim and objectives. Cooper and Schindler, (2005) indicated that the next important step in any research process after study of literature and identifying the research questions is deciding on the most suitable methodology. Avison and Fitzgerald (1995, p. 63) refer to methodology as *"a collection of procedures, techniques, tools and documentation aids…but a methodology is more than merely a collection of these things. It is usually based on some philosophical paradigm, otherwise it is merely a method, like a recipe*‖. Miller (1983) argued that research methodology is essential to any study in order to identify presuppositions and consequence to research advances. This chapter therefore highlights on the following: philosophical point of the research, design of research instrument, data collection and data analysis. The chapter also provides an overview of the research population and the sampling technique adopted.

3.2 PHILOSOPHICAL POINT OF THE RESEARCH

A number of considerations underpins the philosophical position of any research. These philosophical paradigms need to be considered as they shape the choice of research instruments (Christou *et al.,* 2008). Polit and Beck (2004, pg 13) defined paradigm as _a way of looking at natural phenomena that encompasses a set of philosophical assumptions that guide one's approach to inquiry.' Research philosophy relates to the development of knowledge and the nature of that knowledge. Social research borders on ontological and epistemological positions which are discussed below.

Ontology refers to what constitutes reality and how we can understand its existence. Fitzgerald and Howcroft (1998) adopted from Baiden (2006) indicate that there are relativist and realist ontological positions. The realists believe that, the external world comprises of pre-existing hard and tangible structures. These structures exist independently of an individual's ability to acquire knowledge. This position is practical and not concerned with abstract or idealistic view of life. The relativists on the other hand hold to the multiple existences of realities as subjective constructions of the mind (Fitzgerald and Howcroft 1998).

Epistemology refers to what constitutes valid knowledge and how we can obtain it. Epistemological position can be positivist (objective) or interpretivist (subjective). Positivism holds that the existence of the social world is an external entity and its qualities should be able to be objectively measured with scientific methods rather than being inferred subjectively through _dramatic', reflective or intuitive capabilities (Easterby-Smith *et al*, 2008; Saunders *et al*, 2007). Positivists also argue that _facts' can be present independent of the observer in order to produce research that is totally objective and accurate (Fellows and Liu, 2008: 17). Interpretivist on the other hand, hold on to the idea that, one person's reality, derived by observations and perceptions and modified by socialisation (for example, upbringing, education and training), is likely to be different from that of another person (Fellows and Liu, 2008: 18). In other words, Interpretivist believe that, people are able to describe reality in a language they understand (subjectively) and not what others thing might be the case (objectively). Interpretivist do not claim that there is no objective reality, only that reality can't be known or understood separate from culture/values. According to Creswell (2007), interpretive researchers mostly depend on _participants' views of the situation being

studied. The approach gathers mostly qualitative data in a natural setting, a method which is known as naturalistic inquiry.

The philosophy underpinning this research at the epistemological level is the interpretivist paradigm.

Table 3.1 highlights the major differences between positivism and interpretivism.

Table 3. 1 Key Contrasts between Positivism and Interpretivism (EasterbySmith *et al,* 2008: 59; Hussey and Hussey, 1997: 54) as cited in AboagyeNimo (2014)

	Positivist	Interpretivist
Method	Tends to produce quantitative data	Tends to produce qualitative data
The observer	Must be independent	Is part of what is being observed
Human interests	Should be irrelevant	Are the main drivers of science
Data Explanations	Data is highly specific and precise Must demonstrate causality	Aim to increase general understanding of the situation Data is rich and subjective.
Research progress through	Hypotheses and deductions	Gathering rich data from which ideas are induced
Concepts	Need to be operationalised so that they can be measured	Should incorporate stakeholder perspectives
Unit of analysis	Should be reduced to simplest terms	May include the complexity of _whole‘ situation
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reason
Accuracy	Reliability is high and validity is low	Reliability is low and validity is high

At the ontological level, the research adopted the realist position. This is because, though structures exist for improving H&S in the construction industry, members did not recognise and follow the procedures and processes that make them effective. The

existing structures for integrating H&S into public works procurement and how the structures exist could be investigated and identified respectively. The investigation and identification were necessary if roles and processes of procurement were to be structured and implemented to ensure that H&S was integrated more effectively to work together as expected.

At the epistemological level, the research adopted the interpretivist position. To understand how high health and safety standards can be achieved in the construction industry, we must understand the processes a project goes through, health and safety considerations involved and also the stakeholders involved(how these stakeholders interact and their roles). Positivist paradigm is not suited for this research as it engages quantitative methods which deals with frequency of a naturally occurring phenomenon. Interpretivist on the other hand, favour qualitative methods such as case studies, interviews and observations. Qualitative methods seek to describe, decode or translate (Shah and Corley, 2006). An interpretivist perspective can be considered highly appropriate for this type of research as it helps uncover the views of the research participants. An interpretivist perspective was chosen because, data collected is rich and is aimed to increase the understanding of incorporating health and safety into procurement. Even though researchers are scientists, they are first and foremost human beings and as such possess their own assumptions, values and frames of reference which guide what they are capable of seeing and not seeing (Fellows and Liu, 2008: 20). This paradigm is valuable for research that focuses on social arenas by indicating that reality is constructed by the individuals involved (Fellows and Liu, 2008: 18).

3.3 RESEARCH STRATEGY

Apart from the philosophical considerations underpinning this research, there is the need for the clarification of the orientation of the researcher to the conduct of research (Bryman, 2004). It is the way in which the research objectives are questioned. Two known strategies, quantitative and qualitative which differ in many ways but can complement each other exist (Neuman, 2003).Quantitative is objective in nature and based on testing a hypothesis or theory composed of variables. It is used for finding facts about a concept or question and involves the collection of factual evidence. Qualitative research follows an inductive approach in relation to theory. It emphasizes on words rather than quantification in the collection and analysis of data. Patton (2002) identified three kinds of data derived from qualitative research which are indepth and open ended interviews, direct observations and written documents. However, this research is purely qualitative as the study does not involve any creation and subsequent testing of a theory that is, hypothesis which are associated with quantitative research as identified by Bryman (2004). The study adopted qualitative research design for reasons outlined below.

- The research was exploratory and is aimed at providing a holistic approach to improving construction health and safety through public procurement. The study did not involve any creation and subsequent testing of a theory.
- It provides flexibility and affords the researcher the opportunity to conduct an in-depth research. Qualitative is also more responsive to the needs of this research since the unit of measurement is not certain.

The credibility of qualitative research is however dependent on the skill, rigor and competence of the researcher (Patton, 2002). It was the researcher‘s contention that, purely quantitative methods were unlikely to elicit the rich data necessary to address

the proposed research purposes. In the researcher‘s view, the fundamental assumptions and key features that distinguish what it means to proceed from a qualitative stance fit well with this study.

3.4 DESIGN OF RESEARCH INSTRUMENT

In order to achieve the aim and objectives of the study, desk survey, case study and semi-structured interview schedule were designed to gather information from construction and procurement practitioners.

Phase 1

The desk survey (literature review) formed an essential aspect of the research since it sets the pace for the development of questionnaire and interviews (Fadhley, 1991).

Ghana‘s Public Procurement Law, Act 663, health and safety laws in addition to the laws of the UK and US were reviewed to determine the adequacy or otherwise of

Ghana‘s H&S laws. The review also relied heavily on secondary data sources such as periodicals, journals, reports, published and unpublished thesis.

Phase 2

Case study was also employed in this study. As Merriam (1998) indicates, qualitative case study is an ideal design for understanding and interpreting educational phenomena. According to her, ―a case study design is employed to gain an in depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes; in context rather than a specific variable; in discovery rather than confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research‖ (Merriam, 1998 pg. 19). The case study approach involves procedures and techniques of investigations but not exclusively based on intensive interviewing. It was adopted because it was considered to be the best approach for the

study of contemporary issues such as Occupational Health and Safety (Kvale, 1996). Consequently, case study was used in addition to the interviews so that the two methods compensate for each other‘s biases and limitations.

The design of a case study according to Yin (2009) as stated in Ashiboe-Mensah (2012) is made up of the following five components:

1. The case study questions
2. The case study propositions
3. The units of analysis
4. The logic linking the data to the propositions; and 5. The criteria for interpreting the findings

a) The research questions

The main question that this case study sought to answer was:

How does the Act 663 address H&S concerns in the procurement of works? To integrate H&S into public works procurement, it is important to investigate how public works is carried out in Ghana‘s public sector setting hence the use of case study. This was to address the objective of outlining the limitations of the Act with respect to H&S management in public works procurement in Ghana.

b) The units of analysis

The unit of analysis defines what the _case‘ is. The Act 663 was defined as the unit of analysis. This is because the Act provides guidelines for public procurement in Ghana. The focus was thus on a project which was procured by the Kumasi Metropolitan Assembly under the guidelines of the Public Procurement Authority to determine the various processes it underwent, the stakeholders involved and the various considerations looked at especially under H&S. Case study research

involves both single and multiple case studies. The study followed a holistic single case study design. Single data collection was selected and not multiple data collection because, most of the projects undertaken by the Assembly followed the same or similar process or trend. It was therefore expedient to choose a single case out of the lot. Single case designs have been shown to be without interpretation bias (Moran & Tai, 2001).

c) Selection of case

Two schools of thought on case sampling are randomised and theoretical sampling. A self-selection principle of random and unbiased choice has been purported and argued as a valid strategy (Baiden, 2006). The selection of the case follows a deliberate sampling approach. This was due to the following reasons:

- The project was procured using the Public Procurement Act, Act 663, which spells out the rules and guidelines for public procurement works in Ghana. The selection was to investigate the Public Procurement Act, Act 663 and how the Act addresses issues of H&S in the procurement of works.
- There was also easy access to personnel, documents and other information which was necessary for an in-depth investigative study.

d) Data collection

Documentation, interviews and observation were used as data collection methods for the case study. Data on project profile and stages involved in the procurement of the work were collected. Documents were carefully reviewed. The roles played by the various stakeholders was done through review of documents and also through the use of interview.

e) Data Analysis

Analysis of data in case study is often difficult because the strategies and techniques have not been well defined by past research. It is therefore important to employ familiar tools and techniques (Yin, 2003). Data analysis comprised the examining of documents specifically tender and contract documents, site report minutes and tender evaluation report from the assembly and juxtaposed with best practice to bring out the limitations of the Act 663 with respect to H&S. Data analysis was mainly descriptive. The details of the case study have been reported in Chapter four of this study.

Phase 3

In addition to the case study, interviews were also chosen as the primary method of collecting data. According to Kvale (1996), research interviews try to understand something from the subjects' point of view and to uncover the meaning of their experiences. Marczyk *et al*. (2005) also pointed out that, interviews provide a multiperspective understanding of the issues under investigation and have the potential to reveal multiple and sometimes conflicting attitudes about a given topic. In order words, interviews allow people to convey to others a situation from their own perspective and in their own words. The interviews took place face-to-face between the researcher and the respondents. The interviews were audio taped and on the average took between 30 to 45 minutes. The questions for the interview were developed from the following themes from the review of literature.

- Adequacy of statutory laws on health and safety.
- Health and safety provisions in the PPA Act 663.
- Incorporation of health and safety into the procurement process.
- Stakeholders' roles in promoting health and safety in the procurement process.

- Implementation of health and safety requirement in the procurement process Health and safety concerns on specific procurement methods.

3.5 DATA COLLECTION METHODS

This section presents the methods used in the collection of data for the study. The sampling technique, population size, ethical considerations, and validity and reliability were discussed.

3.5.1 Sampling Techniques and Sample Frame

The sampling method employed in this research is the purposive sampling technique. In qualitative research, selection of the research sample is purposeful (Patton, 2002). A purposive sampling defines a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. The reason for using purposive sampling lies in the selection of information-rich cases, with the objective of yielding insight and understanding of the phenomenon under investigation.

3.5.2 Population

Castillo (2009) is of the opinion that a research population is generally a large collection of individuals or objects that is the main focus of a scientific query. However, the population for this study involves a small number of people since qualitative research does not require large populations. The research population include procurement and construction experts from the following institutions: the

Kumasi Metropolitan Assembly (KMA), Public Procurement Authority (PPA), Urban

Roads Department, Kwame Nkrumah University of Science and Technology (KNUST), Architectural and Engineering Service Limited (AESL) and Building, Roads and Research Institute (BRRI). These individuals were those who had at least five years working experience in construction procurement. The reasons for choosing the participants for the interview are as follows:

- Participants from KMA,AESL,BBRI, KNUST, and Urban Roads were chosen based on their experience and expert knowledge in the field of study (The reason for the selection was to explore practices and opinions from the very best in the industry).
- Public Procurement Authority was chosen since they form the legal body for the procurement of public works in Ghana.

3.5.3 Ethical Considerations

The interviewees were made aware of the fact that the research is purely an academic requirement and as such, information gathered will be treated with strict confidentiality. Anonymity of respondents was also promised. This was carried in a very strict interview protocol designed for the study.

3.5.4 Validity and reliability

Validity refers to the degree which a test or an instrument measures or performs the task it is meant for. No set standards exist for evaluating the validity, or *authenticity*, of conclusions in a qualitative study, but the need to carefully consider the evidence and methods on which conclusions are based is just as great as with other types of research. Individual items of information can be assessed in terms of at least three criteria (Becker 1958):

- How credible the informant is.

- Were statements made in response to the researcher‘s or were they spontaneous?
- How does the presence or absence of the researcher or the researcher‘s informant influence the actions and statement of other group(s)?

All these were carefully observed during the interviews to help report on the validity and reliability of the data collected.

3.6 DATA ANALYSIS

There are three main strategies in qualitative data analysis; categorizing strategies (such as coding and thematic analysis), connecting strategies (such as narrative analysis and individual case studies), and memos and displays (Maxwell, 2005). The research however adopted thematic matrix analysis as the method of analysing data; a tool that is ―independent of theory and epistemology and can be applied across a range of theoretical and epistemological approaches‖ as well as different methods (Braun & Clarke, 2006). Data collected from the interview was transcribed verbatim and then sorted into themes. Thematic matrix analysis seek to unearth the themes salient in a text at different levels, and thematic method aim to facilitate the structuring and depiction of these themes.

3.7 SUMMARY

This chapter outlined key elements that are very primary in deciding a suitable research methodology to address any research problem. Described in details were the philosophical stance of the research, research strategy, sampling method, data collection and analysis methods. A summary of data requirement and sources have been provided in Table 3.2.

Table 3. 2: Summary of Data Requirement and sources

Objectives	Sources	Mode
1. To outline the limitations of Act 663 with respect to construction H&S management	Act 663 Journals Live projects	Desk study(literature review) Case study approach
2. To outline practical measures to improve construction H&S management at the key stages of works procurement.	Construction Procurement Experts	Interviews
3. To recommend specific provisions and/or amendments to the Act 663 to improve construction H&S in Ghana.	Researcher	Data analysis

Source: Author's construct

The next chapter presents the analysis and results of the study.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

Previous chapters addressed the introduction, the review of relevant literature, and the research methodology adopted. This chapter presents details of the analysis and results obtained from both the interview and case study conducted in this study.

Findings for this study were centered on the objectives of the research.

4.2 BACKGROUND INFORMATION OF THE RESPONDENTS

Knowing the background information will help generate confidence in the reliability of data collected.The following indicates background information of respondents:

- Professionals considered and their professional association;
- Status of Professionals in their organization;
- Experience of respondents in construction procurement;
- Working Experience of respondents;

A coded key to each of the respondents is represented in table 4.1. Each respondent is labelled with an alphanumeric code that is cross referenced to the report text. For example Building, Roads and Research Institute respondent one (1) is labelled BRRI 1. Building, Roads and Research Institute respondent two (2) is labelled BRRI 2. The respondent from the Urban Roads Department is labelled URD. The codes are to help with easy identification and systematic presentation of data.

Table 4. 1 Coding of Respondents

RESPONDENTS	CODE
Building, Roads and Research Institute respondent one (1)	BRRI 1
Building, Roads and Research Institute respondent two (2)	BRRI 2
Urban Roads Department	URD

Kumasi Metropolitan Assembly	KMA
Public Procurement Authority	PPA
Kwame Nkrumah University of Science and Technology	KNUST
Architectural and Engineering Service Limited	AESL

Source: Author's construct

AESL

He has worked with AESL for 8 years and is currently the regional QS for AESL in Ashanti Region. He holds a BSc degree in Building Technology from KNUST and a master's degree in Construction Project Management from Han University of Applied Science in Holland. He is also a lecturer at Ho Polytechnic from 2010 to date. He is a professional Member of the GhIS (MGhIS, 2010). In 2012, he was a member of the presidential committee set to look into the conflict in Hohoe. He has worked on quite a number of government projects under GETFUND and World Bank projects and has also worked in the UK on a number of projects as an assistant QS. He is well vexed in project cost control and management.

BRRI 1

He is the head of the Construction Division and Project Management Section of the Council for Scientific and Industrial Research (CSIR)-Building and Road Research Institute. He holds a Bachelor of Science degree in Building Technology and an MSc in Construction Management from KNUST. He also has a Certificate in Procurement from the Ghana Institute of Management and Public Administration (GIMPA). He is a distinguished Fellow of the GhIS(FGhIS,2009), Member of the Association of African Quantity Surveyors, Member of the International Federation of Surveyors and Member of the Ghana Institute of Construction. He is an accomplished academic, procurement specialist, project manager and QS, and has worked on several donor funded and national projects. The Public Procurement Act and its structural implementation studies and also the

Built environment have been his keen research interest. He is a senior service lecturer at the Department of Building Technology, KNUST.

BRRI 2

He is currently a QS and a research officer at BRRI in Kumasi, where he has worked for the past 13 years. He holds a Bachelor of Science degree in Building Technology and an MSc in Construction Management from KNUST. He is provisional member of the GhIS and also a member of the Research Staff Association of Ghana. He is knowledgeable in construction management and contract administration. He has worked on quite a number of projects such as Social Investment Fund (SIF) projects, the construction of 375 schools in the three northern regions of Ghana which was funded by African Development Bank among many others.

KNUST

He is currently a QS at the Development Office of the KNUST where he has worked since 2006. He holds a Bachelor of Science degree in Building Technology, LLB Bachelor of Law and an MSc in Procurement Management from KNUST. He is a professional Member of the GhIS (MGhIS, 2009) and also a member of Royal Institute of Chartered Surveyors. He has skills in cost control and contract management, and has worked on a number of projects such as GUSSS hostels and KNUST Exams Hall.

KMA

He is the head of the Quantity Surveying Division at the Works Department, KMA.
He holds a Bachelor of Science degree in Building Technology from KNUST. He has 20 years working experience in construction and procurement. He also has a lot of training in health and safety, consultancy and works procurement. He has supervised

both national and donor funded projects such as Urban Development Grant (UDG), Ghana Urban Management Pilot Programme (GUMPP), District Development Fund (DDF) and Internally Generated Funds (IGF) projects. He is also a board member of Newmont Akim Development Fund (NADEF). He has a few publications to his credit.

PPA

Respondent has a first degree in BSc Development Planning and two masters' degree in MA Economic Policy Management and an MSc in Procurement Management. He worked as development planner from 1996 to 2008. He later took up an appointment in 2009 (where he has been till date) at the Benchmarking, Monitoring and Evaluation Directorate of the Public Procurement Authority of Ghana, which is an institution involved in the monitoring and evaluation of the procurement activities of public institutions. The institution undertakes annual assessments of 1046 public entities and also train procurement professionals. He is currently the zonal director for the Northern sector of Ghana for PPA. He has supervised both national and donor funded projects such as the European Union micro projects for three years, common fund projects, German Agency for Technical Cooperation (GTZ) projects, Kreditanstalt fur Wiederaufbau (KfW) and World Bank projects.

URD

He is a QS at the Department of Urban Roads at Ejisu. He has worked with the Department for 8 years and has been working in the construction industry since 1999. He holds a Bachelor of Science degree in Building Technology from KNUST. He has a certificate in World Bank Works Procurement from GIMPA and also a certificate in

Works and Risk management from the Ministry of Road and Transport School in Koforidua. He has undertaken an in-depth study into the administering and application of FIDIC 4. He is a member of Ghana Institute Of Construction (GIOC) and an affiliate member of GhIS. He has worked on a number of projects under both Donor and Government of Ghana for the Department of Urban Roads.

Table 4. 2 Summary of Background of Respondents

REF	PROFESSION	EDUCATION	PROFESSIONAL QUALIFICATIONS	YEARS OF EXPERIENCE
BRRI 1	Quantity Surveyor Lecturer Procurement Specialist	BSc. Building Technology MSc. Construction Management	Ghana Institution of Surveyors(member)	24years with (BRRI)
BRR1 2	Quantity Surveyor Research Officer	BSc. Building Technology MSc. Construction Management	Ghana Institution of Surveyors (Provisional member) Research Staff Association(member)	13years
AESL	Quantity Surveyor Lecturer	BSc. Building Technology MSc. Construction Project Management	Ghana Institution of Surveyors(member)	8 years(with AESL)
PPA	Procurement Specialist (Zonal Director)	BSc. Planning(Development) MA Economic Policy Management MSc. Procurement Management	Currently a student of Chartered Institute of Purchasers and Suppliers	12 years(as a Development Planner) 5 years(as a procurement specialist)
KNUST	Quantity Surveyor	BSc. Building Technology LLB Law MSc. Procurement Management	Ghana Institution of Surveyors (member) Royal Institute of Chartered Surveyors(member)	8 years working experience (with KNUST)
KMA	Quantity Surveyor	BSc. Building Technology	-	20 years
URD	Quantity Surveyor	BSc. Building Technology	Ghana Institute Of Construct(member)	14 years

4.3 RESULTS OF THE INTERVIEW

Data gathered from the interview were recorded and transcribed verbatim and then sorted into themes. In this research the items that were identified as themes were items

that captured something important about the data in relation to the research objective and their relevance was not based on their prevalence within the dataset

(Braun & Clarke, 2006).

- Health and safety provisions in the PPA Act 663.
- Health and safety challenges in the Procurement of works
- Incorporation of health and safety into the procurement process.
- Stakeholders‘ roles in promoting health and safety in the procurement process.

The section is divided into three dominations. Section 4.3.1 focuses on outlining the limitations of the Act 663 in addressing issues of H&S and the H&S challenges associated with the procurement of works which is first objective of the study. Sections 4.3.2 and 4.3.3 focus on practical ways of integrating H&S into the various stages of procurement and the roles of stakeholders involved in the process respectively. Sections 4.3.2 and 4.3.3 form the second objective of this study.

4.3.1 Limitations of Act 663 with Respect to Construction Health and Safety

The Act 663 enacted in 2003 has established guidelines, principles and tender committees to take charge of its objectives, it is however not clear in addressing issues of health safety. This study therefore sought to outline the limitations of the Act with respect construction health and safety. The emerging themes under the limitations have been broken down into two headings: health and safety challenges associated with the procurement of works and adequacy of health and safety provisions in the Act 663.

Health and Safety Provision in Act 663

The respondents were asked if the Public Procurement Act addresses health and safety issues in the procurement of works. All respondents mentioned that there is no specific aspect of the

Public Procurement Law that gives details on health and safety of issues in the procurement of works as seen in the following responses:

> *"The Public Procurement law does not allow/ address H&S but there is a window of opportunity."* (BRRI 1)
>
> *"As I said earlier on, there is no specific portion or clause on H&S in the Act."* (BRRI 2)
>
> *"In the procurement of works, no."* (AESL)
>
> *—I don't know of any specific H&S provisions in the Act.‖* (KNUST)
>
> *"The act itself is vague on H&S in the procurement of works."* (KMA)
>
> *"Not explicitly. It is inferred."*(URD)

The comments confirm what was reviewed from literature in chapter two (2) that, there is no clause or section in the Act 663 that addresses health and safety. This implies that, the drafters of the Act did not consider health and safety as an important issue for the Act 663 to address.

> *"Unfortunately, when they were enacting the law, those drafters didn't consider H&S as an issue at that time."(BRRI 1)*

A study by Amponsah-Tawiah and Dartey-Baah (2012) revealed that, the governments of Ghana, past and present, have not shown any political will, commitment and support for bold occupational health and safety policies. The neglect of health and safety provisions in the Act 663 is a barrier that affects health and safety in the procurement of works as it does not make health and safety mandatory.

Other respondents pointed out that, health and safety provisions are made only in donor funded projects like projects from the World Bank. These donor institutions tend to

insist on the inclusion of ‗rudiments' of health and safety in their projects as mentioned by a respondent.

> *"But as to the procurement of works, I do not see much. With the exception of when you are undertaking projects from or for institutions like the World Bank where they always talk about what we call the safeguards. That is how the World Bank refers to H&S measures. Safeguards is where you insist on the basic rudiments of H&S. Other than that, there isn't anything embedded in our construction procurement laws."(KMA)*

Challenges

As to the question on the health and safety challenges associated with works procured under the PPA Act 663, the respondents raised the issues of inadequate enforcement and monitoring, training and inadequacy of the H&S laws as illustrated in the following quotations.

> *"H&S issue is a challenge in terms of implementation because it is not contractual."*- (BRRI 1)

> *"The challenge has to do with enforcement, training and education. We are not doing much as a nation. The contractors need to be schooled. That is, their tradesmen should appreciate that it is in everyone's interest to adhere to H&S rules."* – (KNUST)

This confirms the findings of Akorsu (2013), *Kheni et al*., (2008) and, Laryea and Mensah (2010) who revealed that, health and safety regulations are not strongly enforced and many contractors are not even aware of their Health and Safety obligations under these Acts.

According to some respondents Act 663 lacks an aspect that explicitly gives details on health and safety. This has caused much problem; because there is no specific law or rule in the Act 663 which states what is required of a contractor concerning H&S and the penal measure(s) that would go with it if it is breached. Laws are meant to ensure that members of a society or organisation live and behave according to a set of acceptable rules. In a place a where there is lawlessness, everybody does anything anyhow according to his or her discretion. In other words, respondents mentioned that there were health and safety challenges in most construction sites because there are no such laws on H&S as stated by the following participants:

> *"The Act has no specific portions on H&S that, if you look at Act 663 section 22 so and so it's specifically on H&S. There is nothing like that and this sometimes makes it very difficult. That is why if you want to do anything relating to H&S, you have to put it in at the tender data stage. Because, it is there that you have the laxity to make changes else apart from that one, I don't think you can make any changes anywhere. Because once it's a law, it's a law. You cannot change it."* – (BRRI 2)
>
> *"Personally, my biggest challenge is that, there is nothing that ensures at the procurement stage that, contractors satisfy H&S conditions and environment. There is a site, go and put a 6 unit classroom block. We go and cut all the trees without replacing them. During construction, you go to the site and the contractor is not obliged because he doesn't see anything in his conditions that forces him. You can't tell him to stop and give all his workers boots or helmets. You see people hanging on the 6th floor without high visibility vests, no helmets or harness, nothing. If it is put in the requirement, so that for the contractor to*

be responsive, he needs to show a certified H&S... I know the new ones they are trying to put it in. But right now, it is just tax, SSNIT, etc.

He satisfies that and he goes through. It can be put in the post qualification criteria where we'll check for plants and equipment, similar works etc. and then check for H&S methodology." – (AESL)

The respondent from PPA however mentioned that the challenge has to do with cost. He further explained that if a contractor is required to use machinery which assures health and safety at the site, he needs not to use outmoded machinery but sophisticated ones and that comes with high cost. This is seen in the quote below:

"The challenge is that, now we are even trying to amend the Act to take some of those things into considerations. But the challenge is the initial cost. If you want to incorporate all these things... It will build up the cost of works, and it will be carried on to the client because we ask the contractor to strictly for instance use metal scaffolding vis-a-vis wooden scaffolding. And even other safety measure." – (PPA)

This confirms the findings of Wells & Hawkins (2011) who revealed that, improved health and safety in construction comes with a cost. According to the researchers, the cost estimated in improving health and safety is however less than the cost of lost time due to accidents.

In the presence of challenges (associated with H&S on works procured under Act 663) that almost all respondents mentioned, the respondent from KMA said that, he does not see any hitch with the issue of H&S. This is seen the statement below:

"I do not see any challenge with H&S." – (KMA)

4.3.2 Incorporating Health and Safety into the various stages of Procurement

There are some specific processes that respondents mentioned that need to be followed when integrating H&S into procurement process. These processes are planning stage, design stage, tender stage, and tender evaluation, award of contract, construction stage and then evaluation (post).

Planning Stage

Based on the information given by the respondents, a lot of suggestions were made with regard to their stand on how to integrate health and safety into the planning stage of procurement. Some mentioned determining the scope of the project and the budget, and risk assessment (identification of health and safety issues) as some of the ways of incorporating health and safety into procurement at the planning stage. This is seen in the following comments:

> *"All this is a matter of policy. When it's there as a policy, and it's incorporated into the Act, then it means at the planning stage, H&S will be considered through budgetary allocation. This means that the cost of construction will go up a little. For whatever the contractor does, he has to be paid and it's going to increase his preliminaries a little."* – (AESL) *"When you are planning the project that is when you determine who should come on board and all that. That gives you the scope in terms of how big the project is. If you get to know the size of the project, then you will know how to go about it in terms of H&S. For instance, if it's just a single storey structure, then the H&S measures will not be all that serious as compared to a very big project like a hotel edifice, which will require people climbing up and down, hoisting things up and down, then you*

need to provide all those things. You can then document it as part of the process." (BRRI 2)

—Health and safety audits must be carried out before and after the project." (URD)

"Thorough investigation to determine how risky the project is, H&S issues involved. And this could help those carrying out the documentation to know exactly what they need to incorporate in their documentation."(KNUST)

The suggestions of the respondents are in line with the study of the Government of Australia (2006) as indicated in table 2.3. In the briefing note of Wells and Hawkins (2011), risk assessment should be carried out during the planning stage and recorded in a register, out of which a health and safety plan is developed and carried through tender.

Design Stage

Many H&S challenges encountered at the construction stage could be avoided if due consideration and effort was put into the planning and design stage (Charles *et al*., 2007; Hawkins & Wells, 2011). As per the responses from the respondents, it is the stage where all documentation concerning the project is carried out. Here, bills of quantities, drawings, specifications of the project and all the necessary information concerning the project are put together in a tender document. Some of the respondents mentioned safe designs and method statements as ways of integrating health and safety into procurement at the design stage as indicated thus:

"Design stage is when you consider drawings and the documentation of the Bills of quantities and all that. If it's going to be a multi-storey structure, then

*you know people and materials are going to move around a lot. You must therefore provide hoarding (that net thing they put around structures) and incorporate it into the design."(*BRRI 2)

"At the design stage, probably in the contractor's methodology, he should tell you how he is going to implement the design in a safe way." (AESL)

"Like I said, if you look at the design stage. What are the type of safety measures that will be needed? When you are designing a project, you must take all these things into consideration looking at the cost, effects on the environment or the type of equipment that will be used. All these will go into the cost of the project. So that must be taken care of. Your designs must not conflict with the use of these equipment. It should be able to accommodate these equipment and all the staff who are coming or all who are contributing to the development of the project."(PPA)

Tender Stage

During the tender stage, the respondents suggested that health and safety should form part of the criteria for evaluating tenders. This is illustrated in the following quotations:

"H&S should be part of the requirement which will be used in evaluating the tenders." (AESL)

—All these provisions must be in the tender document. All that you envisage so long as H&S measures are concerned, must also be critically analysed, and all of them must be considered in the project. You should not leave any of them out. If you leave them out, it's going to affect the final cost and the implementation of the project so long as H&S is concerned. So at the tender stage, all the

information you require, all that you want the contractor, and all that you want to happen on site must also be incorporated in the tender documents.‖(PPA)

—Once you have stated that these are the conditions for the award of contract or for a firm to qualify, then all those issues must be properly evaluated or looked at. If you said that a contractor should have for instance, a metal scaffolding stated in the tender document. When you are evaluating, you therefore need to verify to make sure that the contractor has those things. Or, you can even look out for work that he has done or whether in those works that he was doing, he actually complied with those provisions. If has records of not complying with those H&S measures from previous works that he has done, and the evaluation panelists have access to those information, you'll disqualify him based on somebody who actually complies with all these H&S measures. Here, the issue is not cost. Somebody might have complied with the H&S measures but his price may be higher. Somebody might have not complied with the H&S measures but his price may be lower. But because he hasn't complied with the H&S measures even though his price is lower, he is not qualified. As we say, the lowest responsive tender. In that case it's not responsive. So we look at all these conditions and make sure the contractor has then whether physically, or he can put on paper that when he is given the award, he is going to adhere to all these H&S measures. Then we can go ahead and award the contract or recommend him for the award of contract.‖(PPA)

The suggestions of the respondent from PPA are in conformity to the work of Wells and Hawkins (2011) who suggest that, per the rules of World Bank, contracts should be awarded to the _lowest evaluated tender'. However, if a contractor fails to meet the requirements of the

client in terms of health and safety, the tender should be rejected as invalid or nonconforming even though his price may be lower.

Contract Stage

The contract stage is where the contract is drafted with the obligations of each party stated. According to the responses given by the respondent, it is the stage where the tenderer that meets the evaluation criteria is selected for the award of the contract. This is illustrated in the following comment:

> *"You've set the rules so you go strictly by the requirement set in the tender document to evaluate them. Those who meet the requirements are then selected for the award." (KNUST)*

Construction Stage

All the respondents deemed the construction stage as a very important stage, as it is the stage where all the paper work done in the previous stages of procurement on health and safety is implemented or actualizes. This is seen in the following quotations:

> *"This is the implementation stage. At this level, there should be some inspectors, who will go round to make sure that, what is stated in the documents you've signed is provided for.*‖ (BRRI 2)
>
> *"This is where you make sure that the contractor complies with whatever provisions concerning H&S on the ground, and everything that has been indicated to promote H&S must actualise on the project site." (PPA)*

Post Evaluation Stage

At the post evaluation stage, a lot of suggestions were made by the respondents with regard to their stand on how to integrate health and safety into the post evaluation stage of procurement. Some respondents suggested the provision of As-built drawings and

health and safety manuals by the consultant, together with the contractor as to the use of the building. As-built drawings are the final set of drawings produced at the completion of a construction project. They include all the changes that been made to the original construction drawings, including notes, modifications, and any other information that the builder decides should be included. The suggestions made by the respondent are illustrated in the comment below.

> *"At the end of the project, the consultants in collaboration with the contractor have to provide As-built drawings. They also have to produce H&S manuals as to how the building has to be used. When these manuals should comply with what the regulation is saying, then the consultant assesses and accepts it before it can be used. As part of the policies, accidents should be recorded and kept by policy. And this will be part of the requirement for the next tender."-*
>
> *AESL*

The respondent also suggested that, records of accidents should be kept by policy. This will serve as a yardstick or reference point in another project. However, according to Boakye *et al.* (2010), many developing countries, of which Ghana is no exception, lack accurate statistics of injuries and fatalities in the construction industry because many of these accidents go unreported.

Some also suggested that health and safety audits should be carried after the project has been completed as illustrated in the following comment:

> *—Health and safety audits must be carried out before and after the project."*
>
> *(URD*

The carrying out of health and safety audits confirms the work of Wells and Hawkin (2011) who advised that audits carried out after the completion of the project should not only be financial but also on health and safety.

4.3.3 Role of Stakeholders in Promoting Construction Health and Safety

Charles *et al*. (2007) suggest that, to enhance construction OHS performance, collaboration between those involved in concept, design, construction planning, construction work, maintenance and demolition are essential. Hislop (1999) opined that construction health and safety is not the responsibility of the contractor alone. This means that all parties involved in a construction project should be accountable for its health and safety. Some of the obligations of the stakeholders given by respondents are as follows:

Role of the Government

Some respondents mentioned that the government of Ghana has a crucial role in maintaining health and safety in the construction industry. They suggested that the government should enact laws to make H&S mandatory in the procurement process and also on construction sites. Not only should the government enact laws or make policies, but also make sure these laws and policies are adhered to through effective monitoring and enforcement. The respondents gave the following as the role of the government:

> *"The government's obligation is to pass the law in construction H&S. And once the government passes the law, it is incumbent on everybody to apply."*- (KMA)
>
> *"Government should be responsible in maintaining good construction environment. The government should create a platform such that, this issue is addressed so that everyone knows why H&S is relevant. Government position should be by law."*- (BRRI 1)

"Government is a policy maker. Government should possibly strengthen the existing provisions for H&S. If some provisions are not applicable now, then new ones should be introduced, that is amended. The government as a policy maker must also be the enforcer and so must have a unit to ensure monitoring and enforcement."- (KNUST)

The views of the respondents are in line with the research of Wells and Hawkins (2011) who asserts that, since the government is the major employer, policy maker, regulator and procurer of construction works, it can play a crucial role in preventing accidents and other work related illnesses by promoting, legislating and enforcing health and safety requirements through a wide range of mechanisms.

The respondent from Urban Roads Department not only gave the role of the government as a policy maker, but also the financier of the project. He explained that, the government who is also the client for most of the public works undertaken in Ghana, has the role of financing or paying for these health and safety measures as illustrated in his comment.

"…Mind you, all these H&S measures comes down to money. When these things are done, people have to be paid. The government therefore has the obligation of making funds available and ensuring that the right thing is done by the contractor through the requisite agencies." - *(*URD)

Role of the Client

Studies have shown that, where clients are committed to health and safety, a high health and safety standard is achieved. The extent to which client influence construction health and safety varies. The CCG Health and Safety Working Group (2007) explains that, the client has the most influence in establishing and monitoring health and safety, and this

influence can be exercised through the setting of criteria to promote a positive health and safety culture throughout the life of a project. The respondents mentioned that, the client plays a crucial role of monitoring to ensure that health and safety measures are adhered to. The respondents also stated that, the client must make provisions for health and safety in every stage of the procurement process as indicated in the comment below.

> *"Clients must complement the effort of the government by making sure that the provisions and rules are incorporated in the various stages of procurement. They could also help in the monitoring of contractors adhering to the provisions by incorporating it in the process. So in their documentation, there should be a section that takes care of health and safety."(*KNUST)

In the public sector setting, the government is the client for most public works executed in Ghana. A respondent made a critical point that, because the government serves as a client and also the implementing authority of health and safety laws, conflicts tend to arise. The conflict stems from the fact that, the people supposed to monitor health and safety are also the same people or institution playing the role of the client at the same time. Certain health and safety procedures are therefore overlooked and in some cases, ignored all together most of the times. This is what the respondent had to say:

> *"Most at times, the government is the client for most public projects and also serves as the implementing authority. So you see where the conflict comes from. He is the referee, the goalkeeper and the player. When the government is the client and the site is not safe, sometimes the implementing bodies will go, but because it's government (it's like government on government) so they leave it. As at now, I can tell you that most of the government projects go on without building permits when in actual fact there should be."(AESL)*

In view of this, a respondent proposed that there should be separate bodies responsible for monitoring and enforcement when it comes to public works as indicated by a respondent as illustrated in the comment.

> *"There should be a separate unit coming from the district assembly, municipal assembly or metropolitan assembly that go round sites making sure that people are complying. If that one is in place, when I come to your site and see that your site is not safe, we shut down your site. You make it safe and then come and call us, and we certify that it is now safe."*(AESL)

Role of the Contractor

A contractor may be a person or group of persons or company with a formal contract to undertake the construction. The contractor may be responsible for supplying labour and material and providing and overseeing staff if needed (Sengupta & Guha, 2002; Ashiboe-Mensah, 2012). On the role of the contactor, the respondents gave the following comments.

> *—The contractor must actually see the need for H&S, and the long term benefits it has on the project, and not on the immediate cost.*‖(PPA)

> *"The contractor must strictly adhere to procurement H&S rules and must employ competent H&S personnel that will educate workers and enforce rules on site. He must provide PPEs for the workers."(*KNUST)

The Act 651 requires the contractor to provide a clean and a safe working environment for his employees. The law also charges the employer, who is in this case the contractor, to provide PPEs to the employees at no cost.

Role of the Employee(s)

Respondents were of the view that, employees obligation is to adhere to health and safety rules on site. This is evident in the following quotations:

> *"The employees are also to take instructions and do as have been prescribed, and not as they want.*‖ (URD)

> *"They have personal obligations to themselves first to follow H&S procedures, and then also to 3rd parties as their actions or inactions could result in an accident not to themselves, but to third parties."* (KNUST)

It is worth knowing that ignorance of one's identity and rights is normally a recipe for abuse. In view of this, a respondent explained that, an employee must be aware of your rights in order to demand it as illustrated in the comment:

> *"As an employee, you should demand your right. That is why the Labour Act is saying that, as an employee, you must know your rights. Should there be any mishaps, you should be able to demand what is due you, that is, your workman's compensation."(BRRI 2)*

4.4 CASE STUDY RESULTS

The Ghanaian construction practice has its own characteristics such as government regulations, qualification systems and procurement systems. The case study will therefore give a proper understanding of the construction procurement practice in Ghana especially in terms of health and safety. The findings from the case study conducted are reported in this section.

4.4.1 Profile of the project

The Government of the Republic of Ghana received funds from the International

Development Association (IDA) towards the cost of Local Government Capacity Support Project (LGSP) and applied part of the proceeds of this fund for payments under the contract for a number of stand-alone packages of works construction and goods supply contracts. This project, for the purpose of this study will be named as **Project A** (for anonymity and confidentially) was part of the works construction contracts**.** The reason this project was chosen is that it was conducted through the

National Competitive Tendering (NCT) procedures specified in the Public Procurement Act, 2003 and the Guidelines of the Public Procurement Authority of the Republic of Ghana. The duration of the project was 52 weeks. It commenced on 18th February, 2013 and was expected to be completed and handed over on 3rd March, 2014.

The project went through the following stages of procurement as prescribed in the Act 663:

STAGE ONE: PLANNING STAGE

At the planning stage, a procurement plan was made by the Assembly in accordance to section 21 of Act 663. Need assessment was carried out and this is when communities bring in their applications expressing their need for a good, work or service and the application is normally written by a community leader, head of school or hospital. All the needs are put together and an inspection is carried out to determine if what the community or institution requested for is really needed. Some needs may be rejected if found not to be necessary or too pressing. Needs are prioritised based on funds available. The needs assessment help in preparing the procurement plan which is sent for approval for inclusion into the budget. The stakeholders that were brought on board at this stage are the KMA, assemblymen, chiefs, community, school and hospital heads. At this stage, funds available in carrying out the project was assessed and the method in which to procure was also assessed.

At the planning stage of procurement, health is not considered in the Act 663. The focus is on the budget and preparation of the procurement plan as indicated in section 21 of the Act. Best practice however indicates or encourages that at the planning stage, general health and safety issues in the project should be identified. Health and safety issues that could be designed out of the project should also be identified.

STAGE TWO: DESIGN STAGE

The design stage is critical to reducing H&S risk for procurement with specific design requirements (Government of Australia, 2006). At the design stage, an architect, together with Quantity surveyors from the Assembly was brought on board to develop project plans and documentation for the project. Design priorities were established with due consideration to the client's and end users requirement and the project scope. The following measures were considered by the architect in consultation with members of the design team bearing in mind the end users of the facility:

The physically challenged were considered thereby introducing ramps into the facility to aid in movement. Uniform steps (150mm/6 inches), to give enough room for the foot of the user, were also put in place to prevent slips or falls. The choice of materials to use was also crucial at the design stage. Due to that, wash terrazzo was considered as the surface finish for the floor to prevent slips and falls. Ventilation was also considered at the design stage. Windows which open to the outside were introduced to allow enough air flow into the washroom. Standard Tender Documents were made by the at the design stage by the Assembly which establishes the works required (technical specifications, plans, bill of quantities or activity schedule), the procurement procedures to be followed, and specifies the proposed contract

conditions.

At the design stage, efforts were made to address health and safety. However, the health and safety focus was on only the end-users of the facility as seen from the considerations given. In the tender documents prepared, health and safety obligation was also placed on the contractor alone.

STAGE THREE: TENDERING STAGE

a) Invitation to tenders

Specific procurement notice was issued by the Assembly and published in national newspapers to invite tenders from eligible tenderers. The invitation for the tender notices was published in the Ghanaian Times and Daily Graphic. Tendering was open to all eligible tenderers who are registered in Ghana as defined in the Guidelines of the Public Procurement Authority of the Republic of Ghana. All tenderers were required to include the following information and documents:

- Copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the tender to commit the tenderer;
- Total monetary value of construction work performed for each of the last five years;
- Experience in works of similar nature and size for each of the last five years, details of work under way or contractually committed; and clients who may be contacted for further information on those contracts;
- Major items of construction equipment proposed to carry out the contract;
- Qualifications and experience of key site management and technical personnel proposed for the contract;

- Reports on the financial standing of the tenderer, such as profit and loss statements and auditor‘s reports for the past five years;
- Evidence of adequacy of working capital for this contract (access to line(s) of credit and availability of other financial resources);
- Authority to seek reference from the tenderer‘s bankers;
- Information regarding any litigation, current or during the last five years, in which the tenderer is involved, the parties concerned, and disputed amount; and
- Proposals for subcontracting components of the works amounting to more than 10 percent of the contract price.

b) Tender

The tenders were deposited into the tender box which was tightly sealed at the scheduled address and time for the tender opening. Tenders received on/before the submission deadline were opened by the Entity Tender Committee in the presence of the representatives of Tenderers who chose to attend. Ten (10) tender documents were purchased and eight (8) were returned before the closing date. Tender figures quoted in the tender documents of the various tenderers were openly announced along with the accompanying documents (Tax clearance certificate, Labour certificate, SSNIT certificate, Ministry of Water, Works and Housing certificate, certificate to commence business, power of attorney and statement of non-association with consultant).

c) Evaluation of tender

Tenders submitted were first checked to determine its responsiveness to the tender document. Tenders determined to be substantially responsive to the

tender document requirements were then checked for arithmetic errors in extension, summations, transfers, and discounts if any. Following the correction of tender prices and receipt of bidders consent to errors, the evaluated tender prices were computed and ranked in ascending order to determine the tenderer with the lowest tender price. To establish the technical/financial capability of the tenderers to execute the contract, post- assessment was conducted using the pre-defined criteria in the tender documents.

Preliminary examination of tenders was carried out to determine responsiveness to the tender document. Each document was examined to confirm that it had substantially satisfied all the commercial requirements of the tender document. The criteria used in assessing the responsiveness of the tenders received were: Eligibility criteria in the Procurement Guidelines of the Procurement Authority of Ghana; the requirement that the tender form is properly signed; the provision of tender security as stated in the instruction to tenderers in the tender document, in correct amount and period and the wording consistent with contents of the tender security form provided in the tender documents, and that; the tender is substantially responsive to the requirements of the tender documents, that is, it conforms to all the terms, conditions and specifications of the tender documents without material deviations or reservations.

Detailed evaluation of tenders (financial evaluation) was carried out to determine the financial capacity of the tenderers. The turnover (that is the minimum annual volume of construction work undertaken by the successful tenderer in the last 5years) and the audited financial account for the last 5 years of the contractor were assessed at this stage to determine his financial capability.

Post-qualification (assessment of tender's capacity to perform the contract). The post-qualification requirement was done to determine whether a tenderer will qualify for the award of contract if he satisfies the following minimum technical and financial requirements: has successfully executed at least three works of similar nature and complexity within the last 10 years, qualification and experience of key personnel, plant and equipment holding, minimum annual volume of construction work in the last 5 years, and access to line of credit. The mechanism was selected since the tenderers were not pre-qualified and it was carried on only the lowest evaluated tender. The tender that satisfied all the above requirements was recommended for the award of the project.

At the tender evaluation stage, it was observed that health and safety however did not form part of the criteria for evaluating tenders. This was as due to the fact that, health and safety was not a requirement for evaluation as the Act did not include it in the criteria for evaluation in section 22. The CIDB Best Practice Guideline #A4, Evaluating Quality in Tender Submissions (1004) provides further guidance on quality criteria which are technical merit, durability, delivery date, equipment, key personnel, health and safety and environment.

d) Award of tender

On the basis of the evaluation which was carried out in accordance with the tender document, **contractor A** was recommended for the award of project A upon approval from the Regional Coordinating Council. The contractor who won the award was notified of the award and the unsuccessful tenderers also notified as the Act 663 mandates. A pre-requisite for contract signature in Act 663 is by the provision of a performance security. In view of that, Contractor A was asked to submit an acceptance letter and performance bond (from a

reputable bank or insurance company) for the contract documents of project A to be signed and carried out. The award of contract was based on the evaluation criteria set in the tender documents of which health and safety was not included.

STAGE FOUR: CONTRACT

The contractor at this stage signed a contract with the Assembly with all the legal obligations of both parties clearly stated in the contract document. The contract did not clearly outline the contractual health and safety responsibilities of contractors as only a general clause on H&S was stated in the contract document. There were no specific guidelines to control expected hazards. The contract merely stated in the conditions of contract that, ―the contractor shall be responsible for the safety of all activities on the site‖ when Hislop (1999) and Durham *et al*. (2002) agree that all parties associated with a construction project should be accountable for health and safety. Charles *et al*. (2007) postulated that, best practice with regard to health and safety also involves contracts that clearly outline the contractual responsibilities of contractors and also the persons responsible.

STAGE FIVE: CONSTRUCTION

A date was scheduled to officially hand over the site to the contractor to commence work by the Assembly (Planning and Works Department). The contractor was given 2 weeks to move to the site and commence work. The duration of the project was 12 months from commencement date.

During construction, a basement had to be created as a result of the terrain (nature of soil and sloping nature of the site). Retaining walls were introduced at the basement to prevent the caving in or collapsing of the basement walls. Drains also had to be introduced at the basement to prevent flooding anytime it rains. The introduction of the

basement in the project stalled the progress of the work as the contractor had to wait for new designs from the Architect in charge of the project. This caused a delay in the completion date of the project and the contractor therefore applied for an extension of time.

Regular visits were carried out by the engineer in–charge whose responsibilities were to advise, inspect and value work done for the contractor to be paid. However, health and safety was not a priority for this project due to the scope of work of the project according to the engineer in–charge. Regular site meetings were also carried as the Act 663 mandates. But from the minutes taken during the meetings, health and safety were never discussed. Best practice requires that there should be regular site meetings where H&S forms part of discussion. There was neither health and safety training nor inspection carried out.

STAGE SIX: CLOSURE AND EVALUATION (POST)

During the post evaluation stage of the project, final inspection of the project was carried out to check whether total work done conforms to specifications as stated in the tender document before it was finally handed to the end-users. Again, financial audits were carried out but no audit was done on health and safety.

At this stage, best practice indicates that the record of H&S during construction should be an issue to be addressed or looked at.

Table 4. 3 Summary of Findings from Case Study (Comparison of Case study findings against Best Practice)

	Stages of Procurement					
	Planning stage	**Design stage**	**Tender stage (invitation, tender and evaluation)**	**Contract stage**	**Construction stage**	**Post evaluation stage**
Best Practice (health and safety considerations)	• Scope the project • Identification of health and safety issues in the project. • Prepare a procurement plan.	Identify key risks from for potential response tenderers.	Health and safety as part of the requirement criteria for evaluating tenders	• Inclusion of health and safety clause • Clearly outlined H&S obligations of all parties involved. • Identification of Health and safety records of potential contractor • Identification of hazard prevention requirements. • Employee training and defining supervision	• Regular site meetings where H&S forms part of discussion. • Inspection and supervision to ensure compliance with H&S standards set. • Require regular health and safety report. • Carry out health and safety audits	Develop a health and safety evaluation report
Case study findings	No health and safety consideration were made. Focus was on budget and procurement plan preparation.	• Health and safety considerations were made for only the end-users of the building and not the workforce involved in the construction activity. • Potential contractors or tenderers were not involved in the design stage which is a typical feature of traditional procurement as design is split from construction.	• Health and safety did not form part of criteria for evaluating tenders. • Selection of contractor was based on lowest price, labour certificate, VAT certificate, SSNIT,MWWR certificate	• General clause in the conditions of contract placing all health and safety obligations on the contractor. • There was no employee training carried out with respect H&S.	• Regular site meetings were carried out in accordance with the Act 663 but health and safety did not form part of the discussion. • Inspections were carried out mainly for the purpose of inspecting work done. • There was no health and safety report.	Financial audits were carried out but no audit was done on health and safety.

4.5 LINK BETWEEN CASE STUDY FINDINGS AND INTERVIEW FINDINGS

This section seeks to link the case study to the findings from the interview. Observations that supports the findings from the interview are highlighted.

Observations made from the case study and interview findings reveal that, health and safety does not form part of the criteria for evaluating tenders in public works in Ghana.

Another link between the case study finding and the interview finding is the inclusion of health and safety clause in the contract. Findings from both methods reveal that, health and safety clauses in the contract was general and it placed all obligations on the contractor alone.

4.6 SUMMARY OF FINDINGS AND THEIR IMPLICATIONS

The aim of the study was to explore practical measures to improve construction health and safety through public works procurement in Ghana. The objectives were to outline the limitations of Act 663 with respect to construction health and safety management; outline practical measures to improve construction health and safety management at key stages of procurement, and to recommend specific provisions and /or amendments to the Act 663 to improve construction health and safety in Ghana.

The study was qualitative in nature and it used primary data. Data was collected using an in-depth interview guide and also through the use of case studies. Seven construction procurement professionals were selected from the public sector. The responses given by the respondents on the limitations of Act 663 in terms of construction health and safety was that, the Public Procurement Act, Act 663(2003) which provides guidelines for the procurement of public works in Ghana, has no provisions for health and safety. Some health and safety challenges in the procurement of works in Ghana identified in

the study are: low or lack of awareness of H&S laws, issues with implementation as the laws backing construction health and safety are inadequate, issues with training, monitoring and enforcement, and inadequate inspection. Research has revealed that many measures are needed to improve health and safety which include an appropriate legal framework, an effective inspectorate, training of workers etc. if these measures are put in place, procurement procedures and contract documents have the potential to remind parties to a contract of their obligations under the law. When these measures are lacking, as in the case of Ghana, an appropriate use of procurement procedures and contract documents have the potential to raise health and safety standards.

Some also argued that even before a law or rule or regulation is implemented, it should exist. In other words there should be specific or explicit rules, regulation or law to harmonise the problem caused by lack of H&S in procurement and construction. The findings also indicate that monitoring and enforcement of health and safety regulations is a challenge. The findings have implications on policy makers who need to amend the Act 663 to include health and safety provisions.

With the issue of integrating health safety into the key stages of procurement, the respondents gave various suggestions which have been simplified into a layout in figure 4.1 and figure 4.2. Figure 4.1 portrays a simplified layout of the functions and relationship between the stakeholders involved in the procurement process and how they will ensure construction health and safety. Figure 4.2 also portrays how H&S can be integrated into the various processes of procurement as discovered from the field survey.

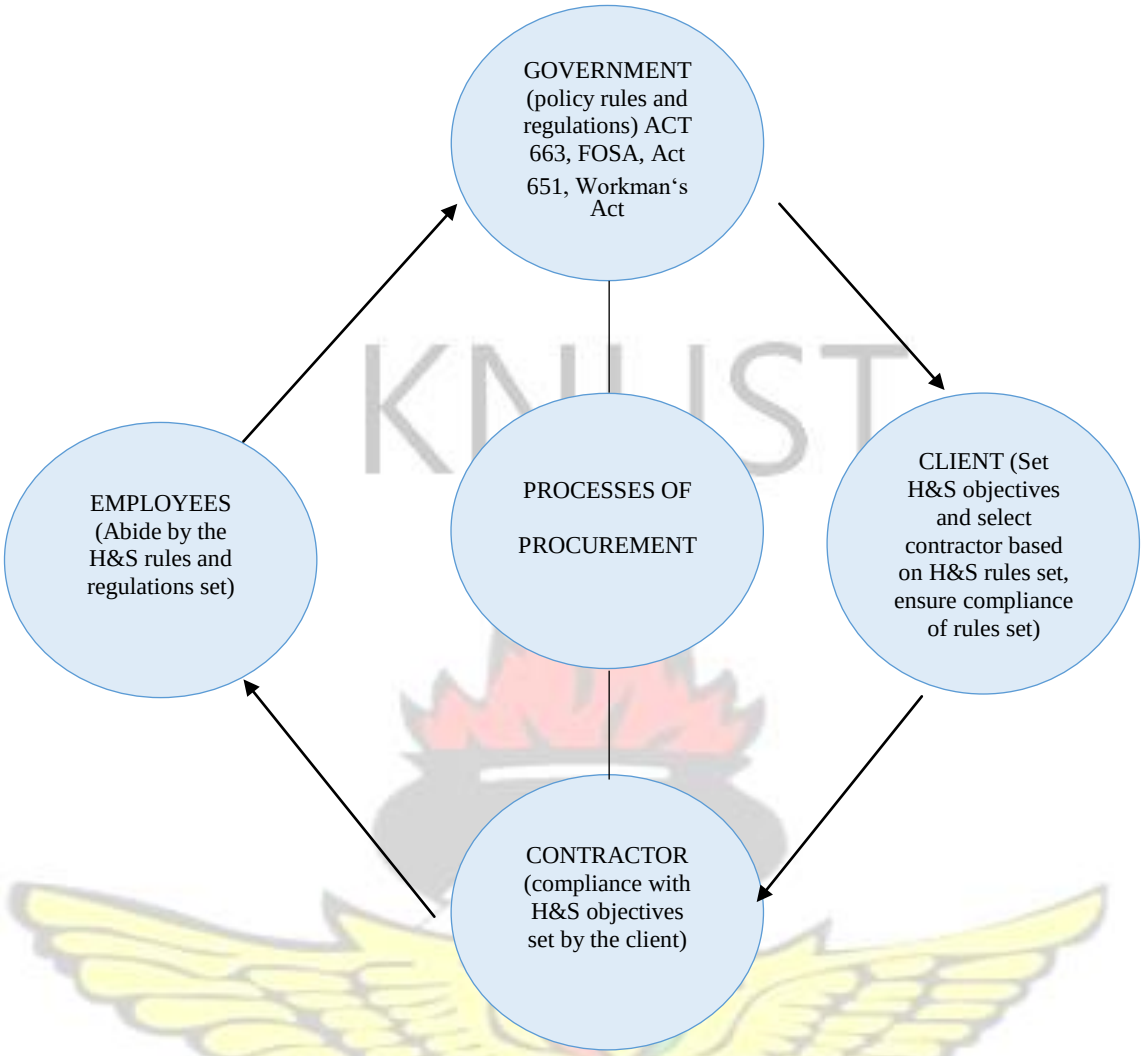

Figure 4.1: Role of Stakeholders in the procurement process in promoting construction H&S

Source: Author's construct

It is evident from figure 4.1 that, H&S is not the sole responsibility of only the client or contractor. It is the responsibility of all parties involved in the procurement process to ensure good H&S practices. Respondents suggested that, the role of the government is to provide the necessary legislation and also provide appropriate structures for monitoring and enforcement. They also suggested that, contractors and employees have the duty of adhering to whatever H&S rules that have been set. The client has the obligation of selecting a contractor who meets the H&S requirements that have been set to ensure good H&S practices.

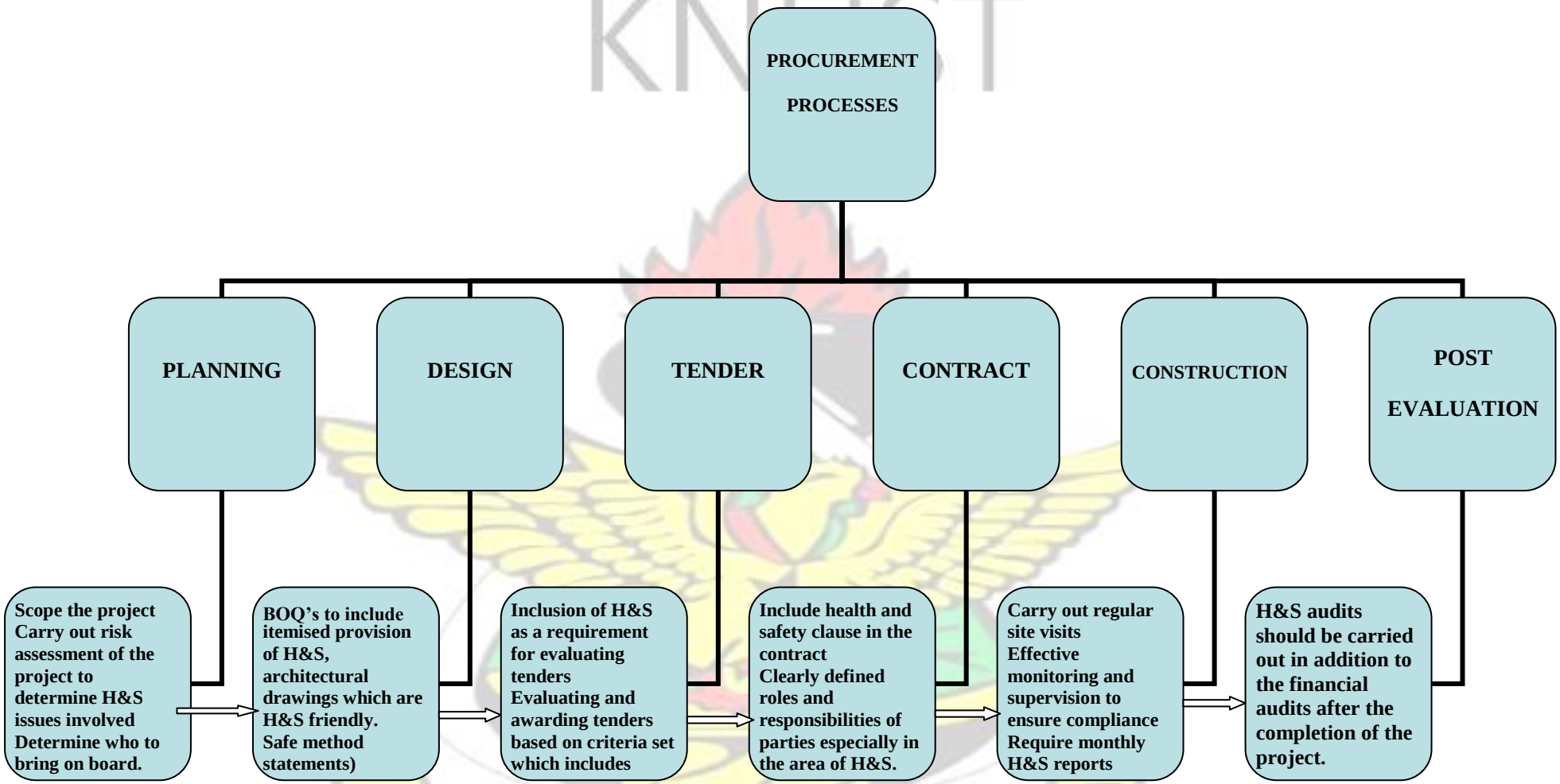

Figure 4. 2: Integrating Health and Safety into the various stages of procurement

Source: Author's construct.

In figure 4.2, the processes of procurement can be said to be mutually dependent on each other in that, what happens at the planning stage has ripple effect on all the other stages.

4.7 CONCLUSION

The findings indicate that there is a need to strengthen efforts to promote construction health and safety in the procurement of works. The Act 663 lacks portions on construction health and safety and needs to be amended to include a health and safety clause or provision in order health and safety mandatory.

The study also indicates that making rules and regulation relating to health and safety of workers is one step ahead of causing a positive change in the sector but it does not end there. Going further to implement it; that is making sure individual contractors and consultants strictly adhere to these rules and regulations will make much of a difference in ensuring health and safety of workers.

The laws alone cannot deal with the issue of health and safety as the spirit of the law may not always be followed. Effective collaboration between the stakeholders involved and the integration of health and safety procedures at every stage of procurement are likely to reduce construction injuries and ill-health in the country.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The general introduction to the study was covered in Chapter One. Chapter Two presented the review on literature. In Chapter Three, methodological issues were considered and appropriate research approaches were selected and justified. Chapter

four discussed the findings and analysis of data. This chapter presents the achievement of research objectives, conclusions and recommendations on the basis of the results from the study. The limitations of the study of have also been presented in this chapter to assist the reader appreciate the results from the study.

5.2 ACHIEVEMENTS OF RESEARCH OBJECTIVES

The aim of this research was to explore practical measures to improve construction H&S through public works procurement in Ghana. The study employed qualitative research designed to achieve its aim and involved a review of literature on procurement of works and health and safety, interviews of key informants and a case study of a project procured under the Act 663.

Objective one was achieved through an extensive review, interview and case study.

Table 5.1 presents a summary of how each objective was achieved in this research.

Table 5. 1 Methods of Achievement of Research Objectives

Objective	Details of Objective	Method of Achievement
1	To outline the limitations of Act 663 with respect to construction H&S management.	Review of Act 663 and other H&S legislation in Ghana. Use of interviews and case study.
2	To outline practical measures to improve construction H&S management at the key stages of works procurement.	Literature review of past research. Use of interview to explore practical ways of improving construction H&S through procurement.
3	To recommend specific provisions and/or amendments to the Act 663 to improve construction H&S in Ghana.	Recommendations are strictly based on the results obtained from the data analysis

5.2.1 Objective One

The first objective focused on outlining the limitations of Act 663 with respect to construction H&S management to determine the adequacy or otherwise of Act 663 in addressing H&S issues in public works procurement. This objective was achieved through an in-depth review of the Public Procurement Act, Act 663(2003). A review on Ghana's H&S legislation was carried out. Interviews involving various stakeholders in the industry were also conducted. A case study of a live project procured through Public Procurement Authority Guidelines to determine the processes and stakeholders involved, and the various considerations looked at especially with H&S in mind was also conducted. The details of the case study were presented in chapter four. The findings from the three methods revealed the following:

- That the Act was not explicit on the issue of H&S.
- Health and safety does not form part of the criteria for evaluating tenders.
- No health and safety audit is carried out before, during and after the project.

5.2.2 Objective Two

The second objective of the research was to outline practical measures to improve construction H&S management at the key stages of works procurement. Interviews were used as the main method of collecting data to achieve this objective. Seven (7) stakeholders were selected based on their expertise and knowledge and they came out with various ways of integrating H&S into the procurement process. The interviews also highlighted the various roles of the stakeholders involved in the procurement process in promoting H&S. Thematic matrix analysis was used in analysing the data. The findings revealed the following as practical ways of improving construction H&S management at the key stages of works procurement.

- At the planning and design stage, the scope of the project and also who to bring on board the project should be determined, and risk assessment also carried out. Findings of the risk assessment must then be entered into a risk register. This register must be updated frequently during the project. A health and safety plan is then developed to curb risks with responsibilities of each stakeholder clearly allocated. That is, H&S items must be priced and captured under the preliminary section of the bills of quantities. Designs should be H&S friendly (buildable, operatable and easily maintained), and there should be a requisition of safe method statements to guide the project.
- At the tendering stage, H&S should be included as a requirement for evaluating tenders. Evaluating and awarding tenders should be based on criteria set which includes H&S. This can be done by examining the H&S records and past performance of eligible tenderers on previous projects.
- Include health and safety clause in the contract. Clearly defined roles and responsibilities of parties involved in the project especially in the area of H&S at the contract stage.
- Carrying out regular site visits, effective monitoring and supervision to ensure compliance and requisition of monthly health and safety reports should be done at the construction stage.
- The findings also revealed that, at the post evaluation stage H&s audits should be carried out in addition to the financial audits after the completion of the project.

5.2.3 Objective Three

The third objective also aimed at recommending specific provisions and/or amendments to the Act 663 to improve construction H&S in Ghana. The amendments which can be found in section 5.4 of the study were suggested based on the findings from the study.

5.3 IMPLICATIONS OF THE STUDY

The research report has had implication for both industry and practice.

5.3.1 Theory

There have been a number of research works on promoting H&S in the Ghanaian construction industry but the use of procurement in promoting H&S has received little attention in the country. Available research also dwells on H&S practices on sites alone but it is important to view H&S management from the inception of a project to its completion.

This research contributes to the body of knowledge by outlining practical measures to improve construction H&S management at the key stages of works procurement and also bringing out the limitations of the Act 663 in addressing issues of construction H&S in Ghana which has not been addressed in other studies.

5.3.2 Industry and Practice

One of the key objectives of this research was to outline practical measures to improve construction H&S management at the key stages of works procurement. The research gives the industry, more specifically the public to look at their current H&S practice in the procurement of works and structure them to enhance the integration of H&S into their procurement practices. The research provides industry with a simplistic and yet,

practical way of improving construction H&S management through procurement by outlining the various stages of procurement and how H&S can be embedded in each stage and the roles of the stakeholders.

5.4 RECOMMENDATIONS

Based on the review of literature and findings from the study, the following key recommendations are made to improving the Act.

- Since there is an on-going review of the Act 663, the drafters should also consider H&S issues as part of the requirements for evaluating tenders.
- The PPA has standard tender documents (STDs) for goods, consultancy services and works. There is therefore the need to incorporate H&S into these documents to be used by every institution. Items on health and safety should be included in the preliminary section of a priced bill of quantities.

Other recommendations for the effective integration of health and safety into the procurement process are:

- Government can set up an office at the various Metropolitan, Municipal and Districts Assemblies for H&S with highly skilled and competent personnel who will engage in training, monitoring and enforcement of provisions for projects.
- Encourage potential contractor‘s participation in the design process to bring their expertise to bear on a project.
- Developing communication tools and channels to enhance effective collaboration between the different parties or stakeholders involved in the construction process.

- Responsibilities and roles of parties involved in the project should be clearly defined especially in the area of health and safety.
- The GhIS, GIA, GhIE, who form the professional body in construction in Ghana must champion the discipline of construction H&S in Ghana on sustained basis by providing training on H&S and certification of construction professional, and the establishment of codes of practice.
- The Department of Labour and the Department of Factories Inspectorate must be equipped with the needed resources to strengthen monitoring and enforcement of H&S laws.

5.5 LIMITATIONS

There were problems encountered in the course of conducting the study at the fieldwork phase, which posed serious constraints to the execution of the study. Meeting with respondents involved some protocols in setting up appointments and being granted authority to conduct them, which was in the first place time unbearable.

This prevented the researcher from involving a large number of informants during the data collection phase.

5.6 CONCLUSION

The overriding importance of human life and health suggests that any project which is completed in accordance to its cost, quality and time objectives, but fails to fully ensure the health and safety of the people associated should probably be regarded as a failure (Honu *et al*., 2013). Literature review clearly reveal that procurement is an important tool that can be used in achieving social objectives, in this case health and safety, as it occurs at the early stage of a project. Therefore, a successful integration of health and safety in public works procurement is of benefit to the government, client, contractor

and employees (workforce). It will help minimize construction accidents, give a clean health and safety record to the contractor which grants him the chance to win future projects (enhancement of corporate's image), and also saves on cost. The nation as a whole save on cost since as an accident free site will help minimize the payment of compensations.

5.7 FURTHER WORK

A follow up study into the private sector of Ghana's construction industry is proposed which will adopt a similar a similar methodological approach with the hope of generating results that are comparable to findings presented in this study. Comprehensive recommendations can thus be made for the private sector of the country in relation to the integration of H&S practices as requirements for the procurement of construction works.

REFERENCE

Aboagye-Nimo, E. (2014). Investigating Good Health and Safety Practices of Small Construction Firms in the East Midlands, Ph.D. diss., Nottingham Trent University,UK.

Affotey-Walters, T. (2007). Public Procurement Act: Policies, Processes and Procedures and Inventory Management. Health Administrators Workshop, Kumasi.

African Economic Outlook Report (2012).

African Economic Outlook Report (2013).

Agbodjah, L.S. (2008). A human resource management policy development framework for large construction companies operating in Ghana, Ph.D. diss., Kwame Nkrumah University of Science and Technology, Kumasi

Ahadzie, D.K., (2007). ―A model for predicting the performance of project managers in mass house building projects in Ghana,‖ Ph.D. diss., University of Wolverhampton, Wolverhampton

Ahadzie, D. K.(Dr.), (2009). Ghana in need of construction industry Development Agenda. [Accessed 20 september 2013].Available at: www.ghanaweb.com/ GhanaHomePage/NewsArchive/artikel.php?ID=170462

Akorsu, A. D. (PhD), 2013. Labour Standards Application along Value Chains in Ghana: Reality Check and Policy Option Economics and Management of Networks Conference, Robinson Hotel and University Ibn Zohr Agadir, Morocco (http://emnet.univie.ac.at/)

Ameyaw, C., Mensah, S. & Osei-Tutu, E., (2012). Public Procurement in Ghana:The implementation Challenges to the Public Procurement Law 2003(Act 663). International Journal of Construction Supply Chain Mnagement, 2 November, Volume 2, pp. 55-56.

Amoah, P., Ahadzie, D. K. & Dansoh, A., (2011). The Factors Affecting Construction Performance In Ghana:The Perspective Of Small-scale Building Contractors. Surveyor Journal, 4 No. 1(2), pp. 41-48.

Amponsah-Tawiah, K. P. & Dartey-Baah, K. P., (2012). Occupational Health and Safety: Key Issues and Concerns in Ghana. International Journal of Business and Social Science, Volume Vol. 2 No. 14, p. 119.

Anvuur, A., Kumaraswamy, M. & Male, S., (2006). Taking Forward Public Procurement Reforms in Ghana. Santiago-Chile, CIB W107 Construction in Developing Countries International Symposium,―Construction in Developing Economies: New Issues and Challenges‖.

Ashiboe-Mensah, N.A (2012). Photovoltaic Adoption in the Ghanaian Building Industry: Perceptions and Relational Dynamics of Innovation Adoption Decision Factors. Ph.D. diss., Kwame Nkrumah University of Science and Technology, Kumasi.

Avison, D.E. and Fitzgerald. G. (1995), Information systems development: methodologies, techniques and tools. London: McGraw-Hill.

Ayarkwa J., Ayirebi-Dansoh, Amoah P., (2010). Barriers to Implementation of EMS in Construction Industry in Ghana, International Journal Of Engineering Science, Vol. 2,No.4

Baiden, B.K. (2006). Framework for the integration of the project delivery team, Ph.D. diss., Loughborough University, Loughborough

Becker, H. S. (1958). Problems of inference and proof in participant observation. American Sociological Review, 23, 652–660.

Boakye, N.A., Fugar, F.D.K & Akomah, B.B. (2010). Ensuring the health and safety of Ghanaian construction workers by decentralised government agencies: an exploratory study In: Laryea, S., Leiringer, R. and Hughes, W. (Eds) Procs West Africa Built Environment Research (WABER) Conference, 27-28 July 2010, Accra, Ghana, 295-304.

Brammer, S., & Walker, H. (2007). Sustainable procurement practice in the public sector: An international comparative study. University of Bath School of Management Working Paper Series

Braun, V. and Clarke, V., (2006) Using thematic analysis in psychology Qualitative Research in Psychology, 3 (2). Pp. 77-101 retrieved 20th May 2014; http://www.informaworld.com/smpp/content—db=all‖content=a795127197‖frm=titlelink

Bruce, T.F., (2009). Occupational Safety and Health in Ghana Available at: http://www.ghanabusinesscode.com/downloads/presentations/occupational_safety_and_health_inghana%5b1%5d%5b1%5d.ppt (accessed on 20th January 2014)

Bryman, A. (2004). Social research methods, 2nd edn.Oxford: Oxford University Press

Bryman, A. and Bell, E. (2007). Business research method (2nd edn). Oxford: Oxford University Press.

Castillo, J. J. (2009). Research Population http://www.experiment-resources.com Date Accessed: 25th March, 2014

CCG Health and Safety Working Group, (2007). Good Practices For Clients To Follow When Procuring Construction Work. Part of CCG's suite of information sheets for businesses that procure construction work Available at:http:// www.constructingexcellence.org.uk/sectorforums/constructionclients group

Charles, M., Pillay, J. & Ryan, R., (2007). Guide to Best Practice for Safer Construction: Literature Review, From Concept to completion. Icon.Net Pty Ltd

Choi, N.Y.T., Chan, D.W.M & Chan, A.P.C., (2011). Perceived benefits of applying Pay for Safety Scheme (PFSS) in construction – A factor analysis approach. Safety Science (Final Accepted Manuscript), Volume 49, Issue 6, Pages 813-823

Christou, E., Valachis, I. and Anastasiadou, C. (2008) Research Methodology in Hospitality Industry: The role of the Inquiry Paradigm. Available on: [http://www.ul.edu.lb/fthm/papers/3rd%20Axis/Methodology%20greece.doc] Accessed on [08/04/2014}

Clarke, E.,(2005). Do occupational health services really exist in Ghana?A special focus on the agricultural and informal sectors, Accra: Ghana Health Services.

Clewett J. (2008), Workplace Health and Safety.

Http://clewett.net.au/whs/index/html/lesson3 (Accessed: 1st February 2014)

Construction Design Manual 2007.Available at: http://www.cdm-regualationsuk.co.uk

CPWR (The Center for Construction Research and Training) Symposium Report, (2012). Best Practices for Health and Safety Technology Transfer in Construction.

Creswell, J.W. (2007). Qualitative inquiry and research design: Choosing among five approaches (2nd edn). London: Sage Publications Limited

Crown Agents (1998). ―The World Bank's Procurement Adult in Ghana. Value for Money Audit Report for Ghana‖, Crown Agents for Overseas Government and Administration Ltd., UK.

Danso, F. O. (2005). Improving Safety on Building Construction Site On KNUST Campus In Kumasi Ghana, Unpublished BSc Thesis, Faculty Of Architecture And Building Technology, KNUST, Kumasi, Ghana

Danso, F.O. (2010). Occupational Health and Safety Issues Involving Casual Workers on Building Construction Sites in Ghana, A Kumasi Study. MSc Thesis, Faculty of Architecture And Building Technology, KNUST, Kumasi, Ghana

Dza, M., Fisher, R. and Gapp, R., (2013). Procurement Reforms in Africa: The Strides, Challenges, and Improvement Opportunities. Canadian Center of Science and Education Vol. 2, No. 2; 2013 ISSN 1927-517x E-ISSN 1927-5188

Easterby-Smith, M., Thorpe, R., and Jackson, P.R. (2008) Management Research (3rd edn). London: Sage Publications.

Egmond, E. & Erkelens, P. (2007). Technology and Knowledge Transfer for Capacity Building in the Ghanaian Construction Building, CIB World Building Congress, CIB2007-137.

Factories, Offices and Shops Act, ACT 328, 1970

Fadhley, S.A., (1991). ―A Study of Project Finance Banking with Special reference to the Determinants of Investment Strategy‖, Unpublished Doctoral Theses, submitted to the Loughborough University.

Fellows, R. and Liu, A. (2008) Research methods for construction (3rd edn). Chichester: Wiley-Blackwell.

Fernau, J., (2011). Learning Legacy Lessons learned from the London 2012 Games construction project , London: Olympic Development Authority.

Fitzgerald, B. and Howcroft, D. (1998). "Towards dissolution of the IS research debates: from polarisation to polarity". Journal of Information Technology, vol.13 (4), pp. 313-326.

Fugar, F.D.K. (2009). Fundamental of Human Resource Management, Lecture Notes, Project Resource Management-Human Resource (BT553), Faculty of Architecture and Building Technology, KNUST, Kumasi, Ghana

Gershon, P. (1999). Review of Civil Procurement in Central Government. Office of Government Commerce

Ghana Integrity Initiative, Quarterly Newsletter, Issue Number 23 - December, 2007 - ISSN: 0855 - 742X

Ghana National Commision for UNESCO, (n.d). Construction, A Lucrative Area waiting to be fully exploited. [Online] Available at: http://www.natcomreport.com/ ghana/ livre/ construction[Accessed 17 December 2013].

Government of Australia (2006). Guidance on Occupational Health and Safety in Government Procurement.

Gyadu-Asiedu, W., (2009). Assessing Construction Project Performance in Ghana: Modelling Practitioners' and Clients' Perspectives. [Online]. Available at: http://alexandria.tue.nl/extra2/200613246.pdf[Accessed 5th January 2014].

Hare, B., Cameron, I. & Duff, A.R (2006). Exploring the integration of health and safety with pre-construction planning. Engineering, Construction and Architectural Management, Vol. 13 No. 5, 2006 pp. 438-450. Emerald Group Publishing Limited.

Haywood, G., (2004). Achieving Excellence in Construction Procurement. European Agency for Safety and Health at work:Actions to improve health and safety in the construction industry. Luxembourg: Office for Official Publications of the European Communities.

Health and Safety Executives, (2013). The Health and Safety Executives Statistics 2012/13. Available at: *www.hse.gov.uk/statistics/about*

Hislop, R. D., (1999). Construction Site Safety: A guide for managing contractors. illustrated ed. Taylor & Francis Group.

Holt, A. 2001. Principles of Construction Safety. Blackwell Science: Great Britain.

Hong Kong Labour Department. 2004. Occupational Safety and Health.

Honu, M., Laryea, S. & Smallwood, J., (2013). Conceptual model for integrating health and safety into construction procurement in Ghana. Accra, Ghana., Procs 5th West WABER conference.

HSE (2014). Health and Safety Annual statistics 2012/2013 Report for Great Britain. Available at: http://www.hse.gov.uk/STATISTICS/enforcement.htm

Hughes, P. & Ferrett, E., (2007). Introduction to Health and Safety at Work. Third ed. Elsevier Limited.

Hussey, J. and Hussey, R. (1997) Business research: A practical guide for undergraduate and postgraduate students. Basingstoke: Macmillan.

International Labour Organization, (2013). Safety and health at work. [Online] Available at: www.ilo.org/global/topics/safety-and-health-at-work/long-en/index.htm [Accessed 12th September 2013].

International Labour Organization, (2003). Safety in Numbers; Pointers for Global safety at work. ILO publications, Geneva

International Labour Organization (2014). Your Health and safety at work: Introduction to Occupational Health and Safety.

Available at: http*://actrav.itcilo.org/actrav-english/telearn/osh/intro/inmain.htm* Accessed on 20th May, 2014

Katsoulakos, T. & Katsoulacos, Y., (2007). Integrating corporate responsibility principles and stakeholder approaches into mainstream strategy. A stakeholder-oriented and integrative strategic management framework. Corporate Governance, p. 7(4) 355–69

Kartam, N., I. Flood and P. Koushki. 2000. Construction Safety in Kuwait: Issues, Procedures, Problems and Recommendations. Safety Science. 36 (3): 163-184.

Kheni, A. N. (2008), Impact Of Health And Safety Management On Safety Performance Of Small And Medium-Sized Construction Businesses In Ghana, Submitted To Loughborough's Institutional Repository. (Http://Magpie.Lboro.Ac.Uk:8080/DspaceJspui/Bitstream/2134/4079/3/Kheni%27s%20phd.Pdf) Accessed On 30th January 2014

Kheni, N. A., Dainty, A. R. & Gibb, A. G., (2008). Health and safety management in developing countries: a study of construction SME's in Ghana, Construction

Management and Economics E. pp. 26(11), 1159-1169.

Kheni, N. A., Gibb, A. G. & Dainty, A. R., (2010). Health and Safety Management Within Small- and Medium Sized EnterpriseS (SMEs) in Developing Countries: Study of Contextual Influences. ASCE Journal of Construction Engineering and management, 136(10), pp. 1104-1115.

Knight, L., Harland, C., Telgen, J. & Caldwell, N. (2007). Public Procurement: An Introduction. Taylor and Francis Group

Kvale S. (1996). Interviews: An Introduction to Qualitative Research Interviewing Sage Publications, Thousand Oaks California

Kwakye, A.A., (1997). Construction Project Administration in Practice. Longman Labour Act 2003, Act 651

Laryea, S. & Mensah, S., (2010). Health and safety on construction sites in Ghana. Dauphine Université, Paris, COBRA (The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors).

Lingard, H. & Rowlinson, S., (2005). Occupational Health and Safety in Construction. ISBN 0 419 26210 5 ed. :Spon Press.

Lionjanga, A. V. (2003). Presentation to the Joint WTO-World Bank Regional Workshop on Procurement Reforms and Transparency in Public Procurement for Anglophone African Countries 14-17 January 2003. Dar Es Salaam.

Mahmood, S.A.I. (2010). Public Procurement and Corruption in Bangladesh. Confronting the Challenges and Opportunities: Journal of public administration and policy research, 2(6), 103-111: University of Maine, Orono.

Marczyk, G., DeMatteo, D. and Festinger, D. (2005), Essentials of Research Design and Methodology, John Wiley and Sons, New Jersey.

Masterman, J. W. E., (2002). An introduction to building procurement systems, E &

FN Spon, London.

Maxwell, J.A. (2005).Qualitative Research Design: An Interactive Approach. Copyright by SAGE.

Merriam, S. B. (1998). Qualitative research and case study applications in education. San Francisco: Jossey-Bass.

Miller, D. (1983), Handbook of Research Design and Social Measurement, 4th ed. London: Longman.

Mock, C., Adjei, S., Acheampong, F., & Simpson, K. (2005). Occupational Injuries in Ghana. International Journal of Occupational Environmental Health, 11, 238−245.

MoESW, Ministry of Employment and Social Welfare (2011). Vision, Mission and Objectives of Department of Factories Inspectorate. http://www.lmisghana.org.gh/index.php?option=com_content&view=article&id=106&Itemid=116 (accessed 3rd March 2014)

Moran, D.J & Tai, W. (2001). Reducing Biases in Clinical In Clinical Judgment with Single Subject Treatment Design, The Behaviour Analyst Today.2 (3), 196-206

Musanzikwa, M. (2013). Public Procurement System Challenges in Developing Countries: the Case of Zimbabwe, International Journal of Economics, Finance and Management Sciences. Vol. 1, No. 2, 2013, pp. 119-127.

National Labour Department (2010)

Nexus G., (2013). Nexus Ghana. [Online] Available at:http://www.commonwealthofnations.org/sectorsghana/business/construction_and_engineering/ [Accessed 22 Decmber 2013].

Neuman, L. (2003). Social Research methods: qualitative and quantitative approaches, Boston: Pearson Education, Inc.

Office of Government Commerce, 2008. An Introduction to Procurement

Ofori, G., (2012). Developing the Construction Industry in Ghana: the case for a central agency

Osei-Tutu, E., Mensah, S. & Ameyaw, C., (2011). The level of compliance with the Public Procurement Act (Act 663) in Ghana. Amsterdam, The Netherlands, Management and Innovation for a Suitable Built Environment.

Otieno (2004). Procurement activities in public institutions. Unpublished thesis. Jomo Kenyatta University of Science and Technology, Kenya

Patton, M. Q. (2002). Qualitative research and evaluation methods (3rd ed.).Thousand Oaks, CA: Sage.

Polit, D. & Beck, C. (2004) Nursing Research (7th ed) Philadelphia: Lippincott

Public Procurement Act, Act 663, 2003

Public Procurement Act, Act 663, 2003 Manual

Reese, C. D., & Eidons, J. V. (2006). Handbook of OSHA construction health and safety (2nd ed.). Boca Raton , FL: CRC Press,Taylor and Francis Group

Saunders, M., Lewis, P. and Thornhill, A. (2007). Research methods for business students (4th edn) London: Prentice Hall

SECBE (n.d.). An Introductory Guide to Best Practice in Construction.Available at: www.secbe.org.uk

Sengupta, B. and Guha, H., (2002). Construction management and planning, Tata McGraw-Hill Publishing Co.

Shaw, F.N. (2010). The Power to Procure: A Look inside the City of Austin Procurement Program, Applied Research Projects, Texas State University

Shah, S.K. and Corley, K.G. (2006). "Building Better Theory by Bridging the

Quantitative-Qualitative Divide," Journal of Management Studies (48:3),pp. 1821-1835.

Thai, K. V., (2001). Public Procurement Re-Examined. Journal Of Public Procurement, 1(1), pp. 9-50.

The Government of Australia, (2010). Health and safety in construction procurement. A handbook for the public sector. Edition 1.

Tookey, J., Murray, M., Hardcastle, C. & Langford, D. (2001). Construction Procurement Routes: Re-Defining the Contours of Construction Procurement. Engineering, Construction and Architectural Management. 8 (1): 20-30

Waters, D. 2004. Introduction To Supply Chain Management, (2rd Edition), Pal grave Macmillan, London.

Watermeyer, R., Jacquet, A. & Pautz, M., (2003). Public construction procurement in a global economy. Singapore, Knowledge Construction Joint International Symposium of CIB Working Commissions.

Wells, J. D. & Hawkins, J.,(2011). Promoting Construction health and safety through procurement: A briefing note for developing countries. Proceedings of the ICE-Management,Procurement and Law, pp. 1-12.

Westring, G., (1997). Ghana Public Procurement Reform. An Audit Report prepared for the World Bank,Stockholm: Advokatfirman Cederquist KB.

WHO, (1986). Constitution: Basic documents. Geneva

Woolcock, S. (2008). Public Procurement and the Economic Partnership Agreements: assessing the potential impact on ACP procurement policies Commonwealth Secretariat.

World Bank. (2003). Ghana 2003 Country Procurement Assessment Report, Washington, DC: Ghana Country Department, The World Bank.

World Bank. (2004). Uganda Country Procurement Assessment Report Vol. II Main Findings and Recommendations. Operational Quality and Knowledge services, African Region.

Yin, R.K., (2009). Case study research: Design and methods. 4th Ed. Sage Publications, London

Yin, R.K., (2003). Case study research: design and methods, 3rd edn. Thousand Oaks, California: Sage Publications, Inc.

APPENDICES

APPENDIX 1

LETTER FOR THE STUDY

20th April, 2014

Dear Sir

SURVEY ON EXPLORING THE INTEGRATION OF HEALTH AND SAFETY WITH PUBLIC WORKS PROCUREMENT IN GHANA

I am a student of Kwame Nkrumah University of Science and Technology currently pursuing an MPhil in Procurement Management at the Department of Building Technology. As part of the requirements in obtaining an MPhil, I am undertaking a research on the topic, An **Exploratory study into promoting construction health and safety in Ghana through public works procurement.** This is an on-going research under the supervision of Dr. Emmanuel Adinyira.

Studies have shown that procurement can further inhibit or promote good occupational health and safety practice as it occurs at the initial stage of a project. Procurement has been found to be a tool that can help to promote social objectives and policies. The purpose of the study is therefore to explore how to integrate health and safety into the public work procurement process.

Due to your knowledge and experience on this matter, I am requesting for an interview which will take about 30-45mins of your time. In conducting the interview, the response of the interviewee will be recorded. However anonymity and confidentiality is promised.

I am attaching a list of themes so you have foreknowledge on the questions that will be asked during the interview. I can be very flexible with my schedule to match your availability. My contact information is on the letterhead in case you have any questions. I look forward to hearing from you and to meeting in person soon.

Should have you any queries or concerns, please contact any of the following: Dorothy Donkoh (ojaysdonkoh@yahoo.com, Tel: 0242339856) and Dr. Emmanuel Adinyira (eadinyira.feds@knust.edu.gh, Tel: 0246753214).

Accept our appreciation for your contribution to this research.

Sincerely,

Dorothy Donkoh

APPENDIX 2

INTERVIEW GUIDE

DEPARTMENT OF BUILDING TECHNOLOGY

FACULTY OF ARCHITECTURE AND BUILDING TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING KWAME NKRUMAH

UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

i. What is the nature of the construction industry in terms of the working environment (how dangerous is the construction industry?)
ii. Comment on the general adequacy of the country's laws on H&S in the procurement of works?
iii. What health and safety standards are set by your procuring organisation?
iv. Is health and safety a consideration in works contractor selection?
v. How have health and safety issues been managed in the procurement of works?
vi. What are the specific H&S concerns with the various procurement methods for works? vii. What specific challenges do you see with H&S on works procured under the PPA Act 663?
viii. Does the Public Procurement Act address health and safety issues in the procurement of works? How?
ix. What specific addition will you recommend for the Act 663 to address issues of H&S in the procurement of works?
x. What challenges do you see with the implementation of existing H&S provisions in our procurement law?
xi. What can be done to strengthen the implementation of existing/future H&S provision in our works procurement laws?
xii. Are there any imperatives to the introduction of health and safety considerations in the PPA Act 663?
xiii. What obligations do the various stakeholders involved in the procurement process carry in dealing with the issues of construction health and safety? (The government, contractors, clients, employees etc.)
xiv. How can health and safety be integrated into the procurement process specifically in terms of planning, design, tender, contract, construction and evaluation of projects?
xv. What are the success factors for integrating H&S into the procurement of works?