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A FRAMEWORK FOR DEVELOPING CONSTRUCTION HEALTH AND SAFETY POLICIES IN GHANA

BY

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DECLARATION

I, Kwadwo Bio Asare declare that, this thesis has not been previously submitted in any form to any University or to any other body whether for the purpose of assessment, publication or for any other purpose. And that this submission is my own work towards the MPhil. Construction Management. To the best of my knowledge, I confirm that except where due acknowledgment has been made in the text; the original works is as a result of my efforts under supervision.

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I declare that I have supervised the student in undertaking the research reported herein and I confirm that the student has effected all corrections suggested.

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I confirm that the student has duly effected all corrections suggested by the examiners in conformity of the Department requirements.

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ABSTRACT

Health and safety (H&S) has become the fourth arm of project management aside project scope, time and cost. In countries where H&S management has been advanced, projects with high risks have been managed and completed with minimal harm to the employees and affected people. Management tools and skills have been development around the subject quite extensively in developed countries like UK. However, the same cannot be said about developing countries like Ghana, where H&S seems to have been left into the hands of the employees. This accession has been confirmed by previous research on H&S of the construction worker in Ghana. Standards such are ILO-ISO-2001, HSG65 and OHSAS 18001:2007 have been around for use by employers. The above mentioned guidelines require first of importance, an H&S policy at work to deal with work related hazards; allocating responsibility of H&S to the employers. The aim of this study was therefore to look into health and safety policies in the construction industry and to propose a theoretical framework for developing H&S policies. The objectives include; to find out the quality of H&S policies (if they exist) in construction companies in Ghana , the factors which affect the development and implementation of the policies and to develop a framework to aid companies in developing quality implementable H&S policies. Extensive literature was reviewed on the various causes and effects of accidents, the H&S management principles or guidelines and factors affecting policy development and implementation. The philosophy for the study was positivism which led to the selection of quantitative approach. Survey technique was employed to inquire into the research questions. In all, 73 structured questionnaires were sent out to the respondents (D1K1 and D2K2 contractors were the main target population) and 51 were filled, returned and included in the analysis. The statistical techniques employed in the analysis of the results included mean score, percentiles and factor analysis. The study showed that policies are joined-up and are managed well. However, policy process does not include all stakeholders during development; communication is bad and there is no room for creativity and innovation in the kind of policies which are available in the construction industry. It further shows that, the policies do not really give cognisance to evidence and legal requirement, the resources are not available and evaluation of existing policies are non-existent. The overall quality of available H&S policies is bad. The research identified stakeholder participation and awareness, policy alignment, legal consultation, cost, culture, administration, client knowledge and expertise as the main factors that affect policy development in the industry. The major attributes that were identified after factor analysis as elements affecting H&S implementation in the industry included; skilled personnel, communication mechanism and

resources, policy consistency, stakeholder involvement, trade union activities, organisational priorities and administration. Based on the above findings coupled with industry best practices for policy development a framework was developed.

Key Words

Occupational Health and Safety, Policy, Formulation, Implementation, Quality, Construction Industry, Ghana

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DEDICATION

This work is dedicated to my wife (Yvonne), parents (Franklin and Veronica) and to all companies who have the H&S of their employees at heart

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ABBREVIATION

ABCECG	- Association of Building and Civil Engineering Contractors of Ghana
GDP	- Gross Domestic Product
GBC	- Ghana Broadcasting Cooperation
GoG	- Government of Ghana
HSA	- Health and Safety Authority
HSE	- Health and Safety Executive
HSG	- Managing for Health and Safety
H&S	- Health and Safety
ILO	- International Labour Organisation
L.I	- Legislative Instrument
MSI	- Musculoskeletal Injury
NIOSH	- National Institute for Occupational Safety and Health
OHSAS	- Occupational Health and Safety Assessment Series
OSHA	- Occupational Safety and Health Administration
OSH/OH&S	- Occupational Health and Safety
PPE	- Personal Protective Equipment

PEEP	- People, Equipment, Environment and Procedure
UK	- United Kingdom
USA	- United States of America
UN	- United Nation

CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND

The importance of the Ghanaian construction industry cannot be over emphasised. Ghana has recently attained a lower middle income country status per the World Bank Report in 2012 and there is a strong indication that this achievement has been made possible on the contributions of the construction industry. In 2009, the growth of Ghana's Economy was estimated to have slowed to 4.7% from 7.3% in 2008. It was realised that what actually helped in maintaining some sort of decency in the growth was the pick-up of construction and harbour activities in the last quarter (Mhango, 2010). In 2011, construction was found to be the second highest contributor to Ghana's GDP after services as indicated in the Vice President's speech read at the first National Building and Civil Contractor's Excellence Award in Accra (GBC, 2012). The industry is also linked with other manufacturing and service providers. This is obvious as products from the above goods and service providers are used on a daily basis on construction sites.

Construction is a high risk activity. According to a 2013 report by Health and Safety Executive (HSE), UK, the construction industry employs only about 5% of the total work force in the country but 27% of very serious (fatal) injuries comes from construction site and it accounts for 10% of major reportable injuries in UK. Due to the increase in constructions activities across the country, health and safety risks are likely to increase. There have been reported fatal accidents on constructions sites in Kumasi. Example is the case involving three kids who drowned in a pond of water during the Sofoline inter change construction on 18th Feb 2012 (Ghanaweb, 2012). This fatal accident was attributed to the fact that there were no signs and barricades to warn off the general public. Occupational Health and Safety (OH&S) has become a very crucial part of construction. It has an effect

on all stages of the project; from initiation stage to the handing over and even beyond, therefore the constraints it brings need to be assessed and managed properly for a successful project (Aiofe and Alistaar, 2013). The duty for making sure that there is proper work health and safety administration on site lies on the client and the contractor and enforcement of such safety polices rest on the shoulders of the government agencies and trade associations responsible for the construction industry (Chiocha et al., 2011). But it must be a collective effort, the client has the responsibility for ensuring that there is adequate planning for health and safety included in construction contracts for which they engage the various stakeholders. The management and monitoring of these plans rest on the client or his representative. The designer must ensure that the specifications and/ or design parameters are quite safe to construct. It is also the duty of the principal contractor for the construction to ensure that the methodologies and technologies adopted for the construction works are not injurious to the worker and the end users.

However, welfare facilities such as safety first aid appliance, good drinking water, sanitation amenities and other work facilities such as personal protective equipment (PPE) and training are not provided for by employers (Danso, 2012). This coupled with the need by workers to meet their basic needs as retorted by Kheni (2008) makes workers to take on activities which are not safe and healthy. Chiocha et al. (2011) discovered that, the level of health and safety awareness and implementation among role players and their employees are low in developing countries. It was their opinion that top management lack commitment to H&S. The question is, are there any clear cut policies in these countries to guide these individuals? Even though legislation or policies have been said not to be enough for achieving a culture of OHS on construction site, it is a good place to start from since it gives directions as to what to do at any point (Haupt, 2001). According to Construction Safety Council, US (2012), a lot of people are exposed to health hazards in the construction industry. These hazards range from chemical (gases, dusts, fumes, mist etc.) to physical (temperature, noise,

repetitive motion etc.) to biological (which includes fungi, poisonous plants and animals etc.), some of which are contagious and hence people end up infecting their families. It was also said that, most health hazards begin manifestation well after the construction activities are completed and can last a life time of the host.

Company Policy is a set of documents that state the broad guidelines/principles which influences a company's objectives, operations and plan; formulated after a thorough analysis of all internal and external factors (risk or opportunities) which affects the company. Policies are normally a company's way of responding to known and knowable circumstances (BusinessDictionary, 2015). It is used to direct every decision around every situation.

1.2 PROBLEM STATEMENT

With increase in the number of construction activities due to the economic changes in Ghana, it is essential that the health and safety of the construction worker and end users of the facilities are considered. A general look at the industry seems to portray a gap in safety consciousness/awareness in the sector hence the need to identify the source of the problem and try to rectify it. According to Kheni et al. (2010), literatures on H&S in developing countries have identified administration as one of the lapses. The rate of accidents leading to injuries, ill health and deaths due to construction activities are alarming and there is the need to take a critical look at this so as to formulate practicable policies to manage H&S on construction sites.

Even though, some works have been done on H&S in the construction industry (Danso et al., 2012 and Laryea, 2010), company's controls and commitments in terms of H&S policies have not really been looked at. The questions are; how committed are these companies to ensuring that projects are safe and healthy? What H&S planning/objectives have been set and communicated by these companies? Do controls exist to confirm the achievement of these objectives? Again, inadequate health and safety management leads to litigations and

claims which are likely to affect the performance of a construction project (Chiocha et al., 2011). Instituting a good OH&S management system can therefore help minimise H&S risks associated with construction works.

1.3 AIM OF THIS STUDY

This research seeks to study health and safety policies in the construction industry and propose a conceptual framework for developing such policies.

1.4 OBJECTIVES

In line with the aim of the study, the following objectives were set;

1. To investigate the quality of H&S policies in the Ghanaian construction industry.
2. To identify factors affecting formulation of H&S policies
3. To identify factors that affect implementation of H&S policies.
4. To develop a conceptual framework for drafting construction H&S policies.

1.5 RESEARCH QUESTIONS

From the aim and objectives of the study, the main questions for this research are;

1. Do Ghanaian construction companies have policies on H&S?
2. What is contained in these H&S policies in the construction companies?
3. What factors affect the formulations of company‘s policy on H&S in Ghana?
4. What prevents companies from implementing H&S policies on projects?
5. How can companies tailor policies to reduce known and knowable H&S risk to make projects incident/accident free?

1.6 SIGNIFICANCE OF THE STUDY

This study will add to the knowledge on health and safety in the Ghanaian construction industry but more importantly give more information to board of directors of companies,

professional bodies and consultants on subjects around which to plan and formulate a practicable Health and safety policies for their companies or clients.

1.7 BRIEF METHODOLOGY

In order to achieve the aim and objectives of the research, positivism in the ontological paradigm was adopted which led to the adoption of the quantitative approach to aid the collection of appropriate data and after which descriptive analysis was conducted on the data. The research was carried out through field survey after simple random technique was used to select the respondent population. Both opened ended and closed ended questions were adopted for this research. This study was a descriptive research based on a mixture of qualitative and quantitative approach.

1.8 SCOPE

The target group were members of the Association of Building and Civil Engineering Contractors of Ghana (D1K1 and D2K2- ABCECG). The concentration was on D1K1and D2K2 because they were deemed to be large and experienced enough with the capacity to have some sort of H&S management system in place on their sites. The sample population was from Accra which is the capital of Ghana.

1.9 RESEARCH OUTLINE

This study was divided into five different chapters; **chapter one** deals with general introduction: background, problem statement, aim, objectives, scope, Methodology and organization of study. **Chapter two** concentrated on various literatures relating to H&S, accident causations, H&S management systems, legislature, policy development and implementations. **Chapter three** is a research methodology; research philosophy, sampling frame (target group), instrumentation design (questionnaire), administration and tools for statistical Analysis. **Chapter four** covers the data analysis and discussion of results. The conceptual framework for policy formulation and implementation is thus developed from

the data analysis and discussion. **Chapter five** which is the last chapter for the study concludes the overall research and suggests recommendations.

1.10 SUMMARY

This chapter discussed the general introduction to the research. It covers the background and the problem statement of the research. Construction industry plays a major role in the socio-economic development of Ghana. However, there is a lapse in the management of construction projects in the country. The research therefore aimed at looking at this lapse; which was H&S policies in the construction industry and to propose a conceptual framework for developing such policies. The objectives were to identify factors affecting the development and implementation of H&S policies in the industry. Scope for the study centered on D1K1and D2K2 contractors with ABCECG in the Greater Accra region. The study is believed to be a contribution of knowledge and improvement to occupational health and safety in the construction industry. A quantitative research approached was adopted for this study based on positivism philosophy in the ontological paradigm.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This stage of the study examinations the various literature relating to general health and safety in the construction industry both locally (Ghana) and internationally. The various H&S management systems which can aid in policy formulation and implementation are considered given attention to the issues of policy. Accidents and incidents are normally caused by a chain of reactions, and there are a number of studies which have been carried out to find out the causation of accidents. This chapter also delves into accident causation models which are of importance in framing a policy to suit any particular situation.

2.2 HEALTH AND SAFETY CULTURE

Culture defines the beliefs and pattern of life of a particular group of people in the same community. Construction is a broad industry bringing people from all walks of life to live and work under one umbrella (Aoife and Alistaar, 2013). According to Choudhry et al. (2007), as cited in Aoife and Alistaar (2013), safety culture was initially and widely used after the assessment of the Chernobyl nuclear accident in 1986. It simply means creating a common platform for understanding and belief among people on the same site to reflect their attitude and perception. The concept of safety culture forms the background within which various safety behaviours are built and lived-out to maturity (Mearns et al., 2003). Health and safety culture is basically influenced by the different industries that projects emanate from. Different projects present different H&S risks. For example, the risks that construction in a gold mine present will be different from the hazards from construction of a public road. A study by Carter and Smith (2006) showed that, the hazards identification on different projects differs. Even though the principles are the same, there is a need for modification to suit a particular project. Carving a safety culture among construction stakeholders is difficult due to the transient and global nature of the industry. However, a good H&S culture reduces all health risk and injuries on site (Pybus, 1998). The culture normally evolves with time based on the environment, past experience, employees, leadership of the organisation and how these factors interact with the organisational structures and control systems (Reason, 1998).

Traditionally, H&S have been dealt with on a reactive base more than a proactive base (Aoife and Alistaar, 2013). In the reactive base, hazards/risks are dealt with as and when they come up. But a better approach is the proactive bases where risks are anticipated, planned for, recognized and appropriately measured or monitoring put in place before they occur on site. This can be achieved if proper H&S policies are put in place at the beginning of each project. Again, there is even a better approach aside the proactive approach which is the innovation

approach. In this approach, H&S are completely considered in all business decision making where, all possible attempts are made to reduce the H&S risk associated with the project. The recognition of the connection between construction safe and healthy and business performance (Hallowell et al., 2009) has helped in putting a proactive management style toward H&S – reducing the associated risk of occupational health and safety at the work place. A number of key accidents have given attention to the effect of organizational factors; such policies and procedures on the outcome of safety performance, with a lot of the investigations recognizing safety culture as having an absolute impact on the outcome of the accident (Reason, 1990). Tam and Fung (2012) retorted that, even though developing a practical and hands-on safety culture needs a long period of time and can be quite expensive in planning and implementation; these do not override the health and life of a worker.

2.3 INDUSTRIAL HYGIENE

For the work place to be conducive for safe and healthy work, site managers have to institute measures for hygienic work environment. Proper environmental controls and/or monitoring techniques or technology must be installed to measure workers exposure to harsh work environment. Construction activities also affect public health and safety. In light of this, whichever system is put in place also goes to a greater extent to prevent the general public from suffering from the residues of construction activities (CSC, 2012). Industrial Hygiene involves the skill of forecasting, identifying, assessing and controlling workplace circumstances that have the potential of causing workers‘ or general public injury and/ or illness (CSC, 2012). Health problems that are picked as a result of posture (ergonomic), noise, vibrations, electricity etc are common in the construction and mining industry (Hermanus, 2007).

In countries like South Africa, USA and China, changes in legislation and commitments of industry role players have renewed efforts in reducing health and safety risk on construction

sites (Hermanus, 2007). These introductions and modifications in regulations have proved to be quiet beneficial (Tam and Fung, 2012). Current ideas on addressing H&S emphasis the duties of management in developing specific OH&S objectives, aligning the commercial of the company and OH&S objectives, pre-emptive risk management built on standards and past experience, communication and good feedback (Hermanus, 2007). These ideas are put in the form of OH&S policy. Some of the proactive regulations which have been taken in some countries include

1. ―Enactment of regulation for factories and industrial undertakings.
2. Punishment by business decisions and encouragement by safety campaigns.
3. Establishment of self-regulatory safety management system.
4. Mandatory safety training courses and
5. A safety supervision plan‖

(Tam and Fung, 2012, p.207)

The benefit of industrial hygiene could not have been put in a better way than what General Lord Dannath said in 2012 after the successful construction of the London Olympic park. He believed health and safety was the main basis from which project manager could get an efficient operation thereby finishing the project on time, economical with no fatality (Aoife and Alistaar, 2013).

2.4 CONSTRUCTION ACCIDENTS - CAUSES AND EFFECT

Even though countries such as USA, Australia and South Africa have had great success in formulating and implementing H&S policies in their construction industries, the same cannot be said about developing countries such as Ghana. A research by Li and Poon (2012) reviewed that, the Ghanaian construction industry spends over $150,000 on only 10% of reported and dealt with construction related accident, which is quite high compared to Ghana‘s income.

All accidents are preventable on site once good safety planning, management procedures and cultural practices are put in place. Risks can be identified before the on-set of any construction activity which is the fundamentals of accident prevention. Identification of accident is by accident investigation technique which runs on accident causation theories (Hosseinian and Torghabeh, 2012). According to Hosseinian and Torghabeh (2012) finding the cause of accident also helps identify management roles in dealing with accident and its impact on construction activities. Also the prevention of H&S risk is best done when safety policies reflect natural degradation and the intrinsic hazards. From the late 1920‘s till date, a lot of models or theories for accident causation have been developed by a number of researchers. Included are

1. Heinrich Domino Theory of Accident Causation
2. Human Factor Theory of Accident Causation
3. Epidemiological Theory Accident Causation
4. Accident / Incident Theory
5. System Model of Construction Accident Causation
6. Complex Linear Model
7. Combination Theory

2.4.1 Herbert W. Heinrich – Domino Theory of Accident Causation

Heinrich in the late 1920‘s did a study to try and explain the causes of accident in industrial set ups. This made him a pioneer in the Accident Causation Theories (Gutierrez, 2010; Hossiman and Torghebah, 2012). This study formed the base for Heinrich‘s axioms of industrial safety in the 1980‘s. He collected and studied a number of industrial accidents – total of 75,000 accidents, which revealed that 88% of 75,000 accidents were triggered by risky workers behaviour, unsafe conditions accounted for 10% and the other 2% of accident were unavoidable (Natural). Heinrich‘s theory rest on five sequential factors which he

believes, accident can occur or be prevented if any one of the factors is altered (Li and Poon, 2013). These factors are;

1. **Ancestry and Social Factors**: Behaviours which are inherited (ancestry) or learnt from ones social environment (culture).
2. **Fault of the Person**: Bad or negative attitude either born with or learnt (includes carelessness, ignorance, stress etc) which contribute to unsafe acts and conditions.
3. **Unsafe Acts and/or Mechanical or Physical Condition**: This is the pivot of the accident causation according to Heinrich. It can be due to negligent on the part of the individual, mechanical or technical failure.
4. **Accident**: Leading to Accident are unsafe acts and conditions. Accident includes electrocutions, slip and falls, fall from height etc.
5. **Injury**: It is the result of accident. Examples are fractures, burns etc.

These factors work in chain reaction where one tips and triggers the other until an accident occurs and the resultant consequence(s) (Gutierrez, 2010). The model is also considered as the simple linear model. The weakness of Heinrich's theory was the fact that, it puts too much blame on the workers and does not really consider the actions of the management in causing and dealing with accidents. However as stated earlier, it was the first real scientific step in accident identification and prevention.

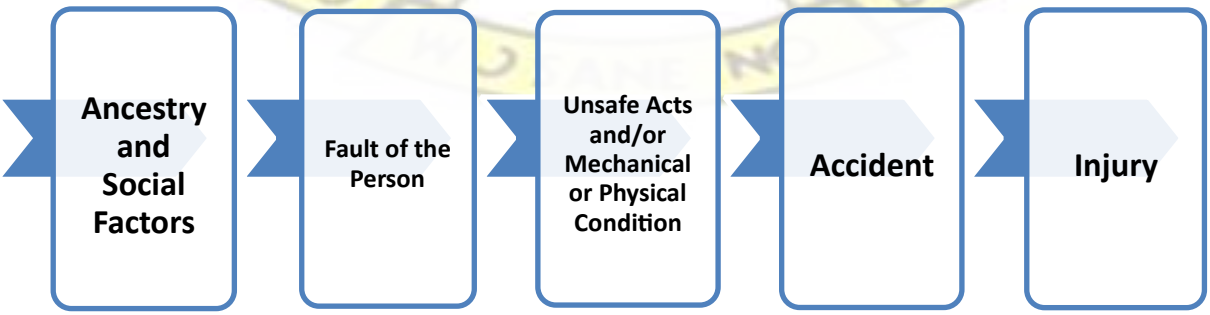


Figure 2.1: Domino Theory of Accident Causation

Source: Gutierrez (2010).

2.4.2 Human Factor Theory of Accident Causation

This theory basically attributes accident to human errors which are placed under three contexts as shown in figure 2.2 below.

1. **Overload:** This is when both the physical and psychological capabilities of an individual worker are exceeded, influenced by internal and external work factors.
2. **Inappropriate Worker Response**: The reaction of a person to a hazardous situation can lead to accident or prevent it from happening. Management response to worker's incompatibility to workstation can be a cause or prevention (Li and Poon, 2013).
3. **Inappropriate Activities**: Thus taken on what is beyond ones skill or training and misjudgement of the level of risk in a given job can all lead to accident.

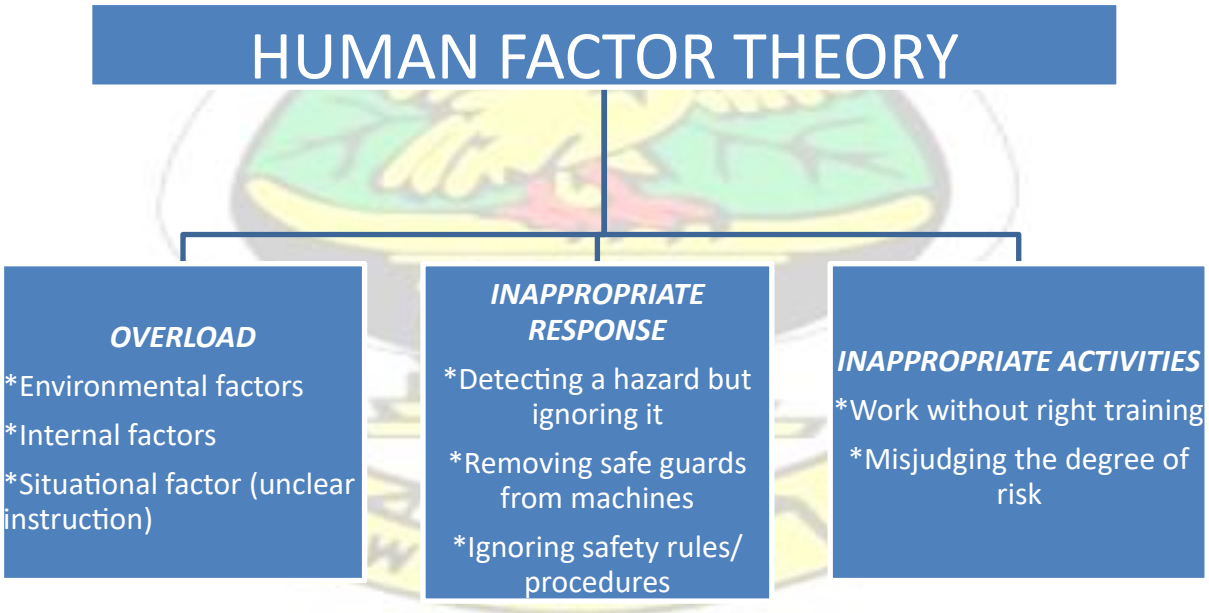


Figure 2.2: Human Factor Theory of Accident Causation Source:

Hinze (1997).

2.4.3 Epidemiological Theory of Accident

Epidemiology is the study of the causes and patterns of diseases in a particular environment. The epidemiologic theory describes an accident as a diseased caused as a result of the inter-relation between the Agent (disease causing organism), the Environment and the Host (Li and Poon, 2012). The theory takes the focus from the traditional safety theories where only accident and the associated injuries are considered, and includes occupational health where environmental factors which results in sickness or impaired health are also considered (Gutierrez, 2010).

Epidemiological theory makes use of the same methods which are used in studying and establishing correlation between environmental factors and causes/patterns of diseases, to study the association between environmental factors and accidents (Hinze, 1997). Factors considered in the host include sex, age, race, birth place, income, education, occupation etc. Factors in the Environment are weather, geography, time, work stations etc and factors in Agent include Chemical, Biological factors and Physical factors (Iskrant, 1962). The two main cause of accident under the epidemiological theory are pre-dispositional features and situational features. Examples of these characteristics are shown in the figure 2.3 below.

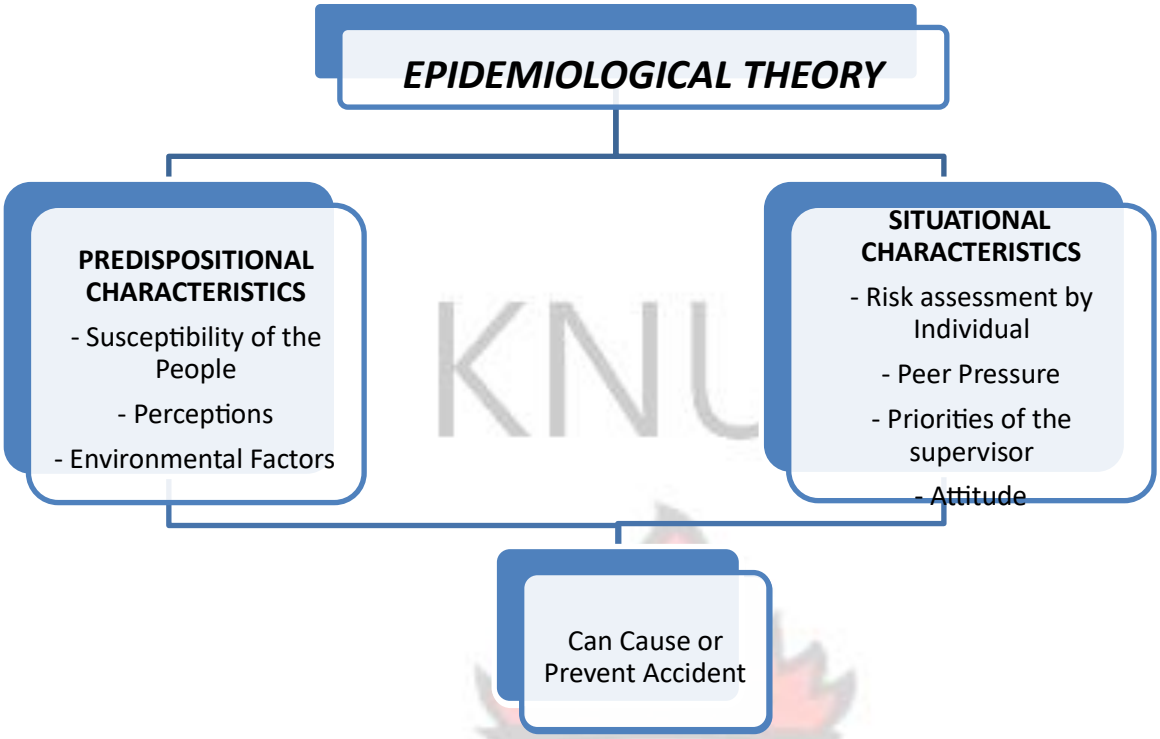


Figure 2.3: Epidemiological Theory of Accident

Source: Hinze (1997).

2.4.4 Systems Theory of Accident Causation

Systems theory considers a group of constituents interacting and interrelating with each other as a whole. The components are the person (host), equipment (agent) and the environment. The basis for occurrence of an accident is dependent on how these components operate together. A change in the pattern of the interaction has the potential to reduce or increase the chance of an accident (Abdelhamid and Everett, 2000). The interaction between these components may be simple or complex and may need a more rigorous analysis to identify and plan for. Thus apart from the primary component (host, agent and environment); information, decision, risk and task to be performed also play a crucial part in the probability of an accident occurrence or prevention (Li and Poon, 2010). Therefore most modern theory uses the PEEP (people, equipment, environment and procedure) approach. An error in any of these stages can cause an accident

2.4.5 Accident/Incident Theory of Accident Causation

The accident/incident theory retains a lot of the human factor philosophy concept and add on to it factors such as ergonomic traps, systems failures and decision to slip up (Gutierrez, 2010). This theory is attributed to Dan Petersen. This is illustrated in the fig 2.4 below

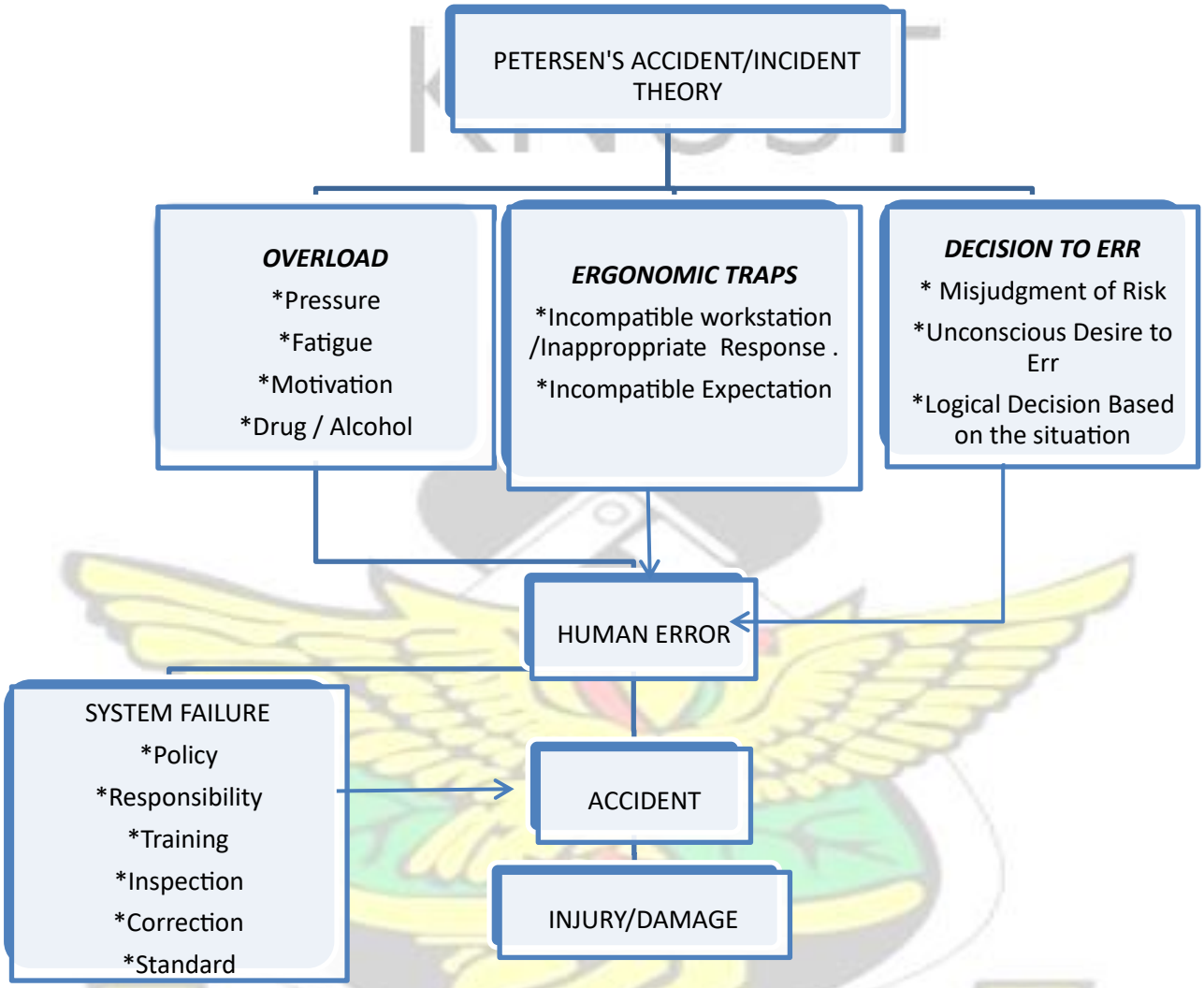


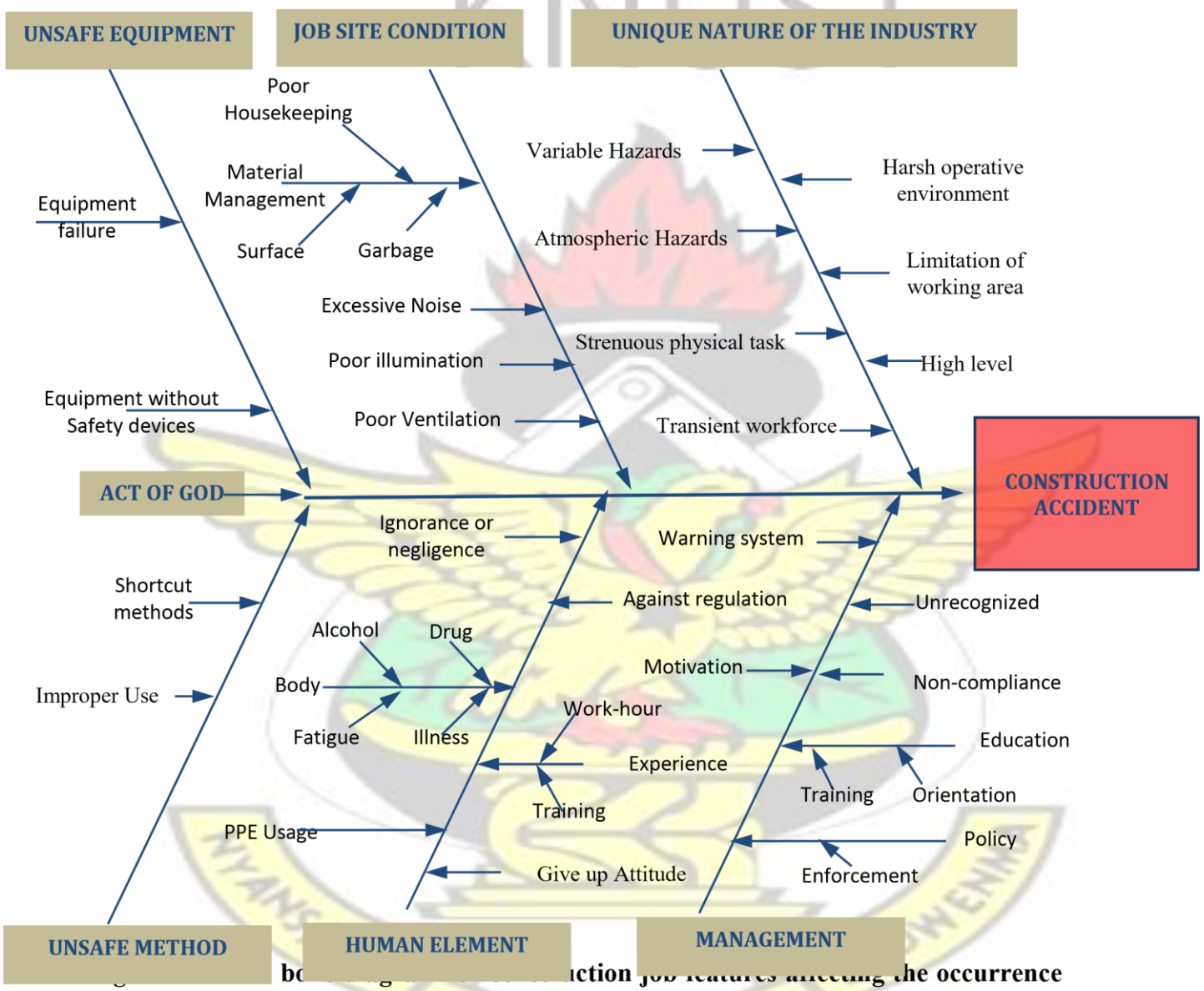
Figure 2.4: Petersen's Accident/Incident Theory.

Source: Gutierrez (2010).

2.5 SUMMARY OF FACTORS AFFECTING THE OCCURANCE OF ACCIDENT

The different theories discussed above seek to reason that, no one single theory can be used to successfully explain all accidents in a particular organisation due to the complexity of some of the accidents. Therefore, there is the need for organisations to vary or combine

theories in dealing with accidents. After Heinrich's model, accident causation models have evolved into a more complex sequence of actions which needs to be handled properly. For companies to deal with these factors there is a need to formulate and implement policies around these accident causation factors. To summarize the factors Sabet et al. (2013) developed a fish bone diagram (shown in figure 2.5 below) to connect the various factor.



bo… …iction job features affecting the occurrence of accident

Source: Adopted from Sabet et al. (2013).

2.6 TYPES OF ACCIDENTS ON CONSTRUCTION SITES

There are various types of accident that can occur on construction sites. But fall from height, motor accidents, electrocution, trip-slips and fall have been identified to be some of the top accident types on sites (HSE, 2010). According to HSE (2014), falls from height accounted for nearly a third of fatal injuries to workers in UK and construction is the industry with the highest rate of fall from height. The workers prone to this type of accident are general workers, carpenters, joiner, electrical fitters, bricklayers/masons, painters/decorators and plasterers. The nature of construction requires the interaction of people and plant or machinery. Unfortunately, there are instances where workers are run over by operating equipment causing injury of fatality. There are four main types of electrical injury: electrocution (fatal), electric shock, burns, and falls caused as a result of contact with electrical energy. In as much as workers know electrical hazards, they are oblivious of the quantity required to cause fatal electrocution (NIOSH, 1998). OSHA estimates that about 350 workers die of electricity related accident every year in the USA.

This requires electrical safety measures at work to prevent such injuries and/or fatality.

2.7 HEALTH HAZARDS ASSOCIATED WITH CONSTRUCTION

Construction health hazards are caused by a wide range of factors but most of them can be grouped as physical, chemical, biological and ergonomic hazards.

2.7.1 Chemical Health Hazard

These hazards include any chemical which has the potential of causing acute or chronic health problems when a person is exposed to. It may be in the form of fumes, gases, vapour, dust, or mist which may be inhaled, absorbed by the skin, ingest (swallowed) or injected into the body by sharp objects (CSC, 2012). These substances are normally contained in construction materials such as cement, coal tar, surface coating materials etc.

2.7.2 Physical Health Hazard

Physical hazards arise as a result of energy transfer (CSC, 2012) and one does not really need to come into contact before been affected by it. Examples are noise, vibration, lighting, temperature, ionizing and non-ionizing radiations, heat, repetitive motion etc.

These cause health problems such as heat rashes, back pains etc.

2.7.3 Biological Health Hazard

Biological hazards are contained in agents such as bacteria, virus mold etc and their toxins. These are normally picked up when working in hospitals, laboratories, demolishing works etc. Skin rashes, hepatitis B, histoplasmosis etc are all caused by Biological hazards (CSC, 2012).

2.7.4 Ergonomic Hazard

It is as a result of the correlations between work, body position and work station. These three put a strain on the body. The strain can cause musculosketetal injuries (MSI‘s). They are normally caused by lifting, sitting posture and repetitive motions (OSHA, 2000).

2.8 TYPES OF HEALTH PROBLEMS ON CONSTRUCTION SITES

2.8.1 Overexertion

This health problem occur when the body‘s bones, mucks, nerves, ligament, tendons or blood vessels are worked beyond their capacity; causing injuries known as Musculoskeletal Injuries (MSI‘s) (Moore, 2015). It is a sprain or strain injury which has been identified as one of the leading cause of loss-time injuries in the construction industry. It is as a result of repeating similar movement, abnormal twist, overstretching, overloading and swinging. Types of MSI‘s include tendon or muscle strain or tear, ligament sprain, bursitis etc. The cost of compensation as a result of MSI‘s is about 18% of all construction H&S related compensations in Canada. People who are at risk of these accident/injuries are carpenters, painters, carpet layers, labourers and steel bender.

2.8.2 Occupational Cancer

According to Health and Safety Executive (HSE), UK, over 40% of occupational cancer deaths/registration comes from the construction industry. This is because people in this industry are exposed to various forms of conditions which can cause cancer. The materials which can affect the health of workers include asbestos, silica, coal tar, solar radiations (sun), diesel engine exhaust. Diseases which can be caused by asbestos include asbestosis, mesothelioma and lung cancer (OSH-UK, 2004)

2.9 MANAGEMENT OF CAUSES OF ACCIDENTS AND HEALTH RELATED PROBLEMS ON SITE

2.9.1 Management Principle of Health and Safety

Just as cost, production and quality are considered integral parts of all business functions, H&S is that part of the business which can impact all of these three business functions (Hallowell et al., 2009; worksafevictoria, 2001). There is therefore the need to manage H&S as it is done for the other components of the company‘s operations. Management and administration of H&S in countries like Ghana takes its root from pre-colonial institutions and systems (Kheni et al., 2010). For example the Factories Act is believed to have originated from Factories Ordinance of 1952 (during the British rule in Ghana) (Kheni et al., 2010). Some of the factors contributing to poor H&S performance include bureaucracy, time, pressure, ignorance, institutional lapses in implementing H&S (Keohn et al., 1995). Kheni et al. (2009) also identified economic climate, extended family culture, individual behaviour, work environment, methods of work as the challenges associated with H&S management. Other challenges identified in managing H&S in the Ghanaian construction include;

- Lack of resource. This implies that little or no resource is given for H&S management. They are normally allocated to other operational aspect of

construction.

- Lack of research on work place exposures.
- High competition in the construction industry due to liberalization policy.
- Delay payment which sometimes makes contractors to take short cut.
- Lack of jobs implying cheap labour plus low socio-economic status of workers. This makes workers to take on works even under hazardous conditions without complaining.
- Illiteracy

Kheni et al. (2010) retorted that, when H&S management is compared in small and large firms, the relationship in risk of accident is inversely proportional to the size of the firm. This implies smaller firms are more likely to have a higher accident frequency rate compared to larger firms which are well structured. This is believed to be due to better organisational structures, better H&S awareness, good training etc in these large firms. One of the factors identified is that, contractors (construction firms) do not have H&S policy which shows that they lack commitment to H&S issues (Haupt and Swallowed, 1999). To rectify this, the employer must be seen with a definite OSH leadership in terms of commitment to OSH and effective OSH programmes in the organization. Organisation should put in place the requisite H&S management system which should contain such commitment and make necessary leadership arrangements to set and sustain the OSH management system.

A good health and safety management system runs on 4 key components to make it effective (Hughes and Ferrett, 2010). These are

1. The planning phase
2. The performance phase
3. The performance assessment or appraisal phase
4. The performance improvement phase.

Successful organisations usually have these elements in place for H&S.

2.9.1.1 The Planning Phase

This phase has the policy statement which states the aims/objectives, organisational commitment and responsibility towards H&S. The policy allocates the responsibility of H&S to a competent senior management member and has realistic objectives set. It includes hazards identification, risk assessment and control settings. Emergency procedures must be established. All relevant legal requirements and benchmarks are identified at this stage. The plan must incorporate the views of appropriate legal institutions, standard authorities, management, trade union and employee to make the output more viable (Hughes and Ferrett, 2010).

2.9.1 .2 The Performance Phase

This stage is where the planned H&S management system gets disseminated to all the stakeholders. Effective communication and training is the key to the success of this phase. Monitoring for avenues for improvement as the plan is put into action is essential. Clients, suppliers, trade unions and employees must be consulted on regular bases to check the success of the established management system. It is during this phase that a particular safety culture is carved in the organisation (Hughes and Ferrett, 2010).

2.9.1 .3 The Performance Appraisal Phase

At this stage the plan is evaluated for further improvement. Activities under this stage includes inspection, audits, feedbacks, review of risk assessment, accident/incident records evaluations etc. These activities can be grouped into two; Reactive to situations or Active. Recommendations are given after the performance appraisal phases which are implemented and monitored (Hughes and Ferrett, 2010).

2.9.1.4 The Performance Improvement Phase

This is when the effectiveness of the instituted H&S management system is reviewed and any weakness identified for improvement. Any good performances as well as underperformance reasons are recorded (Laufer and Ledbetter, 1987). It considers available resources, supervision, and the level of corporation and commitment of all involved in the design and implementation of the management system. Controls such as auditing (either internal or external) are instituted with definite time lines for the implementation of all recommendation for improvement (Hinze et al., 2013). To simplify these four phases, the UK HSE recommends the following four steps to H&S management system; PLAN – DO – CHECK – ACT (Hughes and Ferrett, 2010).

PLAN: to institute a H&S management system based on relevant risk assessment, standards and national and international legal requirement.

DO: to achieve the H&S standards and aims by to implement the plans.

CHECK: measurement of performance of the plan in relation to the standard.

ACT: taken the right actions to correct the wrong or improve the rights after a review.

The Plan-Do-Check-Act proposal forms the bases for the three major globally known H&S management systems (Hughes and Ferrett, 2010). These systems are HSG 65 - UK, OHSAS 18001:2007 and ILO-OSH 2001- international labour organization.

2.9.2 Managing for Health and Safety (HSG 65) - Extracts

This management system was developed by regulators (HSE) in 1991 as a guideline to effective H&S management for organisations in UK. It has been adopted by other countries and gained approval over the years. Since its development, it has been amended to embrace more of continual improvement of H&S management and less on just achievement of H&S standards (HSE, 2013). The Key elements of HSG65 are illustrated below in figure 2.6.

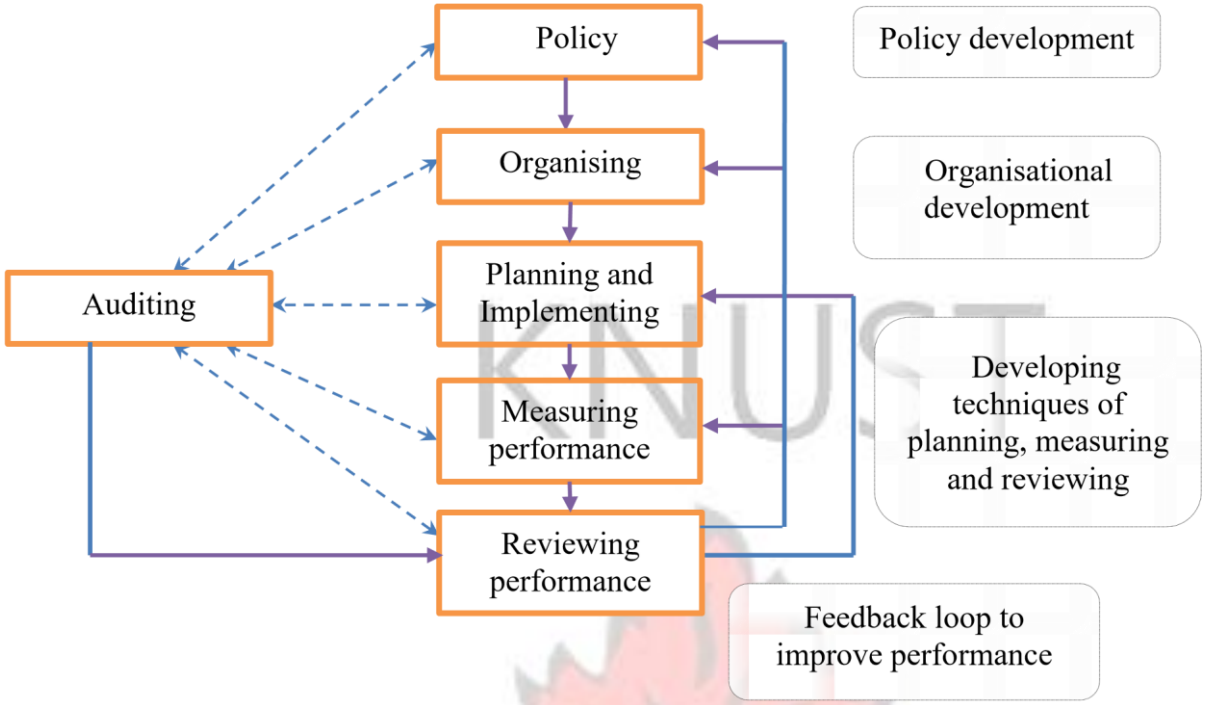


Figure 2.6: Key elements of HSG65

Source: Hughes and Ferrett (2010).

Policy

A good H&S policy sets a specific path for discussion and decision making in organisation. They are the driving force for an excellent business performance, demonstrating company's commitment to continuous improvement (HSE, 2010). It meets all stakeholders' expectations including the legal requirement. An effective H&S policy helps in improving the work flow, quality and efficiency of the organisation (HSE, 2010).

Losses from avoidable accidents are reduced through H&S policy and it embraces workers participation in decisions that affect their H&S. It helps minimise economic losses and paves way for human resources development.

Organising

HGS65 requires an effective management structure and arrangements be put in place for the achievement of the policy. It includes allocation of H&S responsibilities, putting a system

that encourages collaboration between the work force, safety representatives and the management of the organisation. Effective communication systems and competency programs are required for the promotion of a good H&S culture in the organisation. This is a participatory stage in the management system (HSE, 2010).

Planning and Implementing

Clearly defined standard or management system must be established to achieve the policy's aim. At this stage, risk assessment methods are used to evaluate risk or hazards and priorities set. Controls are set for eliminating H&S threats and reducing risks. Hazards can be eliminated by design of an event, the selection of machinery or equipment and the method statement for the execution of the activity. Hazard reductions methods used include physical controls and the use of PPE. These controls are measured against the defined standards to check performance. A progressive health and safety culture can be achieved by the set standards (HSE, 2010).

Measuring Performance

This is when internal reactive and proactive monitoring is carried out in checking for the effectiveness and suitability of the instituted H&S management system against legal requirement and the organisation's beliefs. Active monitoring constantly checks the interaction between people, environment, plant, procedures and systems. A reactive monitoring checks why a particular system has failed using accident/incident investigations (HSE, 2013).

Auditing and Reviewing Performance

At this stage review of the results from the performance appraisal (it checks the actual vs. planned) is carried out. Here all important experience gathered and lessons learnt are considered and applied. This is a check on the instituted H&S management system to ensure

that the anticipated outcome is been achieved. Results from both internal and external audits are used and the lessons applied for continuous H&S improvement (HSE, 2013)

2.9.3 OHSAS 18001:2007, Occupational Health and Safety Assessment Series

This H&S management system was established from BS 8800 meant for integration of British Standard (BS) for quality and environment. It has had influence from international labour standards on H&S principles. OHSAS 18001:2007 is certifiable when all requirements are reasonably met. The key requirements are as shown in fig 2.7

General Requirements

The OHSAS 18001:2007 generally requires any organisation which is accredited or seeking accreditation to set and implement a H&S management system with proper documentation and continuously improve the management system in line with the requirements of OHSAS Standard (Hughes and Ferrett, 2010).

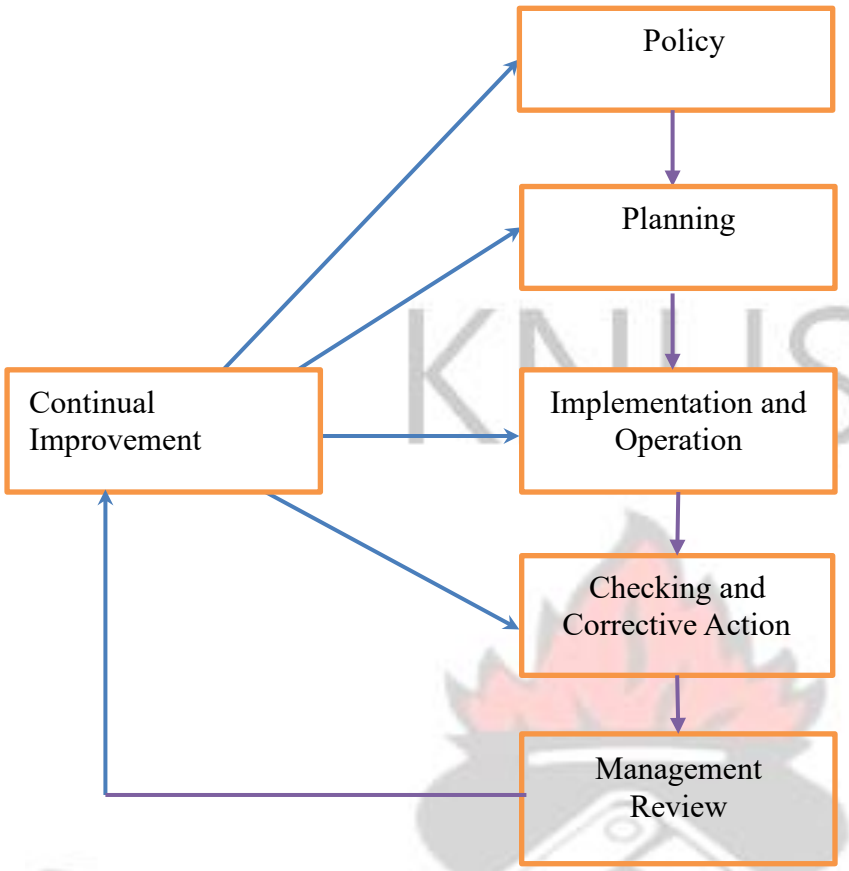


Figure 2.7: OHSAS 18001:2007 requirement Source: Hughes and Ferrett (2010).

OH&S Policy

There should be a definition of scope of the H&S management system to cover all the operations of the organization. The defined scope should be equal to the nature and the risks of the organisation. This must inform the organization's H&S policy; providing commitment to accident prevention thereby improving on H&S performance of the organisation. This policy must be consistent to the applicable legal requirement in the area of operation and must provide be the background on which all relevant targets in relation to H&S are fixed. Heize et al. (2013) stated that, for any H&S policy to be worthwhile it must be implemented through appropriate communication and training programmes to all stakeholders. The policy must be made available to all interested parties.

Planning

This stage relates to hazard identification, assessment of hazards and the establishment of necessary controls for all levels of risks associated with workplace hazards that a worker is exposed. The controls must minimise the risks levels to tolerable levels of exposure. These must be in line with the legal requirement for the country of operation. The scope at this stage should cover all persons having access to the workplace, doing both regular and one time off activities under the control of the organisation (Hughes and Ferrett, 2010). Proper records must be kept for all identified hazards and set controls. Another component is setting of measurable and practical objectives which are in line with H&S policy and programmes such as delegation of H&S responsibilities, time lines and the means of achieving set objectives (OHSAS 18001, 2007).

Implementation and Operation

At this stage the main responsibility of H&S lies with top management in ensuring that adequate resources are made available, roles and responsibilities are well defined with a definite action for accountability at all levels of the organisation (Hughes and Ferrett, 2010). Measures must be instituted to ensure person(s) are competent, given the necessary training and awareness of H&S is created in the organization. Effective communication, participation and consultation at all levels in the organisation with respect to the organisational H&S risks and H&S management system are essential at this stage of the management system. Documentation of deviations and all activities is important for future improvement of the system. There should be operational controls for other business partners such as suppliers, contractors as well as visitors to site (OHSAS 18001, 2007).

Checking

This is the stage where both qualitative and quantitative performance measurement and monitoring are conducted in line with the needs of the organization. the usefulness of the system is checked in connection to the achievement of the objectives of the H&S policy set. For the HSG65 requirement, both the proactive and reactive methods are used for the monitoring of events. This evaluation must be compliant or consistent with the organisational and/or institutional legal requirements (OHSAS 18001, 2007; Hughes and Ferrett, 2010).

Management Review

All management system must be reviewed at scheduled time; H&S systems are no different, to confirm the effectiveness and suitability for the defined scope as well as opportunities for improvement. This review is done by top management with inputs from audits, corrective actions from audits, accident investigation reports, consultation of stakeholders, communiqués, achievements on set targets and other emerging legal requirement. The results of this review must be in line with the organization‘s commitment (policy), performance and available resources. It must produce recommendations for continual improvement (OHSAS 18001, 2007).

2.9.4 ILO-OSH: 2001: Guidelines on occupational safety and health management systems from the International Labour Office

The system should contain essential elements such as policy and organizing for H&S. Other elements include planning, implementation, evaluation and action for improvement for health and safety (ILO, 2001). In 2001, the ILO developed a guideline which was sought to present a practical approach and tool to aid organizations both National and other partners in establishing and implementing an effective H&S management systems at work. The guideline was meant to help national institutions in developing a general framework for OHS management system (supported by laws of state in question) and also encouraging

organisations to integrate H&S management as an important element in of the overall company policy and organization arrangements.

The Main elements of the OSH management system proposed by ILO in organisation are as shown in the figure 2.8 below:

Figure 2.8: Main elements of the OSH management system proposed by ILO Source: ILO (2001).

As established in the above arguments, OH&S are the responsibility of the employer and these duties also include compliance with the OSH requirements pursuant to national laws and regulations (ILO, 2001).

Policy

The ILO-OSH-2001 recommendation for H&S management system required the setting out of specific H&S policy through stakeholder consultation – employer, workers representatives and appropriate government agencies. At all times, the size and area of

operation must be considered with more emphasis on employee participation. In developing the policy, care must be taken to align it with other organizational management systems so that it does not become redundant or hinder the development of other business priorities. There should be sufficient time and resources at employees‘ disposal to allow for effective participation. This can be done by encouraging and establishing a H&S committee at the workplace (ILO, 2001).

Organizing

The generally duty for OSH lies with the employer and should be seen in the leadership provided for OSH in the organisation. Therefore the organisation must allocate the responsibility of H&S to a senior management member who will see to all aspects of the H&S management system; including development of all necessary requirements, implementation of the system and constant performance reviews and evaluations(ILO, 2001; HSA, 2009). Setting of responsibilities, accountability, competence, training and communication are to ensure workers are adequately protected; by the establishment of prevention and health promotion programmes and workers access to records (ILO, 2001). The correct H&S competence needs must be assessed and the employer has the responsibility to ensure that the requisite training is given to all persons as necessary to facilitate safe work. This training must be at no cost to employees. All communications (internal and external) must be carried out in an arranged and established procedure. The clause in ILO-OSH-2001 is very similar in nature to OHSAS 18001:2007.

2.9.5 Hierarchy of Controls for Health and Safety Risk

The main objective for every H&S act or regulation is to eliminate at source the risk to H&S of the persons at a work place. Policies that are tailored to conform to H&S act must be seen to have elimination as the first step in dealing with all hazards. However, there are about five controls in all;

Elimination — this is to physically remove the threat or hazard at the work place. It is thought to be the most effective and preferred control. However, it is not economical and sometimes not possible to remove completely the risks associated with works; such risks must be minimised to a reasonable tolerable level (NIOSH, 2015).

Substitution: This is the replacement method used to control workplace hazards. To be effective the second item used to replace must not provide a hazard or its hazards must be known and fully catered for. Example is replacing asbestos material for insulation in building with cellulose fibre which made from paper for insulation. The cellulose is cheap and less harmful than asbestos (NIOSH, 2015).

Isolation: separating employees and harmful substances or conditions to decrease the risk of work related injuries or illness. Example is using sound enclosure booths to separate employees and a noisy process on work site (NIOSH, 2015).

Engineering controls include redesigning the systems or processes, changing the equipment used for a particular work. An example is using calcium chloride to reduce the effect of dust on workers as well as protect unpaved roads (NIOSH, 2015).

Administrative controls include using policies and procedures for work to minimise workers exposure to work related hazards. Some common practices include job rotations or shifts systems, on the job training, and personal protective equipment (PPE); which must be the last resort because it is a soft barrier to hazard elimination or reduction (NIOSH, 2015). Even though policy is an administrative control it can be formulated to have effect on the all of the top levels of controls.

2.10 LEGAL CONTEXT OF POLICIES

Policies of companies are mostly driven by legal status in the country of operation, the client or customers requirement and the companies believe or objectives. The constitution of Ghana (1992), under Article 24 and 36(10) guarantees the right of the worker to work within safe and healthy conditions and this provision is regarded as Human Rights. Article 24 of

the constitution enjoins that every Ghanaian or every worker in Ghana has the right to work under conditions which is reasonable satisfactory and safe. Article 36(10), puts the state in charge of all health, safety and well-being of all workers in Ghana. However, Danso (2010) observed that Ghana does not have comprehensive legislations on OH&S, but a look at the various laws available indicate quite a lot of legalisation on H&S even though these are not unified (Kheni et al., 2010). In 2012, Ghana drafted and passed into law the Minerals and Mining (Health, Safety and Technical) Regulations, 2012 (L.I. 2182) which comprehensively covers wide range of H&S issues in the minerals and mining sector. There are also bits of H&S topics covered under the following Acts (laws) in Ghana;

1. Labour Act 2003.
2. Workmen compensation.
3. Factories, Office and Shop Act 1970

Even though these laws are made in Ghana, they have a lot of things in common with international conventions and/or regulations such as ILO conventions.

2.10.1 INTERNATION LABOUR ORGANISATION (ILO)

The international Labour Organisation is a UN agency set up in 1919 to deal with labour issues such as International labour standards which includes basic workers‘ rights, workers‘ job-security and making civilize all conditions of employment across the world. They also deal with **decent work** which include opportunity for work that is production with fair income, security in the work place, social protection for families, personal development, social integration and participation of workers/employees in welfare decisions (eg policies making), fair treatment for both men and women etc (ILO, 2012). The ILO achieves the above by various conventions agreed upon by its tripartite governing body (thus governments, employers and employees)

By 2011, the ILO had adopted 189 conventions to regulate the various activities of its members (of which Ghana is included). Conventions that are adopted/ratified by the organisation become legal and binding on its members and hence have to apply the provisions in the convention. According to Yankah (2012), Ghana as of 2006 had ratified 46 of ILO Conventions of which 167 (1988 convention for safety and health in construction) is included. Other important H&S conventions include;

- Workmen's compensation, C019
- Protection against Accident convention, C028.
- OS&H convention 1981 (No 155).

Even though Ghana as a country has not ratified some of these conventions, it is a good place for companies which want to develop a H&S policy for its operations to start from.

The scope of the convention which includes;

1. Construction activities (building and Civil Engineering)
2. Fabrication and erection of oil rigs and off shore installation under construction,

The convention provides a broad range of activities and covers almost all activities that construction borders on. It covers all the duties of employers and employees, engineers/designers/architects, client, competent authority and corporations. It especially, gives employers measures for identifying and eliminating all H&S hazards from their operations thereby indemnifying themselves of most H&S liabilities. These measures are important aspects of construction projects that policies ought to be written for. These include

1. SAFETY OF WORK PLACE

   This covers issues such as welfare and sanitation facilities to promote good health at work, safe site access to and egress from all work place to prevent injuries, proper

housekeeping programme to maintain sanity and clarity at work place, regulation of site visit to protect people present and proper lighting for work (ILO, 1992).

2. SCAFFOLDS AND LADDERS.

According to a research by Liberty mutual Research Institute for Safety (2012), more than 135,000 people are treated each year in the US emergency department for ladder related injuries. It also stated that it caused about 400 deaths in 2007 only. HSE (2014) statistics also shows that fall from height are the major kind of accident in the construction industry and caused about 45% of total fatality in 2011.

The ILO convention No 167 provides for a safe temporary or permanent structure in the form of scaffold or ladder provided and maintained for works which cannot be done from the ground. The make and or installation of such scaffold/ladder must be to the standards of national laws and regulations. According to National Institute for Occupational Safety and Health (NIOSH), poor ladder set up, incorrect ladder selection, lack of inspection, improper use of ladder and lack of ladder safety information are some of the causes of fall accidents at work.

3. LIFTING APPLIANCE AND GEAR

The code has a strict requirement for lifting Appliance and gears. This might be due to the fact that lifting machinery can cause different type of accidents/injuries such as getting hit by moving parts, cut by sharp edges, crushed between moving parts, attachments breaking off and hitting a worker (HSE, 2013). HSE in 2014 puts lifting and handling injuries on top of the injuries to employees for overseven-day injury in construction. As per the ILO code, employer has the responsibility of ensuring that there is proper safety planning for lifting appliance and gears; where all such are properly selected, installed, examined, maintained and operated under the correct procedures. This seeks to reduce the occurrence of accidents due to lifting.

Techniques such as lowering of edges of platforms, tag lines, proper traffic control, level grounds etc are employed for proper lifting procedures (ILO, 1992)

Others include

4. Transport, earthmoving and material handling equipment.
5. Plant, machinery, equipment and hand tools.
6. Work at heights including roof works.
7. Excavations, shafts, Earthworks, underground works and Tunnels..
8. Cofferdams and caissons.
9. Work with compressed air.
10. Structural frames and form work.
11. Work over water.
12. Demolition.
13. Lighting.
14. Electricity.
15. Explosive.

2.10.2 Labour Law, Act 651 2003

The labour law of Ghana, Act 651 came into effect in 2003 after amendment to consolidate the labour provisions in the 1992 constitution. This act has laws which deal with labour and employers issues, trade unions and industrial relations as well H&S issues for industry role players and employees. Part XV is particularly dedicated to work health, safety and environment.

Health and Safety Provisions In Act 651:2003

The employer has the responsibility of ensuring that his employees has access to safe working environment by providing the necessary equipment or supplies needed for a healthy and safe work; that is the general work conditions must be satisfactory. All supplies which include PPE (helmet, safety spectacles, safety boots, reflective vest etc) and safety appliance

required for any work must come at no cost to the employee. Handling, storage and transport of articles and substances are to be free from H&S risk. The law enjoins employers to make available all the necessary information and manuals required for any work to the employee. Depending on the age and literacy level of the employee, the employer has the duty to provide training free of charge and reasonable supervisions for its operations to the employee. However, Danso (2012) observed that most of these things are not provided for by construction companies in Ghana. Once a person is employed, the law requires that he has right to decent work and welfare amenities such as lavatories which are all the duties of the employer. Under this Act, employers are to put in place measures to eliminate or minimise inherent hazards relating to any work that employees are engaged in to prevent accidents and injuries.

Employee Obligation Under The Act 651:2003

Notwithstanding the employer‘s duties, the worker has a duty to use and maintain all safety instruction, appliance and training provided for any such work as he is engaged. These supplies must not be abused by employees but must be used for his personal health and safety as well as ensuring that the deliverables are incident free. Employer‘s instructions are normally contained in the company‘s policies and procedures regarding a particular subject. Per the Ghana Labour Act (2003), workers are also encouraged to report and remove themselves from any work that poses an impending health and safety risks to their employers.

2.10.3 Workmen’s Compensation Law 1987 (PNDCL 187)

Liabilities of employer in case of accident causing injuries are contained in the workmen‘s compensation. To indemnify employer of any damages due to accidents causing injuries at work, this law spells out the necessary procedures. Workmen‘s Compensation Law 1987 (GoG, 1987) basically seeks to protect the interest of the employee however; it gives the employer clues as to how to take a shield. The only way to help the employer manage

situations that can cause damages (in compensations, fines and/or imprisonment) is by way of company policies for the various aspects of the work. The written policies must take the laws of the land covering such matters into consideration.

2.10.4 Factories, Offices and Shops 1970, Act 328

Act 328 (1970) can also serve as a good guide, as it discusses issues pertaining to construction H&S requirement. Under section 57 sub-section 3, the act provides for works in building and engineering construction. The following sections have similarities to activity undertaken in construction; sections 10 to 17 (covers accident, dangerous occurrence, industrial diseases notifications, cleanliness (mostly referred to as housekeeping in construction), overcrowding, ventilation, washing facilities and lighting at work). Other sections are of Act 328 (section 25 to 39) deal with PPEs, noise, weights lifting and hoisting, first aids, workers welfare, fire alarms and fire emergency, safe access to work place and machine guards. The Act also makes provision for lifting appliance (chains, shackles and ropes) and machinery (cranes) in section 46 to 47. Regulations also exist for how employers must deal with confined space works and the removal of dangerous fumes from work places (GoG, 1970). Explosive substances are to be labelled as such and specially regulated to prevent accidents at the work place (GoG-Act 328 section 48 and 49). All these sections require an organisation to write up a direction in terms of policy to deal with them.

Section 57 of Act 328 -Building Operations and Works Of Engineering Construction

This section references all of the above sections as applicable in dealing with building and engineering construction works. The section stipulates that no dangerous conditions and practices (Section 52) shall be carried out to alter any engineering construction design. All methods or modes of operation shall be in line with acceptable safety practices, agreed plans of execution and within engineering specifications (GoG, 1970). The duties of employers, authority of the inspection directorate, liabilities, penalties, offences, court actions and

procedures covered under this Act (Section 60 to 87) are all applicable to the case of building operations and construction.

2.11 CLIENT REQUIREMENT AND RESPONSIBILITY

A client is an individual and/or institution for who owns a construction project (finished or unfinished) (Smith and Roth, 1991). In other words, clients pay for the project and have the ultimate need or use for the project. Clients are undoubtedly the most influential party in any project control. Their decisions and management approaches /actions determine the cost, quality, resources and the H&S for the project (Hallowell et al., 2013). They are normally responsible for the arrangements for management and co-ordination of the project. Per laws such as the Labour Act 2003, the client is the ultimate employer of all employees either for the contractor (indirect employee) or the client (direct employee). Due to this clients are accountable for the effects that their actions and inactions have on both employees and the general public health and safety (HSA, 2009).

But according to the H&S Authority (2009), there is a general recognise of the fact that most clients lack indebt knowledge about construction Health and Safety, implying that there is a need for them to nominate competent person(s)/company to manage H&S on projects. Client can also transfer their H&S responsibilities to the designers and contractors on a project by including clauses (in the form of insurances, warranty etc) relating to H&S which are totally paid for (Hallowell et al., 2013). Most clients require a number of specific H&S provisions on site for which a provisional sum is made available to cater for (Stiedl and Tajgma, 2003). However they stated that, safety clauses included in contracts are driven by donor initiatives. Thus contracts only include clauses for which funds are provided for. This also implies that, at any point where H&S is not strongly advocated for by donor, there is a bigger tendency to neglect it. Therefore, it requires a conscious effort by contractors to adhere to H&S driven by policy decision.

For a successful H&S management on a project, there should be a good collaboration between parties involved in the works (HSA, 2009). Targets must be realistic and funds allocated for projects must be sufficient enough to cater for all aspects of the project because a research by HSA (2009) point to the fact that, deadlines and inadequate funding contribute hugely to poor control of risks on site. In managing H&S on project, owners are to ensure that all necessary and practical measures are put in place to manage H&S throughout the life span of the project. This is needed to ensure that the project is done in a safe, healthy and risk-free (minimised) environment. The arrangements must be particular on specific tasks addressing the hazards relating to the work activity. Roles and responsibilities of team members must be clearly defined and appropriate monitoring system put in place to enforcement the performance of these assigned functions.

2.12 POLICY PROCESS

Policies are built on what is believed to be the ―heart and soul‖ of the organisation values or operations. Consistency, transparency, accountability and quality should be the main roots of every organisation that seeks success in its operations with focus on its customers, staff and service standards (Maree, 1999). Policies can be seen as political, organizational, commercial, and administrative mechanisms that are put together to achieve explicit goals. Policies may apply to government, to private sector organizations/groups, and to individuals (Geurts, 2011). A lot of social scientists have different view on the definition of a public policy. Public policy may refer to the coordinated actions of a government to achieve a desired goal – normally for public interest (Cochran et al., 2009). This can be found or must be manifested in laws, official regulations or publicly accepted way of behaviour. Thus the root of public policy is found in laws and regulations (Cochran et al, 2009). A good policy contains about six (6) to maximum of ten (10) principles which guide decision making. It maintains a strict focus on the key determinants of quality.

Policies are;

- The description of the service commitments to key determinants of quality.
- The guiding principles of the organisation.
- Board guidelines to decision making
- Not directive.
- The bases of the organisation‘s procedures and instructions.
- The measure of growth or improvement or performance of a company.
- The measure of conformity to standard and acknowledgment of firm‘s legal responsibilities.
- Used as helps in the planning for effective delivery
- Proofs of firm‘s commitments towards H&S improvement.
- Used to resolve conflict between production demands and H&S.
- Part of a framework for effective H&S management.

In effect company policies comprise of first of importance the legal requirement for the country in which the company operates from, the client‘s requirement and then any additional principles on which the company is built on (this should not supersedes the laws of the land). It should therefore contain the company‘s best practices and the main method for doing or carrying out any work. Policies are written to reflect special needs of a workplace and should be reviewed and updated on a timely base (Geurts, 2011).

Policy making is the first phase in any planning cycle and it is important to see the dynamism of a policy formulation to be able to design an appropriate implementation and evaluation strategy for an effective policy (Haddad and Demsky, 1995). It functions as the development of real and practical proposals to solve a real societal issue (Waller et al., 2008). Guerts (2011) sees the complexity, dynamism and constantly evolving, interaction and adaptation as the main characteristics of policy making. Cochran et al. (2009) also views policy making

to be tedious endeavour and it involves and includes public opinions, media, expert ideas, citizens, business, unions and association representative, government agencies, bureaucrats and it calls on available legislation, economic conditions culture and attitudes and even international conditions. The dynamism in policy comes in terms of their scope, complexity, decision environment, ranges of choices and decision criteria (Haddad and Demsky, 1995).

A policy can belong to the government (public) or individual or privately owned by institutions rather than a government institution. It can be an issue specific policy, programme policy, multi-programme policy, and strategic policy, regulatory or selfregulatory policy (Cochran et al., 2009). Accordingly, Haddad and Demsky (1995) said there are two important dimensions to policy making; who does it (Actors) and how it is done (the process). The actors can be unitary and rational, public or self-interest. Policy making is a process and a lot of researchers have developed a lot of several hypothetical frameworks to define the process, although none of the framework in itself is complete enough in describing the process (Stover and Johnston, 1999). The process can be a comprehensive approach or incremental approach. Model developed over the years include

Lasswell in 1951 lead the way with his work on the stages of policy process.

Meier 1991 – Linear Model of the policy Process (Based on Lasswell‘s model).

Grindle and Thomas (1991). – Phases of the Policy Process.

Porter 1995- Based on Kingdon‘s 1984 model.

Walt and Gilson (1994) – Actors and their Roles.

The Meier’s 1991 Linear Model of the policy process was built based on Lasswell‘s 1951 model. It prescribes 5 major policy development steps as shown in figure 2.9.

1. Prediction and prescription: thus recognition of a problem, predictions on how the problem will be solved; normally the prediction does not favour natural solution, that is problems must be solved by people not to leave it to nature (Stover and Johnston, 1999; Hardee et al., 2004).
2. Policy makers: Policy makers are responsible for formulating policies in response to the potentially recognized problems. And it is influenced by stakeholders (classes, association, bureaucrats, state interest etc) (Stover and Johnston, 1999).
3. Policy Choice: Appropriate policy is arrived at after consideration is given to suggestions, inputs and policy alternatives (Stover and Johnston, 1999).
4. Implementation: effecting the policy into practise to achieve the goals of the policy.
5. Policy output: The effect and impact of the policy.

This policy process looks straight forward with clarity on the start of a policy process (recognition) with inputs from interest groups and a distinction between policy implementation and outcome. But in reality, the process does not proceed in such a single style, because interest groups are needed in some stages of the policy making process to validate the policy (example at the implementation stage) (Stover and Johnston, 1991). There is also no evaluation stage which helps to start the whole process again if there is a change along the line.

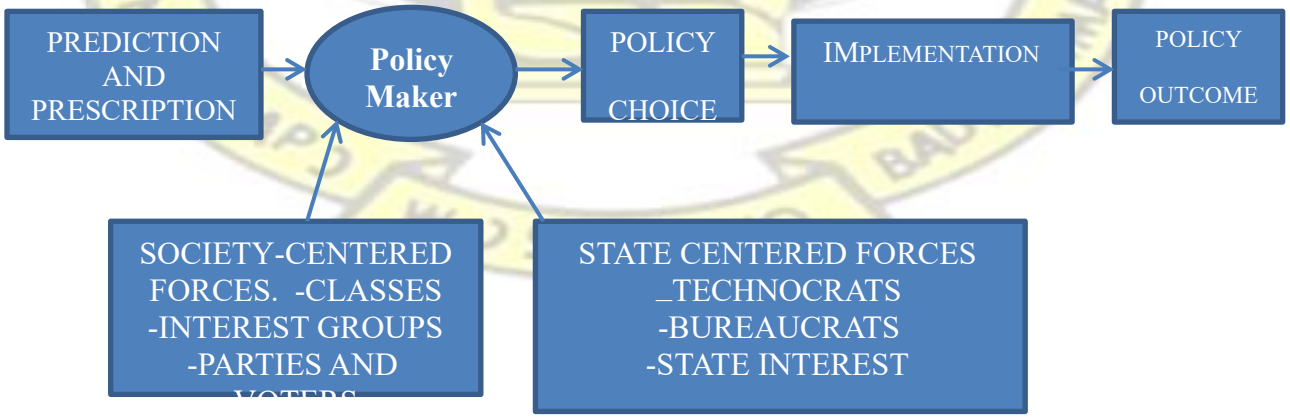


Figure 2.9: Meier's 1991 Linear Model of the policy process Source: Hardee et al. (2004)

Grindle and Thomas (1991) also came out with a different framework that had three different phases - phases of the policy process. The first phase called the Agenda Phase looks at particular issues for inclusions in the policy agenda. Implying policy makers begin to consider an issue for developing a policy only when they are convinced that it merits consideration (Hardee et al., 2004). Grindle and Thomas' framework as shown in figure 2.10 depicts that the process of policy formulation can stop at any stage and that issues do not primarily end in an automatic implementation (Stover and Johnston, 1999).

Decision for or against Reform – the second phase – Thus formulation policy may or may not be implemented. The last phase is the implementation stage. This framework shows the possible iterations in decision needed to advance the process to a desired conclusion.

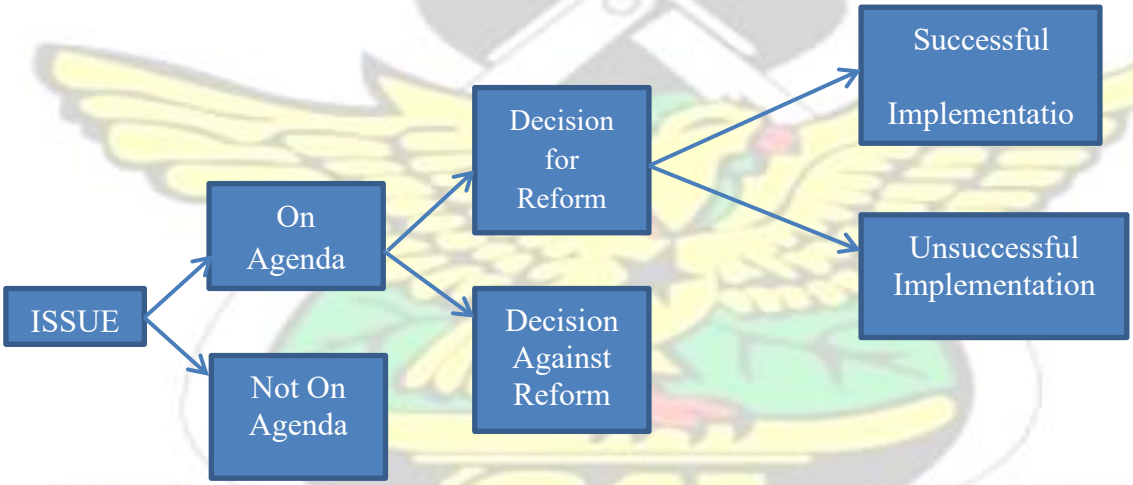


Figure 2.10: Grindle and Thomas' framework for policy process Source: Grindle and Thomas (1991)

Walt and Gilson (1994) considered the actors involved in the policy process and the various roles they play.

Technocrats include scientist, scholars and subject related experts who give information to identify the extent and nature of the problem as well as the causes and solutions.

Bureaucrats work on the structures and institution (normally government) and how these institutions can best address the pertaining problems. Interest Groups include affected people, trade unions, religious groups, etc. they seek to ensure that the voices of the group is heard in a policy decision. Politician or decision makers; seek power to either solve societal problems or to just retain power. Donors support the policy process with funds, technical assistance; provide international recommendations, guideline and even international acceptance (Stover and Johnston, 1999).

In summary, the technocrats bring technical know-how (Knowledge) on board for policy process. The bureaucrats handle all the institutional matters of policy, interest groups brings representation for brainstorming to clear all issues of doubt, politicians make the laws and have the powers for policy direction and the donors influence policy decisions to suit their needs.

These models are just tools that seek to break the complexity of policy making into a more manageable degree (Cochran et al., 2009). Implying none of the models in itself is complete enough to explain the process. Any work in this area might there need to dwell on the qualities and features of more than one model to achieve a meaningful end. A policy can be initiated at the instance of government legislation requirement, civil service originated policy, event driven policy, think tanks, association or trade union driven policy etc. (Waller et al., 2008). Policy is stakeholder driven and therefore, has a great bearing on the way the stakeholders do their business (Geurt, 2011).

2.13 POLICY FORMULATION

The advice and decisions on policy making are based on evidence (Northern Ireland Civil Service, 2003). The evidence includes experts‘ advice, research into the policy area and theories (such as the accident causation theories discussed). Policy formulation is a strategic planning process to develop, discuss and set the goals of a policy which result in a general

concept or idea (Hanzl et al., 2001). It builds a consensus out of scenarios and finds the best way or means for fulfilling an intended goal of an organisation. The results generate a legally binding framework for a more precise plan and /or concept for a given period. Hanzl et al. (2001) retorted that, inclusion and informing all stakeholders is a crucial part of policy formulation because it creates the atmosphere for acceptance of the goals and the policy as a whole.

2.13.1 Factors affecting policy development from international research

Background of the Country

Different countries have different stratifications in terms of population, culture, location, social classes and these greatly affect the process of policy development and implementation (Haddad and Demsky, 1995).

Political Context

Understanding the political environment of a country is very necessary for the development of any policy (Haddad and Demsky, 1995; Cochran et al., 2009). The importance to which the political setting attributes to H&S and the role of the construction industry play in the social-economic processes of the country has a great influence in any policy relating to the industry. According to Haddad and Demsky (1995) the priorities of both the national political elites and the leaders of a particular industry must be distinguished to be able to develop a good policy.

Economic Context

The macro-economics and the human resource needs for a particular policy must be looked at before an agenda is set for policy development (Cochran et al., 2009; Buse et al., 2005; Haddad and Demsky, 1995). Future trends in the sector, financial resource, human resource

and general infrastructure needs are all areas which have to be understood in policy development.

Dynamics of Changes

For a complete policy dev3elopment, the forces of changes against or for a particular policy must be assessed in relation to the present situation (or the time of policy formulation) (Haddad and Demsky, 1995).

Legislation

Legislation is the major force in policy development or change. Legislation is believed to be the views of the general population since it is enacted by representatives of the general population (Beland and Shinkawa, 2007).

Table 2.1 below shows other factors identified from other literature.

SOURCE	FACTORS
(Haddad and Demsky, 1995); (Béland et al., 2007); (Paudel, 2009),	The problem at hand
	The sector or coverage area of the policy
	Political setting
	Economic setting
	Cultural values of the affected people
	Demography
	Institutional structures
	Affordability (cost)
	Feasibility (Administrative or whether it ties up with existing policies at work
	Bureaucracy
	Desirability (effect of policy and compatibility with national development plan
	Records or information for policy development
Cochran, et al., 2009	Bureaucracy
	Legislation
	Time
	Cost
	Interest groups or actors
	Information
	Independence of the policy developer
	Ethical perspectives or principles

	Problem definition
	Policy demand
	Agenda formation
	Ideological considerations
Beland and Shinkawa, 2007	Legislation
	Demography
	Labour mobilization
	Politics
	Institutions
	Scope
	Institutional restructuring
	Economy
	Culture or ideology
Buse et al., 2005	National and international legislation
	Actors- national and international societies
	Situational factors – one time off factors such as epidemic.
	Structural factors
	Cultural factors
	Financial resources
	Political regimes
	Humana resources
	Feedback
	Capacity – experts, coherence of the machinery
	Bureaucracy

Source: Author's construct (2015).

2.14 POLICY IMPLEMENTATION

Implementation is seen as the phase where the plans (including budget, infrastructure or structures and change management) necessary for policy are put in place (Hanzl et al., 2001). This is the phase where the planned policy is live-out. Policy implementation according to experts is believed to be at the heart of policy-making with a continuous feedback from delivery/recipient back into policy formulation (Waller et al., 2008). Policy implementation covers all the actions that public and private entities brings on board in order to achieve the policy objectives (Paudel, 2009). It also includes creation of awareness and information dissemination. Quality control at this phase is important to provide for opportunities for readjusting and policy improvement (Hanzl et al., 2001). Stover and Johnston (1999) stated that national and sub-national policies, guidelines and plans are needed for the effective formulation and implementation of policies. They also asserted that policy response need

financial and other resources (human etc) to build capacity for an effective implementation and output. However, most African countries depend on series of isolated policy statement rather than on a single all-inclusive policy to guide their policy development (Stover and Johnston, 1999).

2.14.1 Complications in Policy Implementation

During policy implementation process, differences are normally observed between the plan lines of action and what happens in reality (Buse et al., 2005). Misjudging ease of the implementation process is, conceivably, the most common mistake in policy planning (Haddad and Demsky, 1995). Normally, it does not matter how deeply various groups have been involved in the formulation processes; the start of implementation brings new situations to light. Implementation brings to light how schedules are unrealistic and overambitious planned programmes. Policy implementation also runs on various models that have been put across by different authors/experts (Buse et al., 2005). There are three well known theoretical models;

- **Top-down approach:** the approach attributes the job of policy formulation to the top management whereas the execution or implementation (Technical, managerial and administration of policy) is the job of the subordinates after they have received communication of the policy form the top management (Buse et al., 2005; Paudel, 2009). The two activities (formulation and execution) are seen as different and are normally separated. This approach is in line with the rational model for policy process which perceives the process to be linear (Buse et al., 2005). Accordingly, Buse et al.

(2005) stated that for this approach to be effective, certain conditions must be in place:

- The objective must be specific and rational.

- Reasons for policy development must be to address real needs at work; sufficient causal theory.
- The process of implementation must be plan in a lucrative way attract compliance
- Implementing officials must be committed and have good knowledge of the policy
- Implementation should be backed by sound legislation as well as support from interest groups.
- The required resources must be made available and policy implementation should be given enough time to mature
- Communication and inclusion of all stakeholders is also vital.

Critiques of this approach believes it is neither a good description of what happened in practice nor a helpful guide to improving implementation due to the fact that conditions for implementation might not all be available at the start of the process (Buse et al., 2005).

Bottom-up approach: In this approach, individual at lower ranks are considered to play a very active role in implementation; implying their suggestion can help redefine policy objectives and change the course of implementation for the better (Buse et al., 2005). Bottom-up approach draws attention to the fact that, policy execution is a collaborative process involving policy makers, implementing official from all levels of the organisation (or government), and other actors (Paudel, 2009). The above argument implies policy can still change at the implementation stage. Problems associated with bottom-up approach include difficulty in distinguishing the works of the various levels of the organisation on policy decision as well as evaluating policy effects.

Principal-agent theory: this theory is based on the fact that sub-optimal implementation of policy is as a result of the institutional structures put in place by modern government in which the Principal (Decision makers) delegates responsibility for implementation of policy

to their sub-ordinates or official (Buse et al., 2005). There is always a relationship between principals (those who define policy) and agents (those who implement policy). This relation allows the principal to specify what is provided and check that this has been accomplished. The agents‘ freedom and the extent to which the principal-agent relates to the agent are affected by:

- The nature of the policy problem- including macro versus sectorial or micro (scale of change), cost, time allocation, type group(s) affected, type of intervention, definition of policy and the degree of political sensitivity (Buse et al., 2005).
- Resource availability and socio-economic and political climate.
- The administrative machinery required for effective implementation; including associations and national agencies.

The implementation of policies from these three theories has three major components (Jenkin et al., 2006; Anderson and Sotir, 2006); interpretation, organisation and application.

Interpretation transformations the formulated policy into units for administrative instructions and interventions

Organisation sets up administrative structures needed for the units rolled out in an implementation programme.

Application: routine administering of the service

Table 2.2 Factors That Affect Policy Implementation Identified From Literature

SOURCE	FACTORS
Hunter, 2003	External agencies
	Time
	Required combination of resources is not available
	The indirect relationship between cause and effect
	Misunderstanding and disagreement on objectives
	Incorrect sequence of task
	Communication and coordination
	Lack of positive and negative incentive to demand compliance
	Evaluation
	FACTORS
Haddad and Demsky, 1995	Implementation funds
	Planning
	Lines of responsibility
	Clarity in objectives
	Human resource for implementation
	Administrative system
	Political support
	Feedback
	Evaluation
Cochran et al., 2009	Traceability of the problem being addressed by the policy
	Financial Resource
	Human resource
	Clarity of the law or policy
	Public support
	Socioeconomic conditions
	Attitudes of affected groups
	Measurable output from policy
Buse et al., 2005	Lack of systems to accommodate new resources
	Lack of government support
	Pressure to achieve quick results
	High cost imposed by administration of policy
	Communication machinery
	Inadequate time
	Resource combination
	Lack of valid theories of cause and effect
	Baseline incidence
	Specific characteristics of population
	Local variations

	Latency period before an effective intervention is observed

Source: Author's construct (2015)

2.15 SUMMARY OF CHAPTER TWO

Chapter two discussed various literature relating to general health and safety in the construction industry both locally (Ghana) and internationally. Standard H&S management systems such as HSG 65, ILO-OSH-2001 and OHSAS 18001:2007 are delved into, to ascertain what is internationally acceptable, to aid in H&S policy formulation and implementation. This chapter also looked at some of the causation models which are of importance in framing a policy to suit any particular situation. Accidents and incidents are normally caused by a chain of reactions, and there are number of studies which have been carried out to find out the causation of accidents. Factors which cause accident can be human errors, mechanical failure or process failure. The results of accident range from no injury to fatality, with resultant legal actions against companies or individuals involved. General policy development and implementation were also discussed to collect information on factors that affect policy. Policies of companies are mostly driven by legal status in the country of operation, the client or customers requirement and the companies believe or objectives. In Ghana, there are a number of laws which contain bits and pieces of regulations on H&S. these laws include the labour law

(Act 651, 2003), workmen's compensation law 1987 (PNDCL 187), factories, offices and shops 1970 (Act 328) and some ILO conventions which regulates H&S. Policy formulation and implementation are processes which are influenced by the political atmosphere, the culture and socio-economics of the place of origin. A collection of these factors is therefore useful in deciding a policy action.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter looks at the stages covered in achieving the objectives of this study. It discusses the strategy used in the overall research design. Research processes, designs (philosophy, approach, strategy etc) and their relationships are looked at in this chapter. The statistical tools employed are also discussed.

3.2 RESEARCH PROCESS

Research process is the steps the researcher goes through when developing an appropriate methodology to effectively answer the research questions. It starts with definition of the philosophical view point of the research, which paves way for the correct selection of research approach and then the strategy adopted for the research. With the strategy chosen, a time horizon is identified and then data is collected for analysis to explain the problem at hand. The aim and objectives provided a clear point of focus for this research which led to the literature review. During which important literature relating to the research was reviewed for the theoretical framework. Based on the literature, a research design was adopted for this work.

3.3 RESEARCH DESIGN

The research design for this work was based on Saunder et al. (2007) research onion idea as shown in fig 3.1. The research onion as retorted by Bryman (2012) is quiet useful due to its adaptability to a wide range of research methodology. This research was therefore designed taking into consideration the philosophical view point, research approach, research strategy, time zone and data collection method all with the aim of achieving the research aim and objectives.

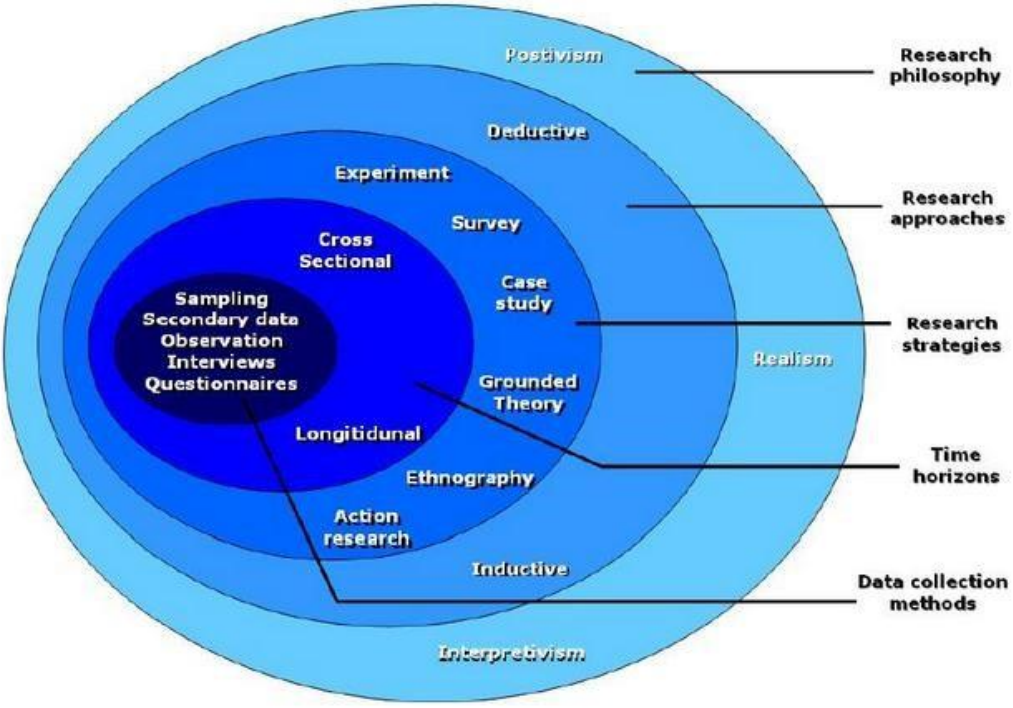


Figure 3.1 Research onion

Source: Adopted from Saunder et al. (2007)

The research design provides a logical link between the research aim, framing of research questions, the data collected and then finally, reporting on the data.

3.4 RESEARCH PHILOSOPHY

Philosophical paradigms as posited by Klopper (2008) are systems of interacted assumptions from ontological, epistemology and methodology. They act to commit the researcher to a particular design. Kuhn (1962) also defines paradigm as an integrated cluster of practical concepts, variables and problems attached with consistent methodological approaches and tools. Olson et al. (1992) simply explain paradigm to mean a pattern, structure and framework or system of scientific and academic ideas, values and assumptions. The assumptions and values that the different paradigms bring to a research work, may be seen as appropriate for some purposes and insufficient or overly complex for other purpose. It all depends on how the researcher views the assumptions.

From the above, research philosophy is basically a set of belief, assumptions, perceptions and the nature of reality and truth relating to a particular research topic. These assumptions provide justification for how the research will be undertaken. There are a lot of philosophical paradigms (including Positivism, Realism, interpretivism, objectivism, subjectivism, pragmatism etc). The three philosophical stands are;

Ontology which looks at the study of being, what exist, what it looks like, what units make it up, and how the units interact with each other. Ontological tries to find out if the existence of nature is an objective reality that really exist or only a subjective reality created in the mind (Henning et al., 2004).

Epistemological assumption looks at the most appropriate ways of enquiring into the nature of the world; what is knowledge, what are the sources and limits of knowledge.

Axiology is about the role of values and ethics in research.

From the three philosophies, there are various paradigms to them. These include constructivism, positivism, realism and pragmatism paradigms.

Interpretivist / Constructivist

Under this paradigm, it is seen as important to discover and understand meanings of realities and the contextual factors that determine, influence and affect the interpretations reached by different individuals. The focus of the researcher is on understanding the meanings and interpretations of _social actors' and to understand their world from their point of view. It is highly contextual and hence is not widely generalizable (Saunders et al., 2007).

Positivism paradigm is based on philosophical ideas of the French Philosopher August

Counter. Positivism is grounded upon values of reason, truth and validity and there is a focus purely on facts gathered through direct observation and experience and measured empirically using quantitative methods – surveys and experiments.

Positivism in the ontological level reasons that, reality is objectively given and it is measureable using properties which are independent of the researcher and his instrument. It argues that knowledge is quantifiable and objective. Ontological Positivism is about uncovering the truth and presenting it by empirical means (Henning et al., 2004). Thus positivism is all about facts in knowledge and ontology looks at reality been independent of social construction. This research supports the positivism in the ontological paradigm which test hypothesise developed from exiting theories (deductive reasoning) through the measurement of observable social realities, even though the research is done in an uncontrolled social environment. Positivist approach provides rational explanation for social occurrence by identifying, measuring and evaluating the factors associated with the phenomena. It draws links between the factors and establishes the extent to which these factors or variable relates to a particular theory or practice (Neville, 2007) Thus, positivism looks at what is open to the human sense which is reality and it argues that questions and answers should be based on what is scientifically observed (empirical inquiry) not on speculations (Gray, 2013).

3.5 RESEARCH APPROACH

The positivist position is generally characterised by the testing of hypothesis established by existing theory (deductive) through measurement of observable social realities (Smith et al., 2009). This work uses the deductive research approach which is in line with the positivist position chosen. Deduction research approach is particularly best for research concerned with looking at whether the observed pattern fits with the expected pattern based on other research works (Smith et al., 2009). As against inductive approach which first collects data

and then patterns are generated from the analysed data, deductive approach moves from a universal view(s) of a particular situation and then works towards the specific truth of the situation (Gray, 2013). It tests ideas or principles through empirical observation or experimentation by setting up indicators which are measurable in an operational format (Gray, 2013). This work therefore, used quantitative variables in testing and formulating the framework.

3.6 RESEARCH STRATEGY

This stage defines how the research was carried out. The strategy has a number of different approaches including experiment, case study, action research, archival research, survey, and ethnography. Due to the fact that this research was done in an uncontrolled environment, experimental strategy was ruled out. Again, action research is characterised by the examination of trends, participation and intervention of the researcher, it was therefore not ideal for this work. Case study which is the assessment of a single unit of a subject in order to set the main characteristics of the subject and to draw generalisation was not used for this work, since the attention was not on a single unit but on a sample representing the population. From the above, the survey strategy was best option adopted for this work. The survey strategy is in line with Cohen et al. (2005) observation that, positivism research uses the traditional strategies of surveys and questionnaires. Survey research strategy dwells on sampling a representative portion of the population. This strategy produces quantitative data which can be analysed empirically and it is consistent with the adopted research approach above. Ethnography which involves the observation of people, examining their cultural interactions and their meaning was also not suitable for this study.

3.6.1 Source of Data

The study employed the use of both primary and secondary data. The primary data was obtained by the use of questionnaires administered to respondents from the population for

the study. The secondary sources of data were obtained using relevant books, journals, magazines and research papers.

3.6.2 Survey

This stage is the operationalization of the concepts for testing the research assumptions empirically. It includes the formulation of appropriate questions in relation to the research questions to bring out the clarity on the topic. Thus research questions might not be easily measured directly; however, the concept can be measured indirectly by measuring variables that are assumed to have a direct bearing to the research questions (Everit, 1998). Survey technique is helpful when the research topic centres on policy formation, programme evaluations and when the information needed has to come directly from affected people (Adinyira, 2010). It also helps to collect data from large number of respondents. From this, the research questionnaires were developed using information from the reviewed literature to measure the characteristics of a policy. Questions were carefully looked at to exclude or minimise the addition of overfed specifics which include rewording of other items or questions and maximising variations in the research question. Different scales have been used in this work but the major one employed was the LikertStyle rating scale. However, the scale was limited to a maximum of 5-values rating. This is because Saunder et al., (2007) found out that, respondents find it difficult to differentiate values between ratings when the scale goes beyond 5-points. They also alluded to a common practice in most research where 5-points are used and accepted. The 5-point scale is accepted because it serves to increase the integrity of the data collected by reducing respondents‘ error.

3.6.3 Questionnaire

The primary information or data for this research was collected using questionnaire. Questionnaire is a set of queries prepared to request for information from respondents in a research. The data from the responses are normally coded into statistically data useful to the

research topic (Roopa and Rani, 2012). The questionnaires for this research were sent out both in printed and electronic form to the target respondents. The questions had predetermined answers on ranked scales for respondents to answers the questions from. The design and administration of questionnaire is important since the responses can be used to make general statements about specific groups or people or entire populations (Roopa and Rani, 2012). The responses from the survey can become useless with inappropriate questions and bad scaling, as it may not accurately reflect the views and opinions of the participants. To check for the accuracy of the questionnaires sent out and to remove as much as possible all forms of ambiguity, it was pre-tested on five contractors. This was a useful check for the questionnaire to make sure that issues were accurately captured in questions to elicit the needed information or answers from participants. The structured questions were design to gather specific and appropriate data, which can be amended for statistical analysis. The questionnaire was administered using a face-to-face or interview approach as well as mailing to few contractors who could not be reached easily for response. This was to give a better response rate.

3.6.4 Structure of questionnaire

The questionnaire was designed to achieve the research objectives. It consisted of an introduction which gave a brief description of the research, its purpose and objectives. The initial part of the questionnaire related to general information about the companies and the respondents. The respondents were requested to answer general information relating to their classification and experience in construction. The respondents were asked to identify the various H&S policies which are available in their firms. Most of the questions were constructed using different Likert scale depending on the objectives of the questions. The respondents were asked to indicate whether a set of given statements were true or not , in relation to your company‘s H&S policies using the scale of 1-5 where *1-“Not true”, 2“Rarely true”, 3-“Sometimes true”, 4-“Mostly true” and 5 –“ Always true”.*

On a priority scale of 1-5 the respondents were asked to rate some identified factors in relation to their companies.

1 – "Not a priority", 2 – "Low priority", 3 –"Neutral", 4 – "Moderate Priority" and 5 – "High priority"

Response to 22 factors affecting the development and 19 implementation factors of H&S policies in companies were ranked on a scale of 1-5 where *1 – "Strongly disagree", 2 – "Disagree", 3 – "Neutral", 4 – "Agree" and 5 – "Strongly agree".*

For the role communication plays in every organisation's success, questions were asked to find out the best way to communicate H&S policies to employees. These were ranked on the scale of 1-4 where *1 – "Not Good", 2 – "Good", 3 –"Better" and 4 –"Best".*

3.6.5 Target Population

The Ghanaian construction industry has a wide range of firms which are registered with the Ministry of Water Resources, Works and Housing (MWRW&H) and categorised as D1K1, D2K2, D3K3 and D4K4. These categories are based on a number of factors such as annual turnover, financials, equipment holding and personnel.

The Ghanaian construction industry is made of a large number of smaller firms. A list released by the ministry of road and transport of contractors in good standing with the ministry on 14th April 2015, indicates only 293 out of 2087 contractors are in A1B1 and A2B2 categories. This shows about 86% of construction firms in Ghana are small in nature and capacity. This study used D1K1 (lager firms) and D2K2 (medium firms) belonging to ABCECG as the target population. These classes were chosen because they were deemed to be large enough to have some sort of H&S management system in place on their sites. Again, with the financial class according to MWRW&H (D1K1 firms, according to MWRW&H are registered as financial class 1, capable of undertaking projects of any value,

class 2 (the medium firms) are capable of undertaking projects up to US$500,000 (Danso, 2010)), these firms employ more people and take on more risky constructions activities as compared to the smaller classes and are therefore more at risk of accidents on their site. Hinze and Gambaetse (2003) stated that, companies with high turnover rates normally comes with higher injury rate because, such companies are constantly employing new workers who are normally prone to being injured on the job due to their inexperience and lack of H&S culture. Moreover the construction industry in Ghana is made up of a small number of large firms and a multitude of small and mediumsized enterprises (SMEs). According to Lingard and Rowlinson (2005), majority of constructions firms in Australia are small with 97 per cent of general construction businesses employing less than 20 people. Again, small businesses are not likely to have professional OHS advisors on staff, may lack the knowledge and the request resources for OHS management (Lingard and Rowlinson, 2005).

Contractors registered with Association normally do well in H&S performance because they have access to joint resources (experts and also assistance from the association) in dealing with H&S issues (Hinze and Gambatse, 2003). To have accurate responses, people with better understanding of H&S standards and policy were the preferred respondents to the questionnaire. These included the project managers, Engineers, Safety Officers and supervisors of the firms.

3.6.6 Sampling procedure

The study employed cluster sampling to select one cluster out of ten clusters created with focus on contractors with D1K1 and D2K2 classifications registered with ABCECG. The ten regions in Ghana were considered as clusters. The reason is that, members with the same classification in the different regions are eligible to undertake similar works. A simple random sampling was used to select one cluster out of the ten clusters. The selection was

made with sampling without replacement. The names of the ten regions in Ghana were written on pieces of papers, folded and a friend was asked to pick one from the papers. In the end, Greater Accra region was selected. The rule for simple cluster is that all members in the selected cluster are included in the study. As at the time of this study, a total number of 73 contractors (both D1K1 and D2K2) were registered with the association and were actively involved in the activities of the association. The study also used a cross-sectional study approach where data was collected once from all the respondents.

3.7 DATA ANALYSIS

Most of the data collected for the research used ordinal scales which measures categorical data. The central tendency measure of an ordinal scale can be its median or mode, and means (Anol, 2012). Hence, statistical analyses may involve percentiles and nonparametric analysis, but more sophisticated techniques such as correlation, regression, and analysis of variance, are not appropriate. Monotonically increasing transformation (which retains the ranking) is allowed. SPSS was used to aid the analysis of the data.

3.7.1 Descriptive Analysis

Descriptive analysis techniques employed for this study included means, mode, standard deviation and percentages. Frequencies are determine after data has been arrange in an order and form the basis for other descriptive measures as mean, standard deviation , median, mode, range, and percentages.

- Mean is the measure of the central point of a data set. It is given by,

$$\bar{x} = \frac{x_1+x_2+x_3+\cdots\ldots+x_n}{n} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where,

$\bar{x}$ = sample mean

n = number of data points; $x_1, x_2, \ldots \ldots x_n$

- Standard deviation speaks of the spread and variability in a group of data. It is the most useful index for assessing the variability in data. It is given by,

$$s = \sqrt{\frac{\sum(X - \overline{X})^2}{n - 1}}$$

where,

s = sample standard deviation $\sum$ = summation of... $\overline{X}$ = sample mean n = number of scores in sample

3.7.2 Factor Analysis

The statistical method used to organize a large number of data into a more manageable mass of factors where the correlation between various individual questions can be calculated and grouped into matrix is Factor Analysis (Nyame-Asiamah and Patel, 2009). Factor analysis is therefore a data reduction tool used to remove redundancy and duplication from a set of correlated variables resulting in smaller set of derived variables (Factors) which are independent of each other. These factors can be used to describe many variables using a few factors. Thus it is used to summarize data so that relationships and patterns can be easily interpreted and understood and also helps to isolate constructs and concepts (Nyame-Asiamah and Patel, 2009). Factor analysis is technique is widely used in social science research for the assessment of convergent and discriminant validity in multi-item measurement scales (Anol, 2012).

To perform a factor analysis, closely correlated cluster of questions called factors is identified, and the relationship between an individual question and these factors is calculated by factor loading, which lies between 0 and 1. Questions are then ranked within the factor as per their factor loadings and calculating the factor-score coefficients for the various factors (Nyame-Asiamah and Patel, 2009). Proceeding to the extraction of the factors, number of tests should be used to assess the suitability of the respondent data for factor analysis. These tests include Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy,

and Bartlett's Test of Sphericity. The KMO index, in particular, is recommended when the cases to variable ratio are less than 1:5. The KMO index ranges from 0 to 1, with 0.50 considered suitable for factor analysis. The Bartlett's Test of Sphericity should be significant ($p<0.05$) for factor analysis to be suitable. The aim of rotation is to simplify the factor structure of a group of items, or in other words, high item loadings on one factor and smaller item loadings on the remaining factor solutions. There are numerous ways to extract factors: Principal components analysis (PCA), principal axis factoring (PAF), image factoring, maximum likelihood, alpha factoring, and canonical (Williams et al., 2010).

3.8 SUMMARY OF CHAPTER THREE

The chapter three details of how the research aim and objectives were achieved. It covered the methodology adopted for the study; the research process, design, philosophy and research approach. The researched was carried out on the philosophy of positivism in the ontological level. In line with research philosophy, a deductive research approached was adopted with quantitative variables to test the factors identified. The source for the data collected is D1K1 and D2K2 contractors registered with ABCECG in Accra. A cluster sampling procedure with random sampling was used to select the respondent contractors (branch). The list of contractors included in the study was 73 in number. Survey technique with structured questionnaire was used for the data collection. Since most of the data collected were ordinal, the analysis run on the data were mean, standard deviation, frequency and mode (descriptive analysis). Factor analysis was also done to reduce the variables size for inclusion into the framework development.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter of the research details the analysis and the discussion of the results obtained after the administration of the research questionnaires. Basically, only primary data is analysed in this chapter. As stated in chapter three, the main statistical analyses used were frequencies, mean, standard deviation and factor analysis.

4.2 DEMOGRAPHIC INFORMATION

This stage of the analysis enquires into the background of respondents, which is purposely to evaluate the credibility of information given out, to create confidence in the precision and reliability of data collected. It includes type of construction activities, position of respondent, years of firm existence; years of experience of respondent and number of employees. Results for demographic information were presented using descriptive analysis which involves frequencies and percentages.

The study sample was 73 D1K1 and D2K2 contractors in the Greater Accra region. A total of 51 out of the 73 questionnaire were answered and returned for the analysis. This represents 69.86% response rate. The high response rate is attributed to the techniques employed by the researcher in the data collection. Use was made of clients of respondent as well as the emailing the questionnaire to companies who agreed to answer them electronically.

Table 4.1: Demographic Information of respondents

	Frequency	Percentage
Different construction activities undertaken by respondent's firm		
Civil and Road	22	42.9
Building	24	47.6
Others	5	9.5
Total	51	100.0

Years of Firm Existence		
1-5 years	1	2.4
6-10 years	11	21.4
10 plus years	39	76.2
Total	51	100.0
Position of respondent		
Manager	6	11.9
Engineering	16	31.0
QS	5	9.5
Safety officer	15	28.6
Others (construction work supervisors)	10	19.0
Total	51	100.0
Experience of respondent with the firm		
1-5 years	27	52.4
6-10 years	18	35.7
10 plus years	6	11.9
Total	51	100.0
Number of employees in the firms		
1-25 Employees	2	4.8
26-100 Employees	33	64.3
100 and above Employees	16	31.0
Total	51	100.0
Policy availability in the industry		
Yes	39	76.2
No	12	23.8
Total	51	100.0

Source: Researcher's Survey (2015)

4.2.1 Kind of construction firms undertake

Different types of construction activities come with different H&S risks and different legal regulations. The culture of H&S is also shaped by the specific industry (client) that a construction company works for. Therefore the clients and the risks that a company is prone to, can subject the firm to develop strategies to deal with work place risks and/or meet the client/legal requirements. The findings indicate that, there was a fair balance between the respondents from the building and then civil and road (shown in table 4.1). 42.9% of the respondents work in companies that are engaged in civil and roads works,

47.6% are in Building firms and 9.5% are engaged in both sectors.

4.2.2 Years of Firm's Existence

The number of years and the nature of works undertaken by company is normally a good indication of the firms experience and knowledge. Most of the firms were more than ten years which the researcher believes gives the firms reasonable experience. A majority of the firms; 39 in number (76.2%) are more than 10years in their fields of operation, 21.4% between 6 to 10 years and only 2.4% were less than 6 years as shown in Table 4.1.

4.2.3 Position of respondent

The results show that the respondents were basically professionals; 11.9 % were the managers of the firms, 40.5 % were engineers/QS, 28.6% were Safety Officers and 19% were supervisors/other as shown in table 4.1. Almost all the respondents (81%) held positions within their firms that are traditionally regarded as being upper or top management positions. However, it must be noted that, not all of these positions were directly related to safety and health. The respondents are therefore deemed to have enough information and knowledge in relation to their firms to give accurate responses to the questionnaire.

4.2.4 Experience of respondent with the firm

The duration which respondents had worked with their current firms ranged from 1year to 10years. As shown in Table 4.1, more than half of the respondents (52.4%) had worked between 1-5years, 35.7% had worked for 6-10years and 11.9% for more than 10 years.

This result indicates one of two things; either employee turnover/retention in Ghanaian construction industry is poor or there are a lot of young professional in the system. Again, the experience of the respondent was needed to give more relevance to the kind and quality of information that was given out by the respondents.

4.2.5 Number of employees in the firms

Per the MWRWH rating of D1K1 and D2K2, these are contractors who employ relatively large number of people. The study (Table 4.1) shows that, 31% of the firms employ more than 100 people and 64.3% employ 26-100 people. Firms that employed between 1 and 25 employees made up 4.8%. Per HSG 65 requirement, any company which employs more than five workers ought to have H&S policy. From the results, all companies involved in this study fall within this category implying there must be an existence of H&S policy on site.

4.2.6 Policy availability in the industry

Contrary to requirements and laws (as stated in section 4.2.5 above), not all of the respondent firms had H&S policy at their work place to deal with risks. A total of 39 respondents representing 76.2% had some sort of H&S policy whiles 23.8% said do not have (as shown in Table 4.1). In my opinion, this might be due to weak regulatory frameworks.

The above finding is important since the responses to the remaining questions were dependent on the level of understanding and availability of some sort of H&S policy at work. Table 4.2 shows the distribution of various policies that are available to the 76.2% of the respondent companies. The policy on smoking scored the lowest (50% of 76.2% of respondents) in the industry. This might be due to the general non-smoking culture among Ghanaians. Most companies (90.6%) had policies relating to cleanliness (housekeeping) on site which is in line with the general work environment. HSE, (2014) ranked accidents resulting from fall from height as the major cause of fatal accident to workers in the construction industry. It accounted for over 39% of all accidents. The results from the finding indicated that 87.5% of the respondent companies had a policy to deal with working at height. Other prevailing policies include first aid (87.5%), fire emergency (81.2%), driving policy, excavation and drug and alcohol policies; each has 78.1% availability.

Table 4.2: Types of Policies available in the industry

	POLICY	Yes (%)	No (%)
1.	Driving policy	78.1	21.9
2.	Drug and alcohol policy	78.1	21.9
3.	Smoking	50	50
4.	Exposure to fumes/chemical vapour/dust	68.8	31.2
5.	Exposure to vibration	71.9	28.1
6.	Exposure to high level of noise	71.9	28.1
7.	Manual handling/lifting of heavy weights	75	25
8.	House Keeping on site	90.6	9.4
9.	Work at height (working on platform, scaffold, hoist etc)	87.5	12.5
10.	Lifting Appliance and gear	53.1	46.9
11.	Unguarded openings in floors, walls and stairways	62.5	37.5
12.	Excavations	78.1	21.9
13.	Ladders usage	81.3	18.8
14.	Movement of mobile construction plant	75	25
15.	Fire Emergency	81.2	18.8
16.	First Aid	87.5	12.5

Source: Researcher's Survey (2015)

4.3 QUALITY OF H&S POLICY IN THE CONSTRUCTION INDUSTRY

To evaluate the quality of policies at work, the 76.2% (39 in No) of the respondents who answered yes to the having H&S policy were asked 32 questions relating to the quality of health and safety policies as shown in Table 4.3. The mean responses of the variables can be considered as an indication of effectiveness of the variables. The variables were initially grouped into major themes. In this study, it is assumed that if the overall mean score of responses for any attribute (Theme); μ is significantly < 3.50 then it counts as a ―poor quality‖ H&S policy, equally, if the mean score is significantly $3.50 \leq \mu < 4.00$, that attribute contributes positively to ―good quality‖ H&S policy. However, an attribute with a mean score falling between $4.00 \leq \mu \leq 4.50$ can be considered as a ―better quality ―and if the attribute is ≥ 4.50 then it is deemed to be of the ―best quality‖. A total of 35 variables were identified, grouped into 8 themes and used in this study. Six (6) out of the eight (8) groups emerged in first group ($\mu < 3.5$), only two (2) groups with 11 variables fell into

$3.50 \leq \mu < 4.00$.

Table 4.3: Variables for assessing the quality of H&S policies in the Construction Industry

		Mean	Std. Deviation
A	**JOINED UP**	**3.62**	
1	Policies have clearly defined scope	3.88	1.00803
2	Company's H&S policies are consistent with workplace operation's objectives	3.59	1.07341
3	H&S Policies are consistent with other operational policies.	3.47	1.01550
4	H&S policies have clearly defined responsibilities for all different departments	3.53	1.29476
B	**INCLUSIVE**	**3.32**	
1	Company H&S policies are set by only management	3.97	1.03127
2	H&S policies are set by management in consultation with employees.	2.78	1.28852
3	There is clear channel for feedback into policy decision between management and workers (eg open forum on policies)	3.22	.97499
C	**COMMUNICATION**	**3.47**	
1	H&S polices are availability and accessibility to all workers	3.66	1.09572
2	H&S policies come in a written form	3.81	.99798
3	H&S Inductions are conducted for all workers	3.84	1.24717
4	Policies are communicated verbal.	2.56	1.13415
D	**INNOVATION, FLEXIBLE AND CREATIVE**	**3.11**	
1	H&S policies at work allows for brain storming on work methods	3.19	.99798
2	People are always rewarded for new ideas	2.69	1.37811
3	Policies are current and include anticipated future issues.	3.13	1.26364
4	The terms used in the policies are flexible, understandable and user friendly	3.44	1.16224

Table 4.3: (Ctd) Variables for assessing the quality of H&S policies in the Construction Industry

		Mean	Std. Deviation
E	**EVIDENCE AND LEGAL BASED**	**3.26**	
1	The H&S policies address real needs of the workplace	3.69	0.89578
2	H&S policies are not adopted from other companies	2.72	1.11397
3	There is proper documentation for all site accident and incident	3.75	1.29515
4	People /worker are invited to share H&S experiences and expertise at work	3.25	1.04727
5	H&S policies meet relevant local legal requirement	3.75	1.04727

6	Policy looks at other international laws.	3.38	1.18458
7	Policies restrict workers from enjoying their rights.	2.28	1.48616
F	**MANAGEMENT**	**3.65**	
1	The company has a senior management member responsible for H&S	3.94	1.43544
2	The safety policy is dated and signed by the senior executive of workplace	4.00	1.16398
3	Policies have stated accountability of Senior management team	3.53	1.41386
4	Executive long term strategy to achieve the policy objectives	3.19	1.20315
5	Company has a training program for staff	3.59	1.07341
6	Policies have definite document title	3.63	1.40850
7	Policies have date of issue and revision	3.69	1.40132
G	**RESOURCES**	**3.37**	
1	Company has a budget for H&S issues	3.34	1.23417
2	Company has a senior management member responsible for H&S management	3.28	1.25040
3	Monitoring and Assessment of the policy	3.59	1.18755
4	Company has good administrative structures and capability for H&S policies	3.25	1.21814
H	**EVALUATION**	**3.30**	
1	Policies are always effective in dealing with work related problems	3.38	1.00803
2	Policy outcomes are measurable	3.22	1.06965

Source: Researcher's Survey (2015)

4.3.1 Joined Up

The ILO-OSH-2001 stipulates that for a good H&S policy, the policy must be specific to the organization, appropriate to its size and the nature of its activities; concise, clearly written, a senior person is made accountable for H&S in the organization. Firms are to define and communicate to the members of the organization the responsibility, accountability and authority of person(s) who identify, evaluate or control OSH hazards and risks. The guideline reiterates how important it is for H&S management system to be compatible with or integrated into other management systems in the organization. Based on the above guideline and the assumptions made for the responses (section 4.3 above), the findings in

Table 4.3 indicate that, H&S policies in the industry have a clearly defined scope (3.88) which are consistent with workplace objectives (3.59) and slightly differ from other operational policies (3.47). Consistency with other operational policies rated low (< 3.5) and this can be due to the fact that, firms do not take other business needs into consideration when drafting H&S policies. However, responsibilities are clearly allocated to departments for accountability. In all, the study showed that H&S policies in the Ghanaian construction industry (D1K1 and D2K2 – Greater Accra Region) are joinedUp and of a good quality in that sense.

4.3.2 Inclusive

The employer in consultation with workers and their representatives must all be involved in the policy formulation process. Again, the employer should ensure as appropriate the establishment and efficient functioning of a safety and health committee and the recognition of workers‘ safety and health representatives, in accordance with national laws and practice (ILO, 2001; HSE, 2013). From the results (Table 4.3) it is clear that, most of the policies in the firms are set by only management with no proper channel for communication and feed backs (mean of 3.22). This can be due to the lack of health and safety committees on site as well as low recognition of such committees if they exist. A higher percentage of respondents said policies are set by only management (Mean of
3.97).

4.3.3 Communication

Policies must be effectively communicated and made readily accessible to all persons at workplace. Some of the best forms of communication identified in literature include inductions, safety trainings and the usage of notices. Because policies need to reflect the organisations values and believes, it is best written by someone within the organisation rather than adopting from outside the company (HSE, 2013; ILO, 2001, OHSAS

18001:2007). Per HSG 65 requirement, if your organisation has five or more employees, then a H&S policy must be written.

From the findings; as shown in Table 4.3, the overall rating (mean = 3.47) for communication of H&S policies was not good. Even though some individual aspects which are required to meet the recommendations in international guidelines were good, the overall rating dropped because verbal communication was poor (MS = 2.56). Available policies in the industry come in written form (MS = 3.81) and were accessible to workers (3.66) with some form of induction for workers (3.84).

4.3.4 Innovation, Flexible and Creative

Worker participation is an essential element of the OSH management system in an organization. The employer should make arrangements for workers and their H&S representatives to have the time and resources to participate actively in the processes of organizing, planning and implementation, evaluation and action for improvement of the OSH management system. Employees involvement in identifying hazards and responding appropriately or in managing health and safety at work helps to prevent accidents – injuries, promote positive perceptions toward safety policies and workers adherence to policies are also created (Hallowell et al., 2013). Henzi (2001) makes the accession that, positive reinforcement in the form of verbal praise or public recognition for safe work behaviour is effective because workers are likely to repeat such actions that resulted in the positive reinforcement.

Drawing from the above and the results of the study (Table 4.3), H&S policies in Ghana can be said to be rigid and does not encourage creativity among workers on issues relating to H&S. The overall MS = 3.11 which is not good. Brain storming on issues which allows workers to air their views scored 3.19 and there is little or no recognition on workers contribution toward H&S management in the industry (MS = 2.69).

4.3.5 Evidence and Legal Based

A quality H&S policy addresses real needs at the work place which include protecting the safety and health of all members of the organization by preventing work-related injuries, ill health, diseases and incidents (ILO, 2001). All policies whether public or private polices must of a necessity comply with relevant national laws and regulations, voluntary programmes, and other requirements to which the organization subscribes. Health and safety polices are no different. There must be documentation of deviations and all activities for future improvement of the system and such records must be consulted in drafting a policy (HSG 65). Hallowell et al. (2013) also states that specific protocols must be followed in an incident investigations so that the root causes can be identify and recorded to be able to develop methods to curb future incidents. These records serve as a source of information on past experiences.

Table 4.3 gives a summary of evidence and legal bases for policy in the industry. To the question of policies addressing needs at work place, respondents rated it good with a MS = 3.6. The response to documentation and whether policies meet relevant local legislation was rated good as the MS = 3.75 each. However, the issue of participation in the evidence and legal group still scored less (MS = 3.25 implying poor quality). Respondents also do not believe H&S policies restrict them form certain rights the mean score was 2.28. From the response there is basically little consideration to international laws with a mean of 3.38. In all, the rating for the evidence and legal base was poor (MS = 3.26).

4.3.6 Management

The employer and senior management should allocate responsibility, accountability and authority for the development, implementation and performance of the H&S management system and the achievement of the relevant OSH objectives (ILO-OSH: 2001; HSG 65; OHSAS 18001: 2007). For credibility and management‘s commitment to H&S policies, ILO-OSH (2001) stipulates that, the policy must be clearly written, dated and made effective

by the signature or endorsement of the employer or the most senior accountable person in the organization. One of the successes attributes for quality compliance at project site identified by Jha and Iyer (2006) is positive attitude of project manager and project participants‘. Likewise safety performance is remarkably strong when top management actively take part in H&S activities (Hallowell et al., 2013).

To achieve policy objectives, basic resources must be made available for implementation processes. The necessary H&S competence requirements should be defined by the employer, and arrangements established and maintained to ensure that all persons are competent to carry out the safety and health aspects of their duties responsibly. Training is needed to set the tone for the policy implementation and feedback channels are very important in evaluating the ―wrongs and rights‖ of the implementations. Due to the fact that accidents are caused by the inability of workers to identify hazard; Hinze (2001) stated that, construction companies must invest resources in training workers on hazard recognition and orientations/inductions to communicate protocol for appropriate response to hazards. It is also important to do a pre-plan of works, which must include hazard identification, and the controls must be included in method statements for works before the construction phase begins, to ensure that safety hazards are avoided or dealt with. In all, policy must be specific and periodically reviewed/revised as necessary to suit changing demands, communicated and readily accessible to all stakeholders.

The survey revealed that (Table 4.3), all the variables under the management except ―executive long term strategy to achieve the policy objectives‖ had a mean score >3.5. Companies with H&S policy have senior management member responsible for H&S (MS = 3.94), dated and signed policy has MS = 4.00. Training program had a mean score of 3.59 which is slightly above the poor quality, this can be due to the fact that management really does not have any long term strategy in dealing with H&S issues. Policies with definite title

had a MS = 3.63 with date of issue and revision having MS = 3.69. In relation to management the average score was 3.65 which puts management group into a good quality zone.

4.3.7 Resources

Effective administration implies having structures and processes necessary for policy implementation in place. Included in these are qualified person(s) responsible for H&S management, defined communication routes to promote coordination between all stakeholders, budgetary allocation for financing H&S and competent team for monitoring and evaluation. Resource must be proportional to the number of people employed on any particular site (Hallowell et al., 2013). Appropriate monitoring and apt feedback help in controlling the negative or positive effect of policy and they enhance the quality of the policy.

From Table 4.3, there is less budget allocation for H&S scoring 3.34 and there is relatively good monitoring and assessment of policy. However, the results shows poor administrative structures to hold and implement H&S policies, MS = 3.25. The quality of resources for H&S policies are therefore rated poor with a mean of 3.37.

4.3.8 Evaluation

Data must be collected and documented regularly for tracking, trending, and closing of corrective actions. Policy expectations and audit results should be communicated to personnel and progress should be measured regularly. There is the need for both qualitative and quantitative measurements of organisation‘s H&S performance. Indicators and targets must be set in relation to the organisation‘s identified hazards and the H&S policy objectives. These are to determine whether policy and objectives are being implemented and risks are being controlled or not.

The study (Table 4.3) shows that, policies are not really effective in dealing with work related hazards (MS= 3.38) and the outcomes are not measurable (MS = 3.22). These can be

due to the fact that, there are no targets set by companies in relation to health and safety. Clients might not also have any stringent health and safety requirements for contractors to meet on projects.

4.4 POLICY FORMULATION

To identify the factors that influence or affect the formulation of H&S policies, respondents were asked to rank; on a likert scale of 1 to 5, factors which they consider having significant effect on health and safety policy development. Table 4.4 shows that, the mean scores of 19 out of 22 factors evaluated are greater than the neutral value of 3.0 for the respondents. This means 19 factors are considered to have significant impact on policy development. Form the results, the factors were ranked.

Table 4.4a: Factors affecting policy formulation

	VARIABLES	MEAN	Std Dev.
1	Lack of full knowledge on H&S management systems	3.738	1.21092
2	Increased cost to construction process	3.667	0.90167
3	Cost of formulation	3.571	1.17167
4	Lack of accurate information or statistics for policy developers to base on	3.548	0.99271
5	Culture of the employees	3.524	1.13133
6	Low levels of H&S awareness among stakeholders	3.500	0.94353
7	Most client lack knowledge on H&S	3.476	1.13133
8	Consultation between management and other interest group	3.357	0.75938
9	Lack of national policy framework on H&S	3.333	0.84584
10	Poor participation by stakeholders	3.333	0.87420
11	No expertise in the industry to assist in policy formulation	3.310	1.09295
12	Financially feasible	3.286	0.99476
13	Lack of comprehensive national Legislation on H&S	3.262	1.10563
14	Existence of health and Safety committees on site	3.262	1.14890
15	Administrative feasibility	3.262	0.98920
16	No government support	3.190	1.15269
17	Policy aligned with existing policy	3.190	0.96873

18	Poor records of accident investigations	3.095	1.32167
19	H&S policy always conflicts with company‘s objectives	2.619	1.16770
20	Loss of competitive advantage due to increase cost of policy implementations	2.976	0.97501
21	Discouragement from actors in the industry	2.833	0.96061
22	H&S policy is a must for a successful construction project	3.833	1.10247

Source: Researcher's Survey (2015)

Table 4.4b: Frequency distribution of responses for policy formulation variables

VARIABLES	Str Disag %	Disag %	Neutral %	Agree %	Str Agree %
Lack of comprehensive national Legislation on H&S	9.5	11.9	31.0	38.1	9.5
Consultation between management and other interest group	.0	14.3	38.1	45.2	2.4
Cost of formulation	11.9	2.4	19.0	50.0	16.7
Culture of the employees	4.8	19.0	11.0	47.6	16.7
Financially feasible	4.8	11.9	45.2	26.2	11.9
Administrative feasibility	2.4	19.0	40.5	26.2	11.9
Policy aligned with existing policy	7.1	11.9	40.5	35.7	4.8
Poor records of accident investigations	19.0	11.9	21.4	35.7	11.9
Existence of health and Safety committees on site	11.9	11.9	21.4	47.6	7.1
H&S policy is a must for a successful construction project	2.4	9.5	26.2	26.2	35.7
Lack of full knowledge on H&S management systems	7.1	4.8	31.0	21.4	35.7
Increased cost to construction process	.0	11.9	26.2	45.2	16.7
No expertise in the industry to assist in policy formulation	7.1	14.3	31.0	35.7	11.9

H&S policy always conflicts with company‘s objectives	21.4	26.2	23.8	26.2	2.4
Most client lack knowledge on H&S	4.8	21.4	9.5	50.0	14.3
No government support	7.1	23.8	23.8	33.3	11.9
Loss of competitive advantage due to increase cost of policy implementations	7.1	21.4	42.9	23.8	4.8
Discouragement from actors in the industry	4.8	38.1	28.6	26.2	2.4
Lack of national policy framework on H&S	2.4	14.3	33.3	47.6	2.4
Lack of accurate information or statistics for policy developers to base on	2.4	11.9	31.0	38.1	16.7
Poor participation by stakeholders	4.8	9.5	35.7	47.6	2.4
Low levels of H&S awareness among stakeholders	2.4	14.3	23.8	50.0	9.5

Source: Researcher's Survey (2015)

4.4.1 Lack of full knowledge on H&S management systems

Results from the responses put lack of full knowledge on H&S management systems at the top of the identified factors. With a better understanding of the H&S management systems, the actors and interest groups driving the policy processes, can contributes effectively to influence policy and take action(s) necessary to strengthen health and safety at work. The various management systems identified in literature underscored the importance of the elements in a successful H&S management system. These elements include, policy; which sets a clear direction for the firm or organisation to follow, organising; which deals with effective management structures and arrangement for delivering policy, planning; systematic approach for implementing policy, performance measurement; setting targets and measuring against standards, and auditing; which review performance, compliance and gives feedback for improvement of the system (HSE, 1997). The issues associated with each of these elements can be understood through a range of definitions, concepts and frameworks, which also help to identify the characteristics of the available management systems.

From the outcome of the study (Table 4.4b), it is clear that managers of construction firms in Ghana do not have knowledge of the various H&S management systems. 35.7% of respondents strongly agreed, 21.4% agreed, 31.0% remained neutral with only 11.9% disagreeing to question of whether lack of full knowledge on H&S management system has effect on policy formulation. The mean score for the responses was 3.738 which were higher than the population mean of 3.00 ―neutral‖. This response is consistent to findings by Ayarkwa et al. (2010) in a on the barriers to implementation of EMS in construction industry in Ghana.

4.4.2 Most client lack knowledge on H&S

Again, Health and Safety Authority (2009), - regulations recognise the fact that most clients know little about construction health and safety implying that, there is a need for them to nominate competent person(s)/company to manage H&S on projects. This is confirmed in the results of the survey conducted (Table 4.4a). The mean for the effect of lack of client's knowledge on H&S policy was 3.476 with a standard deviation of 1.13133. From Table 4.4b 4.8% strongly disagreed, 21.4% disagreed, 9.5% neutral, 50% agreed and
14.3% strongly agreed

4.4.3 Increased cost to construction process

The findings (Table 4.4b) shows 16.7% of the respondents strongly agreed that formulation of policies increase their cost of construction processes, 45.2% agreed, 26.2% were neutral and 11.9 disagreed. The results (Table 4.4a) showed a 3.667 mean score for the responses with a standard deviation of 0.90167. This deters companies from putting policies together to direct their operations. This results show that the extra perceived ―burden‖ which comes in the form of safety equipment for works, that policy seem to put on companies and clients makes them ignore the existence of the subject of H&S.

4.4.4 Cost of formulation

The results indicate the concentration of management on the initial cost of formulating the policy. However, the opportunity cost of not developing a policy far outweighs the initial capital cost that framers of the policy look at. To fully understand the cost impact, Cochran et al. (2009) suggested cost-benefit analysis to be carried out during the policy analysis phase. This compares the benefits or outcomes of the program with the costs of having and implementing it. The results (Table 4.4b) shows 16.7% of the respondents strongly agreed that formulation of policies has a huge cost and hence affects the rate at which a company would want to development H&S policy, 50% agreed, 19% were neutral, 2.4% disagreed and 11.9% strongly disagreed. Table 4.4a indicates a 3.571 mean score with a standard deviation of 1.17167 with respect to cost of formulation.

4.4.5 Lack of accurate information or statistics for policy developers to base on Drawing from the results (Table 4.4b), lack of accurate information is a barrier to policy developers, 16.7% of respondents strongly agreed, 38.1% agreed, 31.0% remained neutral, 11.9% disagreeing with only 2.4% strongly disagreeing to question of whether lack of lack of accurate information or statistics for policy developers has effect on policy formulation. The mean score for the responses was 3.548 which were higher than the population mean of 3.00 ―neutral‖ as shown in Table 4.4a.

As stated in chapter two, policymakers in the rational-comprehensive model take account of all data/information relating to the policy problems and of all policy options, then select the options that best fulfil the policymaker‘s goals (Cochran et al., 2009). Generally, the efficiency and viability of a policy is evaluated by collecting and analysing information relating to the policy. The culture of keeping and retrieving accurate information is generally not the best in Ghana.

4.4.6 Culture of the employees

The degree of participation of people in policy process is partially a function of the culture of the people (directly or indirectly) (Buse et al., 2005). Policies which depart so much from what the public are accustomed to, is difficult to formulate and implement (Buse et al., 2005). The past operating experience and ways of doing things which constitute organizational culture, is also important in policy development. Again, developing a strong and active safety culture may require a considerable period of time and a substantial amount of money for planning, carving and implementation. Nevertheless, the cost of the aforementioned efforts is still minor compared with human health and life (Tam and Fung, 2012)

The study findings indicate (Table 4.4b) the majority of the respondents agreed that policies that are should be in line with the culture of the worker to make the effort worthwhile, 16.7% strongly agreed, 47.6% agreed, 11.0% were neutral, 19.0% disagreed and only 4.8% strongly disagreed. The results further showed a 3.524 men score for the responses with a standard deviation of 1.13133 (Table 4.4a).

4.4.7 Lack of Consultation between management and other interest group

A successful health and safety policy requires that everyone recognize the importance of the policy and actively support health and safety efforts. This can be achieved with the involvement of all interest groups during the development stage. From this stage groups get to understand what is required of them (their role, duties, and amount of authority) when the policy rolled out. Different strategies are employed at this stage to gain priority for one definite analysis and interpretation of both the problem and its solution (Benoit, 2013).

The mean for the consultation between management and other interest group (Table 4.4a) is 3.357 with a standard deviation of 0.75938. From Table 4.4b, 2.4% of the respondents strongly agreed to affect that lack of consultation have on policy formulation, 45.2% agreed, 38.1% remained neutral with 14.3% disagreeing.

4.4.8 Lack of national policy framework on H&S

National policy framework is mostly the main point of call for the development of similar policies at the institutional level. The ILO-OSH-2001, states that a competent national institution should be responsible for formulating, implementing and periodically reviewing a coherent national policy for the establishment and promotion of OSH management systems in organizations. In framing the policy, representatives from relevant organisation(s) should be consulted to ease the process of implementation and integration of the finished policy into the various organisations.

The results indicate (Table 4.4b) 2.4% of the respondent to be in strong agreement to the fact that lack of national policy framework on H&S affects the process of developing H&S policies in the construction industry, 47.6% agreed, 33.3% were neutral on the issue, 14.3% disagreed and 2.4% strongly disagreed. The mean is 3.333 with a standard deviation of 0.84584 (Table 4.4a)

4.4.9 Administrative feasibility

Policy administration requires competent and skilled personnel with appropriate instrumentation for effectiveness of the programme. There should be proper documentation, effective training programmes and risk assessments with effective mitigation measures for smooth administration of policy.

There should be strong leadership and commitment to H&S activities in the organization, as well as putting appropriate arrangements for the establishment of an H&S management system (ILO, 2001). A Total of 11.9% of respondents strongly agreed that, the industry lack strong and committed leadership to foster and make the necessary administrative arrangement for the development of H&S policy and 26.2% agreed to the issue. The neutral respondents were 40.5%, 19% disagreed whiles 2.4% strongly disagreed (Table 4.4b).

4.5 FURTHER ANAYSIS ON POLICY FORMULATION VARIABLES

A closer look at the 22 variables for policy formulation shows that, some of the variables have similar properties and therefore it appears some of them overlap. For these factors, the set of similar properties represents the whole family. Factor analysis is done to concentrate the discussion on fewer numbers of attributes (variables) than the original. Therefore, it provides a deeper insight into variables with the similar characteristics which are grouped under one theme. It also reduces data and remove redundant and duplicated variable from a number of correlated variables, resulting in lesser number of derived variables known as factors which are independent of each other.

4.5.1 Factor Extraction

Table 4.5 lists the eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, the analysis identified 22 linear components within the data set which plays to the fact that, there must be as many eigenvectors as there are variables and that, there will be as many factors as variables. The eigenvalues associated with each factor represent the variance explained by that particular linear component and the table also displays the eigenvalues in terms of the percentage of variance explained (factor 1 has 5.335 as eigenvalue and it explains 24.252% of total variance). It is clear that, the first few factors explain relatively large amounts of variance (especially factor 1) whereas subsequent factors explain only small amounts of variance. This can be observed under the cumulative column. After extraction, all factors with eigenvalues greater than 1 are selected, which leaves us with eight (8) factors. The eigenvalues associated with these factors are again displayed (and the percentage of variance explained) in the columns labelled Extraction Sums of Squared Loadings in Table 4.5. The values in this part are the same as the values before extraction, except that the values for the discarded factors are ignored (hence, the Table 4.5 is blank after seventh factor). In the final part of the table (labelled Rotation Sum of Squared Loadings), the eigenvalues of the factors

after rotation are displayed. Rotation has the effect of optimizing the factor structure and one consequent to that, the relative importance of the eight factors is somehow equalized. Before rotation, factor 1 accounted for considerably more variance than the remaining six (24.252% compared to the others). However, after extraction it accounts for only 17.733% of variance compared to the others respectively.

Table 4.5: Total Variance Explained for Policy Formulation

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.335	24.252	24.252	5.335	24.252	24.252	3.901	17.733	17.733
2	2.760	12.546	36.798	2.760	12.546	36.798	2.261	10.275	28.008
3	2.242	10.192	46.990	2.242	10.192	46.990	2.240	10.183	38.192
4	1.771	8.051	55.041	1.771	8.051	55.041	2.058	9.355	47.547
5	1.443	6.559	61.600	1.443	6.559	61.600	1.920	8.726	56.272
6	1.281	5.821	67.421	1.281	5.821	67.421	1.762	8.011	64.283
7	1.245	5.658	73.079	1.245	5.658	73.079	1.572	7.144	71.428
8	1.164	5.292	78.371	1.164	5.292	78.371	1.528	6.944	78.371
9	.883	4.015	82.387						
10	.705	3.205	85.591						
11	.628	2.853	88.444						
12	.527	2.395	90.839						
13	.462	2.099	92.938						
14	.400	1.818	94.755						
15	.292	1.326	96.082						
16	.272	1.234	97.316						
17	.174	.789	98.105						
18	.153	.695	98.799						
19	.109	.498	99.297						
20	.085	.386	99.682						
21	.042	.190	99.873						
22	.028	.127	100.000						

Source: Researcher's Survey (2015)

4.5.2 Communalities for Policy formulation Variables before Extraction

Table 4.6 shows the communalities before and after extraction. Principal component analysis works on the initial assumption that all variance is common; therefore before extraction the

communalities are all 1. The communalities in the column labelled *Extraction* reflect the common variance in the data structure. So we can see that 80.7% of the variance associated with first variable (Lack of comprehensive national legislation on H&S) is common, or shared variance. Another way to look at these communalities is in the terms of the proportion of variance explained by the underlying factors. After extraction, some of the factors are discarded and so some information is lost. The amount of variance in each variable that can be explained by retained factors is represented by the communalities after extraction.

Table 4.6: Communalities for Policy Formulation

Variable	Initial	Extraction
Lack of comprehensive national legislation on (H&S)	1.000	.807
Consultation between management and other interest group	1.000	.831
Cost of formulation	1.000	.886
Culture of the employees	1.000	.891
Financially feasible	1.000	.881
Administrative feasibility	1.000	.734
Policy aligned with existing policy	1.000	.768
Poor records of accident investigations	1.000	.662
Existence of health and Safety committees on site	1.000	.733
H&S policy is a must for a successful construction project	1.000	.751
Lack of full knowledge on H&S management systems	1.000	.703
Increased cost to construction process	1.000	.789
No expertise in the industry to assist in policy formulation	1.000	.778
H&S policy always conflicts with company‘s objectives	1.000	.725
Most client lack knowledge on H&S	1.000	.864
No government support	1.000	.595
Loss of competitive advantage due to increase cost of policy implementations	1.000	.828
Discouragement from actors in the industry	1.000	.797
Lack of national policy framework on H&S	1.000	.755
Lack of accurate information or statistics for policy developers to base on	1.000	.850
Poor participation by stakeholders	1.000	.775
Low levels of H&S awareness among stakeholders	1.000	.840

Source: Researcher's Survey (2015)

4.5.3 Component matrix for Policy Formulation Variables

Table 4.7 also shows the component matrix before rotation. This matrix contains the loadings of each variable onto each factor. The software, (SPSS), by default displays all loadings;

however an adjustment is made for all loadings less than 0.4 to be suppressed in the output and hence the blank spaces for many of the loadings. This matrix is not particularly important for interpretation and needs to be rotated to optimise the factors.

Table 4.7: Component Matrix for Policy Formulation

Variables	Component							
	1	2	3	4	5	6	7	8
Lack of comprehensive national Legislation on H&S		.546						
Consultation between management and other interest group		.684						
Cost of formulation	.618							-.539
Culture of the employees	.458						.576	
Financially feasible			-.694		.476			
Administrative feasibility		.404	-.466					
Policy aligned with existing policy		.519						
Poor records of accident investigations			.544		.463			
Existence of health and Safety committees on site		.682						
H&S policy is a must for a successful construction project				-.622				
Lack of full knowledge on H&S management systems	.493							
Increased cost to construction process	.466							-.469
No expertise in the industry to assist in policy formulation						.656		
H&S policy always conflicts with company's objectives	.627							
Most client lack knowledge on H&S				.497				.548
No government support	.478							
Loss of competitive advantage due to increase cost of policy implementations	.570							
Discouragement from actors in the industry	.674				-.460			
Lack of national policy framework on H&S	.690	-.431						
Lack of accurate information or statistics for policy developers to base on	.641							
Poor participation by stakeholders	.775							
Low levels of H&S awareness among stakeholders	.758							

Source: Researcher's Survey (2015)

From Table 4.7, eight factors were extracted from policy formulation variables. Factor analysis is an exploratory tool and so it is used to guide the researcher to make various

decisions. One important decision is the number of factors to extract. By Kaiser's criterion, eight factors were extracted. However, this criterion is accurate when there are less than 30 variables and communalities after extraction are greater than 0.7 or when the sample size exceeds 250 and the average communality is greater than 0.6. In this case, we have 22 variables and the communalities as shown in the Table 4.6 are all largely greater than 0.7; So Kaiser's criterion is satisfied. The scree plot can be used to decide on the number of extracted factors. The scree plot is shown below (Figure 4.1) with a thunderbolt indicating the point of inflexion on the curve. This curve seems difficult to interpret because the curve begins to tail off after five factors, but there is another drop after six factors down to the eight before a stable plateau is reached. Therefore we could probably justify retaining either five or up to eight factors.

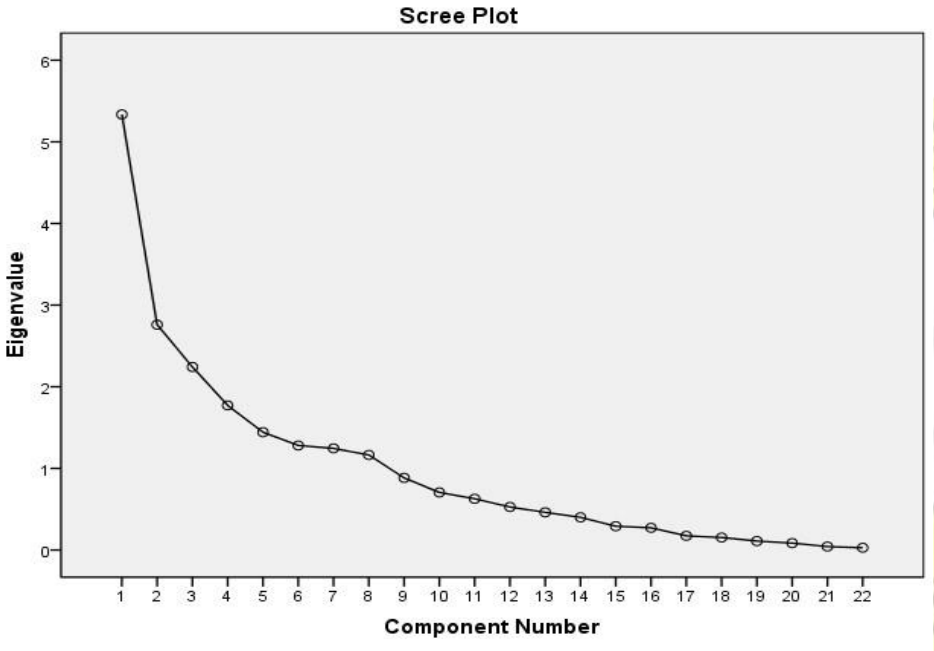


Figure 4.1: Scree Plot for Policy formulation

Source: Researcher's Survey (2015)

4.5.4 Factor Rotation

Table 4.8 shows the rotated component matrix (also called the rotated factor matrix in factor analysis) which is a matrix factor loading for each variable onto each factor. This matrix contains the same information as the component matrix except that it is calculated after rotation. There are several things to consider about the format of this matrix, but the most important is the suppression of some factor loadings. Factor loadings less than 0.4 have not been displayed because such factors loadings were suppressed. Comparing this matrix (Table 4.8) with the un-rotated solution, most variables loaded highly onto the first factor and the remaining factors did not really get a look in. However, the rotation of the factor structure has clarified things considerably: there are eight factors and variables load very highly onto not only one factor. The suppression of loadings less than 0.4 and ordering variables by loading size also makes interpretation considerably easier (because the researcher does not have to scan the matrix to identify substantive loadings).

Table 4.8: Rotated Component Matrix

	Component							
	1	2	3	4	5	6	7	8
Lack of comprehensive national Legislation on H&S			.866					
Consultation between management and other interest group			.827					
Cost of formulation				.626	.514			
Culture of the employees			.443					.447
Financially feasible					.889			
Administrative feasibility						-.598		
Policy aligned with existing policy		.821						
Poor records of accident investigations						.707		
Existence of health and Safety committees on site		.604	.408					
H&S policy is a must for a successful construction project		.658					-.423	
Lack of full knowledge on H&S management systems	.483					.636		
Increased cost to construction process				.838				
No expertise in the industry to assist in policy formulation								.844
H&S policy always conflicts with company‘s objectives							.406	
Most client lack knowledge on H&S							.913	
No government support		.528						
Loss of competitive advantage due to increase cost of policy implementations	.497			.559				

Discouragement from actors in the industry	.503			.495		-.403		
Lack of national policy framework on H&S	.735							
Lack of accurate information or statistics for policy developers to base on	.865							
Poor participation by stakeholders	.806							
Low levels of H&S awareness among stakeholders	.842							

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization Rotation converged in 9 iterations

Source: Researcher's Survey (2015)

4.6 CONSTRUCTS / LATENT FACTORS / THEMES

The results of the factor analysis explain 78.371% of the variables. Table 4.9 below shows the various components extracted from the analysis with the individual factor loading. Themes are given to the different components.

Table 4.9: Latent factors for variables of policy formulation

Components and Variable		***Factor Loadings***	**Variance Explained**
Component 1: Stakeholder participation and awareness			
1	Lack of accurate information or statistics for policy developers to base on	0.865	***17.733%***
2	Low levels of H&S awareness among stakeholders	0.842	
3	Poor participation by stakeholders	0.806	
4	Lack of national policy framework on H&S	0.735	
5	Discouragement from actors in the industry	0.503	
Component 2: Policy Alignment			
1	Policy aligned with existing policy	0.821	***10.275%***
2	H&S policy is a must for a successful construction project	0.658	
3	Existence of health and Safety committees on site	0.604	
4	No government support	0.528	
***Component 3:* Legal Consultation**			
1	Lack of comprehensive national Legislation on H&S	0.866	***10.183%***
2	Consultation between management and other interest group	0.827	
Component 4: Cost			
1	Increased cost to construction process	0.838	***9.355%***
2	Cost of formulation	0.626	
3	Loss of competitive advantage due to increase cost of policy implementations	0.559	
Component 5: Culture			
1	Financially feasible	0.889	***8.726%***
2	Culture of the employees	0.640	
Component 6: Administrative			

1	Poor records of accident investigations	0.707	***8.011%***
2	Lack of full knowledge on H&S management systems	0.636	
3	Administrative feasibility	-0.598	
Component 7: Client's Knowledge			
1	Most client lack knowledge on H&S	0.913	***7.144%***
2	H&S policy always conflicts with company's objectives	0.406	
Component 8: Expertise			
1	No expertise in the industry to assist in policy formulation	0.844	***6.944%***

Source: Researcher's Survey (2015)

4.6.1 Component1: Stakeholder participation and awareness

Stakeholder participation is an integral aspect of policy formulation. From the study results (Table 4.9), this issue came out strong with accurate information (0.865), stakeholder awareness (0.842), poor stakeholder participation(0.806), national policy on H&S (0.735) and encouragement from associations(0.503) forming the core of this theme. There should be a very good data base for framers of policy to have good reason to expend all efforts necessary to plan and develop a policy for such claims. For the effect that the policy will have on the different stakeholders, it is important to created awareness among such groups and with a full representation from the group(s). This also makes the implementation process quite easy, since the major shareholders of the policy are involved with the development of the policy. To give power to policy and make it relevant with all stakeholders, the contribution that a national framework brings on board cannot be overemphasised. It is out of such frameworks that, industry policy developers drawing inspiration to make policies which are necessary for dealing with real issues at work. Table 4.9 show the different variables with their factor loading which forms the stakeholder participation and awareness.

4.6.2 Component 2: Policy Alignment

The second principal component after rotation had four (4) variables as shown in Table 4.9 with the various factor loadings for the individual variables; which have links with the relative importance of the variables in a particular component. These variables were grouped under the theme policy alignment. Variables retained under this theme include policy

alignment with existing organisation policies (0.821), the idea that H&S policy is a good recipe for a successful construction project (0.658), the creation of H&S committee on site to share (0.604) and collate H&S related issues on site for input into the policy development and support from government in terms of laws (0.528), good institutional set ups and different government initiated strategies geared towards the construction industry.

Paudel (2009) stated that the reason for bad quality of policies in countries like Ghana is the weaknesses in our political arena.

4.6.3 Component 3: Legal Consultation

The third principal component after rotation retained 2 variables as shown in Table 4.9 with the various factor loadings for the individual variables. Most policies are formulated in response to legal requirements and / or to meet interesting group‘s demands. There is therefore the need to consult national and international legislation on H&S when developing a policy. The factors are Lack of comprehensive national Legislation on H&S (0.866) and Consultation between management and other interest group (0.827)

4.6.4 Component 4: Cost

Policy processes have both direct and indirect cost which either the organisation or sponsors of the policy would have to bear. Some of the direct cost include cost on policy developers, cost of machinery required for policy, cost of monitoring, and indirectly loss of competitive advantage due to the fact that, the direct cost are mostly transferred to clients who might not see the need for the H&S on their projects. Again, according to Lingard and Rowlinson (2005) most projects which are awarded during competitive tendering goes to contractors with the lowest bid and this puts pressure on prospective contractors to reduce their bids thereby neglecting H&S.

Considering cost, the findings (Table 4.9) from the study placed it at the fourth principal components with increased cost to construction process, cost of formulation and loss of competitive advantage as the main variables that were retained with factor loadings of 0.838, 0.626 and 0.559 respectively.

4.6.5 Component 5: Culture

The fifth principal component after rotation retained 2 variables as shown in Table 4.9 with the various factor loadings for the individual variables. Policies must be framed to sit well with the culture of the people it will affect. It must link up and the people should be able to identify with the policy easily. This makes the development and implementation process easy. The question of whether there is a budget for policy development is also important. The process when well-planned can be less expensive but also the quality of the output might also have impact on the cost of the process.

The study showed that, the culture of the people (0.640), organisational culture (0.889) as well as the how the policy fits into the finance of the organisation must be thoroughly assessed in the process of policy development so that the process can be seen to a logical conclusion.

4.6.6 Component 6: Administrative

ILO (2001) guidelines on H&S management system make argument to the fact that; the employer has to demonstrate strong sense of leadership and management commitment towards H&S. This can be seen in the arrangement that management makes in establishing all the various components in the H&S management system. There should be proper administrative procedures in place to fully equip leaders with the knowledge on health and safety, good records keeping helping framers of policy with the accurate information and causal agents. Organisations must have personnel who are skilful to administer policies.

The component 6 had three variables as shown in Table 4.9; poor records of accident investigations (0.707), lack of full knowledge on H&S management systems (0.636), administrative feasibility (-0.598).

4.6.7 Component 7: Client Knowledge

The biggest shareholder in any construction project is the client, however in Ghana; the study showed that the clients for whom companies work do not have knowledge on H&S. This makes it difficult for them to appreciate the role that a good H&S management system brings to their projects. Such individuals always see H&S policy as detriment to the project since it cost money; time involving and they perceive it to slow projects. The factors retained under client knowledge are shown in Table 4.9; most client lack knowledge on H&S (0.913) and H&S policy always conflicts with company‘s objectives (0.406)

4.6.8 Component 8: Expertise

Policy must be clearly written, sized up to deal with a need (particular hazard), involves different participant from different level on the organization ladder and relevant to regulations to suit the nature of operations in an organisation. It is thus a multi-tasking endeavour which requires someone who is experienced in the subject matter and has a good coordination skilled to be able to bring all the different components necessary for policy formulation. The 8th component retained only one variable which stresses on the effect of experts on the issue of H&S policy formulation (0.844). Table 4.9 shows the variable and its factor loading.

4.7 IMPLEMENTATION

From Table 4.10 all variables with mean score greater than 3 is consider to have effect on the implementation of H&S policies in the construction industry. The results show that 17 factors out of the 19 initial factors included in the study have significant impact on implementation of policy.

Table 4.10: Various factors that affect policy implementation

VARIABLES	Mean	Std. Deviation
Translation of policy into administrative directives	4.4048	4.73729
Lack support and training for managers and front-line staff	3.5952	1.12747
Lack of participation of stakeholders	3.5714	1.03930
Poor Coordination and communication	3.4524	1.01699
Lack of clear and logical consistent objectives	3.4286	1.01556
Lack of committed and skilled implementing officials	3.4048	0.85709
No proper feedback mechanism	3.3810	0.98655
Organizational machinery	3.3810	0.98655
Divergent views due to insufficient consultation	3.3810	0.73093
No clear lines of accountability	3.3095	0.94966
Misunderstanding and disagreement on objectives	3.2381	0.72615
No Incentives and sanctions	3.1905	0.96873
Inadequate support from trade union	3.1429	1.02580
Policies are only spoken of when there is a problem	3.1429	0.97709
Poor fit with local organizational priorities	3.1667	0.72974
No freedom for those on the ground to innovate and adapt policy to local conditions;	3.1190	0.73923
Policies not based on valid causal theories and effect	3.0238	0.92362
The required combination of resources is not available	2.9286	1.15596
Inadequate Time	2.6667	1.00406

Source: Researcher's Survey (2015)

4.8 FURTHER ANAYLSIS ON POLICY IMPLEMENTATION VARIABLES

The 19 variables for policy implementation show that, some of the variables have similar properties and therefore it appears some of them overlap. For these factors, the set of similar properties represents the whole family. Factor analysis is done to concentrate the discussion on fewer numbers of attributes (variables) than the original. Therefore, it provides a deeper

insight into variables with the similar characteristics which are grouped under one theme. It also reduces data and remove redundant and duplicated variable from a number of correlated variables, resulting in lesser number of derived variables known as factors which are independent of each other.

4.8.1 Factor Extraction

For Policy implementation, Table 4.11 lists the eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, the analysis identified 19 linear components within the data set (there must be as many eigenvectors as there are variables and so there will be as many factors as variables). The eigenvalues associated with each factor represent the variance explained by that particular linear component and the table also displays the eigenvalues in terms of the percentage of variance explained (so, factor 1 has 3.972 as eigenvalue and it explains 20.907% of total variance). It is clear that the first few factors explain relatively large amounts of variance (especially factor 1) whereas subsequent factors explain only small amounts of variance. This is evident under the cumulative column. After extraction, all factors with eigenvalues greater than 1 are selected, which leaves us with seven factors. The eigenvalues associated with these factors are again displayed (and the percentage of variance explained) in the columns labelled Extraction Sums of Squared Loadings. The values in this part are the same as the values before extraction, except that the values for the discarded factors are ignored (hence, the table is blank after seventh factor). In the final part of the table (labelled Rotation Sum of Squared Loadings), the eigenvalues of the factors after rotation are displayed. Rotation has the effect of optimizing the factor structure and one consequence for these data is that the relative importance of the seven factors is somehow equalized. Before rotation, factor 1 accounted for considerably more variance than the remaining six (20.907% compared to 16.024%, 11.098%, 8.131%, 7.565%, 6.397% and 5.878%), however after extraction it accounts for only 14.924% of variance (compared to

13.342%, 11.051%, 10.853%, 10.295%, 8.564% and 6.972%) respectively.

Table 4.11: Total Variance Explained for Policy Implementation

Component	Initial Eigenvalues			ction Sums of Squared Loadings			Rotation Sums of Squared Loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance
1	3.972	20.907	20.907	3.972	20.907	20.907	2.835	14.924
2	3.045	16.024	36.931	3.045	16.024	36.931	2.535	13.342
3	2.109	11.098	48.029	2.109	11.098	48.029	2.100	11.051
4	1.545	8.131	56.160	1.545	8.131	56.160	2.062	10.853
5	1.437	7.565	63.725	1.437	7.565	63.725	1.956	10.295
6	1.216	6.397	70.122	1.216	6.397	70.122	1.627	8.564
7	1.117	5.878	76.000	1.117	5.878	76.000	1.325	6.972
8	.822	4.326	80.326					
9	.742	3.907	84.233					
10	.654	3.444	87.678					
11	.587	3.092	90.769					
12	.474	2.492	93.262					
13	.395	2.080	95.342					
14	.311	1.635	96.977					
15	.196	1.032	98.009					
16	.141	.740	98.749					
17	.113	.594	99.343					
18	.077	.403	99.746					
19	.048	.254	100.000					

Source: Researcher's Survey (2015)

4.8.2 Communalities for Policy Implementation Variables before Extraction Table 2.12 shows the communalities before and after extraction. Principal component analysis works on the initial assumption that all variance is common; therefore before extraction the communalities are all 1. The communalities in the column labelled

Extraction reflect the common variance in the data structure. So we can see that 73.0% of the variance associated with the first variable (Lack of clear and logical consistent objectives) is common, or shared, variance. Another way to look at these communalities is in the terms of the proportion of variance explained by the underlying factors. After extraction, some of the factors are discarded and so some information is lost. The amount of variance in each variable that can be explained by retained factors is represented by the communalities after extraction.

Table 4.12: Communalities for Policy Implementation

Variable	Initial	Extraction
Lack of clear and logical consistent objectives	1.000	.730
Policies not based on valid causal theories and effect	1.000	.808
No Incentives and sanctions	1.000	.672
Lack of committed and skilled implementing officials	1.000	.719
Inadequate support from trade union	1.000	.777
Inadequate Time	1.000	.786
The required combination of resources is not available	1.000	.701
Poor Coordination and communication	1.000	.843
No proper feedback mechanism	1.000	.776
Organizational machinery	1.000	.678
Translation of policy into administrative directives	1.000	.743
Policies are only spoken of when there is a problem	1.000	.862
Lack support and training for managers and front-line staff	1.000	.861
No clear lines of accountability	1.000	.775
No freedom for those on the ground to innovate and adapt policy to local conditions;	1.000	.818
Misunderstanding and disagreement on objectives	1.000	.636
Lack of participation of stakeholders	1.000	.833
Poor fit with local organizational priorities	1.000	.826
Divergent views due to insufficient consultation	1.000	.598

Source: Researcher's Survey (2015)

4.8.3 Component matrix for Policy Implementation Variables

Table 4.13 also shows the component matrix before rotation. This matrix contains the loadings of each variable onto each factor. The software, (SPSS), by default displays all loadings; however an adjustment is made for all loadings less than 0.4 to be suppressed in the output and hence the blank spaces for many of the loadings. This matrix is not particularly important for interpretation and needs to be rotated to optimise the factors.

Table 4.13: Component Matrix for Policy Implementation

Variable	Component						
	1	2	3	4	5	6	7
Lack of clear and logical consistent objectives	.506	-.450					
Policies not based on valid causal theories and effect	.637	-.458					
No Incentives and sanctions	.395	.433					
Lack of committed and skilled implementing officials	.633	.535					
Inadequate support from trade union	.438			.609			
Inadequate Time	.492			.435			
The required combination of resources is not available	.600	-.435					
Poor Coordination and communication	.627						
No proper feedback mechanism	.598						
Organizational machinery			.657				
Translation of policy into administrative directives							.590
Policies are only spoken of when there is a problem	.448	.507			-.561		
Lack support and training for managers and front-line staff	.522	.578	-.423				
No clear lines of accountability		.761					
No freedom for those on the ground to innovate and adapt policy to local conditions;	.606			-.469		-.406	
Misunderstanding and disagreement on objectives		.478		-.425			
Lack of participation of stakeholders	.482		.636				
Poor fit with local organizational priorities					.792		
Divergent views due to insufficient consultation			.480				

At this stage, seven factors are extracted from the policy implementation. Factor analysis is an exploratory tool and so it is used to guide the researcher to make various decisions.

One important decision is the number of factors to extract. By Kaiser‘s criterion, eight factors were extracted. However, this criterion is accurate when there are less than 30 variables and communalities after extraction are greater than 0.7 or when the sample size exceeds 250 and the average communality is greater than 0.6. In this case, we have 19 variables and the communalities as shown in the Table 2.12 are all largely exceeded 0.7. The scree plot can also be used to decide on the number of extracted factors. The scree plot is shown below (Figure 4.2) with a thunderbolt indicating the point of inflexion on the curve. This curve is difficult to interpret because the curve begins to tail off after four factors, but

there is another drop after five factors down to the seven before a stable plateau is reached. Therefore we could probably justify retaining either four or up to seven

factors.

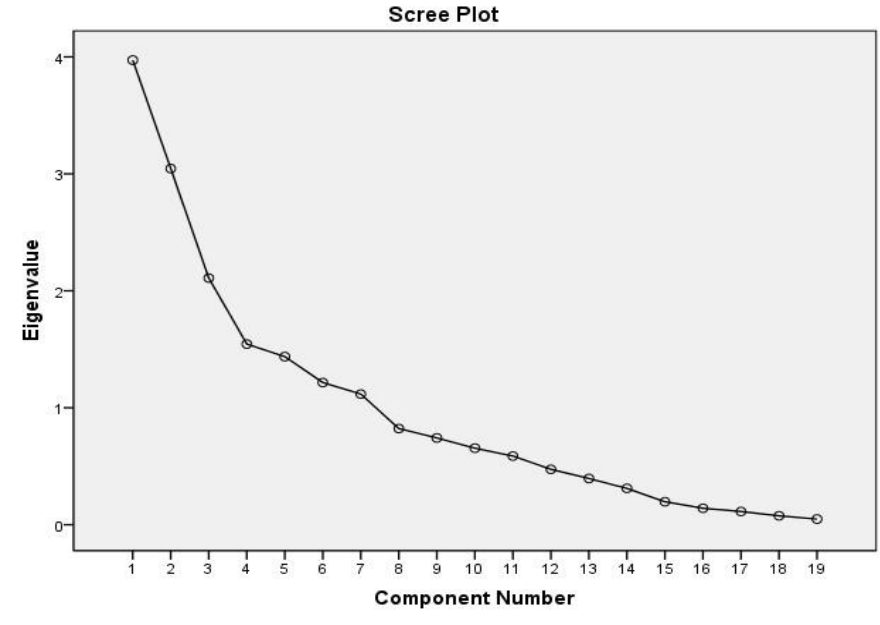


Figure 4.2: Scree Plot for Policy Implementation

4.8.4 Factor Rotation

Table 4.14 shows the rotated component matrix (also called the rotated factor matrix in factor analysis) which is a matrix factor loading for each variable onto each factor. This matrix contains the same information as the component matrix except that it is calculated after rotation. There are several things to consider about the format of this matrix, but the most important is the suppression of some factor loadings. Factor loadings less than 0.4 have not been displayed because such loadings were suppressed.

Compare this matrix with the un-rotated solution, most variables loaded highly onto the first factor and the remaining factors did not really get a look in. However, the rotation of the factor structure clarifies things considerably. The suppression of loadings less than 0.4 and

ordering variables by loading size also makes interpretation considerably easier (because the researcher do not have to scan the matrix to identify substantive loadings).

Table 4.14: Rotated Component Matrix for Policy Implementation

Variables	Component						
	1	2	3	4	5	6	7
Lack of clear and logical consistent objectives			.499		.428		
Policies not based on valid causal theories and effect		.611	.600				
No Incentives and sanctions	.709						
Lack of committed and skilled implementing officials	.661						
Inadequate support from trade union					.792		
Inadequate Time					.819		
The required combination of resources is not available		.626			.427		
Poor Coordination and communication		.761					
No proper feedback mechanism		.859					
Organizational machinery				.786			
Translation of policy into administrative directives							.830
Policies are only spoken of when there is a problem	.809						
Lack support and training for managers and front-line staff	.685		.585				
No clear lines of accountability	.569					.491	
No freedom for those on the ground to innovate and adapt policy to local conditions;			.858				
Misunderstanding and disagreement on objectives						.440	.418
Lack of participation of stakeholders				.805			
Poor fit with local organizational priorities						.875	
Divergent views due to insufficient consultation				.441			

Source: Researcher's Survey (2015)

4.9 CONSTRUCTS / LATENT FACTORS / THEMES

The results of the factor analysis explain 76.000% of the variables. Table 4.15 below shows the various components extracted from the analysis with the individual factor loading. Themes are given to the different components.

Table 4.15: Latent factors for variables of policy implementation

Components and Variable	***Factor Loadings***	**Variance Explained**

Component 1*: Skilled Personnel*			
1	Policies are only spoken of when there is a problem	0.809	***14.924%***
2	No Incentives and sanctions	0.709	
3	Lack support and training for managers and front-line staff	0.685	
4	Lack of committed and skilled implementing officials	0.661	
5	No clear lines of accountability	0.569	
Component 2: *Communication mechanism and Resources*			
1	No proper feedback mechanism	0.859	***13.342%***
2	Poor Coordination and communication	0.761	
3	The required combination of resources is not available	0.626	
4	Policies not based on valid causal theories and effect	0.611	
Component 3: Policy consistency			
1	No freedom for those on the ground to innovate and adapt policy to local conditions;	0.858	***11.051%***
2	Lack of clear and logical consistent objectives	0.499	
Component 4: Stakeholder involvement			
1	Lack of participation of stakeholders	0.805	***10.853%***
2	Organizational machinery	0.786	
3	Divergent views due to insufficient consultation	0.441	
Component 5: Trade union activities			
1	Inadequate Time	0.819	***10.295%***
2	Inadequate support from trade union	0.792	
Component 6: Organizational priorities			
1	Poor fit with local organizational priorities	0.875	***8.564%***
2	Misunderstanding and disagreement on objectives	0.440	
Component 7: Administration			
1	Translation of policy into administrative directives	0.830	***6.972%***

Source: Researcher's Survey (2015)

4.9.1 Component 1: Skilled Personnel

There should be competent personnel; duly trained and experienced in H&S management systems to undertake the implementation of H&S policies. Factors identified to have effect on policy implementation (Table 4.10) included lack of support and training for officials (MS 3.5952, Std dev. 1.12747), no commitment from implementing officials (MS 3.4048, Std dev. 0.85709) probably due to lack of incentives and/or sanction (MS 3.1905, Std dev. 0.96873), no clear lines of accountability (MS 3.3095, Std dev. 0.94966) and the fact that policies only come to light when there is a problem (MS 3.1429, Std dev.). This shows a communication lapses in the management systems that companies run on site. Table 4.15 shows the factor loadings for the variables grouped under the first component; skilled personnel.

According to Hinze and Gambatese (2003), training is widely accepted to play an important role in the development of a worker toward H&S. Likewise, for the quality of implementation to be the best; the responsible person must have control on the subject. Various forms of incentive also exist, which can be used to reward workers for their contributions as well as punitive measures to sanction non-compliance. Workers actions are normally changed with these incentive/sanctions in place and this can have a positive impact on safety performance (Hinze and Gambatese, 2003). The leaders must be committed to the goals of the policy and must have the required managerial skills needed for the policy implementation (Cerna, 2013)

4.9.2 Component 2: Communication mechanism and resources

Four variables from Table 4.10 were retained under this theme; no proper feedback mechanism (MS 3.3810, Std dev 0.98655), Poor Coordination and communication (MS 3.4524, Std dev.1.01699), Policies not based on valid causal theories and effect (MS 3.0238, std dev. 0.92362). However, respondents did not agree on the question of; the required combination of resources is not available (MS 2.9286 std dev 1.15596) since the MS was less than 3. Table 4.28 shows the variables with the various factor loadings The policy must be based on accurate and good causal theory which relates to changes and need of the organisation to be able to elicit the needed behaviour and support from the employees. Normally, health and safety committee on site is one of the effective means of getting some decent feedback form the people on the ground. Resources such as funds must be made available for programmes to roll out the policy.

For the vital role that communication plays in both policy formulation and implementation, this study also looked at some of the best communication channels to disseminate information to employees. From Table 4.16 below, safety talks and meetings was identify to be the number one best way of communicating with a frequency of ―better to best‖ of 92.9%, followed by induction training (with a frequency of better to best of 90.5%), and then notices and reminders, policy-procedure manuals and job description in that order.

Table 4.16: Communication channels

Variable	Not good (%)	Good (%)	Better (%)	Best (%)
Induction training	2.4	7.1	21.4	69.0
Policy and procedure manuals	2.4	16.7	52.4	28.6
Joint health and safety committees	9.5	19.0	42.9	28.6
Job descriptions	0.0	19.0	54.8	26.2
Notices and reminders	0.0	19.0	47.6	33.3
Safety talks and meetings	4.8	2.4	38.1	54.8
Senior management attendance at safety meetings	2.4	31.0	31.0	35.7
Senior management response and review of committee recommendation	2.4	21.4	35.7	40.5

Source: Researcher's Survey (2015)

4.9.3 Component 3: Policy consistency

Policy needs to be consistent with existing policy, stakeholder expectations, local conditions and international regulation. There should not be ambiguities and disparities in the H&S policies and other operational policies. The importance of objectives should also not be compromised with time by changes in operations; it must rather be strengthened to suit changing demands.

The third principal component in Table 4.15 above reported high factors loadings for the variables on; no freedom for those on the ground to innovate and adapt policy to local conditions (0.858), lack of clear and logical consistent objectives (0.499). These variables were also identified to have significant effect on policy implementation as their mean scores were all greater than 3 as shown in Table 4.10.

4.9.4 Component 4: Stakeholder involvement

The following variables as shown in Table 4.15 loaded high factors for the fourth component; lack of participation of stakeholders (0.805), organizational machinery (0.786), divergent views due to insufficient consultation (0.441) with mean scores of 3.5714, 3.3810 and 3.3810 respectively (See Table 4.10)

Participation and channels for involvement in policy implementation by stakeholders are not distinct or clear in the construction industry. Participation brings all interest parties together

to share ideas and to find a meeting point for all the issues raised by the various affected groups. Therefore the process should have identified all stakeholders at the formulation stage and created a platform to resolve issues to create trust in the process

4.9.5 Component 5: Trade union activities

Employers association provides and promote substantive H&S programmes to its member with the aim of assisting its members to implement government initiated or their own initiated H&S programme. Other support can be in the form of regularly updating members on new legislations, expert advice on H&S, helping with safety audits, organising H&S competition and workshops on informative topics on H&S (Smallwood et al., 2009).

There should be time lines allocated for the achievement of various milestones during the implementation programme. The time should be realistic and supported with all the needed resources to achieve the desired results.

From the results of the study (Table 4.10), time allocated for the process was found not to be a barrier. The mean was 2.6667 and the std dev was 1.00406. Support from the trade union is not adequate; mean was 3.1429 with std dev of 1.02580. Table 4.15 shows the variable attributed to the trade union activities and their factor loadings.

4.9.6 Component 6: Organisational priorities

What the organisation sees as important invariably has a huge effect on what it spends time, funds and efforts on. The theme of organisational priorities which represents principal component 6 retained two variables with the factor loadings as shown in Table 4.15. Poor fit with local organizational priorities from Table 4.10 had a mean score of 3.1667 with a std dev. of 0.72973 and misunderstanding and disagreement on objectives had a mean score of 3.2381 and a std dev of 0.72615.

4.9.7 Component 7: Administration

Translation of policy into real administrative directive for practical execution was identified as the biggest challenge in the implementation of policies in the industry with a means score of 4.4048 (Table 4.10). This can be due to the fact that, there is lack of skilled and committed person responsible for H&S management in the organisations. Again, the economic state of companies attributes to the fact that, the required personnel are not engaged to carry out the core administrative duties for H&S on their sites. However, the component retained one factor during the factor analysis as shown in Table 4.15.

4.10 PROPOSED FRAMEWORK FOR POLICY DEVELOPMENT IN THE CONSTRUCTION INDUSTRY

Considering the factors that affect the way H&S policies in the Ghanaian construction industry are formulated and implemented, as well as the quality of existing H&S policies, it is now possible to develop the conceptual framework which is based on the findings of this study. The framework in **figure 4.3** has inputs which are the variable or themes that emerged for the various decision points in a policy process.

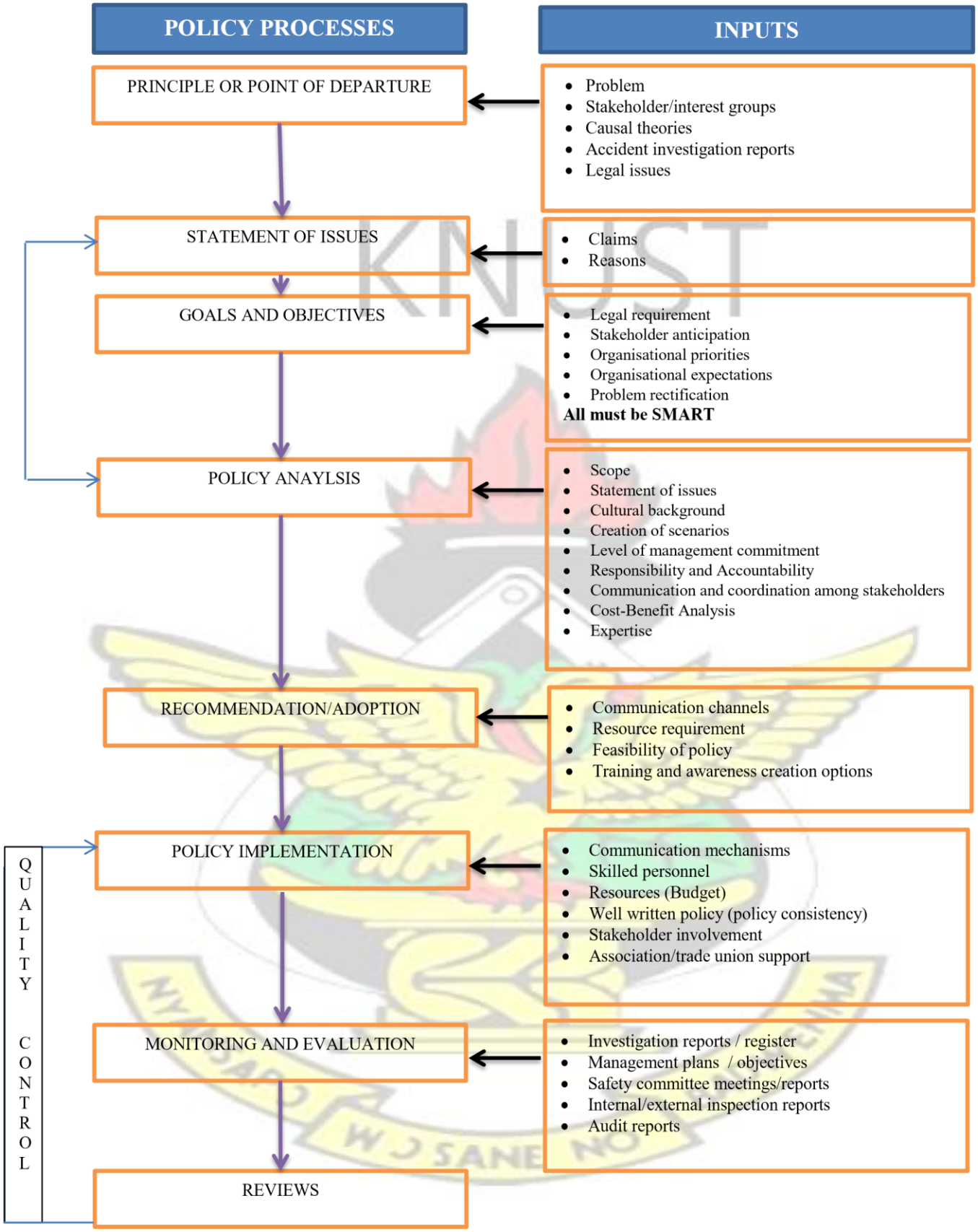


Figure 4.3: Proposed Conceptual framework for developing H&S policies in the Construction industry.

Source: Author's Construct 2015

4.11 THE CONCEPTUAL FRAMEWORK EXPLAINED

The frameworks runs on four main stages; initiation (principles, statement of issues and objectives), formulation (policy analysis and recommendations), implementation and evaluation

4.11.1 Initiation

Principle or Point of Departure

The problem that needs to be dealt with must be clearly defined with all the causes of such issues identified from various empirical reports (accident investigation reports). The acknowledgement of a certain problem demands further organisational attention. The need for the policy must also be in line with stakeholder's visions and it must be seen to fit with regal requirements both locally and internationally.

Statement of Issues

Clarification of issues that warrant the need for the policy i.e. claims and/or reasons based on empirical evidence. Here, an agenda is set for further consideration.

Goals and Objectives

The goals and objectives for the policy must be geared towards meeting legal requirement, stakeholder anticipation and must be in agreement with organisational priorities. The organisation must have expectation for the policy to rectify real risks at work. These objects must be SMART (Specific, Measurable, Attainable, Realistic and Timely) in nature to allow for greater accountability and future improvement.

4.11.2 Formulation

Policy Analysis

Policy analysis is determining which policy options would best deal with a particular situation at hand. It entails a lot of rigorous activities of scrutinizing all possible solutions to the risk. The scope which includes the coverage, affected people, jobs and risks, places etc are clearly defined at this stage. Since statement of issues is based on the best available evidence, it serves as an input during the policy analysis phase. It is characterised by the systematic and transparent access to, and appraisal of evidence. Policies are best written or coordinated by a knowledgeable person(s) in a particular field where the policy belongs. Policies are formulated on theories and models therefore; experts in H&S as well as people who are familiar with the risks associated with the kind of work must be involved in the policy analysis.

Other inputs to the policy analysis are the cultural background of the organisation and the employees. Since organisational structures frequently change, policies must not be built on the structures of an organisation but must be developed on the visions and ideologies of the organisation. Scenarios are created out of the possible solutions to the problem to assess the viability of the solutions before a final decision is taken. There must be a deeper involvement of management and other stakeholders to elicit their total or at least a good level of commitment all. Responsibility and accountability are also evaluated, apportioned and stated without ambiguity to all. Proper communication and coordination among stakeholders is the key to a good and easily acceptable policy. The framers of the policy liaise with all affected people with progress of the policy development as well as solicit for their views on important issues which eventually become part of the policy. The cost benefit analysis is also run at this stage to ascertain the cost implications of the policy on the organisation. An inconclusive policy analysis would have to be moved back to the statement of issues; which might not be adequate enough to warrant a policy to deal with the risk at hand.

Recommendation/Adoption

After the scrutinizing all the options during the analysis stage, recommendations are made for adoption of a particular policy with a sound policy plan or not. At this phase, clear communication channels are proposed with all the requirements for effective delivering of the adopted policy. Resource requirement are defined with stated responsibilities of all stakeholders. For a successful implementation of the policy, the training needs and awareness creation options are must also be suggested.

4.11.3 Implementation

Implementation is the execution of the policy plan or programmes to achieve the goals. It therefore needs skilled personnel and good communication mechanisms. The programme must be backed with adequate Resources (Budget) to enable smooth running of the policy programme. A well written policy (policy consistency) makes the execution easier since it speaks to practical needs and has no ambiguity. Involving stakeholder in the implementation just as in the case of the formulation makes all to accept responsibility for roles. Association/trade union normally have high level of information and programmes which organisations can tap into during the implementation phase.

4.11.4 Evaluation

Monitoring and Evaluation

Every policy needs to be monitored and evaluated for further improvement. This process must be periodic and regular to be able to assess the ups and downs of the adopted policy.

Input for evaluation includes investigation reports or register, management plans or objectives, safety committee meetings reports and findings form both Internal and external inspections and audits reports

Reviews

Reviews give tangible recommendations on how to improve policies and identify good practices which have impact on innovation performance. Reviews serves as a quality control mechanism for policies and are achieved by advisory panel, self-evaluation, departmental meeting, reference groups and internal peer review

Quality control – concerns acceptability as well as functionalism of implemented measures; provides the possibility for readjustment, improvement and reaction. Comments and feedbacks are fed back into the implementation process to allowing for an improved policy as well as implementation.

4.12 SUMMARY OF CHAPTER FOUR

This chapter presented results from the quantitative analysis obtained from the survey. Results have been presented on the quality of available H&S policies in the construction industry, the factors affecting both policy development and implementation. The analysis shows that the quality of H&S policies in the industry is not good. The factors identified to have significant impact on policy formulation include stakeholder participation and awareness, policy alignment, legal consultation, cost, culture, administration, client knowledge and expertise. Seven factors were identified to have effect on policy implementation; skilled personnel, communication mechanism and resources, policy consistency, stakeholder involvement, trade union activities, organisational priorities, administration. Finally a framework which can assist policy developer and companies in tailoring policies for their organisations is proposed based on the findings of the study and industry best practices.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This study, a framework for developing construction health and safety policies in Ghana, had five chapters in all. The objectives of the study are;

1. To investigate the quality of H&S policies in the Ghanaian construction industry.
2. To identify factors affecting formulation of H&S policies
3. To identify factors that affect implementation of H&S policies.
4. To develop a theoretical frame work for drafting construction H&S policy,

The first chapter is the general introduction of the research; capturing the aims, objectives and the scope of the research. Chapter Two reviews literatures in relation to the study; causes and types of accidents, legislation, different H&S management systems, policy formulation and implementation models and factors that affect different policy styles. In chapter three, the methodology in achieving the aims of the study is discussed; including the philosophical view point, research design, research strategy, method of data collection and data analysis. The chapter four was the discussion and presentation of the empirical analysis of the survey conducted. From the literature reviewed coupled with the analysis and discussion of results, a conceptual framework was developed for formulating H&S policies in the construction industry. This chapter (5) which is the last chapter captures the summary of findings from the study conducted and the contribution of the thesis to knowledge. The chapter ends with recommendations. The conclusions on the findings established from the analysis and discussions of the data, have been related to the objectives of the study in this section.

5.2 CONCLUSIONS

5.2.1 To investigate the quality of H&S policies in the Ghanaian construction industry

From the analysis of the results, the quality of H&S policies in the Ghanaian construction industry has been established. The study first identified some of the prominent H&S policies in the industry and found the following policies in the construction industry; housing keeping, work at height, first aid/fire emergency, driving, drug and alcohol, manual

handling, excavation, movement/operation of mobile construction plant and policy on exposure of high level noise. This lead to further probing into the quality of the policies as identified, to determine whether they meet local and international standards.

Base on a review of the various H&S management systems (HSG65, ILO-OSH: 2001 and OHSAS 18001: 2007) and other literature on quality policy process and models, sets of factors were derived to assess or test the quality of H&S policies in the construction industry. In all 35 factors initially grouped into 8 different groups were identified for the assessment process. The study revealed that quality of H&S policies of 6 out of the 8 groups were poor.

Policies were **joined-up**; implying a clearly defined scope, consistency of policies with operational objectives as well as other policies and well defined responsibilities in policies.

Policy management also score good; senior management were responsible and committed to the ultimate execution of policy, a good plan for long term achievement of policy objectives and all policies have definite title and date of issue and date of revision. However, policies were not **inclusive** due to the fact that, they were set by only management with no input from the employees. **Communication** of H&S policies was also poor. Respondents agreed that policies comes in written form and are fairly accessible but the mode of communication is not good. Verbal communication which is an integral part of communication was practically non-existent. This put the overall score of communication to poor. Policy implementation process did not allow for employees **innovation and creativity**. There were no plans to engage worker on brainstorming section to share new ideas on resolving current and anticipated issues. Terms used in policies are also too restrictive for the employees to appreciate and identified with the policy. Policies were found to have little **evidence and legal bases**; lacking the ability to deal with real needs at work. Companies normally adopt policies from other institutions which sometimes do not fit into

their organisational culture as well as the relevant local or national legal requirement. The study established that administrative structures, human resources and budgetary allocation – which constitute **resources** requirement, for policy processes were not readily available. Again, mean for **evaluation** of policy was below 3.5; affirming the fact that outcomes of policies are not measurable and those policies hardly deal with work related issues.

This research study provides evidence that construction H&S policies in Ghana are of poor quality and there is the need to set proper standards and policies which involves all stakeholders with adequate resource backing. Companies with appropriate H&S policies must have good communication machinery coupled with management's commitment to achieve the full effect of the policy. Even though certain aspects of policy management are good, the most important part of management which is strategic plans for policy implementation was non-existent in the industry. This probably accounts for the general poor quality that exists in the construction industry.

5.2.2 To identify factors affecting formulation of H&S policies

After a thoroughly literature review, twenty two (22) variables were initially included in the study to investigate factors affecting the formulation of H&S policies in the construction industry and the analysis churned out eight main factors as the critical. These eight factors were arrived at after a factor analysis was carried out on the 22 variables.

The study identified **stakeholder participation and awareness**, **policy alignment, legal consultation, cost, culture, administration, client knowledge** and **expertise** as the main factors that affect policy development in the industry.

A successful health and safety policy requires that, everyone recognize the importance of the policy and actively support health and safety efforts. This can be achieved with the involvement of all interest groups during the development stage. Legal regulations and representatives from relevant organisation(s) should be consulted during formulation to ease

the process of implementation and integration of the finished policy into the various organisations. The degree of participation of people in policy processes is partially a function of the culture of the people (directly or indirectly). Policies which depart so much from what the public are accustomed to, is difficult to formulate and implement. With these in mind, it is required to synchronise the culture of the organisation and people with every policy. Again, policy administration requires competent and skilled personnel together with appropriate instrumentation for effectiveness of the programme. There should be proper documentation, effective training programmes and risk assessments with effective mitigation measures for smooth administration of policy. There should be strong leadership and commitment to H&S activities in the organization.

The initial cost to developing a policy is important, but what should be considered more is the cost of not formulation the policy to mitigate work related risks. The cost for not creating a policy include legal cost, cost of accident/damage to plant, loss of reputation and above all the chance of losing human life. It is therefore important to do a thorough cost – benefit analysis for any policy to truly ascertain the need of the policy. Lack of client knowledge in H&S issues was one of the factors that came out strongly in this study.

5.2.3 To identify factors affecting implementation of H&S policies.

For this objective, a number of implementation theories were looked at and 19 factors which affect implementation were initially identified and included in the survey. From the initial analysis of the 19 factors, 17 factors were found to have significant effect on implementation of H&S policies in the Ghanaian construction industry. Factor analysis reduced these factors to seven (7) principal components.

Skilled Personnel - lack of committed and skilled implementing officials, lack of support and training for managers and front-line staff, no clear lines of accountability, no incentives and sanctions and policies are only spoken of when there is a problem.

Communication mechanism and resources - poor coordination and communication, no proper feedback mechanism and policies not based on valid causal theories and effect.

Policy consistency - lack of clear and logical consistent objectives and restriction which do not allow implementing official to innovate and adapt policy to local conditions

Stakeholder involvement – poor/lack of participation of stakeholders, divergent views due to insufficient consultation and organizational machinery

Trade union activities - Inadequate support from trade union

Organisational priorities - poor fit with local organizational priorities and misunderstanding and disagreement on objectives.

Administration – problems in translating policy into administrative directives

In all, for effective implementation of policy there must be clearly defined objectives which are measurable, proper strategic management plan that clearly allocates responsibilities to appropriate departments in the organisation and adequate interventions to hold all involved accountable for the performance of the policy.

5.2.4 To develop a conceptual framework for drafting construction H&S policy To develop the conceptual framework for drafting construction H&S policy, the researcher employed industry best practices with respect to policy formulation and implementation combined with the results and discussion obtained from the analyses of the factors which influence policy development and implementation. The factor analysis on the factors enabled the researcher to group the various variables (i.e. 22 formulation factors and 17 implementation factors) under major themes, which ease the process of linking the variables to the various stages of adopted policy process. These identified factors were used as the inputs to be considered at every stage of the policy process. The framework is thus shown in **figure 4.2**

5.3 RECOMMENDATIONS

The following are the recommendation made from the study to help enhance policy development and implementation in the country‘s construction industry;

- In developing a policy, it is important to consider formulation and implementation as a joint entity rather than disjointed one. The two stages form the central stage for any strategic development process. From the framework (***figure 4.1***), policy development is at the top however, implementation is as a direct result of the policy decision (recommendation/adoption). Again, the research identified that policy formulation and implementation share some basic principles which are participation, communication or awareness creation and administration or management of policy. It is recommended that, these common shared attributes be thoroughly covered from the initiation of the policy. This will afford the originators and developers the opportunity to see to a logical conclusion of the policy objectives.
- Clients must not always award contracts to the contractors with the lowest price bid. There must be a rigorous scrutiny with H&S records as part of the qualification criteria. This will reduce the pressure that contractors feel as a result of competitive bidding where the contractor with the lowest price bid wins.
- Client must also show commitment to ensuring safe delivering on projects by contractors, through the nomination of competent institution and/or person to take on the health and safety aspects of their projects.
- Achieving a good H&S records or performance at workplace is by consultation, cooperation and commitment on the part of all stakeholders. Employers and employees need to understand the overall objectives or importance of H&S, their duties towards H&S and how to perform their duties. These can be made possible with a policy which gives guidelines on all H&S related issues and assigns responsibilities as appropriate to all involved. Effective consultation makes a big

difference in all management processes including H&S management. It allows for the views of stakeholder to be heard and included in the policy formulation.

- Developing H&S policies and procedures which are based on causal theories, good consultation and regular training have a good effect on reducing and prevent workplace accidents. How a policy is implemented can be an indication of how it is formulated.
- There must be a comprehensive national legislation specific to OH&S, as it stands as the only factor that can change the way project owners and beneficiaries look at the H&S of workers. This will actually compel all involved in construction works to do due diligence on construction projects to improve the quality of life and safety of their workers

Practical implication

The identified factors can be used by policy framers to access the viability of any policy to be developed and implemented in the construction industry.

Construction companies can also use the framework to;

- Develop H&S policy to deal with the risks and losses associated with accidents and ill health at work.
- Make sure they always leave within local and international legal requirement.
- Develop H&S policy which will give investor confidence in the company operations.
- Set the bar higher among their competitor by developing their H&S policies which will put them as the preferred company for a client with who is safety conscious.

5.4 LIMITATIONS

- Due to insufficient contact of contractors even with the associations they belong to, the study only concentrated on a smaller number of contractors belonging to the Greater Accra branch of ABCECG.
- Contractors which are classified by MRWH as smaller in size were excluded from the research due to an assumption that, they might not provide accurate and relevant information for the study.
- The analysis, discussion and conclusions were based on the data collected.

5.5 RECOMMENDATIONS FOR FURTHER STUDIES

During the analysis and the discussions the researcher identified the following which are all opened for further research.

- Policy implementation process: employee‘s innovation and creativity. This can bring out an appropriate and innovative ways to implement policies in the construction industry.
- An empirical study to determine the degree of participation of people in policy processes as partially a function of the culture of the people (directly or indirectly).
- Employee turnover in the construction industry as a factor affecting H&S performance of companies.

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APPENDIX A

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

COLLEGE OF ARTS AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

MPHIL CONSTRUCTION MANAGEMENT RESEARCH QUESTIONNAIRE – BY

ASARE BIO KWADWO (0242 837651)

INTRODUCTION

Studies in developing countries have shown that, there is a lack of Health and Safety awareness generally in the construction industry. Some attribute this problem to human and administrative lapses.

Again, the rate of accidents leading to injuries, ill health and deaths due to construction activities are alarming and there is the need to take a critical look at this problem. In view of the above, this study seeks to look at some aspects of H&S in terms of policy formulation, implementation and quality of policy to address real needs in the construction industry.

TOPIC

Framework for Developing Construction Health and Safety Policies

AIM

The aim of this research is to study health and safety policies in the construction industry and propose a theoretical framework for developing H&S policies.

DEFINITION

POLICY is a set of documents that state the broad guidelines/principles which influences a company's objectives, operations and plan; formulated after a thorough analysis of all internal and external factors (risk and opportunities) which affects the company. Policies are normally a company's way of responding to known and knowable circumstances. It is used to direct every decision around every situation.

DECLARATION

I shall be grateful of your assistance by providing answers to the questionnaire in this research, which is to collect data for academic purposes only. All information will remain confidential and all data will be reported only in a consolidated format.

FRAMEWORK FOR DEVELOPING CONSTRUCTION HEALTH AND SAFETY POLICIES

Please answer by checking the box which corresponds to your response 1. What Kind of construction is your firm involved in?

Civil and Road ☐

Building ☐

Others (please specify)……

2. How many years has your company been in construction?

1 –5 ☐

6 – 10 ☐

10 plus ☐

3. What is your position in the company?

Manager ☐

Engineer ☐

QS ☐

Architect ☐

Safety Officer ☐

Others……

4. How many years have you worked for your company?

1 – 5 ☐
6 – 10 ☐
10 plus ☐

5. How many employees are on your construction site?

1 –25 ☐
26 – 100 ☐
100 and above ☐

6. Does your company have any H&S policy?

Yes ☐
No ☐

If ***NO*** please move to question ***Number 11 on page 6***

7. Which one of the following health and safety policies below does your company have at your workplace? Tick as many as applicable

	POLICY	Yes	No
17.	Driving policy	☐	☐
18.	Drug and alcohol policy	☐	☐
19.	Smoking	☐	☐
20.	Exposure to fumes/chemical vapour/dust	☐	☐
21.	Exposure to vibration	☐	☐
22.	Exposure to high level of noise	☐	☐
23.	Manual handling/lifting of heavy weights	☐	☐
24.	House Keeping on site	☐	☐
25.	Work at height (working on platform, scaffold, hoist etc	☐	☐
26.	Lifting Appliance and gear	☐	☐
27.	Unguarded openings in floors, walls and stairways	☐	☐
28.	Excavations	☐	☐
29.	Ladders usage	☐	☐
30.	Movement of mobile construction plant	☐	☐

31.	Fire Emergency	☐	☐
32.	First Aid	☐	☐

Please list any other policies available on your site in the space below

……

……

……

……

……

8. Please indicate whether the following statements are true or not, in relation to your company‘s H&S policies, using the scale below as a guide.

1-Not true *2-Rarely true* *3-Sometimes true* *4-Mostly true* *5 - Always true*

	QUALITY	**1**	**2**	**3**	**4**	**5**
	JOINED –UP					
1.	Policies have clearly defined scope	☐	☐	☐	☐	☐
2.	Company‘s H&S policies are consistent with workplace operation‘s objectives	☐	☐	☐	☐	☐
3.	H&S Policies are consistent with other operational policies.	☐	☐	☐	☐	☐
4.	H&S policies have clearly defined responsibilities for all different departments	☐	☐	☐	☐	☐
	INCLUSIVE					
5.	Company H&S policies are set by only management	☐	☐	☐	☐	☐
6.	H&S policies are set by management in consultation with employees.	☐	☐	☐	☐	☐
7.	There is clear channel for feedback into policy decision between management and workers (eg open forum on policies)	☐	☐	☐	☐	☐
	COMMUNICATION					
8.	H&S polices are availability and accessibility to all workers	☐	☐	☐	☐	☐
9.	H&S policies come in a written form	☐	☐	☐	☐	☐
10.	H&S Inductions are conducted for all workers	☐	☐	☐	☐	☐
11.	Policies are communicated verbal.	☐	☐	☐	☐	☐
	INNOVATION, FLEXIBLE AND CREATIVE					
12.	H&S policies at work allows for brain storming on work methods	☐	☐	☐	☐	☐

13.	People are always rewarded for new ideas	☐	☐	☐	☐	☐
14.	Policies are current and include anticipated future issues.	☐	☐	☐	☐	☐
15.	The terms used in the policies are flexible, understandable and user friendly	☐	☐	☐	☐	☐
	EVIDENCE AND LEGAL BASED					
16.	The H&S policies address real needs of the workplace	☐	☐	☐	☐	☐
17.	H&S policies are adopted from other companies	☐	☐	☐	☐	☐
18.	There is proper documentation for all site accident and incident	☐	☐	☐	☐	☐
19.	People /worker are invited to share H&S experiences and expertise at work	☐	☐	☐	☐	☐
20.	H&S policies meet relevant local legal requirement	☐	☐	☐	☐	☐
21.	Policy looks at other international laws.	☐	☐	☐	☐	☐
22.	Policies restrict workers from enjoying their rights.	☐	☐	☐	☐	☐
	MANAGEMENT					
23.	The company has a senior management member responsible for H&S	☐	☐	☐	☐	☐

1-Not at all true, 2-Rarely true, 3-Sometimes true, 4-Mostly true, 5 - Almost always true

24.	The safety policy is dated and signed by the senior executive of workplace	☐	☐	☐	☐	☐
25.	Policies have stated accountability of Senior management team	☐	☐	☐	☐	☐
26.	Executive long term strategy to achieve the policy objectives	☐	☐	☐	☐	☐
27.	Company has a training program for staff	☐	☐	☐	☐	☐
28.	Policies have definite document title	☐	☐	☐	☐	☐
29.	Policies have date of issue and revision	☐	☐	☐	☐	☐
	RESOURCES					
30.	Company has a budget for H&S issues	☐	☐	☐	☐	☐
31.	Company has a senior management member responsible for H&S management	☐	☐	☐	☐	☐
32.	Monitoring and Assessment of the policy	☐	☐	☐	☐	☐
33.	Company has good administrative structures and capability for H&S policies	☐	☐	☐	☐	☐
	EVALUATION					
34.	Policies are always effective in dealing with work related problems	☐	☐	☐	☐	☐
35.	Policy outcomes are measurable	☐	☐	☐	☐	☐

9. What do you think can be done to improve the quality of the H&S policies in your company?

……

10. Does your company do H&S induction for the employees

Yes ☐
No ☐
If YES how often does the company induct workers on safety policies and procedures?

Once every 1yr ☐
Once every quarter ☐
Never ☐
Others (please specify)…….

11. Are the following facilities available on site?

		YES	NO
1	Sanitary facilities	☐	☐
2	First Aid	☐	☐
3	Portable Water	☐	☐
4	Food	☐	☐
5	Change rooms	☐	☐
6	Transport	☐	☐

12. On a scale of 1-5 how does your company rate the following?
• 1 - Not a priority • 2 – Low priority • 3 – Neutral • 4 – Moderate Priority • 5 – High priority

		1	2	3	4	5
1	Turnover and/or profit	☐	☐	☐	☐	☐
2	Reduction of Accident	☐	☐	☐	☐	☐
3	Provision of H&S appliance	☐	☐	☐	☐	☐
4	Usage and improvement of technology	☐	☐	☐	☐	☐
5	Monitoring of safety performance	☐	☐	☐	☐	☐
6	Increasing workers competency	☐	☐	☐	☐	☐
7	Reduction of Number of civil claims	☐	☐	☐	☐	☐
8	Conformance to legal requirement	☐	☐	☐	☐	☐
9	Workers motivation to work safely	☐	☐	☐	☐	☐

13. Indicate by agreeing or disagree which factors affect or prevent your company from developing H&S policies

1 – Strongly disagree • 2 – Disagree • 3 – Neutral • 4 – Agree • 5 – Strongly agree

	FACTORS AFFECTING POLICY FORMULATION	1	2	3	4	5
1.	Lack of comprehensive national Legislation on H&S	☐	☐	☐	☐	☐
2.	Consultation between management and other interest group	☐	☐	☐	☐	☐

3.	Cost of formulation	☐	☐	☐	☐	☐
4.	Culture of the employees	☐	☐	☐	☐	☐
5.	Financially feasibility	☐	☐	☐	☐	☐
6.	Administrative feasibility	☐	☐	☐	☐	☐
7.	Policy aligned with existing policy	☐	☐	☐	☐	☐
8.	Poor records of accident investigations	☐	☐	☐	☐	☐
9.	Existence of health and Safety committees on site	☐	☐	☐	☐	☐
10.	H&S policy is a must for a successful construction project	☐	☐	☐	☐	☐
11.	Lack of full knowledge on H&S management systems	☐	☐	☐	☐	☐
12.	Increased cost to construction process	☐	☐	☐	☐	☐
13.	No expertise in the industry to assist in policy formulation	☐	☐	☐	☐	☐
14.	H&S policy always conflicts with company‘s objectives	☐	☐	☐	☐	☐
15.	Most client lack knowledge on H&S	☐	☐	☐	☐	☐
16.	No government support	☐	☐	☐	☐	☐
17.	Loss of competitive advantage due to increase cost of policy implementations	☐	☐	☐	☐	☐
18.	Discouragement from actors in the industry	☐	☐	☐	☐	☐
19.	Lack of national policy framework on H&S	☐	☐	☐	☐	☐
20.	Lack of accurate information or statistics for policy	☐	☐	☐	☐	☐
	developers to base on					
21.	Poor participation by stakeholders	☐	☐	☐	☐	☐
22.	Low levels of H&S awareness among stakeholders	☐	☐	☐	☐	☐

14. Is the company registered with the compensation commissioner (insurance)?

Yes ☐

No ☐

15. Indicate by agreeing or disagree, which factors affect good implementation of H&S policies in your company

•1 – Strongly disagree • 2 – Disagree • 3 – Neutral • 4 – Agree • 5 – Strongly agree

	FACTORS AFFECTING POLICY IMPLEMENTAION	1	2	3	4	5
1.	Lack of clear and logical consistent objectives	☐	☐	☐	☐	☐
2.	Policies not based on valid causal theories and effect	☐	☐	☐	☐	☐
3.	No Incentives and sanctions	☐	☐	☐	☐	☐
4.	Lack of committed and skilled implementing officials	☐	☐	☐	☐	☐
5.	Inadequate support from trade union	☐	☐	☐	☐	☐
6.	Inadequate Time	☐	☐	☐	☐	☐

7.	The required combination of resources is not available	☐	☐	☐	☐	☐
8.	Poor Coordination and communication	☐	☐	☐	☐	☐
9.	No proper feedback mechanism	☐	☐	☐	☐	☐
10.	Organizational machinery	☐	☐	☐	☐	☐
11.	Translation of policy into administrative directives	☐	☐	☐	☐	☐
12.	Policies are only spoken of when there is a problem	☐	☐	☐	☐	☐
13.	Lack support and training for managers and frontline staff	☐	☐	☐	☐	☐
14.	No clear lines of accountability	☐	☐	☐	☐	☐
15.	No freedom for those on the ground to innovate and adapt policy to local conditions;	☐	☐	☐	☐	☐
16.	Misunderstanding and disagreement on objectives	☐	☐	☐	☐	☐
17.	Lack of participation of stakeholders	☐	☐	☐	☐	☐
18.	Poor fit with local organizational priorities	☐	☐	☐	☐	☐
19.	Divergent views due to insufficient consultation	☐	☐	☐	☐	☐

16. Who is responsible for the implementation of the policy?

Manager ☐
Engineer ☐
Safety officer ☐
Site Supervisor ☐
Ganger ☐
Others (please specify position)……

17. On a scale of one to four, which way will you consider to be good for communicating H&S policies in your organisation?
•1 – Not Good • 2 – Good • 3 –Better • 4 –Best

		1	2	3	4
1.	Induction training	☐	☐	☐	☐
2.	Policy and procedure manuals	☐	☐	☐	☐
3.	Joint health and safety committees	☐	☐	☐	☐
4.	Job descriptions	☐	☐	☐	☐
5.	Notice board notices and reminders	☐	☐	☐	☐
6.	Safety talks and meetings	☐	☐	☐	☐
7.	Senior management attendance at safety meetings	☐	☐	☐	☐
8.	Demonstration of senior management commitment through effective response and review to committee recommendation inspection reports, accident investigations, and health and safety program evaluations.	☐	☐	☐	☐

THANK YOU FOR YOUR CONTRIBUTION TOWARDS THIS STUDY