

**HEALTH SAFETY AND ENVIRONMENT (HSE) RECORD KEEPING
PRACTICES ON COMMUNITY-BASED INFRASTRUCTURAL
PROJECTS IN THE UPPER EAST OF GHANA**

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By

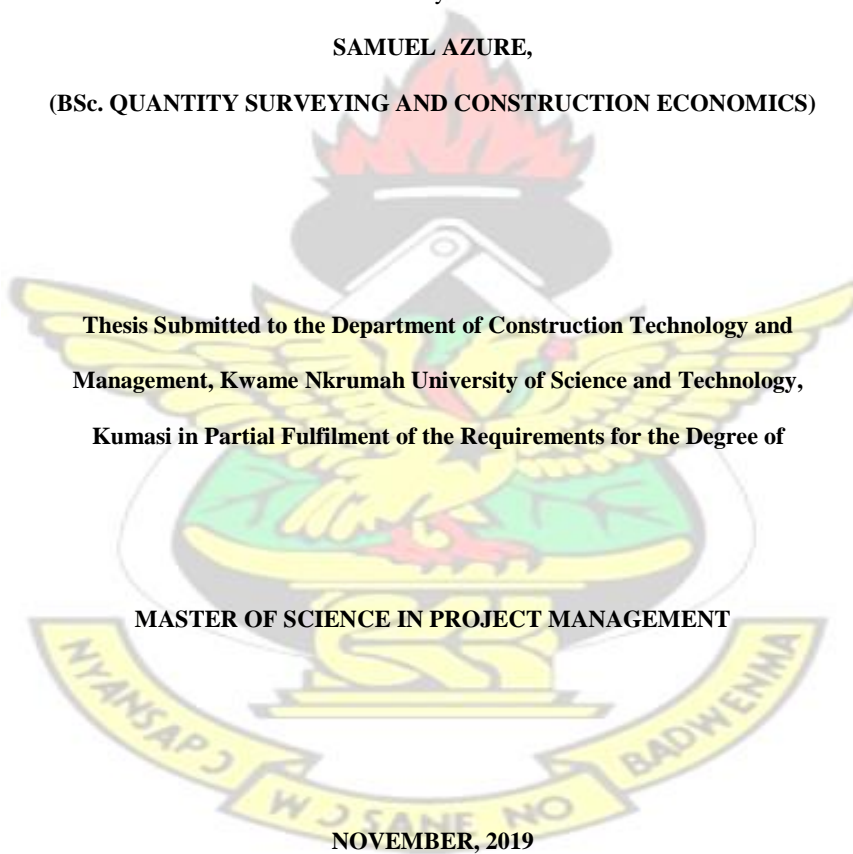
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ABSTRACT

The study examines Health Safety and Environment (HSE) record keeping practices on Community-Based Infrastructure Projects (CBIPs) in the Upper East Region of Ghana. Its specific objectives included: to outline the importance of HSE record keeping practices on projects, identify the best practices of HSE record keeping and lastly, identify the challenges with HSE record keeping practices on projects. Based on preliminary data analyzed, it was quite clear that majority of the target group had proper understanding of Health Safety and Environment (HSE) issues at the community level. The study was carried out in a manner that enabled the researcher to make an objective analysis by using the quantitative research strategy which involved a questionnaire survey. The target group for this research was the Planning Units, the Works Departments (which consisted of Project Managers, Planners, Engineers) at the municipal/district assemblies. A total of seventy (70) questionnaires were administered and fifty-eight (58) responses were recovered representing a higher returned percentage of 82.86%. The analysis of the data gathered was done using Relative Importance Index. The research identified lack of rules and criteria for fitting the organization's arrangement of standard procedures and methodology to fulfill health safety and environment explicit needs of the undertaking as a challenge impeding health safety and environment record keeping practices on projects at the community level. In addition, it identified some of the best practices of keeping health safety and environment records on projects to include financial data repositories containing information such as labour hours, incurred costs, budgets, and any project cost overruns. The research also underscored the significance of health safety and environment record keeping practices on projects as it helps identify or confirm if a problem exists, allow for early corrective action. As part of the recommendations, it was recommended that there should be standardized HSE templates specifically for record keeping on projects and these made available and mandatory for every project at initiation or inception and incorporated into the project documentation.

TABLE OF CONTENTS

CERTIFICATION	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES.....	ix
LIST OF FIGURES	x
ACKNOWLEDGEMENT.....	xi
DEDICATION.....	xii
CHAPTER ONE	1
INTRODUCTION	1
1.1 BACKGROUND	1
1.2 Statement of the Problem.....	4
1.3 Aim of the Research	6
1.4 Objectives of the Research	6
1.5 Scope of the Research.....	6
1.6 Significance of the Study.....	7
1.7 Research Methodology	8
1.8 Organization of the Study.....	9
CHAPTER TWO	10
LITERATURE REVIEW	10
2.1 Introduction.....	10
2.2 Theoretical Review	12
2.2.1 Definition of Health Safety and Environment (HSE).....	12

2.2.1.1 Health.....	12
2.2.1.2 Safety	13
2.2.1.3 Environment	13
2.2.2 Health Safety and Environmental Record keeping Practices on projects.....	14
2.2.3 Types of Health Safety and Environmental (HSE) Records	15
2.2.3.1 An authentic record.....	15
2.2.3.2 A dependable record.....	16
2.2.3.3 The authenticity of a record.....	16
2.2.3.4 An operational record	16
2.2.3.5 Records reserved should be unique	17
2.2.4 Best Practice Framework for HSE Governance	18
2.2.4.1 Director competence.....	18
2.2.4.2 Director roles and responsibilities	19
2.2.4.3 Culture, standards & values.....	19
2.2.4.4 Strategic implications	19
2.2.4.5 Performance management	20
2.2.4.6 Internal controls.....	20
2.2.4.7 Hierarchical structures.....	20
2.2.5 Organizational Process Assets (OPAs) that promotes best practices of keeping HSE records on projects	21
2.2.5.1 Organizational Knowledge Repositories	22
2.2.5.2 Processes, Policies, and Procedures.....	23
2.3 Empirical Review	24
2.3.1 Importance of (HSE) Record keeping	24
2.3.1.1 HSE Recordkeeping and document control.....	25

2.3.2 Innovations in Health Safety and Environment (HSE) Record keeping	26
2.3.2.1 Examples of how new technologies can generate savings and reduce burdens.....	28
2.3.2.1.1 IT tool for duty holder performance	28
2.3.2.1.2 Land-use planning	29
2.3.2.1.3 Laser scanning for investigations	29
2.3.2.1.4 INSPECT tool.....	29
2.4 Summary.....	29
CHAPTER THREE.....	32
METHODOLOGY	32
3.1 Introduction.....	32
3.2 The Study Area	32
3.3 Research Design	33
3.4 Research Strategy	33
3.4.1 Quantitative Approach.....	34
3.5 Unit of Analysis and Data Sources	34
3.6 Population and Sample Size of the Study.....	34
3.6.1 Sampled Techniques	36
3.6.2 Research Instrument	36
3.6.3 Method of data collection, questionnaire design and format.....	37
3.6.4 Method of Data Analysis.....	37
3.7 Ethical Consideration.....	38
3.8 Chapter Summary	39

CHAPTER FOUR	40
DATA ANALYSIS AND RESULTS DISCUSSIONS	40
4.1 Introduction.....	40
4.1.1 Survey Responses	40
4.2 Descriptive Analysis of Demographic Data	40
4.2.1 Portfolio	41
4.2.2 Departments	42
4.2.3 Experience Level	43
4.2.4 Educational Level	43
4.2.5 Involvement in Infrastructural Projects	44
4.2.6 Type of Construction Activity	45
4.2.7 Capacity/Roles and responsibilities	45
4.2.8 Record Keeping Practices.....	46
4.2.9 Types of Record Keeping	47
CHAPTER FIVE	58
SUGGESTIONS AND CONCLUSION	58
5.1 Introduction.....	58
5.2 Review of Research Objectives	58
5.2.1 Review of Objective One.....	59
5.2.2 Review of Second Objective	59
5.2.3 Review of Third Objective	60
5.3 Summary of Findings	60
5.4 Contribution To Knowledge	63
5.5 Suggestions for Practice	64

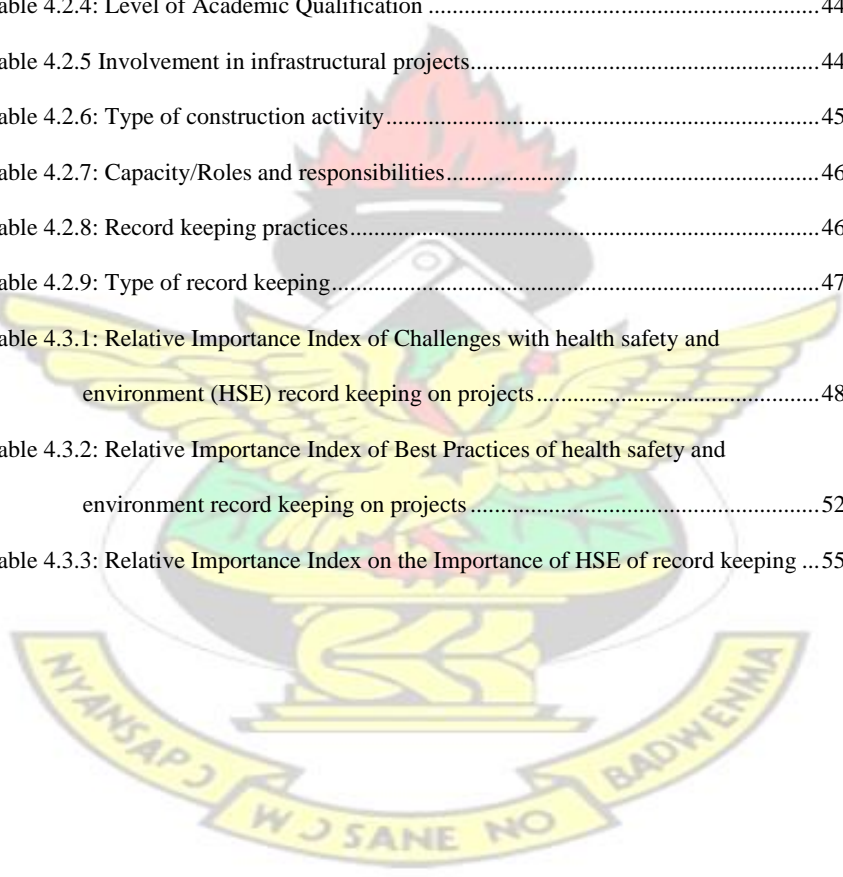
5.6 Suggestion for Future Research.....	64
5.7 Research Limitation.....	65
REFERENCES	66
APPENDIX.....	69

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LIST OF TABLES

Table 3.1: Distribution of Respondents from the Selected District Assemblies	35
Table 3.2: Summary of Data Retrieved from Respondents	36
Table 4.2.1: Portfolio	41
Table 4.2.2: Departments	42
Table 4.2.3: Experience Level	43
Table 4.2.4: Level of Academic Qualification	44
Table 4.2.5 Involvement in infrastructural projects.....	44
Table 4.2.6: Type of construction activity.....	45
Table 4.2.7: Capacity/Roles and responsibilities.....	46
Table 4.2.8: Record keeping practices.....	46
Table 4.2.9: Type of record keeping.....	47
Table 4.3.1: Relative Importance Index of Challenges with health safety and environment (HSE) record keeping on projects.....	48
Table 4.3.2: Relative Importance Index of Best Practices of health safety and environment record keeping on projects	52
Table 4.3.3: Relative Importance Index on the Importance of HSE of record keeping ...	55



LIST OF FIGURES

Figure 2.1: Best Practice Framework for HSE Governance..... 18

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DEDICATION

I dedicate this work to the Lord Almighty God, my dear wife, Esther Atiah and son, Winsigna Wordsworth Azure, my mum Mrs. Martha Anahokrugbo, all my brothers and to my entire family members who have been very supportive to me throughout this programme.



CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

In this research, a project is well-defined as any brief effort assumed to generate an exceptional intervention, package, or outcome by the Government of a country either nationwide or at the local level (PMBOK guide, 2016). Government policies are normally classified into programs and projects. Projects performance is key to every government because projects measure economic growth (Alzahrani and Ensley,2013).

Project health of communities, employee's health programs are becoming increasingly central in the corporate environment and unswervingly impact risk and safety factors. Health and wellness programs together with elaborated available records can address not only physical health factors that enable projects personnel to accomplish their jobs, but also wellness programs that assist in creating a work -life stability, with other stress-inducing matters that may affect mental stability and focus. Projects sites presents exceptional health considerations such as changing work environment, unaccustomed location, fleeting or casual personnel carrying out specific short-or long period task (PMBOK Guide 2003).

Projects Safety involves all exercises of the business financier, the performing organizations or the executing contractors/sellers together with the authorities which regulates wellbeing guidelines, aims and duties so that the project is strategically aligned and executed in a way that avoids coincidences which can lead or has the propensity to cause private damage, loss of life or assets damage (PMBOK Guide 2003).

Building is a dangerous business venture either in European or African countries and contributes to substantial records of work-related coincidences and ill health universally ((Muiruri and Mulinge, June 2014).

While nations with bigger economies, for instance, the U.S and the U.K. have demonstrated their obligation through regulations on reporting, record keeping of occupational accidents have achieved a reduction in accident numbers in industrial or project- related situations. The most important features of health safety and environment regulatory incident reporting and record keeping systems of Occupational Safety and Health Administrations (OSHA's), 29 CFR 1904 recording and propagating Job-related damages and disease of the U.S. and the U. K's. Reporting of wounds, ailments and perilous events guidelines, though when compared, are not the same but each have achieved a significant reduction in health safety and environment accidents due to the nature of record keeping regime/culture and practices.(Ivensky, 2015).

Essentially, Vladimir Ivensky in his article: Detailing and Record keeping Requirements, their impact on safety Management in the U.S. also, the U.K. (August, 2015), stated that, in 2012, the U.S building industry casualties or accident frequency stood by 9.9 per 100,000 permanent workers (BLS 2013); the U.K.'s 2013 rate of mortalities and damages in projects related was 1.9 per 100,000 permanent workers, with a five (5) year minimum of 2.3 (HSE). Based on the above analysis, the United States of America proportion is roughly five times greater as compared to that of the U.K.

It was the substantial difference that called for reasonable investigations into safety procedures regime, culture and performances in both nations, as well as safety administration, performance measurement, event recording structures, health safety and environment (HSE) regulations and their implementation, authorized structures and

procedural wellbeing characteristics in projects just as a survey of health safety and environment administration primacies in the two nations. The equivalent can't be said of nations with smaller economies, predominantly Sub-Saharan Africa (SSA) because, these countries are deficient in appropriate documentation, legislation and surveillance related to occupational health and safety (Hassan, 2012). All these countries have high occupational health and safety (OHS) incidence rate and labourers working in these countries are constantly exposed to occupational accidents and diseases. For example, in Ghana, the building industry represents the most elevated pace of work-related deaths contrasted with other mechanical segments. As indicated by the Labor Department "Yearly Report (2000), Labor Department, Accra, Ghana, p. 22), out of a sum of 902 work related mishaps that happened in building infrastructure sector in the year 2000, 56 were deadly, a casualty pace of 77.6 per 100 000 employees, while the 1999 figure stood at 4,088. These figures represent only those occurring at the formal sector. (Nongiba et al. 2010).

The case of record keeping, it's the practice of generating written documents to backing effective decision making, enable continuing operations, allow for checking effectiveness, and that may be required to meet legal compliance in some situations (CEC. 2013). Record keeping should be an important practice of the Performance Measurement of health safety and environment (HSE) process because; it provides a mechanism by which transparency can be achieved as well as allowing for checking and verifying, as may be required for legal compliance. "Record keeping and performance measurement documents the HSE and the actual results that will empower an association to settle on informed choices with respect to whether programs, policies or projects are accomplishing wanted outcomes or if it is important to actualize remedial activities. At times, record keeping and execution estimation might be recognized as a lawful

commitment as well as used to show office consistence with legitimate necessities" (CEC. 2013). Effective record keeping enables an organization to:

- manage its ongoing operations more effectively with data ("you cannot manage what you do not measure," i.e., you cannot manage for improvement if you do not measure to see what is getting better and what is not);
- demonstrate accountability to regulators, certification or insurance bodies by having appropriate documentation in place and being able to make it available in a timely manner when requested to do so;
- be organized, by having records and documentation to demonstrate procedures, systems, etc., to workers and authorities as needed;
- facilitate both internal and external compliance audits undertaken by certification or regulatory bodies;
- demonstrate a commitment to transparency and verification;
- identify or confirm if a problem exists, and allow for early corrective action; and
- measure and monitor effectiveness of corrective measures introduced to address problems by comparing with baseline data accumulated over time (CEC. 2013).

Be that as it may, in spite of the essentialness of the undertakings in countries with smaller economies, policy makers pay very little or no consideration to health safety and environmental (HSE) record keeping practices in projects implementation.

1.2 Statement of the Problem

In recent past, the government of Ghana launched social intervention projects dubbed One Village One Dam, One District, One Factory, a community-based infrastructure projects amongst others across the nation and especially across the three Northern regions of Ghana. These community-based infrastructural projects by the government's

intent and purposes was to promote agricultural activities and also as a means of empowering local farmers and as well provide livelihood to the citizenry at the local, communized levels.

But since the projects' implementation to date, there have been reported cases of health safety and environmental (HSE) concerns within the entire country, especially communities that benefitted from these interventions. For instance, in the Upper East region, there have been reported cases of incidents of injuries, fatalities, and poor siting of projects among the beneficiary communities as a result of the project implementation. In an interview granted by an official stakeholder, however, declined to comment on the challenges confronting the construction of the dugouts but indicated that her outfit together with consultants and contractors executing the projects will resolve issues facing the project. She further indicated that, a committee was going to be constituted to develop and implement safety measures around the dugouts, Peacefmonline.com (July, 2019).

Aside from the low quality of the dams, the contractors appear to have neglected to put safety measures around them, to protect residents. Community members of Bongo and Bolgatanga stated the dams were death traps since three (3) lives have been lost in the region. Assembly member for Bolga Soe, Richard Abagna was on record to have reported that, three (3) youngsters, with ages around 9, 10 and 11, got drowned in a recently built dam under the 1 Village 1 Dam projects. The District Chief Executive for Bongo, Hon. Peter Ayinbisa was also on record to have confirmed the fatalities and reiterated that, the drowning of residents in the recently built dams were due to construction defects which were yet to be remedied, Citi News Room (May, 2019).

It is in the light of the foregoing that this study seeks to investigate proper health safety and environmental recordkeeping practiced by stakeholders on these community-based projects in the Upper East Region.

1.3 Aim of the Research

The aim of this study was to evaluate the importance of HSE record keeping practices with the implementation of community-based infrastructural projects in the Upper East Region of Ghana.

1.4 Objectives of the Research

To achieve the objective of the study, the targets incorporated the accompanying:

1. To outline the importance of HSE recordkeeping.
2. To identify the best practices of keeping HSE records on projects.
3. To identify challenges with HSE record keeping practices on projects.

1.5 Scope of the Research

The study was intended to cover the entire region. However, the population was narrowed to the Municipal/Districts assemblies, Consultants, Contractors and their employees in the selected Municipal/Districts Assemblies in the region due to their direct involvement in the implementation and execution of community-based infrastructural projects overtime. Basically, the boundaries of the research covered Bolgatanga and Bawku Municipal, Talensi, Bolgatanga East and Pusiga District Assemblies. This decision was touched, because of the bigger population of experts found within specific departments responsible for aspects of these projects. Again, these places were chosen because of proximity to information along these lines making it simpler for the

understudy to recoup information. Questionnaires were however distributed to just the targeted group that had proper understanding and could appreciate the research topic and are as well have been involved in project management at the local level.

1.6 Significance of the Study

The significance of the research was to highlight the responsiveness on the importance of health safety and environment (HSE) record keeping practices on projects, the case of “*Community-Based infrastructure*”, so that projects are strategically aligned and carried out in a way that forestalls mishaps, which causes or can possibly cause individual harm, fatalities, property damage or impact on the environment. The significance of the study seeks to highlight on such benefits as to:

1. Help improve health safety and environment (HSE) record keeping practices to enable heads of competent departments in charge of health, safety and environment to appraise their activities
2. Help keep accurate and updated health safety and environment (HSE) records on project activities.
3. Help streamline health safety and environment (HSE) records and recapitulate into a usable form, which would provide the bases for HSE data compilation for the region if not for the whole country.

The study was to fill the current gap in knowledge and act as a striding nugget for future researchers who would like to conduct studies on the same topic to develop benchmarks for HSE record keeping or similar topics.

1.7 Research Methodology

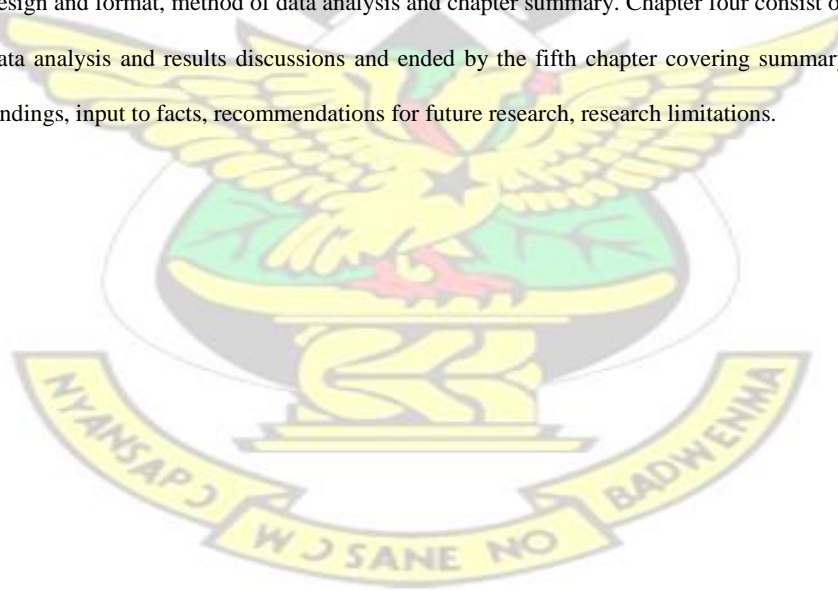
For realizing the purpose of this research, it was appropriate to make usage of appropriate research methods to enable the findings. The strategy that was utilized in completing this examination was a quantitative research system. Quantitative investigation involves the utilization of designed inquiries with probable options. It is a technique of making demand with the objective of testing a speculation with elements, assessed using numbers, and dismembered with verifiable frameworks. Both primary and secondary information were made use in this research. Surveys were the essential information accumulation apparatus which was chosen as research procedure for this exploration. The data gathering is grounded on the "close-ended" questionnaires and this would be given out to relevant persons who have the understanding and familiarity in project administration and in particular, HSE issues associated with community-based infrastructure projects. The respondents targeted are basically the construction technology managers, projects managers, planners, Quantity Surveyors, Civil Engineers, etc. The collection of data through secondary sources was from extant literature through journals, publications of corporate bodies, books, newspapers, online sources, senior dissertation, etc.

The literature review serves to reveal more understanding and knowledge of theoretical and empirical review issues related to the research topic. Therefore, a comprehensive literature review regarding health safety and environment (HSE) record keeping practices was carried out. The information that has been reviewed or studied must relate to the research topic for this research to be carried out efficiently. After the data regarding the questionnaires have been gathered, it was analyzed utilizing the Statistical Package for the Social Sciences (SPSS) and Microsoft Office Excel for information examination.

The analyzed results were presented in a table form with explanations in details regarding the data collected.

1.8 Organization of the Study

This research was arranged in five significant parts. The foremost section manages the outline, establishing the foundation to the investigation, issue articulation, objectives and destinations of the examination, the extent of the research, inquire about procedure and the organization of the research. Chapter Two constitute a literature review of earlier write ups carried out in this study area. Chapter three covers the overview of the study, the study area, the research strategy, populace and test size, sampled techniques, methods, research strategy, research ethics, method of data collection, questionnaire design and format, method of data analysis and chapter summary. Chapter four consist of data analysis and results discussions and ended by the fifth chapter covering summary findings, input to facts, recommendations for future research, research limitations.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

"Wellbeing at work isn't just a sound financial strategy - it is a fundamental human right"

(Kofi Annan, Former UN Secretary General).

The right to life is the greatest ultimate. Yet almost in every year 2.2 million men and women are disadvantaged of that right by occupational accidents and work-related illness and diseases. By conventional approximations, employees get hurt 270 million occupational accidents and 160 million occupational illness, injuries and diseases each year. This is possibly just a small fraction or the tip of the iceberg, as data for assessing nonfatal illness and injury do not exist in most countries especially developing countries. Work-related injuries alone have recorded for more than 10 million Disability-Adjusted Life Years (DALYs) lost, or healthy years of life lost whether to disability or untimely death, and 8% of inadvertent injuries worldwide. Poor occupational health and reduced performing size of workers may lead to commercial loss up to 10-20% of the Gross National Product of a country with developing countries the most affected. Globally work-related deaths, injuries, diseases, and illnesses is believed to have accounted for an estimated loss of 4% of the Gross Domestic Product (Amponsah-tawiah, 1992).

Per the World Health Organization (WHO), an impressive piece of the general ailment and wounds of the populace is work-related or business-related. This announcement, in any case disturbing, isn't stunning as laborers represents practically 50% of the overall populace and contribute fundamentally to the financial related and cultural estimation of present-day society. Unquestionably, people or society commit a considerable level of their lives at pay producing adventures with their vocations which regularly carry substance and creation to their lives. Since work is a fundamental piece of many person's

lives, it by and large is realized that individual's ought to at any rate have a protected and solid workplace. Undoubtedly according to the WHO Health for all philosophies and ILO Conventions on Job-related Safety and Health (No. 155) and on Occupational Health Services (No. 161) every single employee has the right of admittance to work-related health and safety services, regardless of the segment of the economy, scope of the business, or kind of task or obligation and work. The Rio Declaration on environment and development (1992) also indicates that —human beings are at the middle of anxieties for effective progress. They are qualified to a sound, protected and productive life in concurrence with nature. Clearly, the capacity to appreciate a protected and solid workplace is a noteworthy piece of a legitimate future (Amponsah-tawiah, 1992).

Work related security, wellbeing, and natural administration is regularly or fundamentally characterized as the learning of the desire, affirmation, evaluation and managing dangers or risks because of working environment wellbeing and prosperity of laborers, thinking about the likely impact on the quick networks and the whole condition in general. This field is basically tremendous, encompassing a bigger number of endeavors and a few workshop and ecological dangers and hazard. A considerable scope of structures, abilities, information and expository capacities are to be sure expected to fit and execute the majority of the "constituents" that make up national HSE frameworks with the goal that wellbeing is reached out to both the laborer and the whole condition.

An urgent piece of any wellbeing security and natural program incorporates exact record keeping and reporting. Numerous records are interior and don't really all the time expect reports to be submitted remotely to the expert having jurisdiction. The expert having jurisdiction will hope to discover those records promptly accessible upon composed solicitation or during a site visit (Hassan, 2012).

2.2 Theoretical Review

2.2.1 Definition of Health Safety and Environment (HSE)

Project HSE administration process include all activities of the project sponsor/owner and the executing group. These activities govern wellbeing and ecological policies, targets, and duties to ensure the venture or business is strategized and performed in such a manner that stops mishaps in order to maintain a strategic distance from individual harm, fatalities, or property damage. Also, project safety and environment management consist primarily of ensuring that the conditions of the contract are carried out to benefit the safety of both those working on site and in the vicinity of the project. Health safety and environment (HSE) tends to address both the administration of the project and the result of it. (PMBOK Guide, 2003). Health, safety, and environment pertaining to projects are explained as follows

2.2.1.1 Health

According to (PMBOK Guide, 2003) worker health curricula or plans are progressively becoming imperative in the project environment and directly influence risk and safety factors. Health and wellness curricula or plans can help articulate to a large extent not only physical health aspects that enable project personnel to carry out their jobs, but also wellness curricula or plans that help in concretizing a work-life balance and helps with other stress-inducing issues that may have the tendency to affect mental stability and concentration. Project sites offer exceptional health thoughts such as a navigating work environment, unfamiliar location, temporary workers executing precise short- or long-duration tasks, etc.

2.2.1.2 Safety

Project safety includes every event of the project promoter, the executing body/company or the performing contractor as well as constitutional mandated authorities which regulates wellbeing policies, targets and duties so that the project is aligned strategically and implemented in such a way that avoids mishaps which may give grounds or can possibly cause individual harm, fatalities or property damage. The safety of project teams is a top most priority and therefore presents a challenge on projects at all levels of the group or organization. Safety behavior, ownership, and incident reduction is normally closely monitored and controlled throughout the project with the assistance of more than a few resources, including human resources, safety officers, and other business agreement representatives. (PMBOK Guide, 2003).

2.2.1.3 Environment

Project environment includes identifying the environmental characteristics surrounding a project and the potential impact on the projects surrounding (environment), strategizing how to avert the effects, attaining environmental management and development, reviewing the procedures and controlling the outcomes and inspecting environmental conditions.

Appreciating the environmental factors (climate, wildlife, remoteness, cultural resources, etc.) of each exceptional project location needs breakdown analysis and management during the pre-project phases of the project. Establishing commitments, mitigations and controls, as construction begins. (PMBOK Guide, 2003).

2.2.2 Health Safety and Environmental Record keeping Practices on projects

Many south Asian nations are lacking in the pre-requisite health safety and environment (HSE), legal framework and investigation with respect to occupational health safety and environment (OHSE). All these nations have more health safety and environment occurrence incidents and laborers performing duties in these nations are continually left to the mercy of work-related or job-related accidents and diseases. Though work-related accidents and occupational anxieties have been in discussion for quite a while, no substantial changes have been taken, making conditions not comparable to and presenting steady weights to a developing workforce. According to a current research conducted by (Abdulazeez *et al.*, 2015), to study the actual threats faced by infrastructural workers in Pakistan and the feedback on health, safety and environment (HSE) groups or organizations in reducing these threats and in curtailing sustainability in construction companies in Pakistan. Employees working on infrastructural projects are continually exposed to hazardous working environments and have to meet different kind of threats. This embraces exposure to sound, dirt, contaminated and poisonous substances, cases of ergonomics, pressure etc. Employers, administrators and employee's all have deficient understanding knowhow about occupational health safety and environment concerns in Pakistan and especially in developing countries and nations.

The majority of the employees are untrained, unskilled, uneducated and unregulated. There are no inherent directives, which are coupled with both occupational health safety and environment and within infrastructural project management system. Nonetheless, there is an absolutely absence of health, safety and environmental ethics, and neither reporting, monitoring nor evaluating is carried out in the construction industry in developing countries. Organizations and establishments see health safety and environment concerns or issues as an additional financial or economic burden which will

ultimately end up increasing construction budgets and expenses (Abdulazeez *et al.*, 2015).

Employees don't steadily follow health safety and environment instructions and guidelines; they hardly put on or wear personal protective equipment (PPE), they admit wearing this PPE's would cause an impediment in their operations and effectiveness to achieving their desired productivity. The use of personal protective equipment is indispensable in the construction activity, as it is well-thought-out as the last line of defense. Largely, this has affected the construction industry greatly in terms of economic loss, property damages, human loss and image loss, and injury rates have increased disturbingly (Muiruri and Mulinge, June, 2014).

2.2.3 Types of Health Safety and Environmental (HSE) Records

Records – 'information formed, acknowledged or received, and kept as an indication and information by a group or persons, in fulfillment of legal requirements or in the operation of businesses. Records created by the health safety and environment ought to be both precise and comprehensive. The records must deliver evidence of the purpose or action for which they were formed to keep. For evidential purposes, records must be reliable, dependable, with veracity and be operational (*Health Service Policy 2013, p.3*).

2.2.3.1 An authentic record

An authentic record is any record that can be proven to achieve what it was intended or purported to achieve. To ensure proper management and authenticity of health safety and environment records, then archives must be dated, scheduled and signed. These records should be filled in a systematic archiving structure to form part of the repositories or

filling plan so that they are not endangered against unlawful addition, omission or adjustment. (*Health Service Policy 2013, p.*)

2.2.3.2 A dependable record

A dependable record is any record that can be depended on to be the true or precise replica of an occupation or action considered by the health safety and environment (HSE) setting. Notwithstanding, records should contain all important and the requisite facts and must be formed at the time of the act or operation or as quickly as possible, later by a person authorized to perform that purpose, action or operation. (*Health Service Policy 2013, p.5*).

2.2.3.3 The authenticity of a record

The authenticity of a record denotes to it being comprehensive and unchanged. When formed, add-ons or explanations and remarks to the record can solitary be approved by those mandated to cause or make adjustment should be clearly specified on the record. (*Health Service Policy 2013, p.6*).

2.2.3.4 An operational record

An operational record is one that can be situated or sited, retrievable, accessible or available and referenced or interpreted wherever or whenever there is a justified need for that data. It should be traceable within a health safety and environment records management system. Health safety and environment record plans and filing catalogues that capture the records are indispensable in safeguarding records are operational. In electronic records, metadata or contextual data is needed in addition to the physical allocation of records to ensure their sustained usability (*Health Service Policy 2013, p.4*).

2.2.3.5 Records reserved should be unique

Records reserved should be unique (or an automated duplicate, transferred using the proper and demonstrable structure), exceptional or of ongoing reputation to the health safety and environment. They ought to have care conveyance, lawful, economic, organizational or historic resolution. (*Health Service Policy 2013, p.5*).

Records may comprise the following, however, are not restricted to, the underlisted: Health and security close by action plans. Records may likewise incorporate remotely created documentation, for example, outer consultancy reports; lawful consistence notification or material wellbeing information sheets utilized as a major aspect of a wellbeing security and wellbeing programs. Records made might be as printed duplicate or electronic media. Records must be put away in an organized way, be effectively recognizable to encourage their productive and compelling recovery/trade by any ordered individual for reasons, for example,

- ❖ analysis/examine
- ❖ inward/outside evaluation
- ❖ indication of approved consistence
- ❖ appraisal and audit
- ❖ training needs.

The methods took into account putting away records should be useable, dependable and permit safeguarding for whatever length of time that required as per lawful prerequisites and hierarchical capability or effectiveness. A portion of these upkeep periods are protracted or changeless. Archives are records moved to long haul stockpiling for preservation past their moment work related capacity, including changeless records (*Management et al., 2013*).

2.2.4 Best Practice Framework for HSE Governance

The results of this project advocate that there is no ‘one-size fits all’ outcome for HSE governance, since the policies and stages of appointment do differ with the materiality of HSE concerns, scope and magnitude of the establishments in consideration. Notwithstanding, there are some basics that have been obvious in the study (Boardman and Lyon, 2006).

A summary framework for what best practices in HSE governance appearances like has been acknowledged, comprising of seven rudimentary values covering:

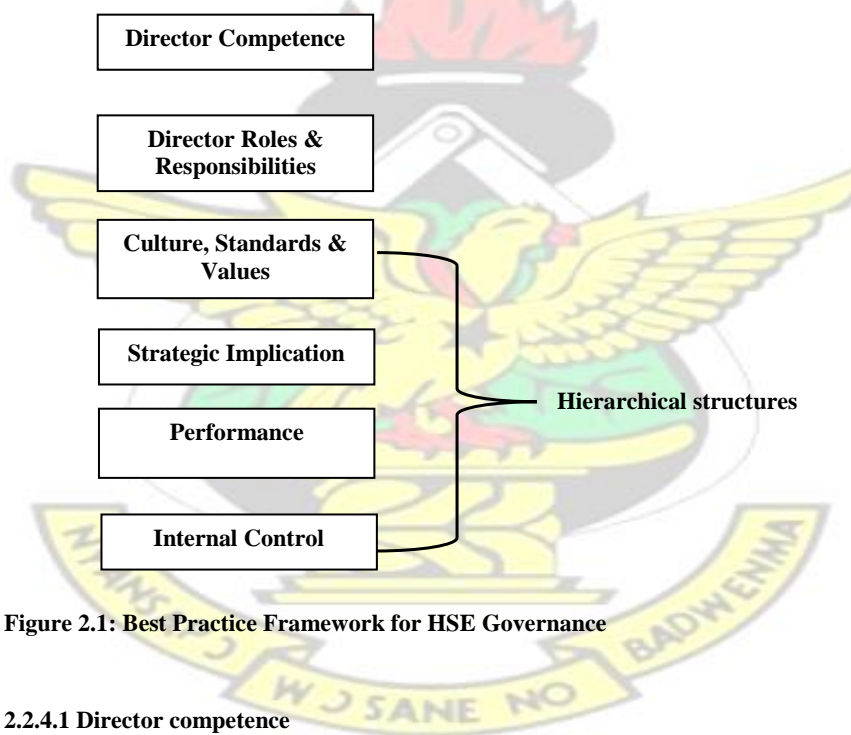


Figure 2.1: Best Practice Framework for HSE Governance

2.2.4.1 Director competence

Every director must have an absolute considerate of the key HSE concerns for their organizations and operations and be frequently evolving themselves through refresher causes to update their skills and facts(Boardman and Lyon, 2006).

2.2.4.2 Director roles and responsibilities

All directors should know their lawful tasks and their responsibilities surrounding HSE issues for their respective organizations. Their roles should be reinforced by terms of reference (TOR), extending to as a least setting HSE plan and strategy enactment, prioritizing and setting ethics, performance specialist care and internal control. At least one nominated director, where they exist should have an additional responsibility of supervising and making sure there is absolute compliance of the HSE governance process (Boardman and Lyon, 2006).

2.2.4.3 Culture, standards & values

The Board Members or of Directors should take tenure for key HSE concerns and be representatives for good HSE execution inside organizations, keeping in mind the fundamental standards and values. The Board of Directors should set the right policies at the top and create an open culture over the association with a greater state of correspondence systems in place both inside and remotely on HSE concerns (Boardman and Lyon, 2006).

2.2.4.4 Strategic implications

The board ought to be responsible for actualizing the HSE plan, understanding the dangers and prospects related with HSE issues and any market weights which may undermine the guidelines and qualities, and in the long run making an arrangement to react (Boardman and Lyon, 2006).

2.2.4.5 Performance management

The board members or directors should outline the key goals and objectives for HSE administration and make provision for motivational structure for senior managers which promotes good HSE performance, harmonizing both leading and lagging pointers or indicators and taking into consideration both substantial and insubstantial issues. Non-executives should be brought on board to help in establishing the suitable motivation schemes (Boardman and Lyon, 2006).

2.2.4.6 Internal controls

The managers should ensure that HSE record keeping incidents are managed and controlled effectively and that an outline to make compliance with the fundamental ethics is well put in place. It is important that the governance structures enable best practices of HSE record keeping management systems, activities and stages of performance to be tested. This procedure should apply, where probable, prevailing internal control and audit structures and be revised by the audit team (Boardman and Lyon, 2006).

2.2.4.7 Hierarchical structures

The board ought to incorporate the HSE record keeping administration technique into the real corporate administration structures inside the business, including the occasions of the fundamental board and its sub-groups, including danger, remuneration and appraisal. At times, the arrangement of an advantageous board sub group to contemplate HSE record keeping might be proper and significant (Boardman and Lyon, 2006).

2.2.5 Organizational Process Assets (OPAs) that promotes best practices of keeping HSE records on projects

Authoritative procedure resources are basically the strategies, measures, rules, and information bases specific to and applied by the executing company. These resources influence and affect the administration of the project in terms of health safety and environment record keeping practices (PMBOK guide, 2016).

OPAs incorporate any training, or information from any or the majority of the performing associations engaged with health safety and environment (HSE) record keeping in the project that can be used to implement and perform or administer the project. The OPAs may also include the organization's HSE record keeping practices lessons learned from earlier projects and past data. OPAs will normally consist of accomplished plans with regards to HSE incidents and the probable records that are kept, risk data (PMBOK guide, 2016).

OPAs are inputs to many project management procedures and that enhance HSE record keeping practices. Since OPAs are central or internal to the organization, the project crew or squad may be able to appraise also, add to the authoritative procedure resources as vital all through the venture. The OPAs are basically classified into two groups namely:

- ❖ Processes, approaches, and techniques; and
- ❖ Organizational information bases

And for the purposes of this study, which aims to explore the best practices of keeping HSE records on projects, the organizational knowledge bases or repositories and the processes, policies and procedures as indicated above shall be considered in outlining the best practices.

2.2.5.1 Organizational Knowledge Repositories

According to (PMBOK guide, 2016), the organizational knowledge repositories for recording, storing or keeping and retrieving data in relation to HSE records on projects may include the following but are not restricted to:

- ❖ Configuration of administration lessons learning central sources containing the sorts of HSE record keeping programming and equipment systems and reference purpose of all executing association morals, strategies, techniques, and any project HSE archives;
- ❖ Financial information archives containing data, for example, HSE episodes acquired costs, spending plans, and any venture HSE cost overruns;
- ❖ Historical or past information on HSE record keeping
- ❖ Issue and deformity administration information sources containing issue and imperfection status, control data, issue and imperfection goals, and activity thing results;
- ❖ Information central sources for measurements and methods used to gather HSE incidents or accidents, illness, damages, how they were recorded and make available measurement data on procedures and products; and
- ❖ Project files from past activities with respect to HSE records kept (e.g., scope of HSE incident to be managed and kept, cost of HSE to be envisaged, plan to mitigate HSE, execution estimation baselines, projects schedules, project timetable system charts, chance registers, HSE reports, and partner registers on HSE).

2.2.5.2 Processes, Policies, and Procedures

The organization's or the company's processes and procedures for conducting its project work through to initiating, planning, executing, monitoring, controlling and bringing the project to a closure provides a vital ingredients and best practices of keeping HSE records on projects which may include the following but are not restricted to (PMBOK guide, 2016):

- ❖ HSE record keeping layouts or formats (e.g., projects board plans, projects records, project registers, report groups, contract formats, chance classifications, chance articulation layouts, likelihood and effect definitions, likelihood and effect frameworks, and partner register layouts)
- ❖ Specific organizational standards such as policies on health safety and environment record keeping (e.g., human resources policies in terms of competence in HSE issues, health and safety arrangements, quality strategies, obtainment approaches, and natural approaches);
- ❖ Organizational communication requirements on health safety and environment record keeping (e.g., specific communication technology available to deal with records of health safety and environment cases, approved correspondence media, record protection and support approaches, videoconferencing, deliberate instruments, and HSE prerequisites);

Notwithstanding the above best practices of keeping health safety and environment records on projects in consideration, Yaya, Japheth Abdulazeez et al. stated that, regular improvements in software and hardware provides a better archival organization for the preservation of digital archival gathering centers on the short-term mechanism for storing the digital data, changing to current procedure and providing long-term access. In other to achieve longevity of digital collections of health safety and environment records

keeping in developing countries, there is a need to not only build software and hardware infrastructure for the storage media, but solving the problems associated with the rapidly changing storage devices.

Unlike analogue data which places importance on the conservation of physical artifacts, it is the informational contents of the digitized material that is well-preserved. It will consequently take a cognizant determination of archivists in developing countries and Africa in general to make sure that the digital data is conserved since “uninterruptedly alteration in software and hardware generates nuisance for staff working on digital longevity” ((Abdulazeez *et al.*, 2015).

2.3 Empirical Review

2.3.1 Importance of (HSE) Record keeping

Recordkeeping is very imperative and significant to health safety and environment (HSE) because it confirms and validates whether objectives and goals of health, safety and environmental concerns with regards to a particular project activity have been met. Notwithstanding, it also allows for corrective action. “Record keeping and performance measurement documents the HSE and concretize outcomes and results that will allow an organization or group to make an informed decision regarding whether programs, projects or investments are attaining the required results or if it is essential to perform corrective actions. Record keeping and performance measurement may be identified as a legislative requirement and/or used to validate administrative and structural adherence to legal requirements (CEC. 2013).

Effective health safety and environment (HSE) record keeping practices of any industry in infrastructural projects-related allows that organization or group to:

- achieve its ongoing operations in terms of health safety and environment more efficiently with data (“you cannot achieve what you do not measure,” i.e., you cannot attain for excellence if you do not measure to see what is getting improved and what is not);
- Prove accountability to regulators, authorization or insurance bodies by having required documents in place and being able to produce it in a timely manner when demanded to do so;
- Be organized, by having records and certification to demonstrate procedures, systems, etc., to workforces or employees and authorities as needed;
- To facilitate both internal and external compliance audits assumed by accreditation or regulatory bodies;
- To show commitment to transparency and verification;
- To identify or confirm if a problem exists, and allow for early corrective action; and
- measure and monitor effectiveness of corrective measures introduced to address problems by comparing with baseline data accumulated over time. (Bureau of International Recycling (BIR). 2006).

2.3.1.1 HSE Recordkeeping and document control.

Maintain appropriate health safety and environment record keeping procedures to back transparency and verification. This will advance the ability to measure performance, and authenticate legal compliance of organizational processes and activities. According to (Bureau of International Recycling (BIR). 2006), recommended records to keep may include:

- Health safety and environmental Reports and records of complaints from clients and other concerned parties, and preventive action taken
- Communications with regards to health safety and environment with concerned parties, local communities/authorities.
- Records of tests for awareness, drills and training exercises
- Health safety and environment incident-related inspections, maintenance and calibration records
- Health safety and environment incident-related records, with corrective/preventive actions taken
- Health safety and environment related audit results: internal, external, third-party
- Periodic achievement review results
- Health safety and environment process monitoring records
- Documentation of environmental-related determinants
- Records of significant environmental aspects

2.3.2 Innovations in Health Safety and Environment (HSE) Record keeping

Making stride with transformation and anticipating and undertaking new health safety and environment challenges is one of the tactical reasons that helped Great Britain work. HSE's strategic priorities include getting into the best form to distribute its duties by a continuous process to advance the health safety and environment structure and anticipating the future by developing and accepting new ways and procedures of working. Comparably, risk-based regulation will be adopted and used to augment productivity, innovation and the safe introduction of new technologies and working performances. Health safety and environment examines failures and setbacks of controls to monitor and manage risk. The knowledge acquired from this action can help projects

design out technological, process or design concerns to help avert these fall-outs occurring in the future. By implementing this approach, possible health safety and environment barriers to innovation can be removed (Britain, 2016).

Executing feasible advancement is the principle obligation of an HSE division in each association. Absence of HSE implies deficiency of feasible infrastructural project sector. Today, maintainability is a fundamental part of development. It implies that improvement ought not exclusively be financially doable yet additionally socially and biologically practicable both for present and who and what is to come. There is highly need to detail new severe approach and laws or to correct old ones, laws which are successful and handy in upgrading HSE and supportability measures in the framework project division of Pakistan and that of creating nations.

The core dangers that are gone up against by development venture laborers are tumbling from tallness, lifting movement, electric shock, harm to properties, and arrival of destructive synthetic compounds to networks and flare-up of sicknesses. HSE divisions of each association assume a significant job in decreasing worksite or business-related mishaps and in advancing maintainable advancement in work settings. For shielding manageable practices on venture destinations, HSE divisions understandable incorporated working technique and system, remembering social, ecological and monetary angles and permitting agreed perspectives and contributions from all partners. What's more, they search for cutting edge green advancements and green assets which are all the more environmentally amicable, financially savvy and need less vitality.

2.3.2.1 Examples of how new technologies can generate savings and reduce burdens

2.3.2.1.1 IT tool for duty holder performance

Health Safety and Environmental experts have industrialized a tool called Find-It to target examination efforts more clearly on higher-risk sectors, poor performers and serious supervisory breaches. Find-It uses advanced procedures to match and connect dissimilar data and provide a collective view of duty holder performance. It helps investigators or inspectors target regulatory activity to where it is most required and lessen problems on compliant businesses (Britain, 2016).

Find-It has been effectively applied in health safety and environment (HSE) since 2012 and the interest of it and the method has been rising from other regulators. This includes Alpha trials for Defra to look at agricultural check, for BRDO looking at local expert or authority guidelines and for the CO/DCLG for use in joint tasking to correct the illegal economy. Scoping studies are underway with ORR and the Defense Security Authority and HSE is in dialogue with more than ten other health safety and environment departments about the use of this procedure (Britain, 2016).

Notwithstanding, there is currently plan been developed to extend the Find-It concept to a Regulatory Intelligence Hub, to provide a harmonized, cross-government procedure to the establishment of intelligence for regulation. This would enhance the targeting and effectiveness of regulatory activity by permitting more effective risk- and evidence-based interventions using suitable technology and paring of data by regulators across government. It would also meet a number of governments aim and purposes by using an advanced resolution to improve working cost-effectiveness and lessen the problem of examination on compliant businesses (Britain, 2016).

2.3.2.1.2 Land-use planning

Health safety and environment (HSE) has incorporated a land-use scheduling service for developers and businesses in the chemical sector. This state-of-the-art, fee-paying service is designed to make a constructive input to national development (Britain, 2016).

2.3.2.1.3 Laser scanning for investigations

HSE experts have invented and installed laser-scanning capability for incident examination work. This improves effectiveness and proficiency in deployment of experts on incident sites, and improves evidence for use in court. Laser scanning allows dimensionally precise picturing of any scene in the form of millions of data points taken by a revolving laser. It enables stages of detail and precision formerly impossible to attain; event evidence can be collated in just a couple of hours that formerly took days with out-of-date procedures. This has been deployed in the Alton Towers and Bosley inquiries (Britain, 2016).

2.3.2.1.4 INSPECT tool

HSE social experts and economists have drawn on 'nudge' procedures to develop the 'INSPECT' tool for both duty holders and policy makers to help them tackle health safety and environment short-comings. There have also been stakeholder engagement and consultation with stakeholder groups, industries and trade unions (Britain, 2016).

2.4 Summary

Occupational safety and health (OSH) is generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account

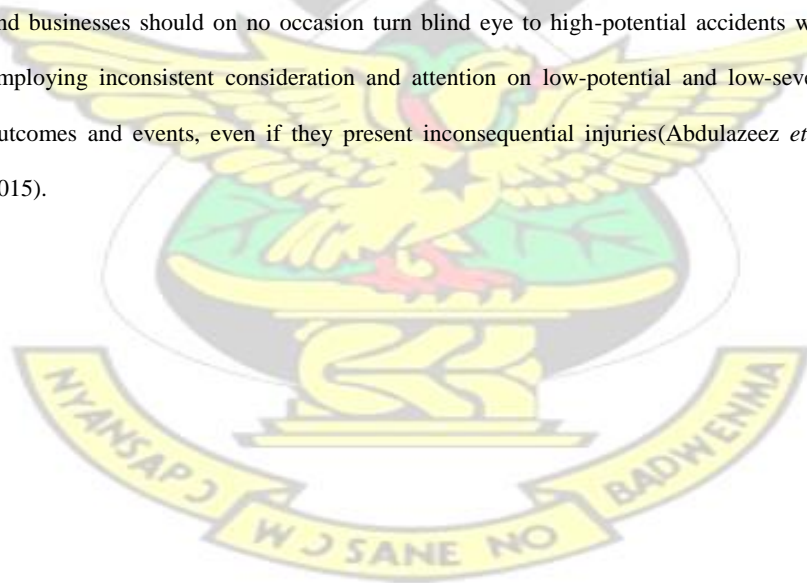
the possible impact on the surrounding communities and the general environment. This domain is necessarily vast, encompassing a large number of disciplines and numerous workplace and environmental hazards. A wide range of structures, skills, knowledge and analytical capacities are needed to coordinate and implement all of the “building blocks” that make up national OSH systems so that protection is extended to both workers and the environment (Alli, 2008).

Regardless of this, conditions at work and in the workplace of numerous associations in Ghana still include an unmistakable and even extreme peril to wellbeing that lessens the prosperity, working limit and even the life expectancy of working people (Asumeng *et al.*, 2015). However, the practice of health safety and environmental record keeping must be treated as a fundamental or an integral part of infrastructure project compliance as it enhances and promotes improved service delivery devoid of higher health safety and environment incidents as well as serving as a basis for following worker health trend overtime. It also serves as a foundation for carrying out reporting, communicating and addressing to minimize health safety and environmental issues on projects. Therefore, steps should be taken to safeguard consistent and systematic health safety and environmental record keeping practices and the preservation and management of project records at all levels. (Boardman and Lyon, 2006).

The proper understanding and expertise of project record keeping in terms of health safety and environment issues and concerns should be incorporated into the project employees or staff through training and re-training, construction and formulation of record keeping systems and regimes, templates to management records kept, policies to deal with and manage HSE records, infrastructural expansion, proper funding, computer skill training, etc as these would help in bettering the problem of poor health safety and

environment record keeping regime, preservation and management and its negative effect on project delivery.

Therefore, there is a crucial need of health safety and environment record keeping regulations to impact safety administration and supervision. Since occupational injury and all other work-related illness and diseases records are a key performance pointer, organizations and businesses characteristically attempt to improve such specific pointers. Such regulations and policy-driven importance can influence an organization to focus on explicit importance, for instance, recordings of definite injuries in a wide range of severity results, or definite and possible high-risk proceedings notwithstanding of whether they lead to in injuries. While the ultimate care is to avert, prevent and to reduce occupational injuries and illnesses of any kind on infrastructural projects, organizations and businesses should on no occasion turn blind eye to high-potential accidents while employing inconsistent consideration and attention on low-potential and low-severity outcomes and events, even if they present inconsequential injuries (Abdulazeez *et al.*, 2015).



CHAPTER THREE

METHODOLOGY

3.1 Introduction

The research methodology applied was one of the fundamentals of the research activity as it specifies the procedures, approaches and philosophical underpinnings to assemble the requisite knowledge for the research question in realizing the aim as well as the objectives of this study. Chapter three presents the various discussions that went into the selection of the research model. The presentation of the study population, sample size and how the size was selected are highlighted in this chapter. Moreover, this chapter outlines the data collection method used and also the data analysis approaches that were adopted for the study. This chapter concisely defines the rationale behind research method used for this study.

3.2 The Study Area

The study was intended to cover the entire Upper East Region of Ghana which consisted of 15 districts where these community-based infrastructure projects were implemented. But due to time and budget constraints, two municipal assemblies and three districts assemblies were considered comprising; Bolgatanga and Bawku Municipal Assemblies, Bolgatanga East, Tanlensi, and Pusiga districts. Bolgatanga and Bawku Municipal Assemblies were selected based on the number of targeted respondents anticipated for the sample size. The number of personnel strengths normally at the municipal level outweighs that of the districts in terms of departments. The researcher was constrained with time to explore the fifteen districts, therefore the reason for selecting the two municipalities to enable him obtain a greater percentage of respondents.

The remaining three (3) districts assemblies were also selected based on budget constraints and proximity to the districts. Due to inadequate resources in term of finances and mobility issues, the researcher relied on the selected districts purposely on their close proximity to the researcher with the aim of making the sample size.

3.3 Research Design

The exploration configuration was a part of the investigation which portrays how the examination was carried out. The strategy of the investigation incorporates, first the number of inhabitants in the examination which covers the Planning Units and the Works Departments of all the two municipal and three districts assemblies, consultants, contractors, together with their employees and community leaders selected from the communities?

3.4 Research Strategy

A research strategy gives a guide to managing from an exact strategy, to a fitting method for gathering and dissecting information. Research design refers to an outline or a strategy that directs a study. As indicated, research strategy can be clarified as the enquiry of research goals. Appropriately, the three principle sorts of research stratagems are quantitative, subjective, and triangulation. Be that as it may, the decision to adapt a specific stratagem fundamentally relies upon the direction of the investigation, the sort, just as attainable quality of data for the research. The exploration stratagem in this manner illuminates the information accumulation strategy to utilize and the selected technique was additionally reliant on the essential data required from the selected test. There are two primary ways by which research stratagem can be directed; quantitative or subjective (Creswell, 1998; Saunders, et al., 2000). Henceforth, this exploration adopts a quantitative procedure.

3.4.1 Quantitative Approach

The main goal for adapting to a quantitative methodology for this research was to get data that can be extensive to portray the interconnections between the research factors. The research received the utilization of investigation plan with a well-organized survey managed by the researcher. To assemble information for the study, self-managed surveys were disseminated to examine members.

3.5 Unit of Analysis and Data Sources

Information gathering is extremely basic in research. The truth of the matter was that, information contributes incredibly to an improved comprehension to a speculative foundation. This happens to be basic in the interest to pick the technique for getting information and again from whom the information would be assembled, substantial attention should be taken in order to get a sound decision since not any amount of analysis can cater for data that was collected wrongfully. The information utilized for this research were fundamentally of two principle sources; primary and secondary. The primary sources involve existent writing from logical diary, specialized papers, working papers, conferencing procedures and so forth. secondary information was sourced from Project supervisors, Planners, Consultants, Quantity surveyors, Contractors, Employees of construction firms and assemblymen in the form of field survey (questionnaires). These groups of people or professionals were recognized as the unit of examination.

3.6 Population and Sample Size of the Study

Population is defined to be the organization of all people of whom estimation is taken. In carrying out the research, a population should be recognized from the said unit of investigation. In other words, the total list of potential individuals involving the unit of

investigation is alluded to as the population. The study was aimed at health safety and environment record keeping practices on community-based infrastructure projects in the Upper East region of Ghana. Study population included Project managers basically within the Municipal/District assemblies' setup comprising the Quantity Surveyors, the Engineers, the Planners, Contractors, and their employees.

The targeted population of this study was the Municipal/District Assemblies Planning Units, Works Departments, the Contractors, the employees to the Contractors, the Assembly-members of the communities involved. Purposive method sampling was utilized to choose 70 respondents as test size for the research. Purposive sampling because, it is a non-probability sampling method which does not make assumptions about the population. The research targeted for instance, every single person deemed to be a Quantity Surveyor, Construction Manager, Civil Engineer or a Planner found at the works department or the Planning unit. Therefore, the 70 respondents were predetermined based on the personnel strength of the works department and the offices of the planning units. The arranged respondents and their responses are introduced in the table 3.1 and 3.2 beneath respectively:

Table 3.1: Distribution of Respondents from the Selected District Assemblies

District(s)	Planning Unit	Works Department	Contractor	Employees	Assemblyman	Total
Bolga Municipal	7	7	1	2	1	18
Consultants	0	0	0	0	0	13
Bolga East	2	3	4	2	3	13
Telensi-Nabdam	4	3	3	3	3	14
Bawku Municipal	2	4	1	1	N/A	4
Pusiga	4	2	N/A	N/A	N/A	4
Bawku West	4	2	N/A	N/A	N/A	4
Total	23	19	9	9	10	70

Table 3.2: Summary of Data Retrieved from Respondents

Respondents	Works Department	Planning Unit	Finance	Consultants	Others	Total
Responses	30	08	02	07	11	58

3.6.1 Sampled Techniques

There exist several testing systems for countless purposes. For this investigation, the primary testing procedure embraced was the purposive sampling method. It is a non-probability sampling method which does not make assumptions about the population. Purposive sampling was used based on the expertise and the experience of the participants with regards to the research. In addition, the study adopted purposive sampling in the sense that, the research was about exploratory purposes and not inferential purposes which makes assumptions about the population. The Works Departments of the municipal/district assemblies were selected based on the availability of professionals with sample representation of Project Managers, Construction Managers, Quantity Surveyors, Civil Engineers, together with the Planning Units because they are the main implementers of most of these community-based projects.

3.6.2 Research Instrument

The researcher structured survey instrument for this examination work and it was partitioned into the accompanying areas: A - Demographic Information; B – Outlining the importance of health safety and environment record keeping; C- Identifying the best practices of keeping health safety and environment records on projects; D – Identifying Challenges with health safety and environment record keeping on projects.

3.6.3 Method of data collection, questionnaire design and format

The questionnaire was the preliminary information accumulation apparatus and was configured to draw and request imperative data from the respondents. The survey was structured dependent on the examination goals and furthermore in connection to writing audit led on the point. A Likert scale was employed and the respondents were approached to rank them dependent on certain power on a five-point scale course of action with various explanations.

The arrangement of the questionnaire utilized in this investigation to meet the stipulated targets was partitioned in four noteworthy areas to be specific: Section 'A' which looked to analyze the foundation of respondents, Section 'B' tried to layout the significance of health safety and environment (HSE) record keeping rehearses on activities, Section 'C' tried to recognizing best practices of keeping health safety and environment (HSE) records on projects and Section 'D' tried to likewise distinguish the difficulties with health safety and environment (HSE) record keeping practices on projects in the Upper East of Ghana. A 5-point Likert scale was employed here extending from **1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree.**

3.6.4 Method of Data Analysis

Information examination alludes to the ways by which answers are found by methods for translating the assembled information. Deciphering here basically means discovering meaning and to clarify. Information investigation comprises of three noteworthy exercises; decrease of information, introduction of information and making of inference as characterized by Saunders et al., (2000). These three noteworthy advances were highlighted in the analysis of the information examined with the end goal of this work. The primary point of the investigation stands to lessening information to an unmistakable

and reasonable structure and furthermore in a structure that can make the data interpretable so that research problem relations can be deliberated upon, verified and also allow the drawing of conclusions. The information gathered were arranged and composed in accordance with the research destinations.

In picking factual apparatus, parametric and non-parametric quantifiable test were considered. In picking one of the two, much apleness was set in a general sense on the level of estimations acknowledged in the research and furthermore the sort of factors. Non-parametric factual testing utilizing elucidating insights, mean score index, Relative Importance Index (RII), were the statistical tools adopted. Illustrative insights included the utilization of rates, recurrence tables and so forth to display the outcomes. The outcomes following the examination gave the driving force to the deliberations of the outcomes. Basic patterns and deviations were unequivocally deliberated about. Purposes behind the result of the investigation were likewise exhibited in connection to past research discoveries.

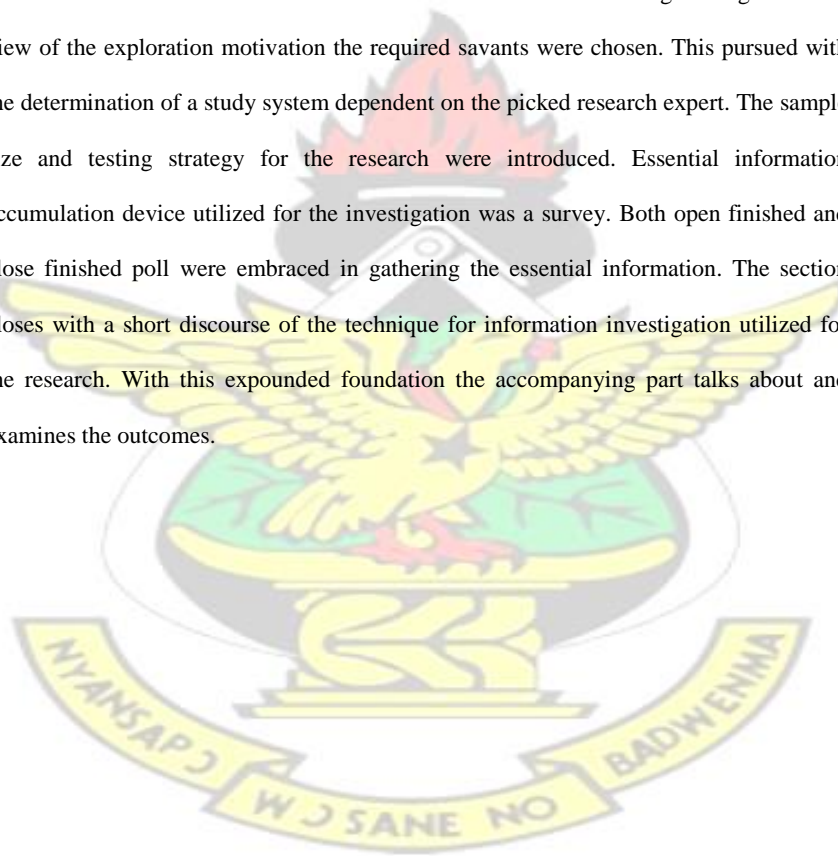
3.7 Ethical Consideration

A few moral contemplations were observed in the lead to the research. Members in the survey were informed to come clean about the research. They were urged to intentionally take part all the while. They were likewise informed that they could choose not to proceed anytime they believe they would prefer not to do as such. Their secrecy was guaranteed as they were not required to give any data that may sell them out. The researcher likewise didn't take part in any misrepresentation of data and that the reactions were as they were gotten from the respondents. The researcher additionally made a point to credit thoughts that were gotten from past researchers (Fouka and Marianna, 2011;

Akaranga and Makau, 2016). Competency of the researcher in delineating pride and trustworthiness was brought to hold up under in the lead of the research.

3.8 Chapter Summary

This part was significantly concerned with the presentation of the technique employed for this research and the strategy utilized in planning the information gathering. The section talked about the different research ideal models that surviving writing offers. In view of the exploration motivation the required savants were chosen. This pursued with the determination of a study system dependent on the picked research expert. The sample size and testing strategy for the research were introduced. Essential information accumulation device utilized for the investigation was a survey. Both open finished and close finished poll were embraced in gathering the essential information. The section closes with a short discourse of the technique for information investigation utilized for the research. With this expounded foundation the accompanying part talks about and examines the outcomes.



CHAPTER FOUR

DATA ANALYSIS AND RESULTS DISCUSSIONS

4.1 Introduction

The outcomes and the deliberations of the field overview after the information gathering are captured and illustrated in Chapter four. Analyzed in this section was the primary data received from the several respondents, made up of Works Department, Planning Unit, Finance Department of the selected Municipal, District Assemblies, Consultants and other key portfolios. With regards to the analysis, Relative Importance Index (RII) was adopted. The analysis was centered on the objectives of the study; to outline the importance HSE record keeping, identify best practices of keeping HSE records and the challenges with HSE record keeping practices on Community-Based Infrastructural Projects (CBIP) in the Upper East of Ghana. As part of the objective to the study was to recommend improvements to enhance HSE record keeping practices on projects.

4.1.1 Survey Responses

Fifty-Eight (58) questionnaires were received, out of a total number of Seventy (70) questionnaires distributed to Works Department, Planning Unit, and Finance Department of the selected Municipal, District Assemblies, Consultants and other key portfolios, using the purposive and simple random sampling technique, representing a greater reply percentage of 82.86%. This was so a direct result of individual appropriation, persistence and hard work due to the fact that, there was enormous time constraint.

4.2 Descriptive Analysis of Demographic Data

This viewpoint or area of the survey comprised of inquiries that tried to welcome the fundamental data and some corresponded issues from the respondents to determine the

respondents' understanding about the examination so as to give thorough respondent qualities. This pertinence of this area was to set up the reliability and create the certainty required in the information gathered. Information incorporated into the examination of the demography were arrangement of respondent, respondent's largest amount of instruction, division, and span of stay in the office.

4.2.1 Portfolio

Table 4.2.1 shows the complete number of respondents with their individual portfolios. This segment of the information was incorporated to permit respondents show their portfolios, because the researcher wanted the respondents identified by such.

Table 4.2.1: Portfolio

Portfolio	Frequency	Percent (%)	Cumulative Percent (%)
Employer	11	11.00	19.00
Employee	19	19.00	32.80
Engineer	20	34.50	34.50
Assemblymen	8	13.80	13.80
Total	58	100	

Source: Field Survey, 2019.

Fifty-Eight (58) questionnaires as shown in table 4.2.1 shows all the number of respondents who finished this segment. Out of this, engineers recorded the most noteworthy number of twenty (20) indicating 34.50%, employees either with works department, planning unit or employees of contractors was nineteen (19) representing 32.80%, employers (contractors) was eleven (11) representing 19.00% and community leaders (Assemblymen) were eight (8) indicating to 13.80% of the whole respondents. It can therefore be inferred that as far as this research was concerned, the required professionals for the study has been achieved.

4.2.2 Departments

Table 4.2.2 shows the absolute number of respondents with their separate divisions. This segment of the information was incorporated to permit respondents demonstrate their department, because the researcher wanted the respondents by their day-to-day activity involvement in the execution, implementation of CBIPs.

Table 4.2.2: Departments

Departments	Frequency	Percent (%)	Cumulative Percent (%)
Works Dept	30	51.70	51.70
Planning	08	13.80	13.80
Finance	02	3.40	3.40
Consultancy	07	12.10	12.10
Others	11	19.00	19.00
Total	58	100	

Source: Field Survey, 2019.

Responses from questionnaires as shown in table 4.2.2 demonstrate the number of respondents who finished this segment. Out of this, Works Departments of the Municipal/District Assemblies (group of Quantity Surveyors, Civil Engineers, Construction Technology Managers professionals) recorded the highest number of thirty (30) representing 51.70%, Planning Units were eight (08) representing 13.80%, Finance were two (02) representing 3.40%, Consultants were seven (07) representing 12.10%, and others were eleven (11) representing 19.00% of the entire respondents.

4.2.3 Experience Level

Respondents were asked of their years of practice with regards to projects in their respective jobs thus to depict their level of experience with issues regarding health safety and environment record keeping practices on projects. Table 4.2.3 below depicts the years of experience with 32.80% of the respondents having had less than 2 years' experience, 19% represented respondents with 3-5years of experience, 20.7% represents respondents with 6-10years of experience and 27.6% represented respondents with 11 or more years of experience.

Table 4.2.3: Experience Level

Years	Frequency	Percent (%)	Cumulative Percent (%)
<2	19	32.80	32.80
3-5	11	19.00	51.80
6-10	12	20.70	72.50
11 or more	16	27.60	100.00
Total	58	100	

Source: Field Survey, 2019

4.2.4 Educational Level

Respondents in the questionnaire were asked of their highest level of academic qualification. From Table 4.2.4 underneath were the reactions. As high as 67.2% of all respondents were Bachelor's Degree holders representing to thirty-nine (39) respondents. Master's Degree holders had 12.1% representing seven (07) respondents. 8.6% out of the total number of respondents were Senior High School holders. Respondent with the background of non-formal and Junior High School were 4 in number representing 6.6%.

Table 4.2.4: Level of Academic Qualification

Level of Education	Frequency	Percent (%)	Cumulative Percent (%)
Non-formal	03	05.20	05.20
Junior High School	01	1.40	06.60
Senior High School	05	08.6	15.20
Bachelor's Degree	39	67.20	82.40
Master's Degree	07	12.10	100
Total	58	100	

Source: Field Survey, 2019

4.2.5 Involvement in Infrastructural Projects

Table 4.2.5 indicates the total number of respondents that were either involved in projects. This segment of the information was incorporated to empower respondents show their involvement in construction projects so as to appreciate their knowledge and understanding with regards to health safety and environment record keeping concerns.

Table 4.2.5 Involvement in infrastructural projects

Preference	Frequency	Percent (%)	Cumulative Percent (%)
YES	53	91.40	91.40
NO	05	08.60	100
Total	58	100	

Source: Field Survey, 2019.

From table 4.2.5 above, indicates the total number of respondents who finished this segment of the questionnaires. Out of the total respondents of Fifty-Eight (58), Fifty-Three (53) respondents are involved in construction projects representing 91.40% and just five (05) representing 8.6% of the entire respondents are either inexperienced or have no knowledge in construction projects.

4.2.6 Type of Construction Activity

Table 4.2.6 indicates the number of respondents with their separate type of construction activity engaged in.

Table 4.2.6: Type of construction activity

Type of cons.	Frequency	Percent (%)	Cumulative Percent (%)
Buildings	51	87.9	87.9
Dams	05	08.6	96.5
Roads	01	01.7	98.2
Others	01	01.7	100.0
Total	58	100	

Source: Field Survey, 2019.

The purpose for this was to allow respondents demonstrate that, they are actually involved in construction projects. And by so doing, respondents who were involved in building construction activities were Fifty-One (51), representing 87.90%, Dams activities constituted five (05) representing 8.60%, while that of roads and others were two (2) representing 3.4% of the entire respondents.

4.2.7 Capacity/Roles and responsibilities

Table 4.2.7 shows the total number of respondents and their roles and responsibilities in construction projects.

Table 4.2.7: Capacity/Roles and responsibilities

Roles.	Frequency	Percent (%)	Cumulative Percent (%)
Planner	21	36.2	36.2
Finance Off.	04	06.9	43.1
Engineer	11	19.0	62.1
Consultants	05	08.6	70.7
Others	17	29.3	100.0
Total	58	100	

Source: Field Survey, 2019.

Respondents were asked of their respective departments or at the field of work. Table 4.2.7 above depicts the roles and responsibilities, with 36.2% of the respondents been planners, 6.9% represented respondents been Finance Officers, 19% represents respondents been Engineers, 8.6% represented respondents been Consultants, and others represented 29.3% of the entire respondents.

4.2.8 Record Keeping Practices

Table 4.2.8 shows the complete number of respondents that were either practicing and keeping health, safety and environmental records or otherwise. This part of the information was incorporated to empower respondents demonstrate their involvement in health, safety and environmental record keeping practices on construction projects.

Table 4.2.8: Record keeping practices

Records	Frequency	Percent (%)	Cumulative Percent (%)
YES	41	70.7	70.7
NO	17	29.3	100
Total	58	100	

Source: Field Survey, 2019.

From table 4.2.8 above, indicates the total number of respondents who finished this segment of the questionnaires. Out of the total respondents of Fifty-Eight (58), Forty-One (41) respondents were involved in health, safety and environmental record keeping representing 70.7% and Seventeen (17) representing 29.3% of the entire respondents do not keep health, safety and environmental records.

4.2.9 Types of Record Keeping

Table 4.2.9 shows the total number of respondents and how they identified with the kind of records they keep on infrastructure projects.

Table 4.2.9: Type of record keeping

Records	Frequency	Percent (%)	Cumulative Percent (%)
HSE records	33	56.9	56.9
Worker Rela	11	19.0	75.9
Financial	10	17.2	93.1
Others	04	06.9	100.0
Total	58	100	

Source: Field Survey, 2019.

The purpose for this was to allow respondents indicate that, they were actually involved in health, safety and environmental record keeping and the kind or indicate any type of such records. And by so doing, respondents who were involved in health, safety and environmental record keeping were Thirty-One (33), representing 56.9%, Worker related records constituted eleven (11) representing 19%, Financial records were ten (10) representing 17.2%, while other records were four (4) representing 6.9% of the entire respondents.

Table 4.3.1: Relative Importance Index of Challenges with health safety and environment (HSE) record keeping on projects

S/No.	Factor	Mean	Standard Deviation	RI I
1	Lack of guidelines and criteria	3.86	1.017	1
2	Inadequate Tech infrastructure	3.78	1.009	2
3	Lack of specific organizational standard	3.74	1.069	3
4	Technical Expertise	3.72	0.988	4
5	Lack of traceability matrices	3.72	1.039	5
6	Lack of financial control procedures	3.72	1.167	6
7	Lack of control procedures	3.71	1.009	7
8	Lack of HSE legislation and culture	3.71	1.043	8
9	Lack of organizational communications	3.66	1.101	9
10	Lack of record keeping procedures	3.60	1.123	10
11	Technological Obsolescence	3.53	1.030	11
12	Computer Phobia	3.50	1.203	12
13	Employer / Employee	3.14	1.220	13
14	Complete waste of time and budget	2.88	1.312	14

Source: Field data, 2019

Lack of guidelines and criteria

Lack of guidelines and criteria for tailoring the organization's set of standard processes and procedures to satisfy HSE specific needs on projects was ranked the primary hindrance by respondent, implying that the inability to clearly specify guidelines and specific criteria to tailor set standards and procedures to satisfy issues regarding HSE was the paramount challenge on HSE record keeping on project.

Inadequate Tech infrastructure

Similarly, inadequate Technological infrastructure was also found to be a major impediment on HSE. Because there are no clear guidelines, we are unable to fully use or purchase technological infrastructures.

Lack of specific organizational standards

Lack of specific organizational standards such as health safety and environment policies were also thought to be very important challenge in health safety and environment record keeping, since an organization's lack of specific standards on health safety and environment policies, health safety and environment record keeping on project will impeded.

Technical Expertise

The lack of specific organizational standard will mean, there won't be procedures in keeping records, resulting to unfulfilled organizational goals. The next challenge ranked by the respondents was the lack of technical expertise. Safety Officers or employees must possess substantial experience and technical skills related to health safety and environmental record keeping on project. Availability of technical expert will guarantee drawing of guidelines and criteria, procure adequate technical infrastructure, implement specific organizational orders to overcome health safety and environmental challenges.

Lack of traceability metrics

The lack of ability and capacity to tract health safety and environment related incidents on projects site from its origins of occurrence through to the entire development to its validation on each level is a challenge which impedes health safety and environmental record keeping practice.

Lack of financial control procedures

Lack of financial control procedures for instance time reporting, required expenditure and disbursement reviews on health safety and environment, accounting codes and standardized contract provisions was another challenge in health safety and environment record keeping. The lack of proper procedures of keeping financial records on health

safety and environment cast doubts on financial transactions of an organization. This event may occur as a result of the lack of inadequate guidelines and lack of expertise which was earlier indicated. Therefore, deficiency in organizational financial control procedures can hinder progress in health safety and environment record keeping practices.

Lack of control procedures

Furthermore, lack of change control systems, in this manner by which performing organizational norms, approaches, plans, and strategies on health safety and environment record keeping will be altered, and how any progressions will be acknowledged and endorsed and approved.

Lack of health safety and environment legislation and culture.

Again, another challenge with health safety and environment record keeping on projects was the lack of health safety and environment legislation and culture. Improper legislation and culture/regime can hinder the proper record keeping practices. Legislations are needed for check and balances. Without proper legislation, there will be no way to effectively keep health safety and environment records. Again, we can say that, in order to implement proper legislation, there must be expertise drafting and implementing such legislations for proper health safety and environment record keeping.

Lack of organizational communications

Also, lack of organizational communication and reporting requirement hinders health safety and environment record keeping practices. Because there was lack of legislations, and no guidelines and procedures to follow, communication channels become very difficult. There is no proper chain of communication. To overcome this, there must be expertise to clearly define proper methods of communications channels architecture.

Lack of record keeping templates

Next is the absence of health safety and environmental record keeping templates. To ensure accurate health safety and environment recording and record keeping practices within industries and organizations, there must be proper standardized templates laid out through legislations by experts.

Technological obsolescence

Technological obsolescence hinders health safety and environmental record keeping. The inability to keep up with latest technological tools such as super computers, internet etc. will ensure inaccurate data. For example, storing records or data on old floppy disc can corrupt data for future use. However, using current storage devices such as clouds, pen drives etc. can help save the loss of data. To overcome the challenge of health safety and environmental record keeping, efforts must be made to keep abreast with the latest technological developments.

Computer Phobia

Computer Phobia is thought to be another challenge in health safety and environmental record keeping. The fear of that computers are taking the jobs of many is preventing them and other organizations from using computers. Computers are fast, accurate and safe to use and so people should be encouraged to use computers in keeping records.

Employees/ Employers

Employer/employees and safety officers especially are normally seeing busy on non-essentials and relegating health safety and environment issues to the background and this needs to be checked on projects to avert the inherent challenges.

Complete Waste of Time and Budget

Finally, many consider health safety and environment record keeping as a complete waste of time. This may be caused by the first thirteen problems especially expertise who will help draft and educate people about the essence of keeping records. Many people do not know the importance of keeping records and so they regard to be a complete waste of time. On the other hand, organizations and establishments see health safety and environment concerns in terms record keeping as an additional financial or economic burden which will ultimately end up increasing project budget and expenses. More expert must come on board to engage employees or employers and the general populations about the essence of health safety and environment record keeping.

Table 4.3.2: Relative Importance Index of Best Practices of health safety and environment record keeping on projects

S/No.	Factor	Mean	Standard Deviation	RII
1	Financial data repositories	3.97	0.9991	1
2	Historical information	3.97	1.059	2
3	Computer support systems	3.91	0.864	3
4	Hybrid	3.90	0.986	4
5	Project file	3.78	1.155	5
6	Configurational management	3.74	1.052	6
7	Online record keeping	3.67	1.161	7
8	Manual	3.48	1.173	8

Source: Field data, 2019

Financial Data Repositories.

According to the respondents, financial data repositories was ranked as the most vital best practices of health safety and environment record keeping on projects. Finance data repository containing information such as labor hours, incurred costs, budgets and any other cost overruns ensures trust and help employees and management know the current state of the health safety and environment records.

Historical information.

Secondly, historical information was ranked the most importance best practice of keeping health safety and environment records on projects. Past experiences help identifies the mistake committed and help avoid committing or repeating those mistakes. Lessons and knowledge learnt from historical information helps to plan effectively for progress.

Computer support systems

Thirdly, the adaptation of computer support systems also ensures the safe keeping of health safety and environment records. For instance, using computer spreadsheets, hard drives, storing data online with the aid of the internet in keeping records ought to be preferred to using books.

Hybrid (manual and computer support) System

Additionally, another best practice is the hybrid system of keeping data. i.e. using both the manual (e.g. books, project files) and computers such PDA, tablets, mobile phones in keeping data. The methods ensure that, in a system where one fails to work, alternative methods can be used. Using the hybrid method prevents data loss.

Project Files from Previous Projects.

Project file was considered another best practice per the Relative Importance Index (RII) ranking, in keeping health safety and environment (HSE) records. With the aid of hybrids methods, organizations and companies can access previous records in terms of scope, cost, timetable, and execution estimation baselines, projects schedules, projects calendar system graphs, danger reports, and stakeholders' registers. For example, with the aid of computers or manual methods, historical financial transactions can be identified for future reference.

Configurational Management Knowledge Repositories

Response also indicates that configurational management knowledge repositories was another best practice in keeping health safety and environment records. This includes lessons learned sources containing the forms of programming, equipment, segments and baselines of all performing association standards, arrangements, techniques. Knowledge software and hardware ensure that upgrades can be made on the existing ones.

Online Record Keeping.

More so, online record keeping was also a best practice in the keeping of health safety and environment records. Keeping records online using computers ensures that data can be accessed at anytime, anywhere without stress. This also guarantees the loss of data in the case of disaster such as fire outbreaks or natural occurrences when these data are kept in books. Online data storage also ensures that one does not need to carry books or record materials along anytime.

Manual.

Finally, manual methods are such as books, or other methods of keeping records other than the computer. These may be very effective and cost effective in the cases when computers cannot be purchased or the internets cannot be accessed.

Table 4.3.3: Relative Importance Index on the Importance of HSE of record keeping

S/No	Factor	Mean	Standard Deviation	RI I
1	Identify or confirm problems	4.05	0.826	1
2	Provide information for employees	4.02	0.868	2
3	Ensure organized organization	3.93	0.814	3
4	Prove responsibility to regulators	3.93	0.953	4
5	Achieve ongoing operations more efficiently	3.91	0.864	5
6	Measure and monitor effectiveness	3.91	0.960	6
7	General HSE management	3.90	0.872	7
8	Track HSE activities	3.83	0.958	8
9	Link HSE cases	3.78	0.992	9
10	Commitment to transparency and verification	3.78	1.027	10
11	Facilitate both internal and external audits	3.62	1.006	11

Source: Field data, 2019

A total of eleven (11) variables were identified and considered as the most appropriate importance of health safety and environment record keeping. From the survey and the responses of the respondents, these variables were ranked from one (1) to eleven (11) using the Relative Importance Index (RII) analysis.

Identify or Confirm if a Problem Exists.

Identify or confirms if a problem exist was ranked as the most vital variable of importance of health safety and environment record keeping on projects. When there are organizational standards and policies and procedures in place, the system allows for easy identification or otherwise confirm if problems exist, then improvise to allow for early corrective action.

Provide Information for Employees.

Provide information for employees was ranked (2) from the RII analysis. The organization's ability to identify or confirm health safety and environment issues through appropriate legislation and standards enables employees have or get quick information regarding HSE records relating to their health and safety at work place.

Ensures an Organized Organization.

Thirdly, to ensure an organized organization was ranked (3) from among the eleven variables. The probable reason was when systems are in place by way of having records and documents to demonstrate procedures to workers and authorities as and when needed, it proves responsibility of the organization.

Prove Responsibility to Regulators

The fourth important variable ranked was, prove responsibility to regulators, authorization or insurance bodies by having suitable documentation in place and being able to make it available in a timely manner when requested to do so. The more industries are pruned to health safety and environment hazards and the likes, they remain in the bad books of their regulators. But once they remain within the regulations that set them up, it's an evidence that, there are standards and system working and makes them more responsible to its workers and regulators.

Achieve Ongoing Operations More Efficiently

The fifth ranked importance of health safety and environment record keeping was achieve ongoing operations more effectively. It's quite remarkably true when there are policies in place to identify or confirm health safety and environment issues, relay this information to employees on time, definitely it's a demonstration of an organized organization.

Measure and Monitor Effectiveness

The sixth ranked importance was to measure and monitor effectiveness by comparing with baseline data accumulated overtime. Basically, it's an indication of existence of procedures that have allowed health safety and environment issues recorded and kept in place overtime to establish a baseline for comparison.

General Health Safety and Environment Management.

Also seen vital and ranked the seventh most importance of health safety and environment record keeping on projects was the general health safety and environmental management followed by the eighth ranked variable: the ability to track health safety and environment activities and occurrences. health safety and environmental record keeping notwithstanding, helps projects to link likelihood health safety and environment cases as operations are ongoing and was ranked the ninth importance of health safety and environment record keeping practice.

Commitment to Transparency and Verification

Demonstrate commitment to transparency and verification and facilitate both internal and external compliance audits undertaken by regulatory bodies were the last tenth and eleventh ranked respectively as the importance of health safety and environment record keeping practices on projects.

CHAPTER FIVE

SUGGESTIONS AND CONCLUSION

5.1 Introduction

This research work sought to evaluate health safety and environment record keeping practices on Community-Based Infrastructure Projects (CBIP) henceforth the goal of the investigation caught in section one. Section two managed into subtleties the write ups of other comparable works on health safety and environment record keeping practices, its importance, best practices and challenges with health safety and environment record keeping practices on CBIP in the Upper East of Ghana. In Chapter three was the methodological methodology for the investigation. Overview polls were sent out and data retrieved for analysis. Section four broke down and talked about into subtleties the information gathered. This part exhibits an outline of the discoveries mulling over the accomplishment of the research aims and objectives. The conversation on the shortcomings or restrictions of the research was charted with suggestions made for future examinations. Chapter five followed the arrangement underneath:

- Review of the research objectives;
- Summary of findings;
- Contribution to information and industry;
- Suggestions;
- Direction for future research; and
- Limitations of the exploration;

5.2 Review of Research Objectives

As noted, before in section 1.2 of this theory, the general point of the research is to assess the importance of health safety and environment recordkeeping practices on

community-based infrastructure projects in the Upper East Region of Ghana. So as to accomplish the above stipulated aim, 3 targets were set up. The fulfilment of every goal is laid out in the following subsections;

5.2.1 Review of Objective One

The first objective was *to outline the importance of HSE record keeping on projects*

To realise this objective, respondents were asked whether they were keeping records, and out of fifty-eight respondents, forty-one (41) responded yes, representing 70.7%. Coupled with this, to access and appreciate the understanding of the respondent, a follow up question was asked based on types of records. Out of the fifty-eight respondents, thirty-three (33) responded having been involved in HSE record keeping on projects.

This is an indication that, there is a general understanding and appreciation of the importance of HSE record keeping. From Table 4.3.3, represents results using Relative Importance Index analysis from Chapter four. An important point to note, thus the smaller the standard deviation from the mean, the better or the accurate the response or the discussion. Therefore, based on the relative importance index ranking in order of descending, presented the eleven (11) importance of HSE record keeping practices on projects.

5.2.2 Review of Second Objective

The subsequent target was *to identify the best practices of keeping HSE records on projects.*

In order to discover the best practices of keeping HSE records on CBIPs, distinctive research subject was concentrated to think of the most conspicuous practices. In all, every one of the nine (9) factors were noted. Respondents were required to rank these

nine (9) best practices according to the level of severity or intensity through a survey. The responses received were analysed using Relative Importance Index or the mean, standard deviation to ranked them in terms preference or of importance.

5.2.3 Review of Third Objective

The third objective was *to identify the challenges with health safety and environment recordkeeping practices on the projects*

For the successful maximization of the importance of health safety and environment record keeping and the ability to maximize the best practices of keeping health safety and environment records on projects, challenges with HSE record keeping should be identified on projects and certain strategies put in place. In all fourteen (14) challenges were identified and noted. Respondents were asked to rank the fourteen (14) challenges in severity terms for consideration. The responses received were analysed using the relative importance index.

In conclusion, the research was able to evaluate the importance of health safety and environment record keeping and practices in the implementation of community-based infrastructural projects in the Upper East Region of Ghana.

5.3 Summary of Findings

In all a total of seventy (70) questionnaires were administered and fifty-eight (58) responses were retrieved from Planners, Financial Officers, Engineers, Quantity Surveyors, Consultants, contractors and their employees, and assemblymen within the study area showing a high reaction pace of 82.86%.

From section 4, as high as 67.2% of all respondents were Bachelor's Degree holders speaking to thirty-nine (39) respondents. Master's Degree holders had 12.1% representing seven (07) respondents. 8.6% out of the total number of respondents were senior high school graduates' holders. Respondent with the background of non-formal and Junior high school leavers were 3 in number representing 4.8%.

From Table 4.7 in section four, a bigger rate of 36.2% were represented by Planners who were twenty-one (21) in number. Engineers made up of Quantity Surveyors, Project managers, Civil Engineers and Construction Technology managers were eleven (11) thus 19% of the entire population. Consultants represented 8.6% of the entire respondents totaling five (5). Others represented seventeen (17) respondents thus 29.3%.

From Table 4.5, 91.4% which is the highest percentage representing fifty-one (51) respondents indicated their involvement in infrastructural projects while 8.6% of the respondents were not.

Out of the fifty-eight (58) responses, forty-one respondents representing 70.9% were much aware of construction project related record keeping practices while seventeen (17) representing 29.3% were unaware or did not practice. Interestingly, out of the same fifty-eight respondents, thirty-three (33) representing 56.9% practiced HSE record keeping on infrastructural related projects, meanwhile, eleven (11) respondents which represents 19% were only aware of worker related records, 7.2% respondents were keeping financial records only on projects and others 6.9%.

From the (RII) analysis, the importance of health safety and environment record keeping practices on projects was ranked based on preference or importance and presented in descending order as follows;

- ❖ Identify or confirm if a problem exists, allow for early corrective action.
- ❖ To provide information for employees, eg health safety and environment policies and risk assessments.
- ❖ It ensures an organized organization, by having records and documentations to demonstrate procedures, systems, to workers and authorities as needed.
- ❖ To prove responsibility to regulators, authorization or insurance bodies by having suitable documentation in place and being able to make available in a timely manner when requested to do so.

For the best practices of health safety and environment record keeping on projects, eight principals (8) variables were looked at based on (RII) analysis. The best practices of health safety and environment record keeping on projects was ranked based on preference or importance and presented in a descending order as follows;

- Financial information sources or center containing data, for example, work hours, acquired costs, spending plans, and any venture cost.
- Historical data and lessons learned information archives.
- Computer support systems
- Hybrid system (manual and computer).
- Project records from past activities, for example, scope, cost, execution estimation baseline, project schedules, risk report and register, projects schedule network diagram and stakeholder register.

For challenges with health safety and environment record keeping practices on projects, fourteen principals (14) variables were looked at based on (RII) analysis. These were ranked based on preference or importance and presented in a descending order as follows;

- ❖ Lack of rules and criteria for fitting the association's arrangement of standard procedures and methodology to fulfill health safety and environment explicit needs of the undertaking.
- ❖ Inadequate technological infrastructure.
- ❖ Lack of specific organizational standards such as HSE policies.
- ❖ Lack of technical expertise.
- ❖ Lack of traceability metrics.
- ❖ Inadequate financial control procedures, for instance, time reporting accounting codes, standardized contract provisions, required expenditure and disbursement reviews.

5.4 Contribution to Knowledge

This research has contributed information to industry in assorted ways. These are illustrated beneath:

- This research has thrown more insight on the benefits of health safety and environment record keeping on infrastructure projects especially at the community-based where issues of HSE are left unattended to in the construction industry.
- The research has unearthed the best practices that can be applied in the keeping of HSE records to allow for effective management of health safety and environment issues as and when they occur on projects. This research in general have add to the knowledge base in terms of awareness, reactiveness and the readiness to abreast our organizations and companies with the requisite health safety and environment record keeping.

- The research has brought to light the various challenges associated with health safety and environment record keeping on projects at the community levels during planning, implementation, executions, monitoring and controlling and closing such projects based on which proposed strategies/recommendations have been given for implementation.

5.5 Suggestions for Practice

In light of the research discoveries, the researcher determined the accompanying proposals to help improve the challenges constraining the health safety and environment record keeping practices on community-based infrastructural projects in the region.

- There should be mandatory and specific enshrined organizational standardised policies to regulate HSE issues, making the sponsor, the performing organization and the employee accountable.
- There should be standardized health safety and environment templates specifically for record keeping on projects and these made available and mandatory for every project at initiation and incorporated into the project documentation.
- The best practices as outlined in this research be should documented and utilized to the benefit of every project in Ghana.

5.6 Suggestion for Future Research

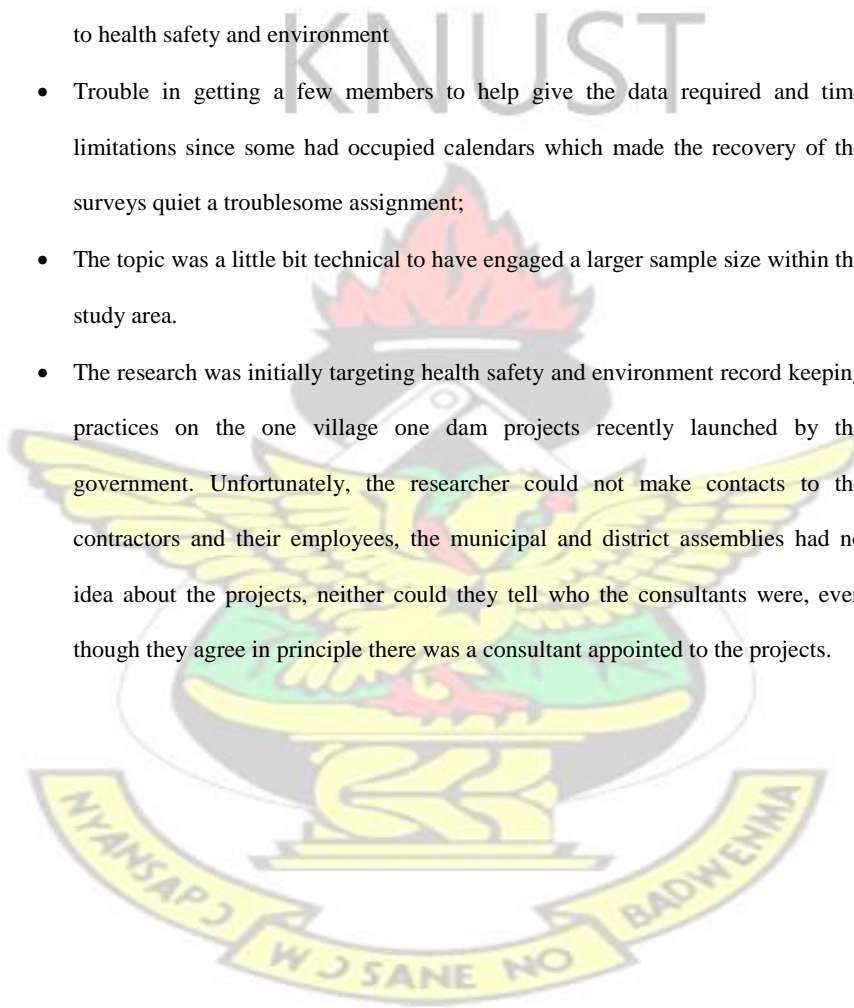
For further studies in the future, the researcher recommends that the underlisted topic be researched:

- Developing benchmarks for health safety and environment record keeping practices on community based infrastructural projects in Ghana.

5.7 Research Limitation

Although the project managed to achieve its objectives, some limitations were noted as:

- A lot more people the researcher contacted to help in the survey, declined to answer the questionnaires due to lack of requisite knowledge to issues pertaining to health safety and environment
- Trouble in getting a few members to help give the data required and time limitations since some had occupied calendars which made the recovery of the surveys quiet a troublesome assignment;
- The topic was a little bit technical to have engaged a larger sample size within the study area.
- The research was initially targeting health safety and environment record keeping practices on the one village one dam projects recently launched by the government. Unfortunately, the researcher could not make contacts to the contractors and their employees, the municipal and district assemblies had no idea about the projects, neither could they tell who the consultants were, even though they agree in principle there was a consultant appointed to the projects.



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APPENDIX

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ART AND BUILT ENVIRONMENT
FACULTY OF BUILT ENVIRONMENT
DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND
MANAGEMENT
RESEARCH QUESTIONNAIRE**

This study is being conducted as part of an academic requirement for the award of an MSc. in Project Management. It is to get information regarding Health Safety and Environmental (HSE) Recordkeeping Practices on Community-Based Infrastructural projects in the Upper East of Ghana

The objectives of this study are:

- To outline the importance of HSE recordkeeping
- To identify the best practices of keeping HSE records on projects
- To identify the challenges with HSE recordkeeping practices on the projects

The information obtained from this survey shall be kept **anonymous and completely confidential**. Only findings in aggregate form will be submitted to the relevant authorities.

Your participation in this survey is much needed and would be highly appreciated for the success of the research.

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SECTION A: BACKGROUND OF RESPONDENTS

Respondents should please tick where applicable: []

1. Indicate your portfolio
a [] employer, b [] employee, c [] engineer, d [] community leader

2. Which of the following departments do you belong to?
a [] works department, b [] planning unit, c [] finance, d [] consultancy,
e [] others specify.....

3. How long have you worked with this department/in this capacity?
a [] less than 2 years, b [] 3-5 years, c [] 6-10 years, d [] more than 11 years

4. What is your highest level of education?
a [] no formal education, b [] primary, c [] junior high school, d [] senior high school e [] first degree, f [] masters degree.

5. Can you confirm, if you have ever been involved construction projects?
A. Yes [] B. No []

6. If yes, what type of construction project?
A. building [] B. dams [] C. roads [] D. Others specify

7. In what capacity were you involved in these projects?
A. planner [] B. finance officer [] C. engineer [] D. consultant []
E. Others specify.....

8. Were you involve in project record keeping?
A. Yes [] B. No. []

9. If yes, what type of records were you recording?
A health safety and environment (HSE) [],
B. worker related records []
C. financial records []
D. Others specify.....

SECTION B: TO OUTLINE THE IMPORTANCE OF HSE RECORDKEEPING

In the table below are some outlined importance of health safety and environment (HSE) recordkeeping which have been considered by different researchers and organizations. Please indicate the intensity level for following stated importance of HSE recordkeeping whether they can be considered by ticking the appropriate boxes.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly Agree

Importance of HSE recordkeeping	1	2	3	4	5
1. achieve ongoing operations more efficiently					
2. Demonstrate a commitment to transparency and verification					
3. Identify or confirm if a problem exists, allow for early corrective action.					
4. To facilitate both internal and external compliance audits undertaken by certification or regulatory bodies.					
5. It ensures an organized organization, by having records and documentations to demonstrate procedures, systems, to workers and authorities as needed.					
6. To prove responsibility to regulators, authorization or insurance bodies by having suitable documentation in place and being able to make it available in a timely manner when requested to do so.					
7. Measure and monitor effectiveness of correctives measures by comparing with baseline data accumulated overtime.					
8. To provide information for employees, eg safety policies and risk assessments					
9. Helps track health safety and environmental activities and occurrences					
10. Helps in general health safety and environmental management					
11. Helps projects link likelihood health safety and environment cases.					
Specify others, if any.....					

SECTION C

IDENTIFYING BEST PRACTICES OF KEEPING HEALTH SAFETY AND ENVIRONMENTAL (HSE) RECORDS ON PROJECTS

In the table below are some common best practices of keeping health safety and environment (HSE) records on projects identified. Please indicate the intensity level for the following whether you agree the stated practices can be considered as the best practices in keeping HSE records on projects by ticking the appropriate boxes.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly Agree

Best Practices of keeping health safety and environment records on projects	1	2	3	4	5
1. Manual					
2. Computer support systems					
3. Online record keeping					
4. Hybrid system (Manual and Computer)					
<u>ORGANIZATIONAL KNOWLEDGE REPOSITORIES</u>					
6. Financial data repositories containing information such as labor hours, incurred costs, budgets, and any project cost overruns;					
7. Configuration management knowledge repositories containing the versions of software and hardware components and baselines of all performing organization standards, policies, procedures, and any project health safety and environment documents					
8. Project files from previous projects (e.g., scope, cost, schedule, and performance measurement baselines, project calendars, project schedule network diagrams, risk registers, risk reports, and stakeholder registers					
9. Historical information and lessons learned knowledge repositories					
Specify others, if any.....					

Commented [CTM1]: List the practices as seen from the literature review and interaction with safety officers on a table and ask the respondents to indicate their level of agreement on a 5 point scale

Do the same for the importance and also the challenges.

Also provide another table of types of records that should be kept and ask them to indicate your frequency of keeping these on the project on a scale.

Same questionnaire can be used to target both the contractors and the consultants.

SECTION D

IDENTIFYING THE CHALLENGES WITH HEALTH SAFETY AND ENVIRONMENT (HSE) RECORD KEEPING PRACTICES ON THE PROJECTS

In the table below are some identified challenges with health safety and environment record keeping practices on projects. Please indicate whether you agree the stated challenges can be considered as such with HSE record keeping on projects by ticking the appropriate boxes.

[1] Strongly disagree [2] Disagree [3] Neutral [4] Agree [5] Strongly Agree

Challenges with health safety and environment (HSE) records keeping practices on projects	1	2	3	4	5
1. Lack of change control procedures, including the steps by which performing organization standards, policies, plans, and procedures or any project documents will be modified, and how any changes will be approved and validated					
2. Computer Phobia					
3. Technical Expertise					
4. Inadequate Technology Infrastructures					
5. Technological Obsolescence					
6. Lack of health safety and environmental Legislation and Culture					
7. Lack of traceability matrices					
8. Lack specific organizational standards such as policies (e.g., health and safety policies, and environmental policies					
9. Lack of guidelines and criteria for tailoring the organization's set of standard processes and procedures to satisfy the health safety and environment specific needs of the project;					
10. Lack of health safety and environmental record keeping templates					
11. Employers/employees/safety officers always busy					
12 It is a complete waste of time					
13.Lack of financial controls procedures (e.g., time reporting, required expenditure and disbursement reviews, accounting codes, and standard contract provisions					
14.Lack of organizational communication requirements on health safety and environment					
Specify others, if any.....					