

**HEALTH, SAFETY AND ENVIRONMENT (HSE) RECORD-KEEPING
PRACTICES ON THE PERFORMANCE OF WASTE MANAGEMENT
PROJECT: A CASE STUDY OF ZOOMLION GHANA LIMITED, HO**

BY

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DECLARATION

I hereby certify that all material contained in this report is my own work towards the award of MSc Project Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University.

All sentences or passages quoted in this dissertation from other people's work have been specifically acknowledged by clear cross-referencing to the author.

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ABSTRACT

As old as the existence of mankind, waste management forms the foundation on which a nation can effectively and efficiently explore the available human and natural resources across all sectors of its economy to ensure socio-economic growth and development. Consequently, waste management firms strive to achieve optimal and competitive project performance by maintaining cost leadership, operational efficiency, overall supply chain profitability, customer satisfaction, and environmental sustainability. A critical aspect of achieving optimal waste management project performance is health, safety, and environment record keeping. Meanwhile, HSE record keeping is often overlooked or worse still conducted improperly with no project management strategy as the basis. The study sought to unravel health, safety, and environment (HSE) record keeping practices of Zoomlion Ghana Limited at Ho, on projects in the waste management industry and recommend strategies for improvement. By applying the Purposive Sampling approach, Semi-structured interviews and questionnaire administration, the research collected data from 6 heads of department, 36 core staff, 43 project staff and 1 regional manager. The Statistical Package for Social Sciences (SPSS) Software and Excel spreadsheets were applied in analyzing the data collected and enhanced with frequencies and graphs. It was revealed that HSE record-keeping practices were generally very important. HSE record-keeping policy framework is particularly lacking. Best HSE record keeping practices being deployed includes corrective implementation measures, using that of government-approved record keeping practice regulations, training procedures and financial budgetary allocation, expenditure, and losses from HSE practice. The dominant type of HSE records kept by the organization was on environment impact compliance measures followed by financial losses and their causal factors and accident records and related investigation outcomes. Negative impact of HSE record keeping practices on employees are lateness to work, absenteeism, lack of innovation positive outcome experienced at Zoomlion Ghana Limited, Ho. Positive impacts of HSE record-keeping practices however identified were improved management and leadership skills, increase project success, and efficient communication. To rectify the lapses in the waste management industry, firms must adopt an HSE record keeping management engineering model that would ensure a seamless management of HSE data entered at all levels across the organization by employees in real-time.

Keywords: Health, Safety and Environment, Record Keeping

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DEDICATION

I entirely dedicate this thesis to the Almighty God for helping me go through this course successfully. It is also dedicated to my entire family especially Miss Bansah Suzzy and friends for their selfless support towards my education.

CHAPTER ONE

INTRODUCTION

1.1 General introduction

As old as the existence of mankind, waste management forms the foundation on which a nation can effectively and efficiently explore the available human and natural resources across all sectors of its economy to ensure socio-economic growth and development. Managing waste properly is essential for building sustainable and livable cities, thus it requires integrated systems that are efficient, sustainable, and socially supported (World Bank, 2019). This, therefore, influenced World Bank's waste management engagement across multiple development areas, including energy, environmental sustainability, food and agriculture, health and population, social protection, transportation, urban development, and water. A survey conducted in Romania indicated that (78.4%) of organizations associated sustainable development with activities for environmental protection, and 85.7% are involved in social activities, where waste management is regarded a key element in ensuring efficient use of resources and sustainable development (Izverciana and Ivascu, 2015).

It, therefore, implies an unsystematic, inefficient, non-strategic and inconsistent waste management project practices will hinder the social and economic progress of the nation involved. Non-compliance with occupational health, safety and environmental policy harm the organization as well as the workforce (ILO and WHO, 2013). According to the World Bank (2019), unlike in developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste: over 90% of waste is often disposed in unregulated dumpsites or openly burned, which tend to have serious health, safety, and environmental consequences. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change

through methane generation, and can even promote urban violence (World Bank, 2019). More so, improper solid waste management causes all types of pollution. The main impacts created by solid waste pollution are health impacts, environmental impacts like contamination of surface and groundwater due to indiscriminate dumping of wastes and the formation of leachate, economic impacts like land price decrease, the economic burden of waste disposal on towns and cities and other social impacts (Pearce and Turner, 1994). Consequently, waste management firms strive to achieve optimal and competitive project performance by maintaining cost leadership, operational efficiency, overall supply chain profitability, customer satisfaction, and environmental sustainability. Sustainable waste management requires the combination of skills and knowledge of physical sciences and engineering together with economics, ecology, human behavior, entrepreneurship and good governance (Halkos and Petrou, 2016).

A critical aspect of achieving optimal waste management project performance is health, safety, and environment record keeping. Haggins, (2009) confirmed that health and safety at the workplace are of vital concern for all stakeholders; employees, employers, management and the public as a whole (ILO and WHO, 2013). Additionally, efficient health, safety, and environment record-keeping practices can assist waste management firms to assess the economic consequences and the types of accidents that most frequently occur at workplaces, identify “high-risk “occupations and processes and devise better accident prevention strategies in future to minimize or eliminate accidents at work (Alli, 2008). In essence, HSE performance data from sites form the basis for management reviews, employee information, and external nonfinancial performance reporting (Baumann, 2018).

Meanwhile, HSE record keeping is often overlooked or worse still conducted improperly with no project management strategy basis. According to the Environmental Services Association (2018) while HSE data serves its purpose in allowing to compare the performance of each of the UK's industrial sectors, it proves less useful in identifying actual risk profiles across the waste industry's different activities, or to reveal which part of the industry would benefit most from targeted intervention. Again, notwithstanding the inadequate geographic coverage, household waste-collection systems are often not effective due to lack of information about collection schedules, improper bin collection systems and poor route planning (Rai et al., 2019).

This study therefore seeks to revive the HSE record-keeping practices of firms in Ghana's waste management industry by identifying the importance of health, safety and environment record-keeping practices of Zoomlion Ghana Limited, unravel key challenges associated with them and their underlying causes, assess their impact on waste management project performance, recommend HSE record-keeping strategies that ensures quality waste management projects in Ghana and the competitive performance of Zoomlion Ghana Limited in the industry.

1.2 Background of the study

Zoomlion Ghana Limited is a giant in the waste management industry in Ghana and other parts of Africa and a member of ISWA global. The company was formed under the company's Act in January 2006. The Company which was formed in 2006 as Zoomlion Ghana Limited with a few numbers of staff has now grown over the past 12 years.

It now has a total core staff of 3,000 and manages over 45,000 contract staffs under various projects. Zoomlion also operates in other African countries such as Togo, Angola, Zambia and Equatorial Guinea and Liberia while negotiations are far advanced

for the company to start operations in other African countries such as Sierra Leone, Southern Sudan (<http://zoomlionghana.com>).

Zoomlion Ghana Limited is committed to satisfy clients and customers by continuously improving all projects undertaken to make them cost-effective. Zoomlion Ghana Limited is committed to building long-lasting relationship with all partners, private sector customers (industry), Ministries, Department and Agencies (MDA's) of central Government, Metropolitan, Municipal and District Assembly (MMDA's) or Local Authorities, and the communities it operates in. (<http://zoomlionghana.com>)

1.3 Statement of the problem

The complex internal and external business environment of waste management service providers associated with the challenges of waste management projects on virtually all sectors of a nation's economy, often pose huge challenges to initiating and completing waste management projects effectively and efficiently at optimal profits. Again, given the casual nature of waste management operations and the large volume of human and equipment resources that may be required for a single project, especially in developing countries, project planning, scheduling, costing, and health, safety, and environmental management, and database management systems do not most often follow appropriate project management models and theories, and thus gets complicated affecting smooth execution and successful completion of projects (Agyepong, 2018).

In Ghana, waste management is often characterized by inadequate financial and logistical arrangements, poor service coverage, operational inefficiencies, dearth of skilled manpower, lack of enforcement of regulations, and poor cultural attitudes to waste handling. The situation is worsened by the low interest of successive governments in

developing countries to prioritize environmental sanitation and public health-related issues (Agyepong, 2018). Moreover, MMDA's in Ghana have limited resources and are unable to deliver effective and efficient sanitation services as they continue to struggle to implement the measures required to deal with the ever-growing problem of waste (Agyepong, 2018).

In summary, Ghana's waste management industry firms including Zoomlion Ghana Limited, Ho do not practice proper HSE recording keeping as a result are faced with major project management challenges especially with health, safety, and environmental records management coupled with their limited resources, with negative effects on socio-economic development. This study seeks to discover the proper project management strategies toward efficient and effect HSE recording keeping practices.

1.4 Research questions

Consequently, the study would address the following questions;

- a) What is the importance of HSE record-keeping practices being implemented by Zoomlion Ghana Limited, Ho?
- b) What are the challenges associated with HSE record-keeping practices at Zoomlion Ghana limited, Ho and what are their underlying causes?
- c) How do these HSE record-keeping practices affect the performance of waste management projects at Zoomlion Ghana limited, Ho?
- d) What HSE record-keeping strategies would ensure quality waste management projects in Ghana and the Competitive performance of Zoomlion Ghana Limited in the industry?

1.5 Aim of the study

The study sought to investigate record keeping practices on projects in the waste management industry and recommend project management strategies for improvement.

1.6 Objectives of the study

Precisely, the objectives of the study include;

- a) To outline the importance of HSE record-keeping on waste management projects.
- b) To identify best HSE record keeping practices on waste management Projects.
- c) To identify the effects associated with HSE record keeping practices on waste project performance.
- d) To recommend strategies for improvement in HSE record-keeping practices that ensure quality waste management projects in Ghana and the competitive performance of Zoomlion Ghana Limited in the industry.

1.7 Significance of the study

First of all, the study will specifically guide Zoomlion Ghana Limited, Ho with a more effective and efficient health, safety and environment record-keeping tools, models and strategies and generally update its current management team on contemporary project management practices, through its recommendations in order to make sure current and subsequent waste management projects are conducted with optimal quality and successfully executed to meet expectation of stakeholders.

The study would further provide an opportunity to strengthen and ensure effective and efficient contemporary regulatory framework on reporting, recording, and management of occupational health, safety, and environmental issues for ongoing and future projects of Zoomlion Ghana Limited, Ho.

Moreover, the project would recommend accurate HSE data generation and recording systems that would guide sanitation policy formulation and implementation.

Consequently, Ghana's socio-economic status would receive a major boost as a result of its waste management industry firms adopting and applying the HSE record-keeping strategy recommendations of this study.

Finally, the findings of this study will provide recommendations to assist future researchers, academic institutions and government policymakers with regards to the best HSE record keeping and waste management project practices, thus adding purposefully to the existing studies.

1.8 Scope of the study

This study typically delves into assessing the strategies, practices and policies of health, safety and environment record-keeping by waste management firms across the world and particularly Ghana, narrows down to examine how these practices are carried out at Zoomlion Ghana Limited, Ho, and their effect on the outcome of waste management projects conducted over the years, as well as the challenges involved.

1.9 Limitations of the study

Key limitations of the study include the limited time frame allowed for the conduct of the study and the compilation of its report.

A long-term survey of multiple waste management firms and their series of projects conducted over a particular period would have relatively enhanced the quality of data collected and in-depth analysis. Moreover, department heads unwilling to allow full access to their health safety and environment records generated, as well as detailed

reports of their project outcomes over the years, usually on the premises of trademark and competitive strategy protection.

Furthermore, HSE data that might have been generated with inaccurate tools and procedures by Zoomlion Ghana Limited may also affect the quality of data available, the outcome of impact analysis on waste management projects and the strategy recommendations of this study.

1.10 Organization of the study

The study is organized as follows; chapter one generally provides a background information on the critical role of HSE record keeping in the global waste management industry and the consequential implications for socioeconomic development, statement of the problem, the aim of the study, objectives, research questions, the scope and shortfalls, the significance of the study. Chapter two presents a thorough review of previous scholarly works related to this study topic including the health, safety and environment record-keeping practices evident in the global waste management industry, the challenges associated with these HSE record-keeping practices and their underlying causes, the effect of HSE record keeping practices on waste management project performance and output on a global perspective as well as the HSE record-keeping practices and strategies that ensures quality waste management projects outcomes. Chapter three reports the research philosophy, the research approach, and research design, population and sample size, and tactics as part of its methodology. Chapter four reports a detailed analysis of the data collected from the field survey. Finally, the discussions, summary of findings and strategic recommendations would be presented in chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Research projects in the waste management industry are rife. However, most of existing works have focused on the value chain processes involved in the generation, collection, and disposal and recycling of waste in urban areas (municipal waste) and their impact on politico-socio-environmental factors. While most of these studies focused on developed nations, the health, safety and environmental welfare of the business environment of waste management firms and the effectiveness of their waste management projects is woefully lacking and far-fetched, especially in developing countries such as Ghana (Ferrara & Missios, 2005, Troschinetz & Mihelcic, 2009, Kumar et al., 2009); for which this study seeks to add to scholarly knowledge in this regard. This section will therefore review existing relevant literature related to the best health, safety and environment record keeping practices in the waste management industry, the critical role of HSE record keeping in the waste management industry, the types of HSE records kept in the waste management industry and strategic project management modeling approach to improving HSE record keeping practices in the waste management industry.

2.2 Definition of Keywords and Concepts

The following defined and explained words are key to understanding the subject matter of this study report. They include; **Health, Safety, Environment, Record Keeping, Waste Management Project, Competitive Performance.**

The World Health Organization (WHO) defines **health** as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. In the operational and working context, health must be considerably managed to exceed the widely rooted notion that health simply means the absence of disease (Smith et al. 1999).

Safety has been defined as ‘a state in which hazards and conditions leading to physical, psychological or material harm are controlled to preserve the health and well-being of individuals and the community (Smith et al., 1999).

Smith et al. (1999) practically explain **the environment** as involving all the physical, chemical and biological factors external to a person, and all the related behaviors.

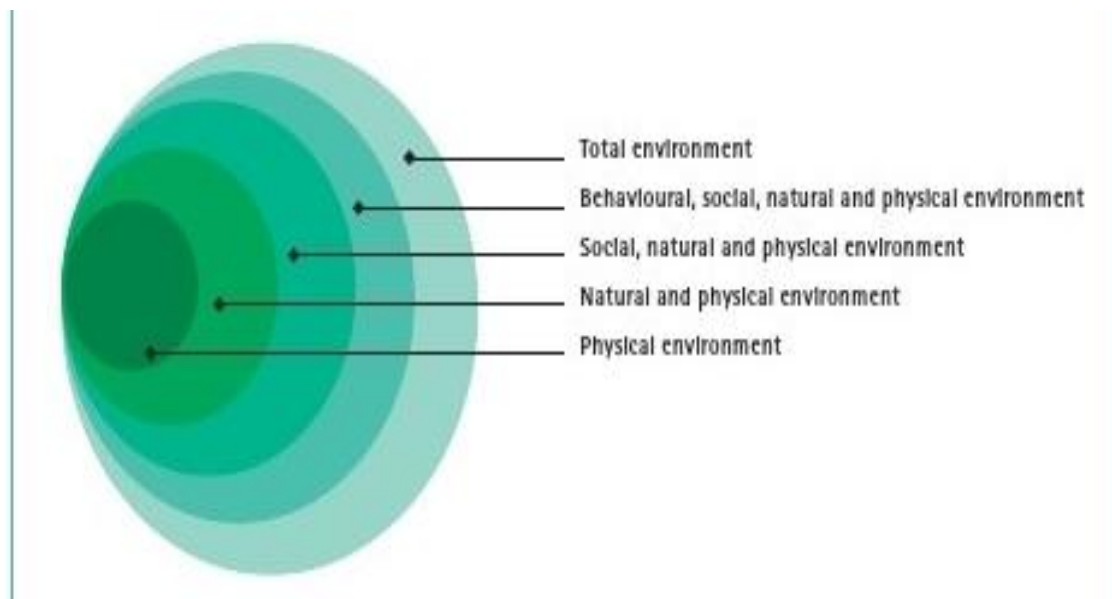


Figure 2.1: Definition of Environment

Source: Smith et al. (1999)

Waste management project is generally understood as a structured process that comprises the segregation, storage, collection, relocation, carry-age, processing, and disposal of solid waste to minimize its adverse impact on the environment (Joshi and Ahmed, 2016).

Competitive performance or superior performance as explained by benefits Braun (2006); cited in Mehdi (2006) refers to conditions that enable companies to operate in a more efficient or higher-quality manner than the companies it competes with, which results in financial benefits.

2.3 Globalisation of Waste Management Industry

This section provides a broad overview of the waste management industry across the world emphasizing mainly on current trends in waste management project performance, nature of waste management projects, key institutional and regulatory stakeholders in the industry, and factors that influence waste project management performance. This overview is particularly necessary to better appreciate the effect of HSE record practices on waste management perspectives, and as well as fine-tune focus of answering the research objectives accurately.

2.3.1 Performance trend of waste management projects

The global waste management market size is expected to reach \$530.0 billion by 2025 from \$330.6 billion in 2017, growing at a CAGR of 6.0% from 2018 to 2025 (Singh and Patil, 2019). The waste management market is segmented based on waste type, service, and region. Based on waste type, the market is bifurcated into municipal waste, industrial waste, and hazardous waste. In 2017, the municipal waste management segment dominated the market, in terms of revenue, and is expected to maintain this trend in the coming years. By service, the market is classified into collection services (collection & transportation, storage & handling, and sorting) and disposal services (landfills, recycling, composting & anaerobic digestion, and others). Among these, the disposal service segment is anticipated to dominate the global waste management project market throughout the forecast period (Singh and Patil, 2019).

Europe is expected to dominate the waste management market share shortly, owing to an increase in favorable government initiatives along with high-end technology adoption by management services. However, Asia-Pacific is anticipated to drive the demand for waste management services, due to the presence of densely populated countries such as China and India, where an increase in urban penetration is being witnessed. Moreover, government interventions in India, such as Swachh Bharat Abhiyan, are expected to boost the demand for waste management projects. Furthermore, emerging economies in Asia-Pacific and LAMEA have focused on adopting solid waste management solutions, which is expected to spread awareness and increase the utility of these systems shortly (Singh and Patil, 2019).

As discussed by Singh and Patil (2019), ACLEAN Harbors, Inc., Daiseki Co. Ltd., Waste Management Inc., Suez Environment S.A., Advanced Disposal Services, Veolia Environment S.A, Covanta, Remondis AG & Co. Kg, Biffa Group, Hitachi Zosen Corporation, and Zoomlion Ghana Limited are some of the leading key players operating in the waste management industry. An increase in environmental awareness, rapid industrialization, surge in population, and the rise in urbanization foster the growth of the global waste management market. Besides, the implementation of stringent government norms toward open dumping is expected to fuel waste management project growth. The key strategies adopted by these players in managing their projects from 2015 to 2018 were product launch, acquisition, partnership, business expansion, and collaboration. For instance, Veolia, one of the leading waste management service providers, collaborated with Tetra Pak in November 2018 for recycling used beverage cartons collected within the European Union.

2.3.2 Nature of waste management projects

According to (Speth, 2008) raw materials are becoming scarce and energy more expensive. Worldwide, soil, air, and water pollution are on the rise. The problems of waste management projects are escalating because of changing consumption patterns, industrial development, and urbanization. Traditional systems of waste management projects are no longer appropriate. In many developing and emerging countries, the waste management systems for projects in use are still inadequate, and unsustainable. It is common practice to dispose of rubbish in unsafe landfills and illegal dumps, or rivers and sewers, especially on the peripheries of urban centers. Local authorities are often unable to introduce integrated waste management systems due to the associated high costs. Very few projects are capable of financing themselves while operating effectively. Sustainable waste management projects and recycling systems aim to reduce the quantity of natural resources consumed, while ensuring that any resources already taken from nature are re-used many times, and the amount of waste produced is kept to a minimum. The processing of waste plays a key part in this. The partners in developing and emerging countries make progress by introducing proper waste management systems in their projects that are ecologically and economically sustainable. More financing systems and partnerships for the management and processing of waste products, staff training, and positive organizational culture are established.

Waste management is the process of treating solid wastes and involves different solutions to recycle items. Waste can be solid, liquid, or gaseous and each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce the

adverse effects of waste on human health, the environment or aesthetics. Waste management practices are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches (Singh and Patil, 2019).

As part of effective waste management, a great deal of waste management projects takes the form stipulated by the waste management hierarchy model. This focus on waste prevention, waste reuse, and waste elimination (see figure 2.2). The prime aim of waste management projects is to minimize waste generation and maximize waste collection using the available resources most efficiently. Lucia (2013) further explained that per the waste generated in projects should be categorized essentially into the non-hazardous; such as construction material, welding waste; metal waste; wood waste; and hazardous waste; such as contaminated textile waste (used Personal Protective Equipment) and contaminated packaging.

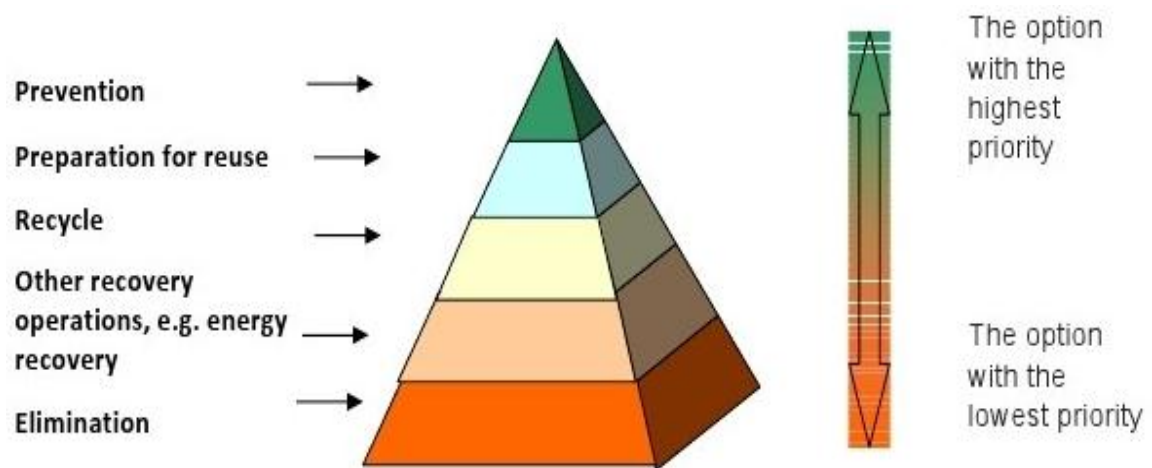


Figure 2.2: Waste Management Hierarchy

Source: Lucia (2013)

3.1.3 Factors that influence waste management project performance

Waste management projects are usually influenced by a series of intertwined factors that directly and indirectly have repercussions for their performance outcome. These factors are observed to span across major stakeholders including the internal and external business operations of waste management firms, government agencies, social processes of inhabitation, and other physical environmental factors. First, Singh and Patil (2019) explained that the rate of municipal solid waste generation and the efficiency of managing it is linked up with urban lifestyle, where global urban population estimated and forecasted to grow by approximately 1.84% every year until 2020, at the rate of about 1.63% per annum from 2020 to 2025, and around 1.44% per annum from 2025 to 2030. In the same vein, rapid urbanization and commercialization were major drivers of solid waste in Pakistan, which had adverse effects on the environment. Factors that inhibited solid waste management project were attributed to unauthorized waste disposal practices due to lack of waste management processes, absence of financial support and integration of personnel, political and technical issues, lack of appropriate data management technologies and practices and the absence of pragmatic application of regulations and laws (Iftikhar and Aziz, 2017).

Tu (2009) examined the factors that influenced the performance of solid waste management firms in Los Baños, Laguna, Philippines by interviewing eighty-six waste-pickers. After series of standard deviation tests, variables relationship test, and multiple regression analyses, the identified factors had consequences at the departmental and organizational levels: such as the socio-economic characteristics of income, perceptions of policies and plans by employees, nature of programs and project, and frequency of participation of members in the organizational activities. Main factors at the

organizational level included the strategic goals and culture of the organization, decision-making processes, record-keeping practices, issues, strengths, and weaknesses.

2.4 Critical Role of HSE Record-Keeping in Waste Management

The critical importance of HSE record-keeping is unequivocally evident in existing literature. Previous works have examined the relevance of HSE policy and regulatory frameworks in other industries such as the manufacturing, health, education and other service sectors. Previous literature remains significantly silent on keeping health, safety and environmental records on projects in the waste management service industry, especially for developing countries like Ghana. Other works, however, have extensively discussed the importance of HSE database management in business management operations. Generally, an effective record-keeping system and timely documentation strategy would most likely assure an organization the following (Commission for Environmental Cooperation (CEC), 2013); ability to manage its ongoing projects more effectively with data, ensure transparency and accountability to regulators, certification or insurance, be organized, demonstrate procedures and systems to workers and authorities as needed, facilitate internal and external compliance audits processes, demonstrate a commitment to transparency and verification, and measure and monitor effectiveness of corrective measures taken.

In the discussion presented by Rowe (2014), it is legally required to keep health and safety records that would be inspected and reviewed periodically for improvement purposes by committees within organizations as well as related state regulatory agencies. It was outlined that keeping good health and safety records is crucial to ensure the compilation of vital information, convenient retrieval of data, easy information

dissemination among key stakeholders, and data consistency and continuity. It was also added that it improves the health, safety, and environmental practices of workers and performance measurement, having been informed clearly by recorded knowledge of related HSE measures.

In addition to the above, Smallwood (1999) sought to understand the underlying factors for which firms keep health, safety, and environment records. Human factors, legislation actions, financial issues, avoidance of fines, cost of accidents, enhanced productivity, quality and customer satisfaction, client pressure, to reduce cost of training replacement personnel were among the factors identified. Meanwhile, key benefits of keeping HSE records were outlined as follows; reduced injuries, reduced damage to property, less downtime, revived employee motivation, enhanced industrial relations, less compensation insurance, fewer hidden costs, increased efficiency, and improved marketability. More so, the UNEP Basel Convention (2011) confirmed that record-keeping and performance measurement document entries provide Environmentally Sound Management results that guide organizations to make informed decisions towards implementing corrective actions.

Furthermore, the International Atomic Energy Agency (IAEA) (2001) considered the need for an international repository system, such as the IAEA's Waste Management Database which facilitated information exchange during WIRKS implementation and reduced or eliminated redundancies in the reporting of information. This further supported the process of reporting requirements that were derived from the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Finally, keeping health and safety records establish a relationship between exposure and health effects towards ensuring an effective workplace health and safety management

system. For instance, it helps to monitor the nature of hazards and control risks to tame the effects of injury or illness (Roban, 2014). The need to keep qualitative, quantitative and inferential records about people and events in an organization that is factual and relevant in terms of task, causative agent and functional department was extended further by Roux (2015). In its entirety, therefore, keeping such quality records is essential for undertaking future investigations and research project areas that are untapped.

2.5 Best HSE Record-Keeping Practices in the Waste Management.

Best HSE practices that are applied in various industries correspond to their generic operations. These practices have generally sought to ensure optimal efficiency and profitability of projects. The waste management service industry has been particularly lacking in specifying the best HSE record-keeping practices. Previous research works in the waste management industry have mainly focused on analyzing the effectiveness of core processes from waste collection through disposal to recycling. A comprehensive analysis of the health, safety and environmental record-keeping system for the waste management industry, especially in developing countries such as Ghana is yet to be presented. This research fills the gap in this regard.

Tyler (2018) outlined the core practices of HSE management system and the application of the Hazards and Effects Management Process (HEMP) (figure 2.3), in that, the organization must ensure continuous improvement by using effective motivation and communication techniques for measuring HSE performance. Moreover, there should be a thorough and regular audit of HSE standards and practices. The proposed HSE management model as depicted in figure 2.4 ensures a keen focus on critical HSE activities and addresses risks associated with Health, Safety and the Environment.

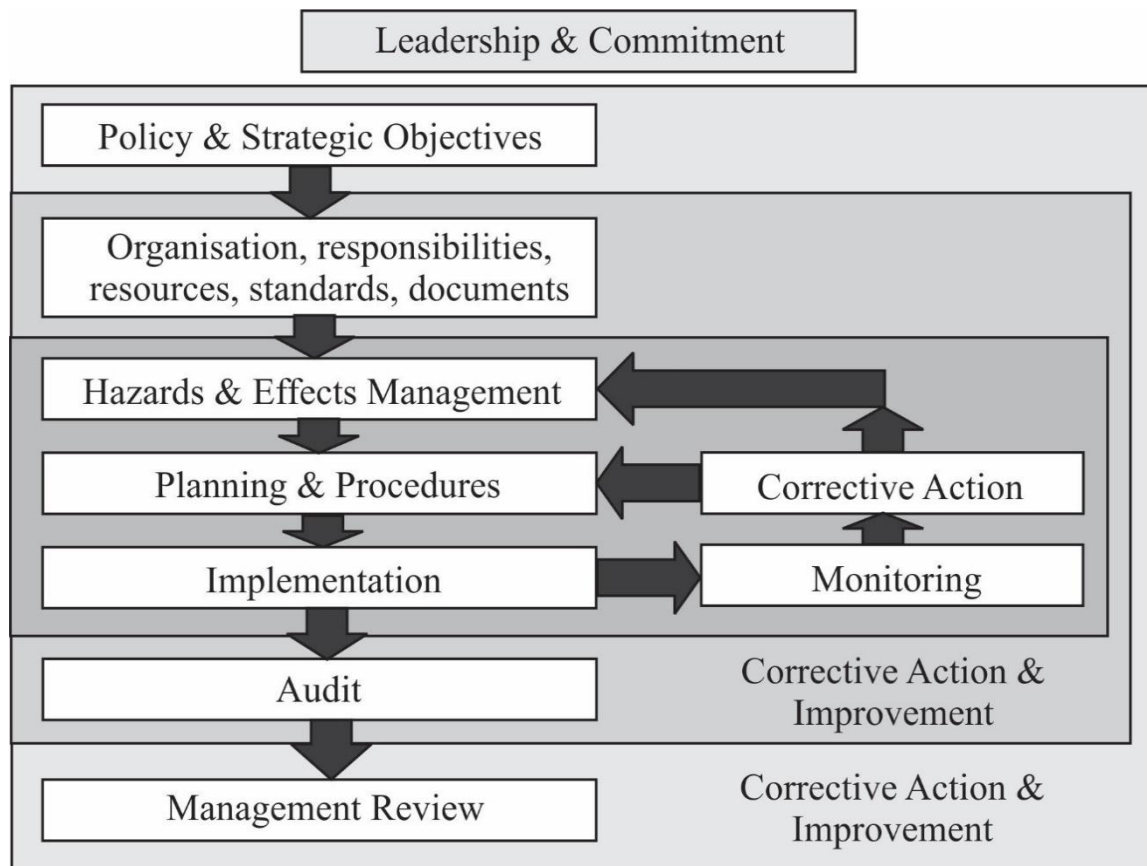


Figure 2.3: Structure of HSE Management Process Source: Tyler (2018)

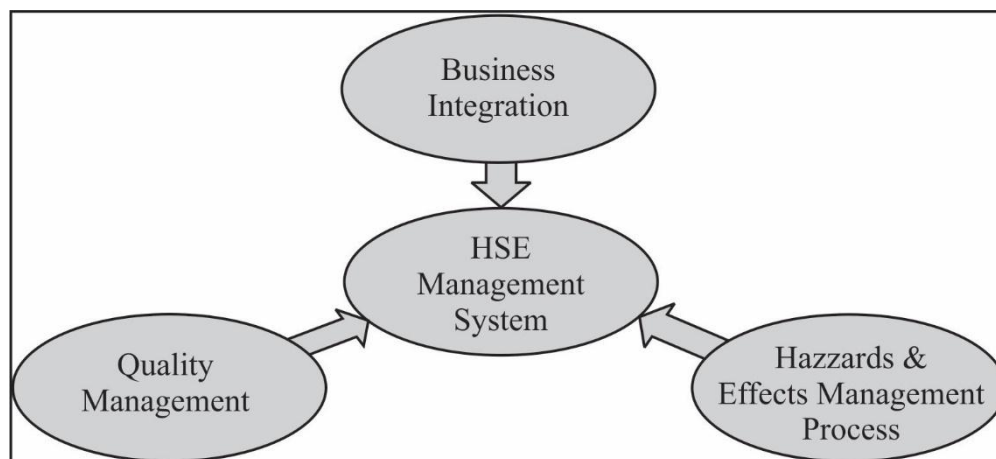


Figure 2.4: HSE Management System Model

Source: Tyler (2018)

The Commission for Environmental Cooperation (CEC) (2013) further exemplified best practice to mean those that include performance indicators whose data are quantitative (numbers, frequencies and ranges) and/or qualitative (descriptions,

observations and meanings) in nature, and studied over a specific period of review to measure and monitor the organization's ability to achieve set HSE management goals. Performance criteria for health and safety records management are worker lost-time incidents, medical leave incidents, reportable incidents, compliance with usage of personal protective equipment as per company guidelines, the concentration of heavy metals in worker blood levels, and compliance for all required training objectives for worker health and safety. Whiles, the performance criteria for the environment include an increase in the average percentage of material reclaimed per unit recycled over a while (Commission for Environmental Cooperation (CEC), 2013). In addition to the above, strategies for transparency and verification in record-keeping were also discussed. This involved making facility environment, health and safety policy(s) available to the public, making consolidated summaries of facility health and safety performance available to the public, making HSE reports available to shareholders and society, providing information about facility activities and operations to clients as necessary, demonstrating due diligence or duty of care, developing an annual report based on performance information gathered, verifying planning, operating, checking, and taking corrective actions for HSE to demonstrate compliance with applicable legal requirements and industry best practices, and providing public assurances that operations and activities are compatible with HSE regulations (Commission for Environmental Cooperation (CEC), 2013).

Other best practices of HSE records management also emphasized the need to maintain appropriate record-keeping practices that allow for transparency and verification. To this end, the Bureau of International Recycling (BIR) (2006) recommended the following: reports and records of customer and third parties' complaints should be

compiled, records of tests for emergency preparedness must also be kept, drills and training exercises should be recorded, inspection, maintenance, and calibration of records, incident records with corrective/preventive actions taken should be recorded, documentation of environmental performance information, and process monitoring records should be continually documented.

Records Management Programme implemented in Victoria is also indicative of some best HSE record-keeping practices. The programme comprised a record-keeping framework, record-keeping procedures, processes and practices, records management systems and structures, people and organizational structures, sufficient budgetary and facilities resources (Public Record Office Victoria, 2014). In a nutshell, records management must transcend all agency records in all formats and systems.

2.6 Types of HSE Records Keeping in the Waste Management

Existing literature portrays a trend where the types of HSE records kept are derived from goals and strategic direction set forth by waste management service providers across the world. While some firms are selective on which HSE records to keep, a few other firms have comprehensive policies HSE record keeping.

The International Atomic Energy Agency (2005) advocated an enterprise record management system that each organization handling and processing waste can be integrated with an overall waste management record-keeping system, which provides functionalities for generating, approving, transmitting, correcting, maintaining, retention and disposition of all records important to safety. This was presented in a tall list:

- (a) Data needed for a national waste inventory;

- (b) Data needed for waste characterization;
- (c) Records from the control process for treatment, packaging, and conditioning;
- (d) Documentation on the procurement of containers required to provide confinement for a specified period (e.g. in a repository);
- (e) Specifications for waste packages and audit records of individual containers and packages;
- (f) Operating performance trends;
- (g) Incidents of non-compliance with the specifications for waste packages and the actions taken to rectify them;
- (h) Monitoring records;
- (i) Records of safety assessments;
- (j) Written operating procedures;
- (k) Any additional data required by the regulatory body.

Moreover, Roban (2014) examined health waste management practices to identify the types of HSE records kept. It was revealed that healthcare risk waste containers were traceable to the point where the waste was generated. Again, a bar-coding system or tags were applied to monitor healthcare risk waste. Hazardous waste was specifically cautioned to be kept on file for three years and copies of the completed Waste Transfer Form should also be kept on for a minimum of five years. The system's ability to trace records kept was also emphasized. The following types of HSE records were kept and managed (Roban, 2014).

- a) Details of point of generation
- b) Date of collection
- c) Tags and tracers reference numbers
- d) Waste type and quantities
- e) Details of waste contractor and carriers

- f) Destination of waste
- g) Disposal/treatment methods

2.7 Strategies for Improving HSE Record-Keeping Practices in Waste Management

A review of the literature indicated that generic models have been proposed for records generation and management. Specific models have not been presented for analyzing the types of HSE records that should be kept and also suggested the most efficient strategies to improve HSE record-keeping practices in the waste management industry. This forms the crux of the research study. As analyzed by the Commission for Environmental Cooperation (CEC) (2013), the plan-do-check-act model presented a perfect platform for record-keeping and project performance measurement. It was specifically confirmed further that the plan-do-check-act model is often used by business management systems mainly for planning environment, health, and safety (EHS) management systems (see figure 2.5).



Figure 2.5:A Generic Plan-do-check-act Model Applied to record-keeping

Source: Commission for Environmental Cooperation (CEC) (2013)

In the same vein, Sugioka (2014) presented an application of the plan-do-check-act model in an HSE policy framework. This further enlightened waste management firms on a strategic approach to managing their HSE records. The framework was designed following international standards and was aimed at constantly working to improve workplace health, safety, and environmental activities. Relevant documentation to this policy included the HSE Management System Manual, Procedures, and guidelines.



Figure 2.6: A typical HSE Management Policy Model

Source: Sugioka (2014)

Sugioka (2014) further explained the implementation of the Assess-Plan-Do-Check-Act (A-PDCA) cycle which begins with risk assessment. "Assess" involves risk management and the establishment of legal and other requirements, "Plan" involves the drafting of HSE Plans and Emergency Response Plans, "Do" and "Check" involves the collection

and analysis of HSE-related data as well as the HSE audit, and “Act” connotes management review (figure 2.7).

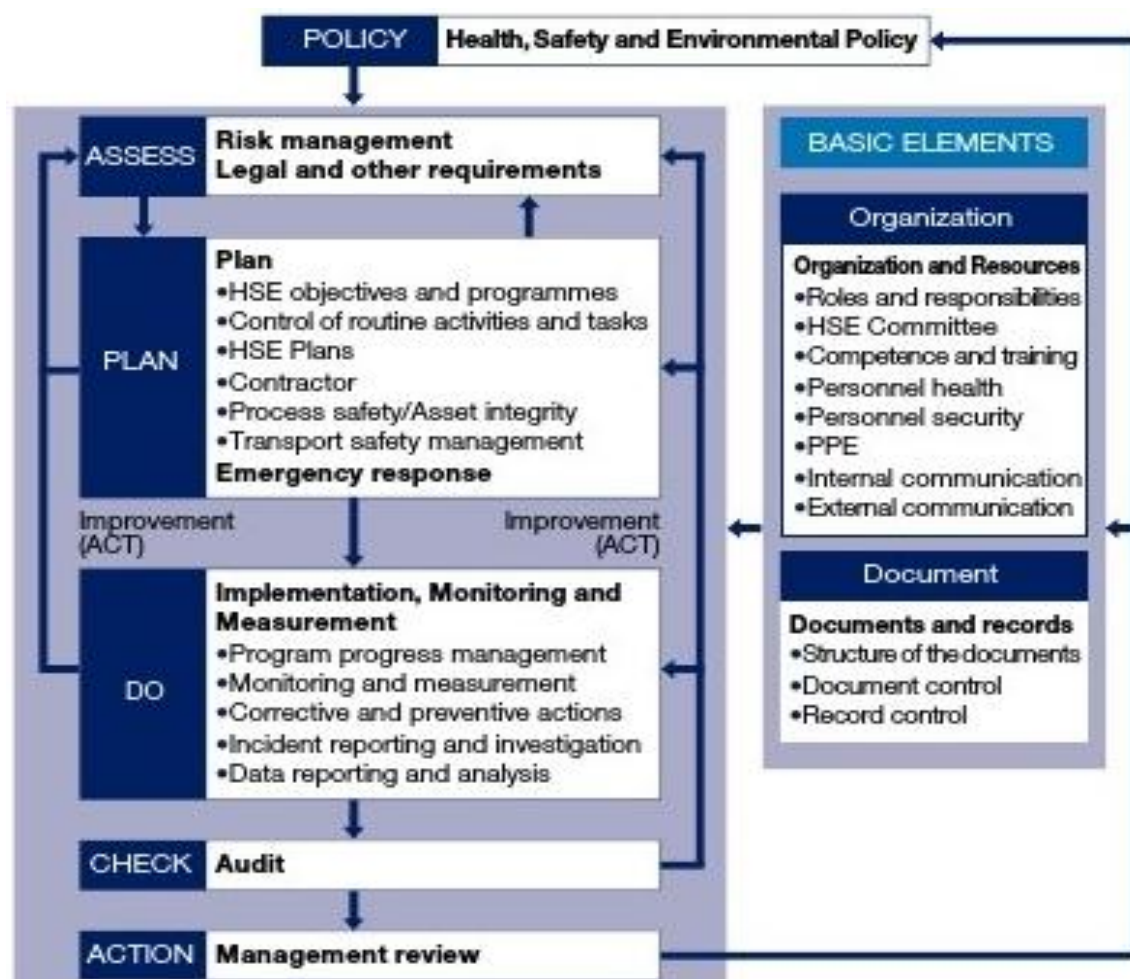


Figure 2.7: The A-PDCA Cycle of HSE Policy and Record Management

Source: Sugioka (2014)

Another very important model is the Environmental Management System (EMS), which is similar to the Occupational Health and Safety (OH&S) or quality systems (Public Record Office Victoria, 2014). The tool is applied for managing environmental impacts of business processes, from planning to implementation. It was adopted to sort and guide other country’s HS policy, including the European Eco-Management and Audit Scheme (EMAS), the British Standard (BS7750) and the Australian and International

standard AS/NZS. The Victorian Government's EMS programme required departments to alignment agency records management with other key strategies, such as the annual EMS audit, enables records management considerations and providing risk-related reports, to mitigate future health and environmental hazards impact (Public Record Office Victoria, 2014).

Finally, Lucia (2013) also explained the Transgaz HSE-Management System, which is worth presenting. This model also provided generic HSE record-keeping strategies including the ESMP source documentation, control documentation and the key HSE-MS documentation for managing construction waste. This is illustrated below in figure 2.8.

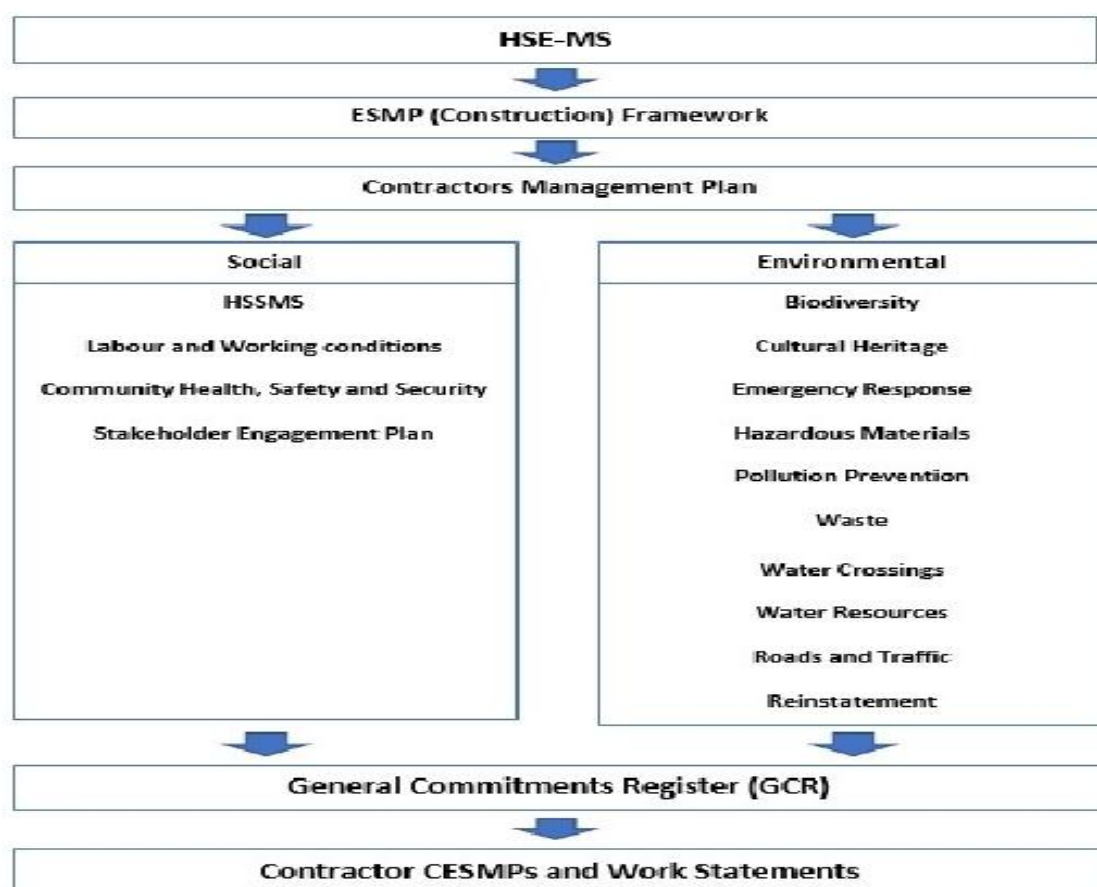


Figure 2.8: Transgaz HSE-Management System for Managing Construction Waste

Source: Lucia (2013)

2.8 Summary and Conclusion

Research projects in the waste management industry are rife. However, most of the existing works have focused on the value chain processed involved in the generation, collection, disposal, and recycling of waste in urban areas and their impact on politico-socio-environmental factors. While most of these studies focused on developed nation, the health, safety and environmental welfare of the business environment of waste management firms and the effectiveness of their waste management projects is woefully lacking and far-fetched, especially in developing countries such as Ghana.

The global waste management market size is expected to reach \$530.0 billion by 2025 from \$330.6 billion in 2017, growing at a CAGR of 6.0% from 2018 to 2025. Traditional systems of waste management are no longer appropriate. In many developing and emerging countries, the waste management systems in use are still inadequate, and unsustainable. It is common practice to dispose of rubbish in unsafe landfills and illegal dumps, or rivers and sewers, especially on the peripheries of urban centers. Waste management is the process of treating solid wastes and involves different solutions to recycle items. Waste management projects are usually influenced by a series of intertwined factors that directly and indirectly have repercussions for their performance outcome. These factors are observed to span across major stakeholders including the internal and external business operations of waste management firms, government agencies, social processes of inhabitation, and other physical environmental factors.

The critical importance of HSE record-keeping is evident in the existing literature. Previous works have examined the relevance of HSE policy and regulatory frameworks in other industries such as the manufacturing, health, education and other service sectors. Best HSE practices that are applied in various industries correspond to their

generic operations. These practices have generally sought to ensure optimal efficiency and profitability of projects. For instance, the application of the Hazards and Effects Management Process (HEMP) ensures continuous improvement by using effective motivation and communication techniques for measuring HSE performance. Moreover, there should be a thorough and regular audit of HSE standards and practices.

A review of the literature indicated that generic models have been proposed for records generation and management. Specific models have not been presented for analyzing the types of HSE records that should be kept and also suggested the most efficient strategies to improve HSE record-keeping practices in the waste management industry. Meanwhile, the plan-do-check-act model presented a perfect platform for record-keeping and project performance measurement.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three outlines the logical, systematic and procedures deemed appropriate for collecting and analyzing the data as per the objectives of the study (Saunders et al., 2009). As a result, this chapter looked at how data was gathered for the study. The methodology enlightened the tools or techniques needed for research design, data collection, the population and sampling techniques, data sources, data collection instruments, and data analysis plan. This is necessary to ensure accurate and ethical data generation, reliability and generalizability.

3.2 Design of the Study

Research design according to Welman et al. (2009) is best described as the overall plan, according to which the respondents of a proposed study are selected, as well as the means of data collection or generation. Research design optimizes the validity of data for a given research problem.

3.2.1 Research Design

A descriptive research approach was employed for the collection of primary data. A descriptive survey as described by Leedy (2002) involves the collection of data to answer questions concerning the current status of the problem. It points to vital facts about the respondent's opinions and experiences, which provide an understanding of the phenomenon. (Corrigall & Trainor, 2011).

3.2.2 Research strategy

(Saunders et al., 2009) refers to a research strategy as the “general plan of how the researcher will answer the research questions to the study. Several types of research strategies include experiments, surveys, case studies, ethnography, grounded theory, action research, and archival research.

This study adopted a case study research strategy to ascertain the real-life context of HSE record keeping practices on projects in waste management at Zoomlion Ghana Limited, as explained by Robson (2002); cited in Saunders et al. (2009). Consequently, this study can also be considered as exploratory. An exploratory research reveals the in-depth knowledge about a subject for further interpretations of other phenomena (Slack and Parent, 2006). The study seeks to investigate the best practices with HSE record-keeping, identify the types of HSE records kept and also explain their importance for waste management project performances over the years.

3.2.3 Research method

Research method is a systematic and scientific process of data collection, compilation, analysis, interpretation, and implication concerning the problem of a study as coined by (Herbst & Coldwell 2004)

To ensure a holistic approach to answering the objectives of this study, quantitative methods was adopted in the study. Moreover, This was supported with statistical interpretations, including frequency tables and percentage proportions. Quantitative research uses numbers and statistical methods and measurements to (Thomas, 2003) emphasis the collection of numerical data, the summary of those data and the drawing of inferences from the data.

3.3 Research Data

Research data refers to recorded factual material commonly retained by and accepted in the scientific community as necessary to validate research findings of a study as cited by (Burnham, 2012).

3.3.1 Source of data

Data collected from first-hand-experience which may include anything known to be true or exist is termed as primary data. Primary data is more reliable, authentic and objective since it collects specific data for a problem under study (Mohajan, 2016).

On the other hand, secondary data is collected for other purpose and already published which provides possible and easy access to data to assist a problem under study and also provide opportunities to test new ideas, theories, models and frameworks (Smith, 2008).

Both primary and secondary data were collected for this study. The main techniques for primary data collection were the semi-structured interviews and the self-administered questionnaires. Kvale (2008) defines the research interview as a process of deriving knowledge during an interaction between the parties involved in the conversation. Moreover, open-ended and close-ended questions were included in the questionnaires completed by research participants without the researcher's involvement (Holmes et al., 2011). While closed-ended questions have a limited number of answers for participants to select from; open-ended questionnaires allow participants the privilege to express their views on the subject matter without answer option restrictions.

The semi-structured interview was conducted with selected heads of department of Zoomlion Ghana Limited, and the General Manager to verify the progress of waste management projects, HSE record-keeping practices, types and policy compliance, and their associated benefits. The questionnaires were administered to project staff and core

staff to further verify specific HSE policies, their effectiveness on implementations and the impact of their implementation on employees and the organization as a whole.

Secondary data sources for this study included organizations' records, books, data achieves and database.

3.3.2 Data collection method

A field survey approach was employed by the researcher to collect data for the study in which questionnaires were designed and self-administered to solicit opinion from the respondents which generated opinion and raw data needed for analysis as opposed to the postal questionnaires due to time factor. The questionnaires form part of the primary sources of data used in this study. On the other hand, secondary sources of data were also used which were obtained from organization records. Respondents answers the questionnaires in privacy without interference of the researcher (Holmes et al., 2011). Questionnaires provided a set of questions and scale designed with available options to solicit enough raw data required in accomplishing the information requirements comments where necessary.

Semi-structured interview was conducted with selected heads of various departments within Zoomlion Ghana Limited, Ho to verify the progress of waste management projects, HSE record-keeping practices, types and policy compliance, and their associated benefits. The questionnaires were administered to project staff and core staff to further verify specific HSE policies, their effectiveness on implementations and the impact of their implementation on employees and the organization as a whole.

3.4 Analysis of Data

The Statistical Package for Social Sciences (SPSS) software, Version 23.0 and Excel spreadsheets were the main instrument used to code and analyze the quantitative data derived from questionnaires. To ensure consistency the responses for the open-ended questions were grouped based on common ideas that the respondents expressed. Frequencies cross-tabulations such as histograms and bar graphs and connotations as pie charts were used to depict the written interpretations of the raw data obtained.

3.5 Sampling

Taking a subset from an entire population is called sampling and also known as the sampling frame. Sampling can be used to make inferences about a population or to make generalizations concerning existing theory. Sampling aids data collection and inexpensive as cited by (Scott & Morrison, 2007).

3.5.1 Population for the study

Loseke (2012) defines ‘population’ in research as the whole of every case or instance, being it type of people, places, behavior, things or time. The population of this study, therefore, encompasses all categories of employees of Zoomlion Ghana Limited, Ho.

3.5.2 Sample size

Sample size refers to the number of observations drawn from a sample or population for a study. The sample size is mostly small to allow in-depth exploration and understanding of phenomena under investigation. There are different strategies to determine the sample size which includes census, published tables, formulae. The sample size for this study was 80, which was selected randomly and conveniently due to the unpublsh total number of workers in zoomlions Ghana limited.

3.5.3 Sampling technique

According to Kish et.al (1970) sampling technique is the method for the selection of individuals on which information is collected.

Generally, the sampling technique consists of two types; probability and non-probability sampling. Probability sampling also known as random sampling depicts the situation in which every item in the population has an equal chance of been included in the sample with examples such as simple random sampling, systematic sampling, and stratified sampling. Non-probability sampling, on the other hand, deals with small samples intended to examine real life of a phenomenon (Sanders, et. al 2011). Purposive sampling technique was adopted to select department heads and the General Manager whiles core staff and project staffs were selected using a simple random sampling technique. Simple random sampling aimed at selecting unique entities from the population that allows every member an equal chance of being selected, also because of ease of obtaining the respondents and the fact that they could best provide the needed information on the study and are homogenous (Thompson, 2012). Purposive sampling aimed at selecting particular subjects to provide expert knowledge required by the study (Saunders et al., 2009).

Table 3.1: Sample Size of the Study

No.	Respondent Role	Number of Respondent
1.	Heads of Department	6
2.	Core Staff	30
3.	Project staffs	43
4.	Regional Manager	1
	Total	80

Core staffs are workers directly employed by Zoomlion Ghana Limited whiles project staffs, on the other hand, are staffs recruited on contracts under the various projects undertaken by the organization.

3.6 Research Ethics

As opined by Partington, (2003) Ethics is a philosophical term derived from the Greek word *ethos*, meaning character or custom and defines a social code that conveys moral integrity and consistent values. It consequently educates and monitors the conduct of research to ensure a high ethical standard such as trust, honesty, confidentiality, and protection of intellectual property of a research study (Fleming, 2018).

3.6.1 Ethical considerations

The consent of respondents to this study was sought before questionnaires administered and interviews conducted. The main aim of the research was discussed thoroughly with each respondent. Respondents answers were treated as confidential and used only for academic purposes and only for the study. Respondents were not harmed or abused, both physically and psychologically, during the conduction of the research towards improving the validity, authenticity, and representativeness of the study findings.

In contrast, the researcher attempted to create and maintain a climate of serenity.

3.6.2 Issues of validity and reliability

Research credibility is defined according to Colorado State University as the researcher's ability to clarify that the research objectives can be accurately answered with the methodologies set forth (Jonker and Pennink, 2010). The project, therefore, would examine the credibility of its findings by testing the reliability, validity, and generalizability of its data sources and collection tools.

First of all, relevant literature derived from academically active sources and agencies such as journals, books, online articles, and white papers were reviewed to lay a firm empirical and theoretical. Theoretical models for records management were also reviewed and adopted for proposing efficient HSE record-keeping systems for Zoomlion Ghana Limited. The questionnaire would be administered in a manner that ensures that the required level of validity and reliability is achieved. To this end, the questions posed in the questionnaire were relevant enough to provide accurate measures that render it internally valid. Moreover, the study would also try as much as possible to achieve a near 100% response rate. Furthermore, the interview guide was structured to ensure flexible discussion, and to generate relevant information which would be similar to findings when applied in other research projects. This makes the data reliable. Biases would be avoided by ensuring that the question asked do not signal particular answers to respondents.

3.6 Summary

The research methodology employed in the study was discussed above. Procedures on how the questionnaire was administered and the various sections in the questionnaire were indicated. Subsequently, the statistical tools for data analysis were discussed. With this background, statistical results obtained from the data were discussed in chapter four.

CHAPTER FOUR

PRESENTATION OF ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter presents the demographic characteristics, academic credentials and work experience of respondents. It also presents the findings on the best HSE record keeping practices, types of HSE records kept at Zoomlion Ghana Limited, Ho, the effects of HSE record practices on their waste management projects and measures implemented to improve HSE record keeping practices. For this analysis, seventy-four (74) questionnaires were successfully administered out of a targeted number of eighty (80) respondents. Thus, the response rate was 92.5%. Discussions of these findings was also presented with the aid of statistical tables and graphs.

4.2 Demography of Respondents

The waste management industry has over the years advocated the need for a collaborative approach to achieving greater success in waste management projects. This has therefore been reflected in the gender balance evident in various waste management firms across the world. The study in the same vein revealed that 56.8% of the population 43.2% female population at the Ho office of Zoomlion Ghana Limited (**figure 4.1**). This constituted 42 male respondents and 32 female respondents. The age range of respondents also depicted 29.7% falling within the range of 15-30 years, 13.5% falling within 31-50 years and 56.8% falling within the range of 51 years and above as represented in (**table 4.1**) the age distribution of Zoomlion Ghana Limited, therefore, portrays an aging workforce, which confirms the general trend in various other firms anyways. This perhaps can explain the slow pace of growth in Ghana's waste industry,

in that the workforce would not be versatile enough to carry out multiple projects at the same time.

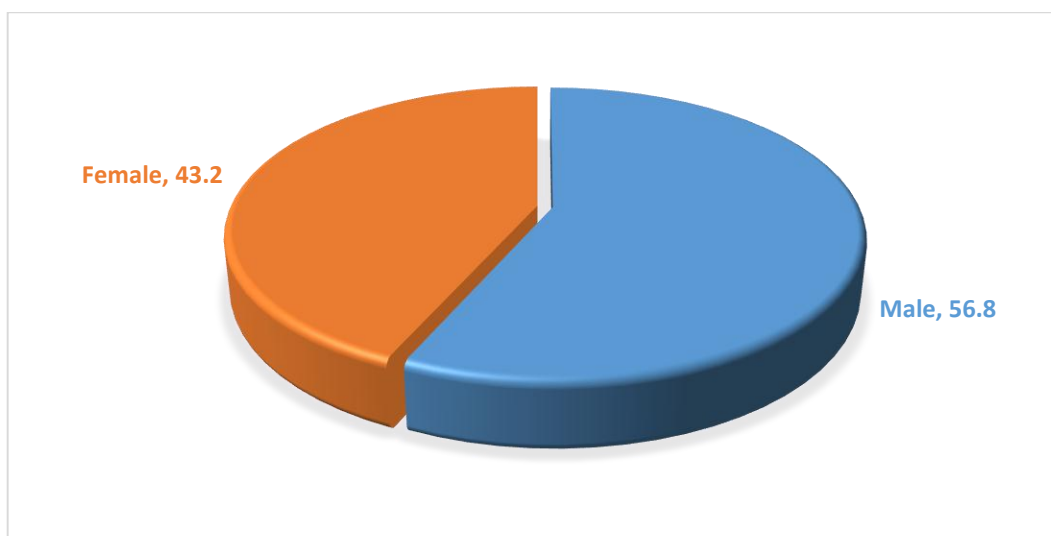


Figure 4.1: Gender Distribution of Employees Zoomlion Ghana Limited, Ho

Source: Field Survey (2019)

Table 4.1: Age Distribution of Employees in at Zoomlion Ghana Limited, Ho

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-30	22	29.7	29.7	29.7
	31-50	10	13.5	13.5	43.2
	51 and above	42	56.8	56.8	100.0
	Total	74	100.0	100.0	

Source: Field Survey (2019)

Meanwhile, these workforces are observed to have served in the industry for a significant number of years. The study showed that over 59% of respondents had served

in the organization for over 8 years with 18.9% being 12 years and above. A little over 28% have served in the organization for less than 10 years, and even with that, 24.3% have served in the organization for between 6 to 10 years as shown in **(table 4.2)**. More so, it gives a clear indication that the current workforce of Zoomlion Ghana Limited has in-depth experience in the waste management industry.

Table 4.2: Years of Employees Experience at Zoomlion Ghana Limited, Ho

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0- 3	11	14.9	14.9	14.9
	6-10	18	24.3	24.3	39.2
	8-12	31	41.9	41.9	81.1
	Above 12 years	14	18.9	18.9	100.0
	Total	74	100.0	100.0	

Source: Field Survey (2019)

To slightly confirm the general perception that unskilled labor dominates Ghana's waste Industry, the study revealed that close to 40% of the workforce of Zoomlion Ghana Limited, Ho have tertiary education with about 60% having had secondary school education or lower **(figure 4.2)**. A possible implication of this situation is that the few management team members may have a hard time trying to drive home strategic plans, thus waste management project execution inefficient may not be uncommon.

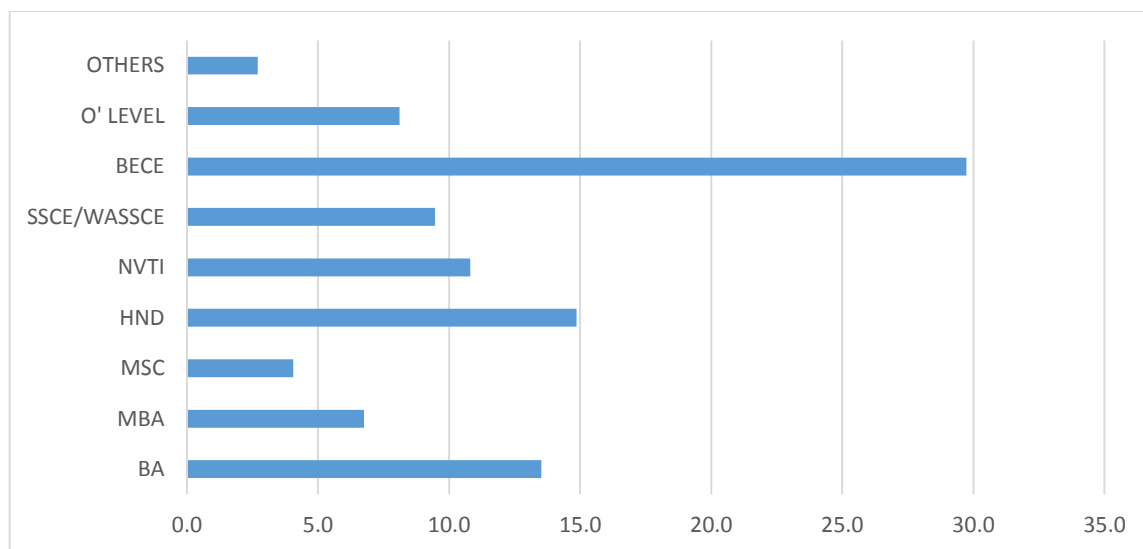


Figure 4.2: Academic Credentials of Employees at Zoomlion Ghana Limited, Ho

Source: Field Survey (2019)

4.1 Presentation of Study Findings

4.1.1 The importance of health, safety and environment record keeping on waste management projects at Zoomlion Ghana Limited in Ho

The critical role of an efficient waste management system to Ghana's socio-economic development and the world at large is beyond doubt. While most firms in the industry are striving daily to find lasting solutions to the waste management problems and challenges that currently engulf the nation, they fail to appreciate the need for effective keeping of a comprehensive health, safety and environment records that further guides accurate policy and strategy formulation and implementation. The study tested the key benefits that Zoomlion Ghana Ltd, Ho derived as a result of keeping proper health, safety, and environment records. It further delved into examining the efficiency of related HSE record-keeping practices.

Having outlined potential benefits factors for respondents to score on a Likert scale of 1-5, the survey showed that, quite a considerable percentage of respondents were not really sure of the benefits that come with keeping appropriate HSE records, ranging between 26% to 46% across all possible benefits considered. For instance, 45% of respondents were not sure of how keeping HSE records could directly impact policy formulation with only 7% of respondents strongly agreed to that notion. Again, 46% of respondents were not sure that keeping HSE records could provide a safe workplace environment for all workers. However, 12% disagreed, 20% agreed and 20% of respondents strongly agreed. Meanwhile, 28% of the respondents strongly agreed that keeping proper HSE records enhances the ability of firms to retrieve and disseminate vital within the organization and across the industry as a whole. 22% of respondents also agree to the above, leaving another 34% not being sure. Additionally, 19% of respondents bluntly disagreed that keeping HSE records could indirectly help to reduce damage to properties and human life, with an additional 7% strongly disagreeing. Please refer to (table 4.3) and (figure 4.3) to better appreciate the finding.

Table 4.3: Key Benefits of HSE Record Keeping at Zoomlion Ghana Limited, Ho

No.	Key benefits of HSE records keeping	Strongly Disagree		Disagree		Agree		Not Sure		Strongly Agree		Total Frequency
		Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	
1	Directs policy formulation	0	0%	10	14%	26	35%	33	45%	5	7%	74
2	Reduces the cost of accident/ill health	0	0%	9	12%	26	35%	22	30%	17	23%	74
3	Provides safe workplace for all workers	1	1%	9	12%	15	20%	34	46%	15	20%	74
4	Meeting trade/international trade requirements	5	7%	14	19%	20	27%	23	31%	12	16%	74
5	Satisfying stakeholder's interests	0	0%	10	14%	18	24%	32	43%	14	19%	74
6	Reduced damage to property	5	7%	14	19%	19	26%	20	27%	16	22%	74
7	Helps to comply with HSE regulations	2	3%	13	18%	18	24%	23	31%	18	24%	74
8	Enhances information retrieval and dissemination	0	0%	12	16%	16	22%	25	34%	21	28%	74
9	Increased efficiency and profitability of project	0	0%	25	34%	16	22%	15	20%	18	24%	74
10	A vital yardstick for performance measurement	3	4%	10	14%	22	30%	19	26%	20	27%	74

Source: Field Survey (2019)

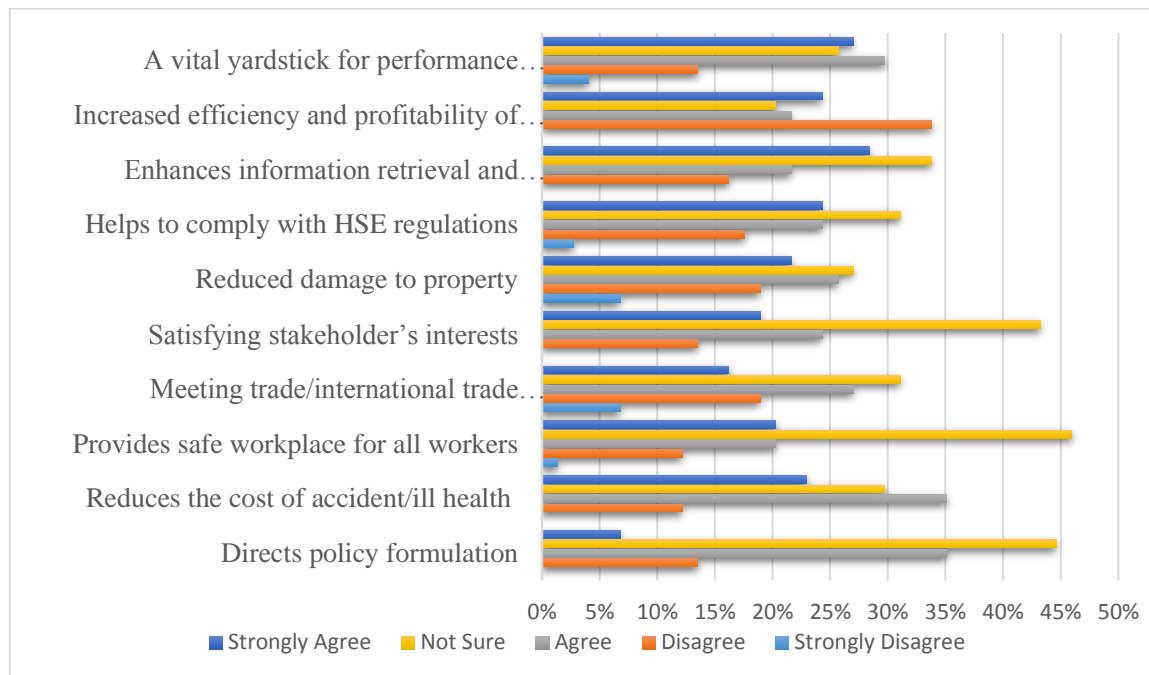


Figure 4.3: Key Benefits of HSE Record Keeping at Zoomlion Ghana Limited, Ho (Graphical view)

Source: Field Survey (2019)

Furthermore, the study revealed that there were no tangible policies related to keeping HSE records at the various departments of Zoomlion Ghana Limited, Ho. 48 respondents representing 65% confirmed this. However, 35% of respondents believed policy frameworks existed (**table 4.4**). A related follow-up question of how often HSE records were kept showed that HSE records were regularly kept. 43% of respondents claimed that these records were regularly kept, 24% admitted to occasional keeping of HSE records and 15% believed they were kept periodically. Interestingly, 18% claimed such records were never kept (**table 4.5**).

Table 4.4: Organization HSE policy in operation

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	26	35%	35.1	35.1
No	48	65%	64.9	100.0
Total	74	100%	100.0	

Source: Field Survey (2019)

Table 4.5: HSE Records keeping

	Frequency	Percent	Valid Percent	Cumulative Percent
Regularly	32	43%	43.2	43.2
Occasionally	18	24%	24.3	67.6
Periodically	11	15%	14.9	82.4
Never	13	18%	17.6	100.0
Total	74	100%	100.0	

Source: Field Survey (2019)

Although this finding did not commensurate with that of HSE policy issues, there are instances where firms carry out activities without having competitive policies covering them. With regards to employee training programmes on HSE practices and record-keeping, 58% percent of respondents confirmed attending annual training programmes at Zoomlion Ghana Limited; 19% attended monthly training programmes on monthly basis, 16% of respondents alluded to weekly training programmes and finally 7% never received training on HSE record-keeping practices (**figure 4.3**).

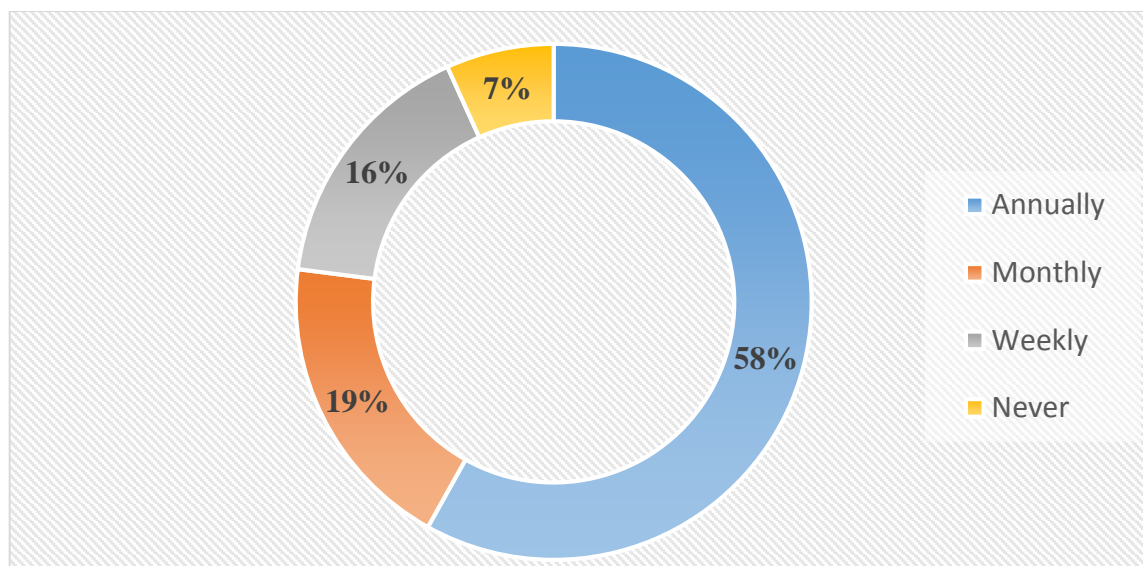


Figure 4.4: Number of times employees receive training on keeping HSE records

Source: Field Survey (2019)

Table 4.6: Importance HSE record keeping practices to the Organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Very Important		48	65%	64.9	64.9
Quite Important		17	23%	23.0	87.8
Somewhat Important		5	7%	6.8	94.6
Not Important		4	5%	5.4	100.0
Total		74	100%	100.0	

Source: Field Survey (2019)

4.3 Best practices of keeping HSE records of waste management projects

Another crucial part of this study is to ascertain the best practices of keeping HSE records at Zoomlion Ghana and the particular types of records kept. Respondents were asked to agree or disagree on the scale 1-5 to 8 HSE record keeping practices on waste

management projects, considered as their best. The survey showed that for all factors, 39% represented the highest proportions of the strongest level of agreement, with 12% being the least. The level of strong disagreement also ranged from 3% to 9% across all practices considered. For instance, 34% of the workforce at Zoomlion Ghana Limited strongly agreed that recording HSE corrective implementation measure were their best HSE record keeping practices on waste management projects. To these same practices, 32% of respondents were not sure, 19% agreed, 9% disagreed and 5% strongly disagreed. More so, only 16% strongly to using information systems and technologies as well as a theoretical model as the best HSE record-keeping practices. 35% agreed but 26% were unsure they were their best HSE record-keeping practices worse still, 20% disagreed and 3% strongly disagreed that they were their best practice of waste management HSE record keeping. Finally, on the examples of best HSE record-keeping practices, 30% of respondents considered Government approved HSE record-keeping practices as the best option, with 27% also agreeing, 22% not being the sure but another 22% also disagreeing entirely. Please refer to **table 4.7** for more details.

Table 4.7: Best HSE Record Keeping Practices at Zoomlion Ghana Limited?

No.	Best HSE record keeping practice on waste management projects	Strongly Disagree		Disagree		Agree		Not Sure		Strongly Agree		Total Frequency
		Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	
1	Records of HSE Planning and Operational Practices	5	7%	10	14%	15	20%	25	34%	19	26%	74
2	Records of HSE Training Procedures	3	4%	5	7%	25	34%	32	43%	9	12%	74
3	Records of HSE Documentation and Reporting Processes	7	9%	14	19%	19	26%	24	32%	10	14%	74
4	Records of External HSE Regulatory Agencies and Auditors	6	8%	10	14%	20	27%	16	22%	22	30%	74
5	Using Information systems, Technologies and Theoretical Models	2	3%	15	20%	26	35%	19	26%	12	16%	74
6	Records related to HSE financial budgetary allocations and expenditure	3	4%	10	14%	26	35%	15	20%	20	27%	74
7	Records of HSE Corrective Implementation Measure	4	5%	7	9%	14	19%	24	32%	25	34%	74
8	Daily Keeping, Reporting and Sharing of HSE related records	5	7%	8	11%	10	14%	22	30%	29	39%	74

Source: Field Survey (2019)

A further assessment of the types of HSE records kept indicated that, financial losses and damage evaluation data, environmental impact analysis data, and accident record and investigation, procedures were dominant. With the flexibility of selecting multiple options of the types of HSE records being kept, 68 responses out of a total of 256 representing 18.4%, kept record on environmentally related impacts of waste management projects. 67 responses representing 18.1% keep financial records loss records related to health and safety practices (see **figure 4.5**). It can be deduced therefore that the firm does not keep a competitive health, safety and environment records perhaps due to the lack of an integrated record-keeping system for health, safety, and environment-related issues.

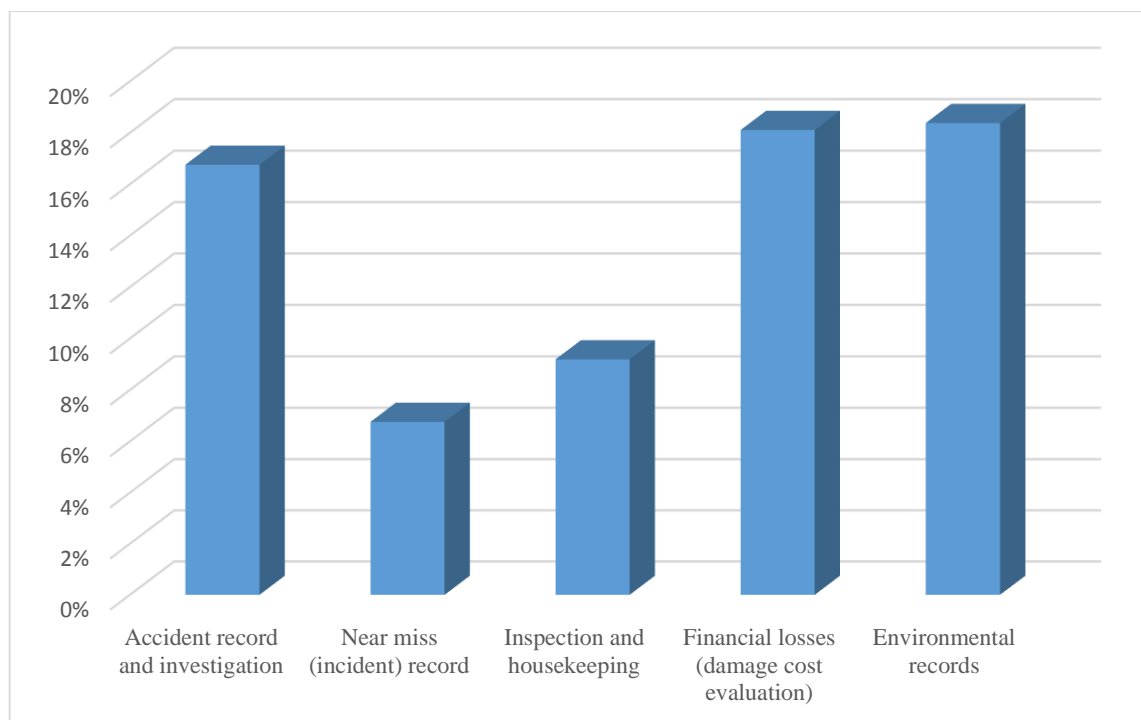


Figure 4.5: Types of HSE Records Kept at Zoomlion Ghana Limited

Source: Field Survey (2019)

4.4 Effect of HSE record keeping practices on waste management projects

It was also vital for this research to analyze the impact of the current nature of HSE record keeping practices on the performance of Zoomlion Ghana Limited workers and that of waste management projects. The underlying challenges of ensuring effective HSE record-keeping as also unraveled mainly, highlighting the causal factors. The study identified the lackadaisical attitude of workers, unnecessary delays by staff and lateness to work or even absenteeism as the many negative effects of the current status of HSE record keeping practices on staff performance. 24% each of the respondents attested to these factors. 22% agreed to delays on part of individuals but 29% disagreed. Whiles 28% of respondents agreed to absenteeism and lateness, with 27% disagreeing. Again, 44% of the workforce at Zoomlion Ghana agreed that initiative levels of staff, as their thinking scope does not transcend health, safety, and environmental repercussions. However, 33% disagreed with this assertion conversely; these were some positive

effects, which were strongly advocated by respondents. For instance, 24% feels that keeping HSE records can increase project conception rate. However, 27% were not quite sure. 20% also generally agreed that keeping proper HSE records motivates staff to perform better. Moreover, enhanced communication that results from coordinated HSE record-keeping practice is agreed by the workforce to a proportion of 39% meanwhile, 33% still disagrees. **Figure 4.6 and 4.7** explains more.

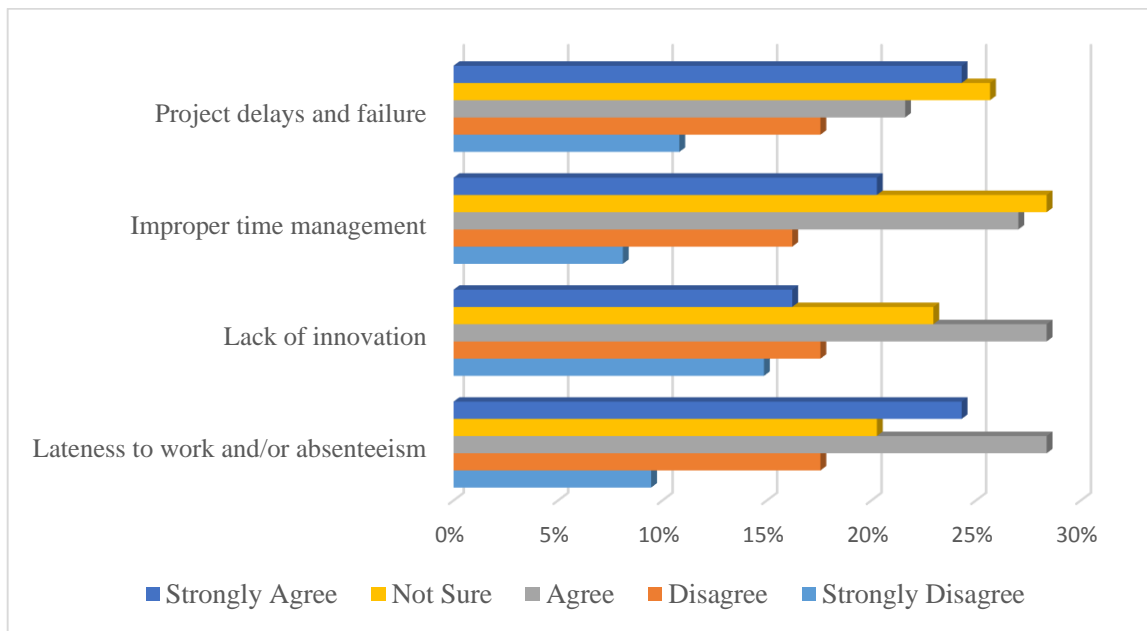


Figure 4.6: Negative impacts of HSE Record keeping practices on staff performance at Zoomlion Ghana Limited, Ho

Source: Field Survey (2019)

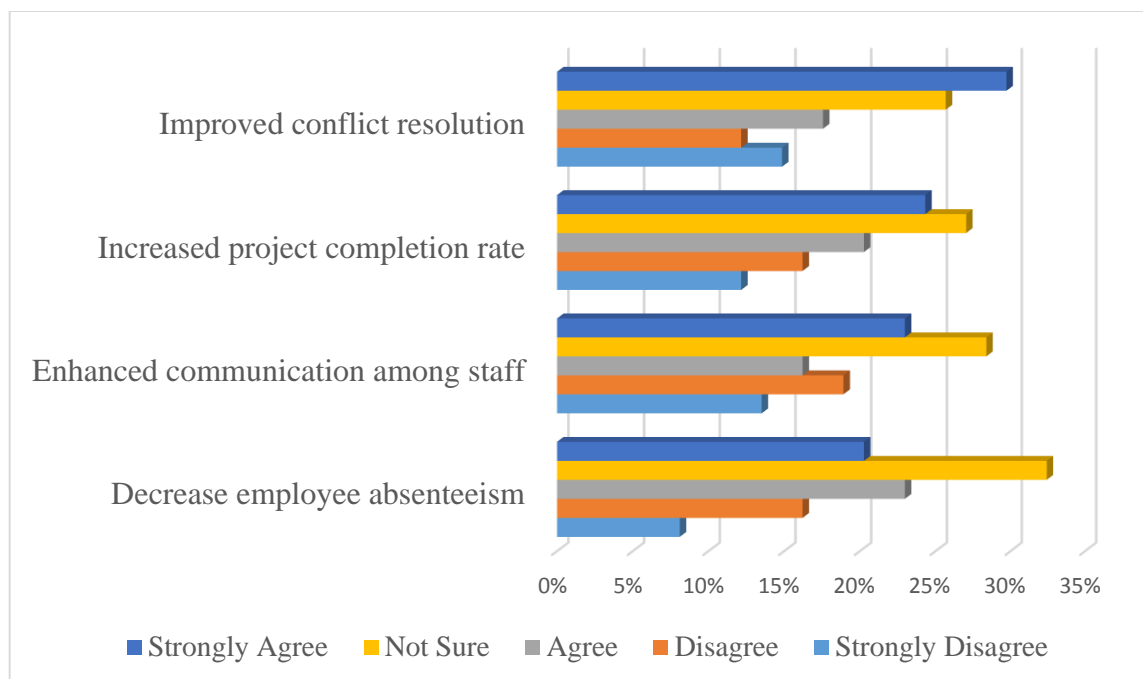


Figure 4.7: Positive impacts of HSE Record keeping practices on staff performance at Zoomlion Ghana Limited, Ho.

Source: Field Survey (2019)

On the flip side, the study also surveyed the effects of HSE record keeping practices on the performance of waste management projects. Negatively, keeping HSE records presented an overly bureaucratic administration process and also caused delays in projects. 20% and 18% of respondents strongly agreed respectively to this negative implication at Zoomlion Ghana Limited. Again, 45% of respondents agreed that keeping HSE records may lead to a reduction in relevance generation. More surprisingly, about 41% of respondents generally agreed that keeping HSE records decreased productivity and profitability. Notwithstanding the above, some positive impacts were also examined. 18% to 25% of respondents fell within the range of generally and strongly agreeing to factors tested; including increased project success, efficient communication, improved leadership skills, and proactive employee activities. Only 5% to 18% disagreed with these positive impacts of keeping appropriate HSE records. However, a chunk of

respondents, in the average proportion of 30% remains unsure about these positive impacts that keeping proper HSE records can bring to waste management projects (Figure 4.8 and 4.9).

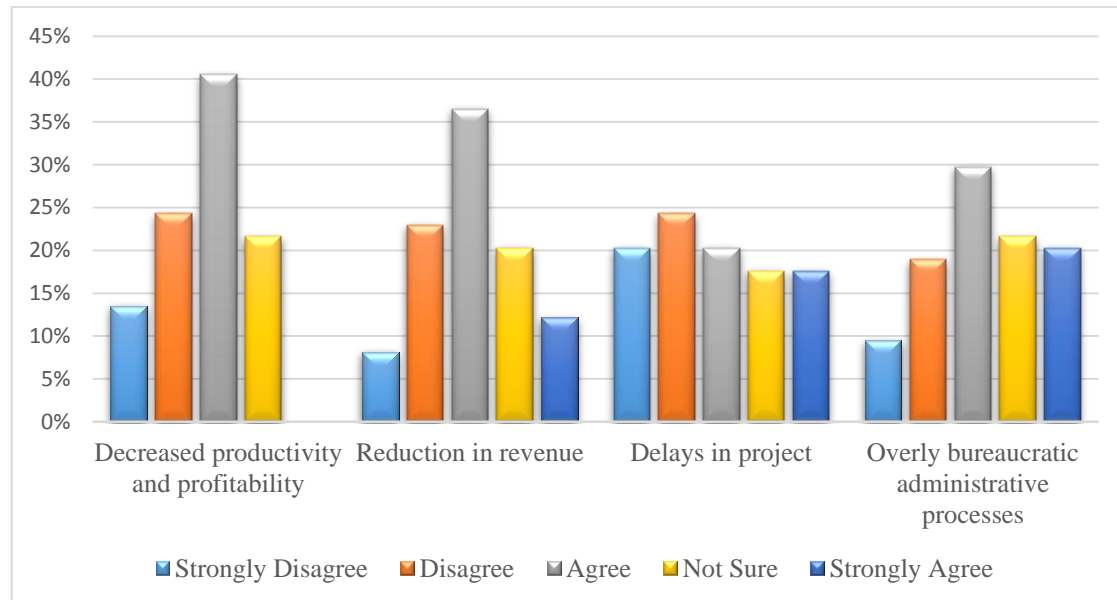


Figure 4.8: Negative impacts of HSE Record keeping practices on waste management performance at Zoomlion Ghana Limited, Ho.

Source: Field Survey (2019)

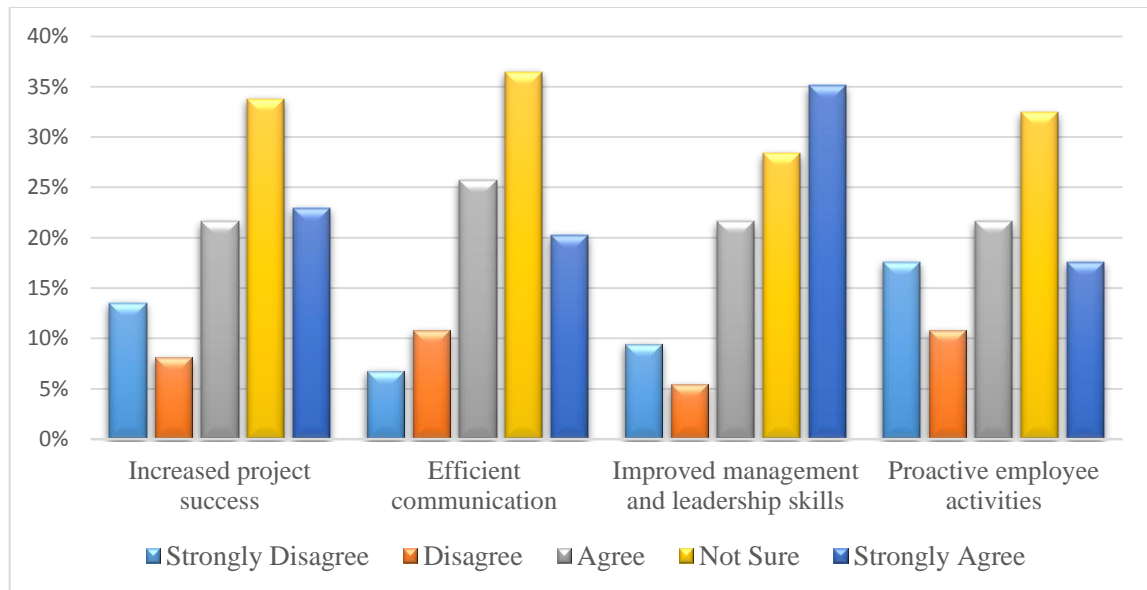


Figure 4.9: Positive impacts of HSE Record keeping practices on waste management performance at Zoomlion Ghana Limited, Ho

Source: Field Survey (2019)

The study further went on to understand the challenges that engulfed Zoomlion Ghana Limited, Ho quest to achieve efficiency in keeping health, safety and environment records. The major difficulty identified was the lack of expertise or specialist support. About 88% of the total responses considered some level of challenges in this regard. Another major challenge confessed is the lack of awareness among staff (84%) of total responses. Finally, 54% of respondents considered financial challenges as a major difficulty whiles 27% consider it a minor challenge (**figure 4.10**).

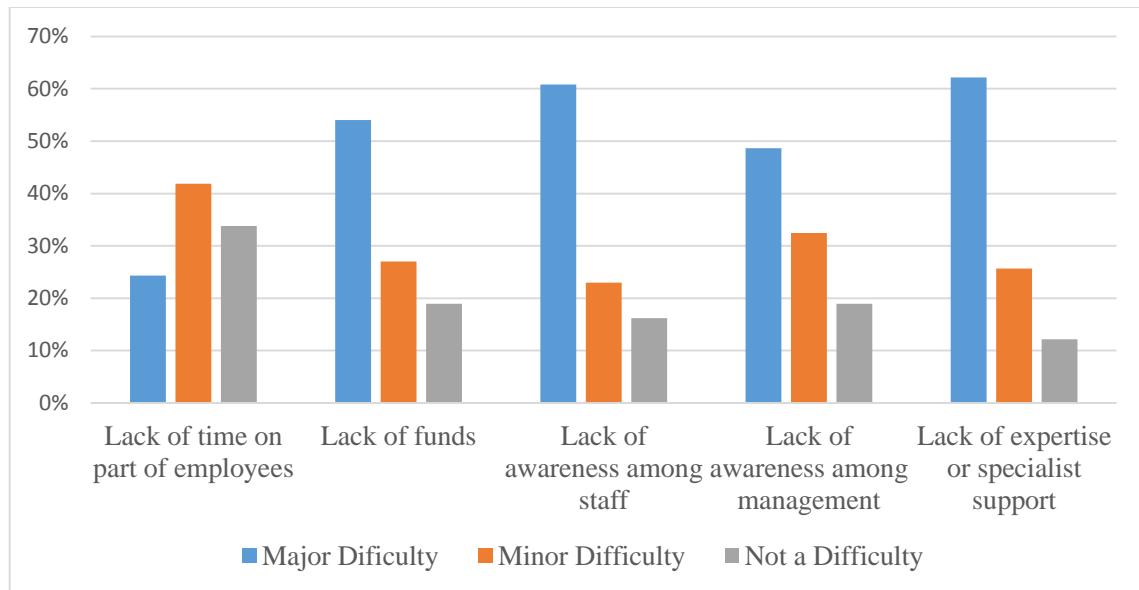


Figure 4.10: Challenges associated with HSE Record keeping Practices at Zoomlion Ghana Limited

Source: Field Survey (2019)

Consequently, what are the possible factors that may be influenced the effectiveness of carrying out HSE record-keeping practices? The study revealed that 27% of respondents considered hoe financial resource capacities as critical factors that influenced the effectiveness of HSE record-keeping practices. 20% more workers also agreed to the same factor, with only 19% disagreeing. Again, 19% of respondents strongly feel that the non-effective keeping of HSE records are caused by week internal communication structures. Although 35% were not sure, 24% agreed to this influencing factor. A total of 21% of respondents disagreed anyways. Moreover, 34% of the workers strongly believed the influences in HSE records keeping were caused by ineffective leadership. 19% agreed generally and only 7% disagreed. But yet again 41 % were not sure. Refer to **table 4.8**.

Table 4.8: Factors Influencing the effectiveness of HSE record keeping practices at Zoomlion Ghana Limited

No.	Factors that influence the effectiveness of HSE record keeping Practices	Strongly Disagree		Disagree		Agree		Not Sure		Strongly Agree	
		Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	HSE record keeping practice awareness creation	6	8%	10	14%	15	20%	26	35%	17	23%
2	Leadership commitment	5	7%	0	0%	14	19%	30	41%	25	34%
3	Supervisor and line management training and commitment	9	12%	11	15%	20	27%	25	34%	9	12%
4	Workers behavior and participation	10	14%	9	12%	16	22%	22	30%	17	23%
5	System of recognition and rewards	10	14%	8	11%	13	18%	26	35%	17	23%
6	Documentation policies and procedures	15	20%	10	14%	17	23%	21	28%	11	15%
7	Positive HSE culture	3	4%	13	18%	15	20%	23	31%	20	27%
8	Internal Communications structure	7	9%	9	12%	18	24%	26	35%	14	19%
9	Financial resource capacities	4	5%	10	14%	15	20%	25	34%	20	27%
10	Performance evaluation	10	14%	7	9%	19	26%	20	27%	18	24%

Source: Field Survey (2019)

4.5 Strategies to improve HSE record keeping practices on waste management projects at Zoomlion Ghana Limited in Ho

Before recommending appropriate strategic models for the optimal conduct of HSE record keeping practices on waste management projects, the study sought to ascertain the measures that were already in place. 31% of respondents claimed that reward schemes were being instituted for some few complaint employees, while 27% explained that frequent training programmes on HSE data management were being organized and evaluated. 16% plan HSE record keeping and management programmes with external stakeholder such as government authorities and consultants in the industry. As low as 4% outsourced HSE records keeping operations while 14% strive to use software

packages. Meanwhile, a considerable 8% of respondents do nothing to improve their deficient HSE record practices (**table 4.9**).

Table 4.9: Strategies applied to improve HSE record keeping practices at Zoomlion Ghana Limited

No.	Strategies to improve HSE record keeping practices	Response	
		Frequency	Percent
1	HSE Record Keeping Software	10	14%
2	Frequent HSE data Management Training	20	27%
3	Outsource HSE Record Keeping Operations	3	4%
4	Plan HSE Record Keeping and Management with all Stakeholders	12	16%
5	Reward compliant employees	23	31%
6	Do nothing	6	8%
	Total	74	100%

Source: field survey 2019

Ghana's waste management industry has improved steadily over the past years but at a rather regrettably low pace. It's a crucial role in development cannot be overemphasized. Unfortunately, most firms in the industry have failed to appreciate the need for effective and integrated health, safety and environmental impact management impact policies that would ensure optimal efficiencies going forward. Whiles they take delight in securing efficient machinery and expanding their human resource capacities, they do not appropriate collect and manage data related health, safety and environmental impacts on

their waste management projects over the years. Using Ho branch of Zoomlion Ghana Limited as a case for the study, it was revealed that there is the need for an integrated system that records critical information about HSE-related issues which may have competitive bearings on the performance outcome of waste management projects.

Notwithstanding the general perception that HSE record-keeping practices were very important, many workers in the industry are less informed on the nitty-gritty of such a relationship between HSE record-keeping practices and organization growth. A lot more of them are not previewed to how HSE record-keeping practices should be embedded in the strategy policy formulation, ensure a congenial working environment for employees and avoid damage to property and life in the workplace and the surrounding environment. However, they somewhat believed it could assist in waste management information management such as retrieving and sharing. The information of the above requires waste management project managers to step up efforts of awareness creation among all employees and table relevant steps to coordinate their operations. It is not surprising therefore that HSE record-keeping policy framework is particularly lacking and the rate of keeping HSE record in the organization is not encouraging though the regularity of the process is slightly below average. Moreover, HSE practices are often furnished with their training needs, record-keeping is relegated to the background.

A further probe into understanding the HSE record-keeping practices at Zoomlion Ghana Limited revealed that recording HSE data related to corrective implementation measures, using that of government-approved record keeping practice regulations, training procedures and financial budgetary allocation, expenditure and losses from

HSE practice were the best process being deployed. However, the use of software technologies and information systems were in the low and virtually nonexistent perhaps due to financial commitment involved. Moreover, the dominant type of HSE records kept by the organization was on environment impact compliance measures followed by financial losses and their causal factors and accident records and related investigation outcomes. But the unanswered questions still remain that these types of HSE records enough to ensure progressive efficiency in the industry? At what levels are these data collected? by what means are they collected and disseminated? And for what purpose?

Part of the above questions were tested in this study to find out the effects of HSE practices in the organization on staff performance and waste management project performance. Lateness to work, absenteeism, lack of innovation and delay on the project were the prevailing negative impacts of HSE record keeping in the organization. Employees most definitely do not understand the possible implications of not keeping track of health and safety issues and how these could affect their performance. They virtually fail to take cue from previous project activities that led to quality output, in order to direct future operational activities. Slight positive outcome however experienced is enhanced communication among employees and improved project completion rate. The general effects on waste management project performance outcomes are obviously overly bureaucratic administrative processes, delays in project as a result of health and safety issues, reduced revenue generation and decreased productivity and profitability. On the other hand, key positive impacts of HSE record-keeping practices on project performance identified were improved management and leadership skills, increase project success, efficient communication and proactive employee activities.

Finally, efforts to improve HSE record-keeping practices are employee reward systems that are aimed at motivating employees to comply with efficient HSE record practices, frequent training seminars to create and increase awareness on HSE data management and planning HSE management with related stakeholders. Software systems and technologies were not patronized.

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CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Saunders et. al (2009) explained the importance of converting the analysis of research survey data into summarized vital and relevant information that explains the research objectives clearer. The five chapter of this project report would provide the summary of the research findings, a general conclusion, the proposed HSE record keeping model for Ghana's waste management industry and recommendations of future research.

5.2 Summary of Findings

Then workforce of Zoomlion Ghana Limited, Ho has a balanced distribution of gender. The workforce however, shows an aging trend, which confirms the general trend in various other waste management firms in Ghana. again, the current workforce of Zoomlion Ghana Limited has in-death experience in the waste management industry. With regards to academic credentials, the organization is dominated with unskilled labor dominates, so as the industry at large.

Notwithstanding the general perception that HSE record-keeping practices were very important, many workers in the industry are less informed on the nitty-gritty of such a relationship between HSE record-keeping practices and organization growth. A lot more of them are not previewed to how HSE record-keeping practices should be embedded in the strategy policy formulation, ensure a congenial working environment for employees and avoid damage to property and life in the workplace and the surrounding environment. HSE record-keeping policy framework is particularly

lacking and the rate of keeping HSE record in the organization is not encouraging though the regularity of the process is slightly below average.

Best HSE record keeping practices being deployed include corrective implementation measures, using that of government-approved record keeping practice regulations, training procedures and financial budgetary allocation, expenditure and losses from HSE practice. The use of software technologies and information systems were in the low and virtually nonexistent perhaps due to financial commitment involved. The dominant type of HSE records kept by the organization was on environment impact compliance measures followed by financial losses and their causal factors and accident records and related investigation outcomes.

Negative impact on employees are lateness to work, absenteeism, lack of innovation and delay on the project. Employees do not understand the possible implications of not keeping track of health and safety issues and how these could affect their performance. However, some positive outcome experienced at Zoomlion Ghana Limited, Ho are enhanced communication among employees and improved project completion rate.

Negative effects on waste management project performance outcomes are overly bureaucratic administrative processes, delays in project as a result of health and safety issues, reduced revenue generation and decreased productivity and profitability. Key positive impacts of HSE record-keeping practices however identified were improved management and leadership skills, increase project success, efficient communication and proactive employee activities.

5.3 Conclusion

Effective Health, safety and environment record keeping practices on waste management projects in Ghana is crucial for quality project performance outcome and sustained socioeconomic well-being. Unfortunately, HSE record keeping practices have outlived their significance in waste management firms as they fail to appreciate the key benefits associated with it. Consequently, they do not apply comprehensive systems to ensure its accurate recording of health, safety and environment related data. This have substantially affected the pace of growth and innovation in the industry, mainly due to the gross inefficiencies that engulf waste management projects. Zoomlion Ghana Limited, Ho as well as other waste management firms are therefore recommended to adopt the model for managing HSE records on waste management projects, proposed in this project in order ensure their superior performance and competitive edge in the industry.

5.4 Recommendation

Per the findings of this study, practices that are related to health, safety and environmental activities within zoomlion Ghana limited Ho, is not effective and efficient. Besides, there is no comprehensive information management system that can enhance HSE record-keeping practices in order to fully harness its benefits for profitable and effective waste management projects. To rectify these lapses in the waste management industry, firms must adopt the following HSE record keeping management engineering model that would ensure a seamless management of HSE data are entered at all levels across the organization by the employees in real-time (**figure. 5.1**)

Divide waste management projects into strategic management phases. Firstly, waste management firms in Ghana, particularly Zoomlion Ghana Limited, Ho, should identify waste management activity parameter that are critical to health, safety and environmental sustainability and assign the available workforce to the management phases. The waste management project workforce or stakeholders would encapsulate those external to the organization, such as the environmental protection agency in Ghana. This would involve a value chain analysis in order to avoid missing out on important project phases that may have repercussions related to health, safety and environmental management practices and regulations. These phases may include project planning, staff training session, waste collections, disposal, and recycling.

Specify the type of HSE records to be kept. After identifying and assigning available workforce to the various tasks and the strategic management phases derived above, waste management project managers should list all the types of HSE records that must be kept at each phase of the project. Performance targets for HSE practices should also be set alongside. The types of HSE records to be kept should be guided by internal and external influencing factors, mainly emphasizing incidents, impacts and remedial actions.

Install a HSE information management system. Install an enterprise information management system with an embedded digital repository to facilitate the entering, retrieving and sharing of HSE records between and among project participants. At every stage of the waste management project as identified in the first step of this model, each employee will enter HSE related records directly into the system in the form of pictures, videos or texts. These records are then received at another management unit for analysis.

Monitor and control HSE practices and record keeping processes during project periods. It is vital for waste management project managers at Zoomlion Ghana Limited to continually ensure that health, safety and environmental compliance processes are being carried out as planned and achieving a high performance outcome. Therefore, various types of records and entry procedures are closely monitored and controlled to minimize errors. Any errors noticed are rectified and forwarded for analysis. The model gives the opportunity to invest in preventive measures at early stages of waste management projects in order to avoid huge losses in the future.

Identify key challenges and causes of HSE record keeping inefficiencies. A complement to the monitoring and control of HSE practices is to unravel the problems that may crop up in implementing the entire HSE record keeping process. This may include system failures, adding of irrelevant data on HSE related records, poor leadership styles and low awareness creation. In addition, the possible causes of these inefficiencies should also be identified. All of these data on challenges and causes are forwarded for analysis.

Analysis and performance measurement. This stage collates the results at every stage of the process for analysis and performance outcome evaluation. Here, the results derived depicts how well the entire firm have been able to take appropriate HSE records as specified earlier and according to the performance targets indicated. All recommendations for improved efficiency are also resented at this stage of the process.

Install a digital HSE data repository. The result derived at the analysis stage as collated from all project management units at every stage is forwarded into the digital repository.

The HSE information could be retrieved to guide policy formulation and to inform subsequent waste management projects.

5.5 Study contribution and Implications for Future Research

This project ascertained the types and best practices of health, safety and environment record keeping at Zoomlion Ghana Limited in Ho, assessed the importance of health, safety and environment record keeping on waste management projects, and recommended HSE record keeping strategies that would ensure quality waste management projects in Ghana and the superior performance of Zoomlion Ghana Limited in the industry.

Future research studies should focus on applying the proposed model to other data management systems in other industries to test its validity and reliability further. Secondly, other works should consider the plausibility and feasibility of applying sensor technologies for waste collection in Ghana. finally, other research scholars should measure the impact of current waste management practices on the health conditions of each district in order to limit the scope of waste management solutions and recommendations in Ghana.

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APPENDICE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT

(Questionnaire for Employees and Management)

Please fill your responses to these questions in the questionnaire for the study entitled Health Safety and Environment (HSE) record keeping practices on waste management Project performance in Ghana: a case of Zoomlion Ghana Limited, Ho.

This study is for academic purpose only and any information provided would be treated with utmost confidentiality.

Instruction: *Please tick the appropriate answer from the options and provide answers where necessary.*

Personal Information

1. E2RGender a). Male ☐ b). Female ☐
2. Age? a) 15-30years ☐ b) 31-50years ☐ c) 51 years and above ☐
3. How long have you work in this organization? a) 0- 3 ☐ b) 4- 7 ☐ c) 8-12 ☐
d) Above 12 years
4. Academic qualification obtained?
BA ☐ BSc ☐ MBA ☐ MSc ☐ HND ☐ NVTI ☐ SSCE/WASSCE ☐ BECE ☐
☐
O'LEVEL A'LEVEL OTHER
5. Which category of staff do you belong in this organization?
 - a) Head of department ☐
 - b) Senior staff ☐
 - c) Junior staff ☐
 - d) Project/ contract staff ☐

Importance of HSE Record Keeping on Waste Management Projects (A)

Which of the following would you consider as key benefits of keeping HSE records? (*thick all that apply*). (Strongly disagree: 1, disagree: 2, not sure: 3,

Agree: 4 and strongly agree: 5)

Key benefits of HSE records keeping	1	2	3	4	5
Directs policy formulation					
Reduces the cost of accident/ill health					
Provides safe workplace for all workers					
Meeting trade/international trade requirements					
Satisfying stakeholder's interests					
Reduced damage to property					
Helps to comply with HSE regulations					
Enhances information retrieval and dissemination					
Increased efficiency and profitability of project					
A vital yardstick for performance measurement					

6. Does your organization have HSE policy in operation? a) Yes ☐ b) No ☐

7. How often do you keep HSE records?

a) Regularly ☐

b) Occasionally ☐

c) Periodically ☐

d) Never ☐

e) Others.....

8. How often do employees receive training on keeping HSE records?

a) Annually ☐

b) Monthly ☐

c) Weekly ☐

d) Never ☐

e) Other.....

9. How important do you regard HSE record keeping practices for your organization?

- a) Very Important ☐
- b) Quite Important ☐
- c) Somewhat Important ☐
- d) Not Important ☐

Best HSE Record Keeping Practice on Waste Management Projects (B)

10. Which of the following do you consider the best method of keeping HSE records?

(thick the appropriate that apply in each category). (Strongly disagree: 1, disagree: 2, not sure: 3, Agree: 4 and strongly agree: 5)

Best HSE record keeping practice on waste management projects (B)	1	2	3	4	5
Records of HSE Planning and Operational Practices					
Records of HSE Training Procedures					
Records of HSE Documentation and Reporting Processes					
Records of External HSE Regulatory Agencies and Auditors					
Using Information systems, Technologies and Theoretical Models					
Records related to HSE financial budgetary allocations and expenditure					
Records of HSE Corrective Implementation Measure					
Daily Keeping, Reporting and Sharing of HSE related records					
None of the above					
Other					

11. Which of the following factors influence the effectiveness of HSE record keeping Practices in your organization? (*thick all that apply*) (**Strongly disagree: 1, disagree: 2, not sure: 3, Agree: 4 and strongly agree: 5**)

Factors that influence the effectiveness of HSE record keeping Practices (B)	1	2	3	4	5
HSE record keeping practice awareness creation					
Leadership commitment					
Supervisor and line management training and commitment					
Workers behavior and participation					
System of recognition and rewards					
Documentation policies and procedures					
Positive HSE culture					
Internal Communications structure					
Financial resource capacities					
Performance evaluation					
Other					

12. What types of HSE Records are kept in your Organization (*Thick all that apply*)?
- a. Accident record and investigation ☐
 - b. Near miss (incident) record ☐
 - c. Inspection and housekeeping ☐
 - d. Financial losses (damage cost evaluation) ☐
 - e. Environmental records ☐

Effects of HSE Record Keeping Practices on Waste Management Projects (C)

How have HSE Record keeping practices impacted project performance in your organization? (*thick all that apply in each category: negative or positive*)

(Strongly disagree: 1, disagree: 2, not sure: 3, Agree: 4 and strongly agree: 5)

Negative impacts of HSE Record keeping practices on project performance	1	2	3	4	5
Decreased productivity and profitability					
Reduction in revenue					
Delays in project					
Overly bureaucratic administrative processes					
Other					
Positive impacts of HSE Record keeping practices on project performance					
Increased project success					
Efficient communication					
Improved management and leadership skills					
Proactive employee activities					
Other					

13. How has HSE Record keeping practices impacted staff performance? (*thick all that apply*)

(Strongly disagree: 1, disagree: 2, not sure: 3, Agree: 4 and strongly agree: 5)

Negative impacts of HSE Record keeping practices on staff performance	1	2	3	4	5
Lateness to work and/or absenteeism					
Lack of innovation					
Improper time management					
Project delays and failure					
Others					
Positive impacts of HSE Record keeping practices on staff performance					
Decrease employee absenteeism					
Enhanced communication among staff					
Increased project completion rate					
Improved conflict resolution					
Other					

14. What are the key challenges associated with HSE record keeping Practices? (*Major difficulty=1, Minor difficulty=2, Not a difficulty=3*)

Challenges associated with HSE record keeping	1	2	3
Lack of time on part of employees			
Lack of funds			
Lack of awareness among staff			
Lack of awareness among management			
Lack of expertise or specialist support			

Improving HSE Record Keeping Practices on Waste Management Projects (D)

15. Do you apply any special model to manage HSE record keeping? a. Yes ☐ b. No ☐

If Yes, name it.....

16. What HSE record keeping strategies have you implemented in the past?

- a) HSE Record Keeping Software ☐
- b) Frequent HSE data Management Training ☐
- c) Outsource HSE Record Keeping Operations ☐
- d) Plan HSE Record Keeping and Management with all Stakeholders ☐
- e) Reward compliant employees ☐
- f) Do nothing ☐

17. Are there any particular reasons why workplace HSE record keeping practices are not effectively carried out? *Please tick for each of the following whether it applies to your organization or not*

- | | | |
|---|------------------------------|-----------------------------|
| a) You can select more than one option | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| b) Necessary expertise is lacking | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| c) Procedure too burdensome | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| d) Staffs unwilling to participate in the process | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| e) Fear of intimidation | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

Thank you for your time

