ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE

Assessment of Safety and Health Management Practices in Construction Projects – A case of ELMI OLINDO Construction Company

By: Bitania Shiferaw Gudetta

A Project Work Submitted to Addis Ababa University School of Graduate Studies in Partial Fulfillment of the Requirements for the Award Master of Arts Degree in Project Management

Advisor: Solomon Markos (PHD) **June 2020**

Addis Ababa, Ethiopia

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DECLARATION

I, the undersigned, declare that the study entitled "***Assessment of Safety and Health Management Practices in Construction Projects – A case of ELMIOLINDO Construction Company*** "is the result of my own effort and study that all sources of materials used for the study have been acknowledged. I have conducted the study independently with the guidance and comments of the research advisor.

This research study has not been submitted for any degree in this University or any other University. It is submitted for the partial fulfillment of the degree of Master of Art in Project Management.

Bitania Shiferaw

Signature: _____

Date: _____

LETTER OF CERTIFICATION

This is to certify that Bitania Shiferaw has carried out this research work on the topic entitled "***Assessment of Safety and Health Management Practices in Construction Projects – A case of ELMI OLINDO Construction Company"*** under my supervision.

This work is original in nature and suitable for submission in partial fulfillment of the requirement for the award of Master of Arts Degree in Project Management and the student has my permission to present it for assessment.

Advisor: Solomon Markos (PHD)

Signature: _____

Date: _____

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SCHOOL OF COMMERCE

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By Bitania Shiferaw Gudetta

Approval Sheet

Advisor	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____

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First and foremost I would like to thank the almighty God who is my strength and my firm foundation. Next my sincere gratitude goes to my father, without him none of this would have happened and when I count my blessings, I count him twice. Thank you for being the best father one could ever ask for dad. Mikiye thanks a lot. Last, but not least, I would like to convey my sincere gratitude to my advisor Solomon Markos(PhD) for his excellent, constructive, remarkable and genuine comments and continued guidance for the successful accomplishment of this project work. I would like to thank him for not giving up on me when the project took longer than expected.

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ACRONYMS

BC	Building Contractor
GC	General Contractor
ETB	Ethiopian Birr
GDP	Gross Domestic product
GTP	Growth and Transformation Plan
H & S	Health and safety
HSC	Health and Safety Commission
HSW	Health and Safety at Work
ILO	International Labor Organization
NGO	Nongovernmental Organization
PLC	Private Limited Company
PM	Project manager
WHO	World Health Organization
MOLSA	Ministry of Labor and Social Affairs
SPSS	Statistical Package for Social Sciences

ABSTRACT

The construction sector has been considered to be among hazardous industries in both developed and developing countries. This is because the construction industry has a poor health and safety performance record compared to other industries across the globe. Labor law in every nation states that it is the responsibility of an employer to ensure that every worker employed by the company works under safe and healthy conditions and free from any harm. The main objective of this project work is to assess the practice of health and safety management in constructions by taking ELMIOLINDO Contractors PLC construction sites in Addis Ababa as a case. 50 professional employees of the company participated in filling out the questionnaire given to them by the researcher additionally, documented sources were used for more accurate data including site observation/visit. The data has been combined through structured questionnaire and interviews; and analyzed using descriptive statistics with Microsoft Excel & IBMSPSS Software. This research found out that both of the construction sites have had an accident during the past three years. According to the findings, of the study every stakeholders in the industry take a share for the fatalities that occurred with contractors taking the largest part. As a result, the study revealed that the company has limitations in its workplace health and safety management practices.

KEY WORDS: Health and Safety management, Construction industry, Employee/Worker, Accident, Injury, ELMIOLINDO contractors P.L.C, Ethiopia.

Chapter One: Introduction

1.1. Background of the study

In todays' world, construction industry is considered as the backbone of development of every nation and plays a great role in the growth of any economy. Globally, the construction industry hugely influences the economy, the environment and the society. In 10 trillion USD revenue and added value 3.6 trillion, the sector is account for about six percent of the world GDP, according to World Economic Forum's 2016 report.

In many developing countries, major construction activities account for about 80% of the total capital assets. In these countries, construction accounts for 10% of their GDP and more than 50% of the wealth invested on fixed assets. Additionally, the industry provides high employment opportunities, next to agriculture Ofori(2006). Construction industry plays a vital role in any developing country. This is because developing countries are largely dependent on the growth and development of their physical infrastructures and because the linkage of the construction industry to both economic and social sectors is very significant. Information obtained from Ministry of Construction indicated that the sector had a 9.5 percent share from Ethiopia's total Gross Domestic Product (GDP) in 2016. The sector is the second largest employing industry through creating jobs for over 1.8millioon citizens thereby alleviating urban poverty. The sector's contribution is greater in the case of developing countries including Ethiopia and the industry has been playing a crucial role in sustaining country's rapid and equitable socio – economic development and changing the livelihood of millions of peoples.

Health: - is the general condition of a person in mind, body and spirit, usually meaning to be free from illness, injury or pain. The World Health Organization (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 2006).

Safety - is the state of being "safe" (from French Sauf), the condition of being protected from harm or other non -desirable outcomes. Safety can also refer to the control of hazards in order to achieve an acceptable level of risk; protection of people from physical injury. It is related to external threats, and the perception of being sheltered from threats.

Safety management is essential knowledge in a project management area which recognized in *The Guide to the Project Management Body of Knowledge* (PMBOK Guide, 2011, cited by Cretu et.al.2011). Safety management is the procedure used to recognize H&S risks and implement actions to decrease the possibility of a risk materializing and to diminish or eliminate the potential consequences of identified project H&S risks (SAEED, 2017).

The improvement of safety, health and working conditions depends ultimately upon people working together, whether government, employers or workers. Safety management involves the functions of planning, identifying problem areas, coordinating, controlling and directing the safety activities at the work site, all aimed at the prevention of accidents and ill health. Effective safety management has three main objectives: to make the environment safe; to make the job safe; and to make worker safety conscious. (ILO, 1999; ILO., Safety and Health in Construction Code of Practice, 1992; ILO., Global estimates of fatal work related diseases and occupational accidents., 2005; ILO 2001).

Injuries and fatalities resulted in accidents in the construction industry still an obstacle clings construction industry to its infamous position as the industrial sector responsible for more occupation accidents, than any other. Consequently, the improvement of H&S in construction is still an essential goal for all contributors in the construction processes. Safety management is taking account of all risks and accidents that may believably be expected that put project employees at risk, to minimize such risks. It is thus important to identify appropriate safety actions and strategies to accommodate potential serious H&S problems. (SAEED, 2017).

1.2. Background of the company

ElmiOlindo Construction PLC is a local construction company registered at the Ethiopian Ministry of Urban Development as grade 1 general contractor. It has been operating on the Ethiopian construction industry for over 70 years. With extensive experience in the building construction sector Elmi is currently undertaking several construction projects in Addis Ababa as well as in different parts of Ethiopia. In 2018 the annual turnover of the company has reached close to 1billion birr. It has a combined workforce of 3,200 employees composed of internationally and locally engaged skilled/unskilled personnel that have ample experience in the construction sector and have worked for the company for many years.

ElmiOlindo has over 70years of experience in its field and its today a leading construction company in Ethiopia. Its capacity has grown to undertake major projects with confidence and professional execution.

1.3. Problem statement

According to recent estimates released by the International Labour Organization (ILO), each year 2.78 million workers die from occupational accidents and work – related diseases (of which 2.4 million are disease related) and additional 374million workers suffer from non – fatal occupational accidents globally. It is estimated that lost work days globally represent almost 4 percent of the world's GDP, and in some countries, this rises to 6 percent or more (Hamalainen et al, 2017; Takala et al, 2014).

According to a report of Ethiopian ministry of labor and social affairs (MOLSA, 2016) from 334 companies total of 4535 work related accidents were reported 100(2.21%) were fatal whereas 4435(97.79%) were non-fatal in 20015/16 Due to these safety and health related problems a cost of 3,787,430.76 ETB is incurred for medical case and loss of 11,466 working days due to the absence injured employees. According to the report, the construction industry is ranked to be the third hazardous sector; next to manufacturing.

Even though, Ethiopia has various laws, rules, regulations, and standards of work related to work place safety, the practical application of those is very insignificant. As a result, in todays' construction sector, accident and ill health problems are increasing at an alarming rate. This problems in turn have a very significant impact, on the employees, on the project, on the project stakeholders, and to the country at large, in so many different ways.

1.4. Objectives of the Study

1.4.1. Main Objective

The Main objective of this study is to investigate the current safety and health management practices in a case of ELMI OLINDO Construction Company.

1.4.2. Specific Objectives

- To assess safety and health management practices used in constructions which are being undertaken by ELMIOLINDO building contractors PLC.

- To identify the critical factors causing accidents and injuries in construction sites in ELMI OLINDO Construction Company.

Significance of the study

The current problems of health and safety in construction industry can be addressed and solved on a global scale resulting in changes and improvements that can be observed globally. Hence, solutions to health and safety problems in one country may readily be adapted to other countries to generate further improvements.

The significances of the study is to suggest measures to be taken during all the stages of the project and to provide safe work place to all employees and to protect them against accidents, to make sure the presence of satisfactory health and safety standards within the organization**,** to provide every personnel in the company a platform that can give them access to a thorough discussion about health and safety issues, to reduce the number of accidents and to provide a safe and healthy working environment, thereby reducing the absence of employees and turnover rate, which in turn brings an increased productivity. Moreover, to improve the health and safety standards used at the given construction sites by covering general health and safety provisions as well as duties and responsibilities of the employers, engineers, and contractors regarding safety measures and the minimum necessary requirements.

Scope/delimitation of the study

Geographical scope: This study has focused on the assessment of safety and health management practice in building construction projects which are constructed by ElmiOlindo construction PLC located in Addis Ababa, Ethiopia. The selection of Addis Ababa, Ethiopia is based on the convenience to the researcher.

Conceptual scope: The major variables that were measured in this study are health and safety management practices at some selected building construction sites of ElmiOlindo Construction Company.

Methodological scope: The target population of the study comprises employees of the company that are engaged in building construction. The study population contains employees which are professional engineers or which have other related educational background or expertise in building construction sector.

1.5. Limitations of the study

The subject of safety and health management practice of construction projects in general, the case in the Ethiopian construction industry have not been adequately researched; hence, it may take time to collect all the data necessary about all stakeholders for the study. Because of time limitation the research will only address construction projects that are constructed in Addis Ababa, Ethiopia. It might be difficult to collect sufficient data and gave more empirical results and the finding of the result may not represent as a general representation in the construction industry. Questionnaire data collection was limited to ELMI OLINDO contractors P.L.C and building projects located at Addis Ababa.

Chapter Two: Review of Related Literature

2.1. Introduction

This study begins with a detailed literature review on health and safety in the construction industry focusing firstly on the nature and scope of the construction industry and the activities that involve hazardous operations. Additionally, health and safety issues in construction industry is reviewed. The issue of health and safety in both developed and developing countries irrespective of implementing and sustaining health and safety management is reviewed to find gaps in construction site safety and health conditions.

2.2. Theoretical review

Prior to moving to a thorough discussion of health and safety, some of the basic occupational health and safety definitions are required as well as the legal framework for health and safety

2.2.1. Basic Concepts and Definitions of Operational Terminologies

Health: - is the general condition of a person in mind, body and spirit, meaning to be free from illness, injury or pain. The World Health Organization (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 2006).

Safety: is the protection of people from physical injury. It is related to external threats, and the perception of being sheltered from threats. According to the industrial Dictionary definition safety is a relative freedom from danger, risk, injury or threat of harm or loss of personal and/or property, whether caused deliberately or by accident.it is also related to external threats, and the perception of being sheltered from threats. Freedom from any danger of risk is said to be safety (Davis, 1999). According to Lingard, (2005) safety is defined as an absence of any harm or dangers that have a state of protection and condition not involving risks (Lingard, & Rowlinson, 2005). Construction environment condition should be self-explanatory and safe enough for the environment and participant to perform their particular duties and tasks safely (Jannadi, & Bu-Khamsin, 2002).

Safety Management is defined as the management functions connected with the carrying on an industrial undertaking that relate to the safety of personnel in the undertaking, which includes the

measuring, auditing or reviewing of the performance of those functions and the planning, developing, organizing and implementing of a safety policy.

Accident is an unplanned event/incident that happen suddenly and unintentionally resulting damage to property or injury and loss of life; short and long term effects or incidents due to exposure on construction site and consequently interruption to construction process (ESAW, 2007).

Work-related accident refers to an event that directly affects a workers health during the performance of work activities (Roberto, 2006).

Ill health is to be defined as an identifiable/ or adverse physical or mental condition arising from and/or made worse by a work activity and/or work related situation.

Construction - construction is a high-risk activity, which must be managed starting from procurement, through the detail design process and to the end of the construction stage.

Company is a social unit of people systematically structured and managed to meet a need or to pursue collective goals on a continuing basis.

Workplace is a physical location in which construction or other work activities are performed.

Employee - is an individual who is employed to give services to a company/organization on a regular basis in exchange for compensation.

2.2.2. Construction industry categorizations in Ethiopia

The Ethiopian ministry of urban development and construction defines the construction industry as a sector of the economy that transforms various resources for socio economic development of the country. This includes all processes in the physical infrastructure that are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished; which can be categorized as: Buildings, Transportation systems and facilities such as airports, harbors, highways, subways, bridges, railroads, transit systems, pipelines and transmission and power lines and Structures for fluid containment, control and distribution such as water treatment and distribution, sewage collection and treatment distribution systems, sedimentation lagoons, dams, and irrigation and canal systems; underground structures, such as tunnels and mines (MUDC 2012).

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2.2.3. Health and safety management and its necessity

Workplace safety is important for each and every employee in the industry because all the workers desire to work in a safe and protected atmosphere. Health and safety is a key factor for all industries in order to promote the wellness of both the employees and employers. It is a duty and moral responsibility of the company to look after the employees' protection. Health and safety is the subject of many laws and regulation, failure to comply with the law renders companies and individuals liable to prosecution. Health and safety is important because it protects the well-being of employers, visitors and customers (Lucy 2016)

Safety and health principles are universal, but how much action is needed will depend on the size of the organization, the hazards presented by its activities, the physical characteristics of the organization, products or services, and the adequacy of its existing arrangements (HAS, 2006).Safety management can be defined as the management functions connected with the carrying on of an industrial undertaking that relate to the safety of personnel in the undertaking including: the planning, developing, organizing and implementing of a safety policy and the measuring, auditing or reviewing of the performance of those functions.

2.2.4. Injuries in building construction sites

According to the WHOs definition, an injury is the physical damage that results when a human body is suddenly or briefly subjected to intolerable levels of energy. It can be a bodily lesion resulting from acute exposure to energy in amounts that exceed the threshold of physiological tolerance.

Authority of health and safety excusive (HSE) define hazard as any source of potential damage, harm or adverse health effects on something or someone under certain conditions at work (HSE, 2004).

The severity of each hazard depends on the concentration and duration of exposure for that particular job. By stander exposures can be approximated if one knows the trades of workers nearby construction workers are exposed to a wide variety of health hazards on the job ("environment clearance," 2018).

Construction site injuries are often serious in nature even though construction workers take safety precaution and must adhere to safety precaution. Construction is a sector that has very specific

hazards, like working from heights, work with power tools, more than one trade and more than one employer/contractor working on a single site with lack of coordination, working in the outdoor elements, work with power tools, contractual work as opposed to permanent employment, lack of standards or regulations among workers in terms of expertise in their trade and training standards, less regulation and enforcement than other sectors. The ill-defined conditions of construction site with numerous material-handling, transportation and storing operations which involve various equipment is considered as responsible factor for frequent occupational accidents and occupational diseases (Jean Caude, 2004).

2.2.5. Scope of the construction industry and general problem description

The construction industry plays a vital role in the social and economic development of all countries. its scope is very wide from larger civil engineering projects such as road and bridge, building, water supply and sewerage schemes and river and canal work etc. construction works are also needed in agriculture, industry, education, health and other service industries. It is classified into various segments industrial, housing, commercial, utilities and infrastructure work. Thus the construction industry is a mixture of different organizations, which directly and indirectly influence the construction process. These organizations include property developers, architects, engineers, quantity surveyors, accountants, lawyers, civil engineering contractors, engineering contractors, management contractors, laborers, subcontractors and specialist trades. The construction industry‘s importance has been confirmed by several studies (Coble and Haupt,1999).

Nearly all construction sites are temporary in nature and, during the construction process, are constantly changing. This always leads to the temptation to compromise on health and safety issues, such as the provision of adequate welfare facilities or the safe re-routing of site traffic. In addition the construction sector is characterized by a very fragmented structure in the production phase with a large number of independent companies. This type of organization often makes management assignments in the building sector difficult and complex. It is not unusual that several sub-contractors are involved in a single construction project, often more than one at a time, with varying influence on their own and other sub-contractors ‘working conditions. A division of decisions and authority between different, legally separate companies have often made

placing responsibility diffuse and difficult. The client, the consulting engineers, architects, general contractor and a number of subcontractors carry out the building jointly. Moreover, at any given time, there are many young people receiving training on site in the various construction trades. These trainees need supervision and structured training programs. A further characteristic of the construction industry, that makes management of this sector more troublesome, is the unfavorably high supervisor-worker ratio. Supervisors who have more a personal and positive relationship with workers have more favorable safety performance records (Hinze, 1997; Levitt &Samelson, 1993).This relationship is harder to develop if the ratio is too high, which is generally the case within the construction industry (Smallwood, 2000).

Rowlinson and Lingard (1996) have attributed the prototype nature of construction projects, the transient nature of work, low education levels of the workforce and high levels of subcontracting, as major contributing factors to poor safety records within the construction industry worldwide. In conclusion, it can be said that the majority of the contractors especially the subcontractors are reluctant to implement occupational health and safety program at construction sites.

2.3. Empirical review

2.3.1. Characteristics of construction industry

Construction is a vast and an active economic sector, which is also considered as backbone of the world's economy in general (Panassaya, 2015). Particularly in Ethiopia, this sector mobilizes an enormous amount of various resources and budgets that embraces huge manpower of different professions by creating a large job opportunity (Lucy, 2016).

Construction Industry is an industry which is involved in the planning, execution and evaluation (Monitoring) of all types of civil works. Physical infrastructures such as Building, Communication and Energy related construction works; Water supply and Sewerage civil works, etc are some of the major projects / programs in the construction Industry.

The Construction Industry can be categorized into three major sectors; namely,

I. Transport and Communication (Road, Railway, Airway, and Telecommunication related physical works).
II. Water and Energy works ; and

III. Buildings and Other Physical Infrastructures

Accordingly, their capital budget requirements vary extensively depending on the focus the economical trend requires for the nation development. Construction Industry has long been realized as one among the most important enablers for social, economic and political development of countries. Specifically this fact is strengthened in the case of least developing countries like Ethiopia. This is because on the one hand these projects are inter- sectoral, and on the other hand the demand of such infrastructures in these countries consume substantial amount of their capital budget. Characteristics of construction industry can further be divided by its features of output, its size, government as a main client, nature of demand for construction output, nature of construction work, variety of construction technology, and structure industry

2.3.2. Health and safety management practices in construction industry

The construction industry has a high number of fatalities and long term injuries. This is unacceptable in modern society and it also makes the industry inefficient. Occupational health and safety has been defined by the International Labor Organization (ILO), 2001 as "The prevention and maintenance of the highest degree of physical, mental and social well – being, the prevention of ill – health among workers caused by their working conditions, the protection of workers from factors adverse to their health in their employment, and the placing and maintaining workers in occupational environments adapted to their individual and psychological conditions." Health refers to the protection of bodies and minds of people from illness resulting from materials, processes or proceeding used in the workplace whereas safety is protection of people from physical injury (Hughes and Ferret, 2008). Safety means a state in which no danger of a damage causing accident exists.

2.3.3. Factors affecting safety and health performance in construction

The construction industry has faced a wide range of challenges especially due to the occurrences of accidents or incidents or hazards at the site. The main cause of accidents is poor health and safety performance of the workers from a combination of contributing causes (Nawi et, al 2016) According to Nawi et al. (2016), there are four categories of factors affecting safety performance that should be focused on, which are: *management, safety culture, behavior and awareness*. On the other hand, Couto et al. (2017) highlighted time barriers as the factors affecting safety

performance at construction sites. Safety performance can be influenced by factors including top management's and project managers' poor safety awareness, poor safety resource, lack of training and reckless operations (Tam, Zeng, and Deng, 2004).

Table 2.1. Summary of literatures on factors affecting the safety and health performance in construction

Factors	**Author(s) and year of publication**	**Health and safety management practices**
Personal protective equipment (PPE)	(Al – Kaabi and Hadipriono, 2003), (Kenrick, 2012)	Lack of and inappropriate PPE were related to the incident that caused the injury.
Work environment	(Mattila, et al 1994), (Site – Safe, 1199)	Poor housekeeping and the untidy construction sites had the largest contributing factors to accidents,
Improper accidents/incidents report	(Al – Kaabi and Hadipriono, 2003), (Hassanein and Hanna, 2008), (Shibani, et al..,2012)	Managers are kept aware about where accidents are occurring so that they can dedicate their responsiveness to problem areas.
Safety and Health policy	(Sawacha,..et al…1999), (Shibani, et al,.2012)	Accomplished when top management takes a dynamic attention and is dedicated to safety and health improvement as well as maintaining good safety and health policy.
Weather condition	(Brake and Bates, 2002), (Neitzel, et al,…2001)	Extreme weather conditions have direct effect on safety and health performance. There are signs for heat stress like; nausea, headache, fatigue, excessive thirst, profuse swearing, confusion, painful large muscle cramps and loss of consciousness. Those signs of heat stress can lead to heat cramps, heat exhaustion, or heatstroke, which if untreated or sufficiently severe, may lead to death.
Complexity of design	(Hinze and Wiegand, 1992) (Kartam, et al..,2000)	Safety and health performance was found to be influenced when designers improve awareness to the safety consequences of their design decisions.

2.3.4. Research works on health and safety practice in construction industry

The activities of the construction industry have raised serious health and safety concerns amongst governments, health and safety stakeholders, health and safety professionals and researchers over the past few decades (Enhassi and Mayer 2002, Gibb 2005, ILO 2005). Health and safety management in the construction industry has evolved from measures adopted in accident prevention to more systematic and proactive approaches to minimizing the risk of hazards in the industry.

Table 2.2. Summary of literature review on safety in construction industry

Title	Author and year	Objective	Findings
A survey of work- related injuries among building construction workers in south western Ethiopia.	Lette,..etal…(2018)	Assessment of the prevalence of injury and associated factors among building construction workers in south western Ethiopia.	Working without personal protective equipment (PPE), absence of vocational training, chewing chat and working overtime were significantly raised the probability of having work related injuries among construction workers.
Occupational health and safety status of ongoing construction work Patuakhali science and technology university, Dumki, Patuakhali.	Hasan, et, al…(2017)	Addressing the major health and safety related hazards in construction site in PSTU and recommending some management options to reduce health related hazards and thereby increases safety.	Falling from height, being hit by falling objects, back and muscle pain (due to manual handling), ill health caused by hazardous chemicals, dust, noise, fire injury are found to be the major hazards in the PSTU construction site.
Health hazards risk and safety practice in construction site (review study)	Vitharana. et,al..(2015)	To identify the major health hazards, risks and causes of poor safety practices in construction sites. In addition, the differences in safety practices in both developed and developing countries and methods to improve construction site safety is also	By comparative analysis, health hazards in construction site can be categorized into two: acute health hazards and chronic health hazards. Mostly reported acute health hazards are ; workers fall from height and electric shocks while mostly reported

		identified.	chronic hazard is exposure to hazardous substance.
Challenges of mega construction projects in developing countries	Ahmad and Othman (2013)	To identify, validate and classify the challenges of delivering mega construction projects in developing countries.	The identified challenges are: engineering challenges, human development challenges and sustainability challenges.
Issues of construction site safety and health in developing countries: A case of Jordan	Alkilani et al (2013)	Case study of the Jordanian construction industry and its health and safety practices.	The findings highlight that a lack of government commitment exemplified by regulation , policy and legal regulation, policy and legal constraints that limit the operational efficiency of government departments responsible for health and safety management, thus hindering the development of good health and safety practices.

2.3.5. Incorporating health and safety with project management

Recent researches in construction site accidents suggest many accidents on construction sites can be prevented by taking all the necessary steps in all phases of the project life. Every stakeholders in a project have a role to play in improving the health and safety performance of construction sites and completed projects. Current thoughts on health and safety in construction put emphasis on integrating health and safety management in the entire construction process. This view of integrating health and safety management into construction processes requires responsibility for health and safety to be equitably shared between the key stakeholders in a construction project.

Hinze (1998) has emphasized, addressing the safety of construction workers in the design phase involves recognizing the potential impact designers' decisions can have on the health and safety of construction site workers. Integration of health and safety into project planning has been promoted by authors such as Kartam (1997), Cameron and Duff (2002), Murray (2002), Saurin et al. (2004). The work of these authors have each sought to explore avenues for managing health and safety as integral aspect of projecting planning during one or more of the phases of project

execution. For instance, one of the most recent studies, Hare et al. (2006) investigated the integration of health and safety with the pre – construction phase of projects. The authors highlighted the importance of effective teams and effective two – way flow of information for successful integration.

2.3.6. Legal aspect of safety and Health management

Cotton et al., (2005) noted that the institutional and legal governance frameworks on occupational health and safety in developing countries have little impact. The majority of contractors are small and medium Enterprises operating within their domestic markets where enforcement of health and safety standards is very lax. Enforcement of health and safety regulations remains a problem due to lack of adequate resources available to government institutions responsible for occupational health and safety administrations.

The issue of governing safety and health at work on legal basis in Ethiopia dates back to 1940's when the first legal instrument proclamation No. 58/1945 was promulgated. The origin of this legislation was the result of the advent of industrialization that took place in the country. This legislation was framed itself on the basic principles underlined by the two notable ILO conventions on Labour inspection. A more comprehensive legislation on occupational safety and health management replaced this in 1964 i.e. Proclamation232/1964 in order to address the change occurred.

The parent legislative frame work of the land is the constitution of the Federal Democratic Republic of Ethiopia Proclamation No. 1/1995 (21st August, 1995). This grand legislation has several articles pertaining to matters of decent work in general and of safety, health and Working environment in particular.

Unlike many countries in Ethiopia there is one comprehensive labor law that is operating in order to address all aspects of ensuring labor relations to be governed with basic fundamental rights and obligation focusing on industrial peace in all working places. The law applies to all employer employee relationship or undertaking who employs one or more persons.

The Labour Proclamation No.1156/2019 states **"**There is a need to create favorable environment for investment and achievement of national economic goals without sacrificing fundamental workplace rights by laying down well considered labour administration; and determine the duties

and responsibilities of governmental organs entrusted with the power to monitor labour conditions; occupational health and safety; and environmental protection together with bilateral and tripartite social dialogue mechanisms; political, economic and social policies of the country”

2.4. Research Gaps

The above researches examined and evaluated the topic based on the following major construction industry activities on sites this are: occupational safety and health factors on building construction worker, construction hazard and injuries in construction projects, challenges of construction projects in developing countries, analyzing building construction accidents in different projects and construction cost analysis

Accordingly, it has been investigated that most of the articles only focus on different construction injuries, analyzing accidents in different private building construction projects and also safety and health factors in construction works. Generally the topics or issues which are addressed in the literatures or articles but not fruitful are: construction and safety management mechanisms, engineering aspect and root causes analysis for each and every accidents and hazards.

Another gap identified from the literature review is that generally there is a shortage of research done on building construction sectors especially in Addis Ababa regardless of the many construction projects.

Chapter Three: Research Design and Methodology

This section discusses the research design, research process, sample and sampling technique, sources, tools and procedures of data collection and method of data analysis employed for the study.

3.1. Research design and approach

This study used descriptive research design approach. Questionnaires were used to gather information. This type of research design will help to identify the nature of the health and safety measures used on the construction sites and to evaluate their enforcement mechanisms on construction sites.

In addition, interviews were undertaken with managers, site supervisors and other site personnel. Questionnaires were used as the main instruments of data collection. The questionnaires were self-administered whereby they were hand delivered to the respondents to complete the questionnaires themselves. Direct observations of construction sites are made to observe and document job site organizations, work practices, equipment and tools handling and others.

3.2. Data types, sources and method of data collection

In this study, both primary and secondary data were used. Primary data is collected through questionnaire and interviews through oral communication were undertaken.

3.3. Validity and reliability

To guarantee the validity of the collected data and to give added depth the questionnaire was initially piloted by few members of project managers to ensure consistency, clarity and relevancy, and cross checking was also done. Each piece of data to be gathered from official sources was double checked with data from other secondary sources. The main reason for cross checking is to nullify errors from data and to have enough confidence over the data. This helps in drawing a conclusion that is more meaningful and reliable.

3.4. Target population

The population of the study comprises 50 employees of the company that are engaged in the building construction projects (PM's, safety engineer, office engineers, site engineers, quality engineers, electrical engineer, sanitary engineer & others) with engineering educational background and expertise.

Census (complete enumeration) is used for the target population. This method is used because of the small number of study population. The census comprises the population of the 2 grand projects which are currently being undertaken by ELMIOLINDO contractors P.L.C in Addis Ababa, Ethiopia.

3.5. Data analysis and presentation

In this study, descriptive statistics was the major technique used to analyze the information gathered. Data collected through questionnaires were analyzed using quantitative descriptive statistics with the help of Microsoft Excel spreadsheet and SPSS software the relative importance index method (RII) was used to determine and rank the construction phases and the relative emphasis they require on health and safety and analyzed by the program MS-Excel. The relative importance index is computed as (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007): using the formula below;

$$RII = \frac{\sum W}{AN}$$

Where:

RII is relative importance index,

W is the weight given to each factor by the respondents and ranges from 1 to 5

A = the highest weight = 5

N = the total number of respondents

3.6. Organization of the study

This paper is organized into five chapters. Chapter one provides the introductory aspect of the study which encompasses the background of the study, statement of the research problem, objective of the study, the research question, significance of the study, scope of the study, limitation of the research and organization of the research. Chapter two presents literature review with general descriptions by different researchers on construction, safety and health management practice. Chapter three is about research design and methodology Chapter Four presents data analysis and interpretation. And the last chapter is conclusion and recommendations.

3.7. Research ethics

All the ethical issues needed to be considered in a scientific research is considered in this study. The study results depended on the data provided by the respondents and the qualitative data obtained from interview and the process was realistic and bias free. In addition, the researcher asked for the consent of the interviewees and pledged to keep confidentiality of the information gathered to conduct the study.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter discusses the results of collected data from questionnaire, observation and other documented sources in different sub topics on health and safety management practice in building construction projects in Addis Ababa. The topics mainly focus on local grade one contractor which is known as ELMIOLINDO construction P.L.C. The analysis has five parts, the first part, is general information about respondents. Part two states information about the project. Part three contains information about health and safety related issues on building construction sites. Part four discusses about health and safety management practices and the final part, which is part five deals with safety and health performance factors evaluation. Organizing questionnaire and other data in a systematic manner is very crucial to have a clear and unambiguous set of information and data that can easily be understood and also to make the analysis easier. The analysis is done

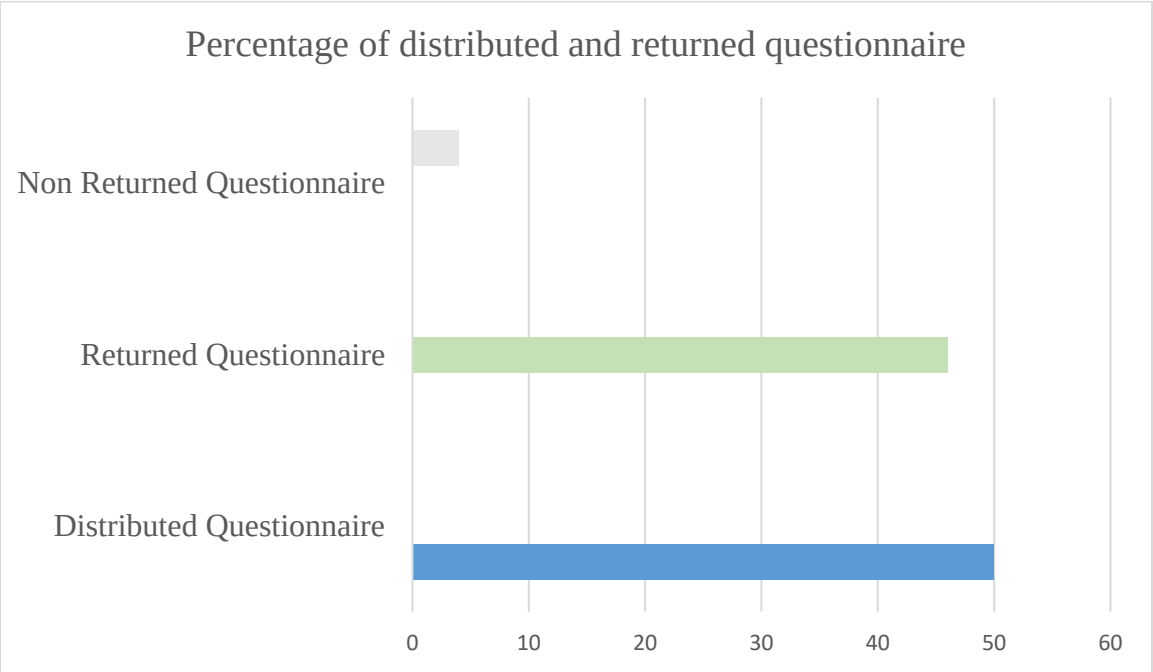
using IBM SPSS software and descriptive statistics such as: averages, percentages, median and mode are used. In addition to the pilot study, Cronbach alpha coefficient is used to test the reliability of the study. Tables and charts are used to present the data; to provide easier understanding and to create a clear picture of the information to be delivered.

4.2. Response Rate

In this chapter, the analysis of the distributed questionnaire is presented. The analysis presents statistical results of the collected questionnaire using quantitative method. The following section demonstrates the number of survey questionnaires distributed to the projects of the company and provides an overall picture of the response rate.

The questionnaire was designed and distributed to the respondents to investigate health and safety management practice in building construction projects which are currently being undertaken by ELMIOLINDO Construction Company in Addis Ababa. 50 copies were distributed to the respondents. The respondents contain: Project managers, project site engineers, project office engineers, human resource managers, safety officers, data collectors, quality control engineers, safety coordinators and logistics engineers. Out of the 50 distributed questionnaires, 46 questionnaires were filled out and returned representing 92 % response rate. 8 % failed to respond. The following figure shows the percentage of both distributed and received questionnaires:

Figure 4.1 Questionnaires distributed vs. Questionnaires returned



Source: (Own survey, 2020)

4.3. Demographic Characteristics

This section briefly states the findings on the demographic characteristics of the sample, meaning educational background of respondent, job title of respondent, year of experience, job type, cost of project and average no of employees. The responses to each question is analyzed as a whole to present an overall view of the health and safety situation in the company.

Some interrelated questions are grouped together to make the analysis more sensible. The result is presented using appropriate frequency tables charts, figures and graphs.

4.3.1. Job title of respondents

Table 4.1. Position of person who completed the questionnaire.

Job title	Frequency	Percent
Project manager	2	4.3%
Project site engineer	19	41.3%
Project office engineer	9	19.6%

HR manager	2	4.3%
Safety Officer	5	10.9%
General Forman	2	4.3%
Quality Control engineer	3	6.5%
Logistics engineer	2	4.3%
Project engineer	2	4.3%
Total	46	100.0

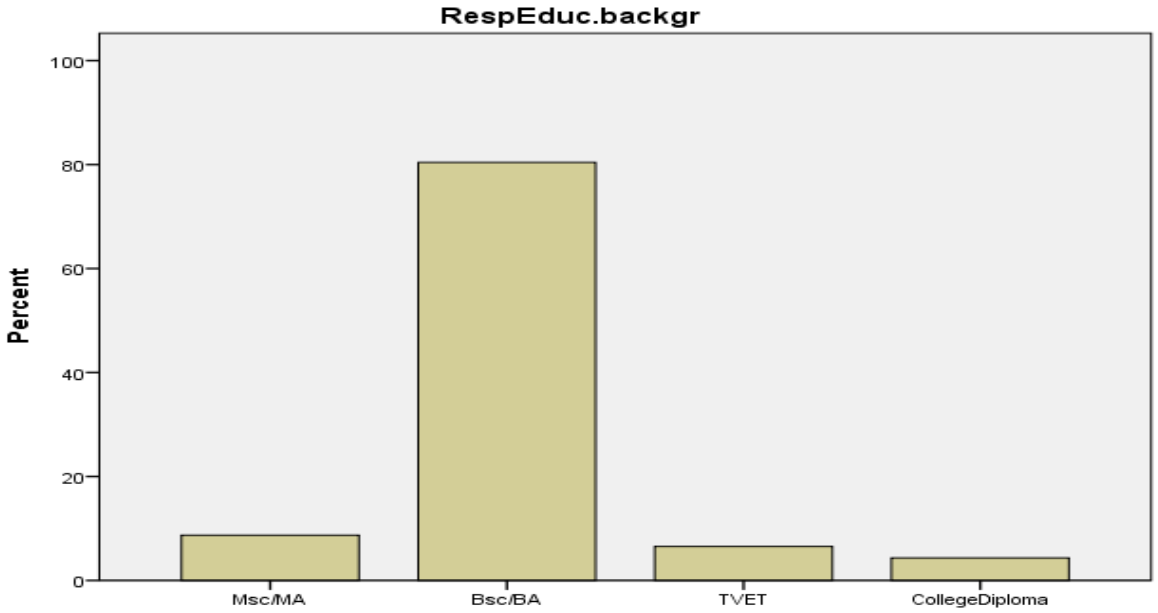
Source: (Own survey, 2020)

As stated in Table 4.1, 41.3% of the persons who filled the questionnaire are project site engineers, 19.6% are project office engineers, 10.9% of the respondents are project safety officers, 6.5% are quality control engineers and project managers, human resource managers, general formans, quality control engineers, logistic engineers and project engineers each represent 4.3% of the respondents.

4.3.2. Educational background and work experience of respondents

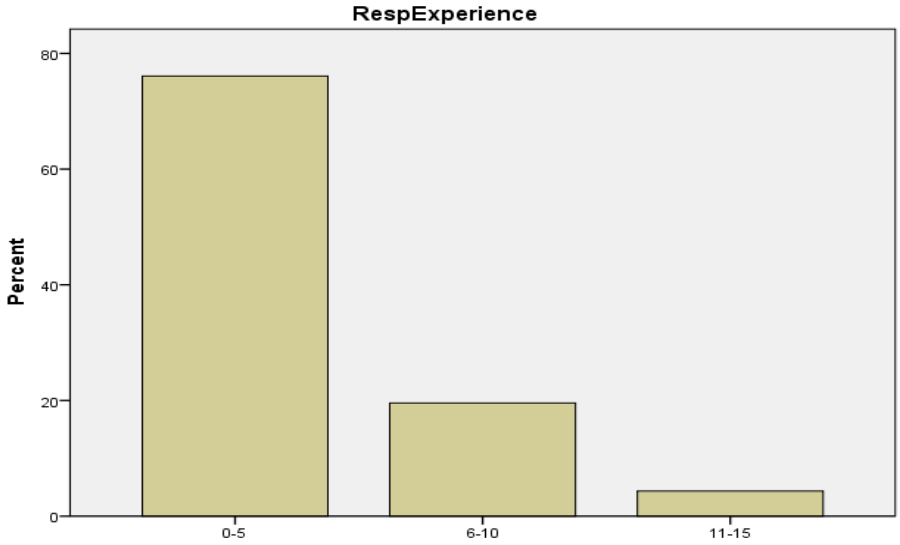
As it can be seen from the following bar chart, 14 of the respondents or about 80.4% of the respondents have BA/BSC, 8.7% or 4 of the respondents hold second degree, 3 of the respondents or 4.3% of the respondents have college diploma and 2 of the respondents (2.5%) are TVET graduates. When it comes to experience of workers in the construction industry 35 or 76.1% of the respondents have work experience of between 0 to 5 years, 9of the respondents or about 19.6% of them have between 6 to 10 years of experience and the remaining 4.3% or 2 of the respondents have worked in the construction industry between 11-15 years.

Figure 4.2 Educational background of respondents



Source: (Own survey, 2020)

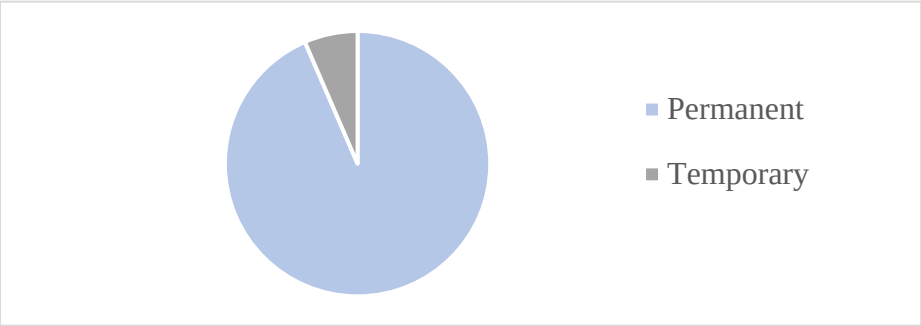
Figure 4.3 Experience of respondents in the construction industry



Source: (Own survey, 2020)

4.3.3. Job type of respondents

Figure 4.4. Job type of respondents



Source: (Own survey, 2020)

Out of the 46 respondents, 93.5% or 43 of them are permanently hired and 3 of them or about 6.5% of them are hired on temporary basis.

4.3.4. Cost of projects in of Ethiopian birr and Average number of employees

This project work has focused on two of the projects which are currently being undertaken by ELMIOLINDO Construction Company. One of the projects' cost is estimated to be between five hundred million and two billion Ethiopian birr and the number of employees, on average lies between 200 and 300. The other giant project which is being executed by ELMI is estimated to be greater than 2Billion Ethiopian birr and the number of employee is greater than three hundred.

4.4. Health and Safety related issues on building construction sites

4.4.1. Fatalities which take the highest number in each projects over the past 3 years

Both of the construction project sites have had an accident during construction over the past 3 years. From the collected data, temporary injury takes 78.3% of the work fatalities and this makes it the mostly occurring fatality in the given sites. This indicates that majority of the project fatalities are temporary injury and this resulted in a reduction of workers productivity through preventing them from work partially or totally for a specific period of time. This in turn lowers productivity of workforce which results in additional project costs such as, cost of delays, cost of project rescheduling such as crashing the project time, cost of replacing the injured employee, wages paid and many other related costs. In addition to temporary injury, Disability and death

take 16.2 and 6.5 percent of the fatalities respectively. This is not a small number because when we sum up this two, we get around 28% and this means out of 100 employees who were working for the company, about 28 of them were either disabled or dead over the past 3years.

Table 4.2. Type and frequency of fatalities

Type of fatality	**Frequency**	**Percent**
Death	3	6.5%
Disability	7	16.2%
Temporary injury	36	78.3%
Total	46	100

Source: (Own survey, 2020)

4.4.2. Reasons of accidents in construction sites

When we come to the reasons of those accidents, 50% of the respondents believe that the accidents that occur in construction sites are due to employee carelessness. 24% of the accidents result from management carelessness, 15% of the accidents are due to lack of personal protective equipment and the remaining 11% takes lack of safety guidelines. From this figure it can be said that 50% of the respondents blame the workers which include the respondents themselves for the fatalities that occur at workplace and the reason, will be discussed in the preceding section.

Table 4.3. Causes of accidents

Causes of accidents	**Frequency**	**Percent**
Lack of safety guidelines	5	10.9
Lack of PPE	7	15.2
Management carelessness	11	23.9
Employee carelessness	23	50.0
Total	46	100

Source: (Own survey, 2020)

4.4.3. Reasons of accidents in construction sites that are attributed to the management

Table 4.4. Reasons of accidents attributed to the management

Description	Frequency	Percent
Failed to hire employee safety officer	5	10.9
Failed to prepare employee safety guideline	24	52.5
Failed to prepare safety training to the workers	17	37.0
Total	46	100

Source: (Own survey, 2020)

From the data analysis and as it can be seen from the above table, 52% of the respondents believe that the major reason of accidents that is concerned to the management is that the management failed to prepare site specific employee safety guidelines. Meanwhile, about 37% of the respondents believed that the management failed to prepare safety training to the employees and the remaining 11% believed that the management failed to hire enough amount of employee safety officer. From this figure, it can be deducted that at these sites, lack of safety officer is not the major reason for poor health and safety performance but lack of employee safety guideline and lack of proper training is. We can link this finding to the previous section and say that the reason why the workers are so careless about their health and safety at workplace is that they don't have enough awareness and knowledge about the issue. In addition, the workers do not have a guideline to follow on how to protect themselves from workplace fatalities.

4.4.4. Reasons of accidents in construction sites that are attributed to the employees

Description	Frequency	Percent
Do not have proper training on health and safety	25	54.3

Do not have experience in using equipment and machinery	7	15.2
Do not have safety culture	11	23.6
Do not have motivation to protect themselves from injury	3	6.5
Total	46	100

Table 4.5. Reasons of accidents attributed to the employee

Source: (Own survey, 2020)

As it can be seen from the above about 54.3% of the respondents believe the major reason of accidents attributed to the workers is that the employees did not get a proper and formal training on health and safety issues. 24% of the respondents believe that the employees do not have safety culture. 15.2% of the respondents believe that the workers do not have experience and knowledge on how to operate equipment and machineries and the remaining 6.5% of the respondents said the employees do not have motivation to protect themselves from injuries that occur at construction sites. The other information the researcher gathered through oral interview is that the workers are very negligent in protecting themselves from injuries and this is due to lack of awareness and knowledge.

4.4.5. Who should take responsibility for the accidents that occur during construction on site?

Table 4.6. Responsible parties for accidents that occur at construction sites

Description	Frequency	Percent
The workers	4	8.7
The consultants	6	13.0
The contractors	33	71.7
The clients	3	6.5
Total	46	100

Source: (Own survey, 2020)

In addition to the measure of accidents in the sites, respondents were asked to respond to the question, “Who is responsible for the accidents that occur during construction on site” and results

were analyzed as shown in the above. Accordingly, majority of the respondents or about 72% of the respondents believe that the contractors shall be hold responsible for the accidents that occur on site. 13% of respondents said the consultants are responsible for the accidents; 8.7% of the respondents believe that the employee themselves are responsible for the accidents; whereas the remaining 6.5% of respondents blame the clients for the accidents that occur at construction site during construction.

From interview and documented sources, the researcher investigated that the contract document of the project clearly and precisely states that the responsibility of ensuring H&S of workers lies in the hands of the contractor and the contactor shall be hold responsible for any accident that occurs during construction period, hence supporting the respondents answer.

4.4.6. Description and frequency of injuries that occur at construction sites

Table 4.7. Description and frequency of injuries that occur at construction sites

Item number	Description	Frequency of injury and fatalities		
		High	Medium	Low
1	Fall from heights	13%	**45.7%**	41.3%
2	Struck by object	**60.9%**	30.4%	8.7%
3	Excavations (slides, collapse, etc.)	17.4%	**58.7%**	23.9%
4	Scaffolding(falling from scaffolding during construction)	**73.9%**	15.2%	10.9%
5	Sudden dismantling of construction hoists and elevators	4.3%	**82.6%**	13%
6	Cuts and lacerations	**71.7%**	17.4%	10.9%
7	Crashes and collisions	**76.1%**	15.2%	8.7%

8	Exposure to loud noise	19.6%	**47.8%**	32.6%
9	Electrocutions	10.9%	34.8%	**54.3%**
10	Fire （from electric, fuel, chemical)	19.6%	**63.0%**	17.4%

Source: (Own survey, 2020)

The above table shows the most commonly occurring dangerous and or hazardous conditions that occur during construction at construction sites. Respondents were requested to rate the frequency of those accidents. Accordingly, being struck by objects, falling from scaffoldings during construction, cuts and lacerations and crashes and collisions are the most frequently occurring hazards at construction sites. Whereas, fall from heights, slides and collapses during excavation, sudden dismantling of construction hoists and elevators, exposure to loud noises and fires that come from electric contact, and fuel and chemicals take average value. Finally electrocution is rated to be the least frequently occurring hazard.

4.5. Health and safety management practices

4.5.1. Availability of Health and safety staff at construction sites

Table 4.8. Availability of health and safety staff at construction sites

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
01	Do your construction projects/sites have a Safety Officer?	42	4	91.3	8.7
Reasons behind “No” answers					
A	Upper level management carelessness	4		8.7	

Source: (Own survey, 2020)

As it can be seen from the above table, majority of the respondents, about 91.3% witnessed the availability of health and safety staff at the construction site. The remaining 8.7% said that there is no health and safety management staff at the construction site and this is due to carelessness of upper level management, from this, we can say that the lack of poor health and safety management practice in those sites did not result from lack of health and safety management staff.

4.5.2. Suitability of the site layout for the health and safety of workers

Table 4.9. Suitability of site layout for health and safety of workers

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
02	Is the site layout suitable for health and safety of workers?	27	19	58.7	41.3
Reasons behind "No" answers					
A	The natural setting of the site is not suitable	19		41.3	

Source: (Own survey, 2020)

Regarding the issue of suitability of site layout for health and safety of workers, 58.7% of the respondents said that the site is suitable for health and safety of workers, while the remaining 41.3% of the respondents believed that the site layout is not suitable for health and safety of workers and the reason is the unsuitability of the natural setting of the ground. In addition to this, the researcher has made a site visit to see the general setting of the workplace. As a result, construction materials such as reinforcement bars, nails, sands and many other items were just simply put here and there in an organized and unsafe manner. The place is very dirty and it is hardly possible to walk around without a safety shoe, given corroded and dangerous materials are all over the place. The researcher tried to interview the project managers about the issue and the reason for this, according to the project managers is the narrowness of the construction place/site.

4.5.3. Availability of formally written company wide and project specific health and safety guideline

Table 4.10. Availability of health and safety guideline

Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**

03	Does the construction company has formally written health and safety guideline?	38	8	82.6	17.4
Reasons behind "No" answers					
A	Lack of contractual agreement	1		2.2	
B	Top management commitment problem	6		13.0	
C	Lack of enforcing law	1		2.2	
Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
04	Does the project have site specific health and safety guideline?	1	45	2.2	97.8
Reasons behind "No" answers					
A	Budget constraint	10		21.7	
B	Lack of contractual obligation	1		2.2	
C	No company health and safety policy in the firm	2		4.3	
D	Upper level management and commitment problem	32		69.6	

Source: (Own survey, 2020)

About 38 or 82.6% of the workers said the company has a companywide formally written health and safety guideline, the remaining 17.4% said that the company has no formally written health and safety guideline and the reason is upper level management and commitment problem, lack of enforcing law and lack of contractual obligation. When it comes to project site specific health and safety guideline, 97.8% of the respondents responded that the project site does not have site specific health and safety plan. From this, 69.6% of the respondents said the reason for the lack of project specific health and safety guideline is upper level management and commitment problem; 21.7% of the respondents said the reason is lack of budget constraint. 4.3% of the respondents believed there is no company health and safety policy in the firm and the remaining 2.2% said there is no contractual obligation related to this matter. From this figure, it can be seen that The Company has a companywide and broader health and safety guideline but not project specific health and safety management guideline. Uniqueness is one of the main characteristic of every

project, but here the company does not seem to have a health and safety guideline that is customized to the specific project sites.

4.5.4. Health and Safety inspection and audit

Table 4.11. Health and safety inspection and audit

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
05	Does health and safety inspections on site done regularly?	36	10	78..3	21.7
Reasons behind "No" answers					
A	Upper level management and commitment problem	5		10.9	
B	Lack of contractual obligation	2		4.3	
C	Lack of health and safety policy implementation on projects	3		6.5	
Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
06	During construction, does health and safety related issued get audited regularly?	21	25	45.7	54.4
Reasons behind "No" answers					
A	Upper level management and commitment problem	12		26.1	
B	Other	13		28.3	

Source: (Own survey, 2020)

Concerning health and safety inspection, 78.2% of the respondents said that the sites health and safety is inspected regularly. The remaining 21.7% claim that there is no regular health and safety inspection on site, and they put upper level management and commitment problem, lack of contractual obligation and lack of health and safety policy implementation on project as major reasons for this. The other important issues here is that the audit of health and safety related

matters. About 45.7% of the respondents said during construction, health and safety related issues get audited regularly. On the other hand, majority of the respondents, about 54.4% of the respondents believe that there is no health and safety audit. 26.1% of the respondents hold the upper level management responsible for this matter, while the remaining 28.3% said that there is no habit of writing reports and documenting files they believe that this is due to carelessness and lack of awareness of the concerned parties.

4.5.5. Issues related to health and safety resources

Table 4.12. Issues related to health first aids

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
07	Is there adequate first aid and first aider in your construction site?	37	9	80.4	19.6
Reasons behind "No" answers					
A	Budget constraint	8		17.4	
B	Upper level management and commitment problem	1		2.2	
Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
08	Is there a manual of instruction on how to use first aid tool kits?	21	45.7	25	54.3
Reasons behind "No" answers					
A	Budget constraint	6		13	
B	Upper level management and commitment problem	11		23.9	
C	Other	8		17.4	

Source: (Own survey, 2020)

When we came to health and safety resource, as inspected in each project sites through questioner, 80.4% of the respondents witnessed that there is adequate first aid and first aider(s) on their construction project sites. But when it comes to a manual of instruction on how to use first aids, about 54.3% of the respondents said there is no manual of instruction on how to use and the

top reason for this is upper level management and commitment problem and budget constraints. In addition, some of the respondents told the researcher through oral interview that even though there is a first aid tool on the sites, most of the workers do not know what to do with it.

Table 4.13. Issues related to personal protective equipment

Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
09	Does the firm provide adequate Personal Protective Equipment(PPE)	21	25	45.7	54.3
Reasons behind "No" answers					
A	Budget constraint	7		15.2	
B	Lack of awareness	1		2.2	
C	There is no contractual obligation	3		6.5	
D	There is no standard in the code of practice	2		4.3	
E	Other	12		26.1	
Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
10	Is there a manual of instruction on how to use Personal Protective Equipment (PPE)?	16	30	34.8	65.2
Reasons behind "No" answers					
A	Lack of awareness	17		15.2	
B	Budget constraint	11		23.9	
C	Lack of contractual obligation	1		2.2	
D	Upper level management and commitment problem	3		6.5	
E	Other	8		17.4	

Source: (Own survey, 2020)

When it comes to personal protective equipment, 45.7% of the respondents said that the company provides personal protective equipment (PPE) for employees while majority of the respondents or about 54.3% witnessed that there is no adequate amount of personal protective equipment provided for the workers. And some of the workers through interview, told the researcher that the

number of PPE'S available on site is disproportional to the number of workers and the essential PPE's such as safety shoe are given only to certain people, additionally, the quality of the PPE's on the site is very low, due to lack of standard in the code of practice and this is largely contributing to the fatalities that are occurring at the construction site. The reasons for this, as replied by the respondents is, budget constraint and lack of awareness, among others. In addition, about 65.2% of the respondents said that there is no manual of instruction on how to use the Personal Protective Equipment. For example, there are different types of safety shoes used under different circumstances and phases of construction periods but, the safety shoes and other PPE's come with no instruction and unpacked, and the respondents largely believe that this again is related to the quality of the materials, since most of the materials which are of a good quality come along with an instruction on how to use them. For this problem, majority of the respondents believe that there is lack of budget, while others believe that this is due to lack of awareness by the concerned parties and upper level management and commitment problem.

4.5.6. Managers support in health and safety activities

Table 4.14. Managers support in health and safety activities

Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
11	Do managers encourage and support worker participation in health and safety activities?	17	29	37	63
Reasons behind "No" answers					
A	Budget constraint	3		6.5	
B	Lack of awareness by all parties in the industry	15		32.6	
C	Upper level management and commitment problem	3		6.5	
D	Lack of health and safety policy implementation on projects	7		15.2	
E	Other	4		8.7	
Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
12	Does separate data sheet provided for all hazardous materials on site?	26	20	56.5	43.5

Reasons behind “No” answers			
A	Budget constraint	4	8.7
B	Upper level management and commitment problem	4	8.7
C	There is no contractual obligation	10	21.7
D	There is no standard in the code of practice	2	4.3

Source: (Own survey, 2020)

The other issue is concerned with managers’ role in improving health and safety of workers. While 37% of the workers said there is managers support in health and safety activities, majority of the respondents about 63% of them believed that managers are not playing an active role in improving the health and safety at work place, the reason for this; the respondents said, is lack of health and safety policy implementation on projects, lack of awareness by all parties in the industry, and upper level management and commitment problem. In addition, 56.5% of the respondents said that there is no separate data sheet provided for all hazardous materials on site and the reason for this is there is no contractual obligation that mandates that managers/the company to do so. This number implies that the company has a very significant limitation on works that need to be done in improving the health and safety of workers.

Table 4.15. Supervision of staffs trained in health and safety

Item no	**Description**	**Frequency**		**Percent**	
		Yes	**No**	**Yes**	**No**
13	Does proper supervision by staff trained in Health and Safety get carried out on your project?	2	44	4.3	95.7
Reasons behind “No” answers					
A	Budget constraint	6		13	
B	Upper level management and commitment problem	11		23.9	
C	Lack of educated personnel in the area of knowledge	23		50.0	
D	Lack of Health and Safety policy implementation on projects	4		8.7	

Source: (Own survey, 2020)

Majority of the respondents, 95.7% of them said that there is no supervision on staff trained in health and safety of workers. From this 95.7% of respondents, 50% of them believed the reason for this is lack of skilled personnel in the area of knowledge, 24% of the respondent said this is due to upper level management and commitment problem, while the remaining respondents said this is due to budget constraint and lack of health and safety policy implementation on projects. This figure clearly describes that there is no supervision of health and safety by staffs trained in health and safety in those sites due to lack of educated or trained workers in health and safety.

4.5.7. Government and local authority follow up and contribution in improving health and safety in the projects

Table 4.16. Government contribution in improving health and safety

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
14	Do local authorities and health and safety enforcement agencies visit sites for inspection?	2	44	4.3	95.7
Reasons behind "No" answers					
A	Lack of attention from government	29		63.0	
B	Budget constraint	2		4.3	
C	Lack of skilled personnel	2		4.3	
D	There is no standard in the code of practice	11		23.9	

Item no	Description	Frequency		Percent	
		Yes	No	Yes	No
15	Is there a governmental or non-governmental organization follow up and contribution in improving safety in the construction projects?	1	45	2.2	97.8
Reasons behind "No" answers					

A	Lack of attention from government	15	32.6
B	Budget constraint	17	37.0
C	Lack of skilled personnel	4	8.7
D	There is no standard in the code of practice	9	19.6

Source: (Own survey, 2020)

The last subtopic for this section is concerned with the role of the government on following up the health and safety of workers at construction site. Accordingly, 95.7% of the respondents said that there is no site visit, inspection and audit from local authorities concerning the health and safety of workers at construction site, about 63% of the respondents said the reason for this is lack of attention from government while others believed that there is no contractual obligation and standard in the code of practice. Likewise, about 97.8% of respondents said that there is no governmental or nongovernmental organization that follows up and contribute in improving health and safety in construction projects. The labor proclamation 377/2003 states that labour inspectors at Federal and Regional level are responsible for "ensuring the implementation of provisions" concerning a wide range of topics in all sectors of employment. Promoting and encouraging good health and safety of workers at workplace is among the functions, but as we have seen from the respondents answer, the implementation of this proclamation, by the concerned party (MOLSA) is under question.

4.5.8 Construction Phases and the relative emphasis they require on health and safety management practice

Table 4.17. Construction phases and the relative emphasis they require on health and safety practices

Item number	Construction Phase	Mean	Standard deviation (σ)	Coefficient of variation (CV)	Relative Importance Index(RII)	Rank
1	Mobilization	9.59	0.65	0.06	14.13	10

2	Demolition and site clearance	2.69	0.55	0.2	83.04	3
3	Erection of hoardings, welfare facilities and so on	7.08	0.55	0.07	39.13	7
4	Setting out	4.91	0.58	0.11	60.87	5
5	Excavation and foundation installation	2.15	0.59	0.27	88.48	2
6	Frame construction	6.04	0.46	0.07	58.26	6
7	Cladding installation	1.37	0.67	0.48	102.39	1
8	Roofing	4.09	0.51	0.12	76.52	4
9	Lighting, mechanical and electrical system	9.4	1.02	0.1	25.44	9
10	Utilities and other finishing works	8.09	0.69	0.08	38.91	8

Source: (Own survey, 2020)

As shown in the above table, most of respondents ranked cladding installation to be the first phase that requires proper health and safety management follow up. Next to that Excavation and foundation installation requires emphasis, demolition and site clearance come third. Roofing, setting out, frame construction, erection of hoardings and welfare facilities, utilities and other finishing works, lighting mechanical and electrical systems and finally mobilization are ranked consecutively based on their RII and average value. To check the response variability standard deviation and coefficient of variance were used; CV<1 indicates a relatively low variation.

4.6. Health and Safety Performance Factors Evaluation

Table 4.18. Health and safety performance factors evaluation

Item	Factor description	Degree of impact						Mean	RII
		High		Average		Low			
		Freq	Aver	Freq	Aver	Freq	Aver		
1	Design complexity	36	78.3	7	15.2	3	6.5	1.28	90.58
2	The project budget	39	84.5	3	6.5	4	8.7	1.24	91.3
3	The project schedule	36	78.3	7	15.2	7	6.5	1.28	90.58
4	Environmental condition	9	19.6	34	73.9	3	6.5	1.87	71.01
5	Whether condition	34	73.9	9	19.6	3	6.5	1.32	89.13
6	Work environment	33	71.7	9	19.6	4	8.7	1.37	87.68
7	Personal protective equipment (PPE)	40	87.0	5	10.9	1	2.2	1.15	94.93
8	Provision of first aid	29	63.0	13	28.3	4	8.7	1.45	84.78
9	Safety signs, signals and barricades	35	76.1	7	15.2	4	8.7	1.32	89.13
10	Safety and health inspection	38	82.6	4	8.7	4	8.7	1.26	91.3
11	Accidents and incidents misreport	13	28.3	33	71.7	0	0	1.72	76.81
12	Reward and punishment systems	32	69.6	10	27.7	4	8.7	1.39	86.96
13	Safety and health policy	40	87.0	5	10.9	1	2.2	1.152	94.93
14	Contractual specification on health and safety	34	73.9	9	19.6	3	6.5	1.32	89.13

Source: (Own survey, 2020)

As we can in the above table based on frequency and Relative Importance Index, personal protective equipment and safety and health policy are ranked to have high degree of impact on health and safety.

The project budget and safety and health policy are ranked second, design complexity and the project schedule are ranked third. Weather condition, safety signs signals and barricades and contractual specification on health and safety are ranked fourth on the relative impact they have on health and safety of construction workers. Work environment, reward and punishment systems, provision of first aid, accidents and incidents misreport, and environmental conditions are ranked respectively based on the relative degree of impact they have on health and safety of workers in construction industry.

CHAPTER FIVE: - SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Introduction

The fifth and the final chapter of this project work reflects on the major findings of the study, what we can conclude from the findings and the recommendation that can be made based on these findings.

5.2. Summary of major findings

The construction industry is categorized under the most hazardous industries across the globe. As shown in the literature review section of this study, empirical reviews revealed that the industry has poor health and safety performance record. This project work is conducted on safety and health management practice in some selected sites of construction projects which are currently being undertaken by ELMIOLINDO contractors PLC.

The study has tried to assess the current health and safety management of the sites. Both of the construction project sites have had an accident during construction over the past 3 years. From the collected data, temporary injury takes the largest share of the work fatalities and this makes it the mostly occurring fatality in the given sites. In addition to temporary injury, disability and death are among the fatalities. When we come to the reasons of those accidents, 50% of the respondents believe that the accidents that occur in construction sites are due to employee carelessness. 24% of the accidents result from management carelessness, 15% of the accidents are due to lack of personal protective equipment and the remaining 11% takes lack of safety guidelines.

From the data analysis, 52% of the respondents believed that the major reason of accidents that is concerned to the management is that the management failed to prepare site specific employee safety guidelines. Meanwhile, about 37% of the respondents believed that the management failed to prepare safety training to the employees and the remaining 11% believed that the management failed to hire enough amount of employee safety officer. Again, 54.3% of the respondents believe the major reason of accidents attributed to the workers is that the employees did not get a proper and formal training on health and safety issues. 24% of the respondents believe that the workers do not have safety culture. 15.2% of the respondents believe that the workers do not have

experience and knowledge on how to operate equipment and machineries and the remaining 6.5% of the respondents said the employees do not have motivation to protect themselves from injuries that occur at construction sites.

The other information the researcher gathered through oral interview is that the workers are very negligent in protecting themselves from injuries and this is due to lack of awareness and knowledge. , majority of the respondents or about 72% of the respondents believe that the contractors shall be hold responsible for the accidents that occur on site. 13% of respondents said the consultants are responsible for the accidents; 8.7% of the respondents believe that the employee themselves are responsible for the accidents; whereas the remaining 6.5% of respondents blame the clients for the accidents that occur at construction site during construction.

Respondents were asked to rate the frequency of accidents and accordingly, being struck by objects, falling from scaffoldings during construction, cuts and lacerations and crashes and collisions are the most frequently occurring hazards at construction sites. Whereas, fall from heights, slides and collapses during excavation, sudden dismantling of construction hoists and elevators, exposure to loud noises and fires that come from electric contact, and fuel and chemicals take average value. Finally electrocution is rated to be the least frequently occurring hazard.

Concerning health and management practices, majority of the respondents, about 91.3% witnessed the availability of health and safety staff at the construction site. The remaining 8.7% said that there is no health and safety management staff at the construction site and this is due to carelessness of upper level management. Regarding the issue of suitability of site layout for health and safety of workers, 58.7% of the respondents said that the site is suitable for health and safety of workers, while the remaining 41.3% of the respondents believed that the site layout is not suitable for health and safety of workers and the reason is the unsuitability of the natural setting of the ground.

About 38 or 82.6% of the workers said the company has a companywide formally written health and safety guideline, the remaining 17.4% said that the company has no formally written health and safety guideline and the reason is upper level management and commitment problem, lack of

enforcing law and lack of contractual obligation. When it comes to project site specific health and safety guideline, 97.8% of the respondents responded that the project site does not have site specific health and safety plan. From this, 69.6% of the respondents said the reason for the lack of project specific health and safety guideline is upper level management and commitment problem; 21.7% of the respondents said the reason is lack of budget constraint. 4.3% of the respondents believed there is no company health and safety policy in the firm and the remaining 2.2% said there is no contractual obligation related to this matter.

Concerning health and safety inspection, 78.2% of the respondents said that the sites health and safety is inspected regularly. The remaining 21.7% claim that there is no regular health and safety inspection on site, and they put upper level management and commitment problem, lack of contractual obligation and lack of health and safety policy implementation on project as major reasons for this. The other important issues here is that the audit of health and safety related matters. About 45.7% of the respondents said during construction, health and safety related issues get audited regularly. On the other hand, majority of the respondents, about 54.4% of the respondents believe that there is no health and safety audit. 26.1% of the respondents hold the upper level management responsible for this matter, while the remaining 28.3% said that there is no habit of writing reports and documenting files they believe that this is due to carelessness and lack of awareness of the concerned parties.

Speaking of health and safety resources, as inspected in each project sites through questioner, 80.4% of the respondents witnessed that there is adequate first aid and first aider(s) on their construction project sites. But when it comes to a manual of instruction on how to use first aids, about 54.3% of the respondents said there is no manual of instruction on how to use and the top reason for this is upper level management and commitment problem and budget constraints. In addition, some of the respondents told the researcher through oral interview that even though there is a first aid tool on the sites, most of the workers do not know what to do with it.

When it comes to personal protective equipment, 45.7% of the respondents said that the company provides personal protective equipment (PPE) for employees while majority of the respondents or about 54.3% witnessed that there is no adequate amount of personal protective equipment

provided for the workers. And some of the workers said that the number of PPE'S available on site is disproportional to the number of workers and the essential PPE's such as safety shoe are given only to certain people, additionally, the quality of the PPE's on the site is very low, due to lack of standard in the code of practice and this is largely contributing to the fatalities that are occurring at the construction site. The reasons for this, as replied by the respondents is, budget constraint and lack of awareness, among others. In addition, about 65.2% of the respondents said that there is no manual of instruction on how to use the Personal Protective Equipment. For example, there are different types of safety shoes used under different circumstances and phases of construction periods but, the safety shoes and other PPE's come with no instruction and unpacked, and the respondents largely believe that this again is related to the quality of the materials, since most of the materials which are of a good quality come along with an instruction on how to use them. For this problem, majority of the respondents believe that there is lack of budget, while others believe that this is due to lack of awareness by the concerned parties and upper level management and commitment problem.

Another issues is managers' role in improving health and safety of workers. While 37% of the workers said there is managers support in health and safety activities, majority of the respondents about 63% of them believed that managers are not playing an active role in improving the health and safety at work place, the reason for this; the respondents said, is lack of health and safety policy implementation on projects, lack of awareness by all parties in the industry, and upper level management and commitment problem. In addition, 56.5% of the respondents said that there is no separate data sheet provided for all hazardous materials on site and the reason for this is there is no contractual obligation that mandates that managers to do so, and again there is a budget constraint, no standard in the code of practice and upper level management and commitment problem.

Majority of the respondents, 95.7% of them said that there is no supervision on staff trained in health and safety of workers. From this 95.7% of respondents, 50% of them believed the reason for this is lack of skilled personnel in the area of knowledge, 24% of the respondent said this is due to upper level management and commitment problem, while the remaining respondents said this is due to budget constraint and lack of health and safety policy implementation on projects.

The other important issue is the role of government in improving the health and safety of workers. Accordingly, 95.7% of the respondents said that there is no site visit, inspection and audit from local authorities concerning the health and safety of workers at construction site, about 63% of the respondents said the reason for this is lack of attention from government while others believed that there is no contractual obligation and standard in the code of practice. Likewise, about 97.8% of respondents said that there is no governmental or nongovernmental organization that follows up and contribute in improving health and safety in construction projects. This again, as said by the respondents, calls for lack of attention from government on the issue, lack of skilled personnel, lack of standard in the code of practice and lack of budget.

5.3. Conclusions

The main objective of this project was to assess the practice of health and safety management in construction places taking ELMIOLINDO contractors PLC construction sites in Addis Ababa as a case. In this project, descriptive research design is used. Questionnaire and interviews where used as a method of data collections, site visits and observations were also made.

The health and safety management practices of the projects were assessed and the critical factors causing accidents were identified. Accordingly, both of the construction project sites encountered an accident over the past three years and temporary injury takes the largest part. The respondents largely blame the contractors for the accidents that occur at construction site, since the responsibility of providing adequate health and safety resources, providing project site specific health and safety guidelines, and above all training the construction workers on how to protect their health and safety lies in the hands of the contractor. The company has a companywide health and safety guideline but not project specific clear and detailed safety guideline taking into account the unique characteristics of projects; this has largely contributed to the accidents that occurred at these sites. In addition, there is no government follow up on the health and safety of workers at construction site, there is no site visit, inspection and audit from local authorities. Additionally, there is no governmental or nongovernmental organization follow up and contribution in improving the health and safety of workers who are working at construction projects.

Even though, Safeguarding the health and safety of workers is mainly the responsibility of the employer or the contractor in this case, every stakeholder in the industry should play its role in order to create a safe and harm free construction work environment.

5.4. Recommendation

This study revealed that ensuring the health and safety of workers working at construction sites is not the responsibility of one party. Based on that, here are some recommendations:

ELMI work operatives should ask the project managers or their immediate bosses for provision of adequate health and safety materials. In addition, they should immediately report to health and safety officers when they get in to a work condition that makes them exposed to unsafe work environment. ELMI workers should know that safety comes first and they should be aware, conscious and motivated to take every necessary actions to protect themselves from workplace fatalities. In addition, they should be bold enough to exercise their rights to be safe from workplace injury and fatalities; which is guaranteed to them by the FDRE constitution.

As we have seen in this study; though all parties in the ELMI OLINDO identified two projects the responsibility to safe guard the health and safety of the workers, the contractors take the lions share. ELMI OLINDO as a contractor has to plan where to put mobilized goods and stock the materials according to their usage and characteristics in order to have a well-organized site layout structure. This will make the work environment very safe, clean and appealing and this in turn can increase the motivation and hence the productivity of the workers. It doesn't matter whether the site is wide or narrow, what matters most is how wisely the smallest available space possible can wisely be used.

In addition, ELMI OLINDO as a contractor should clearly state the percentage of budget allocated to health and safety related issues out of the total project cost. Moreover, ELMI should provide all the required health and safety resources; that satisfy international and local standards, together with their manual of instruction. Again, ELMI should train their workers, they should have enough amounts of health and safety staff that has adequate training on health and safety related issues.

The clients should also subject the contactor to a legally binding contract agreement, to enforce the contractor to deliver a zero accident project work delivery which is stated on the contract agreements.

Last but not least, the government should safe guard the health and safety of construction workers through a continuous follow up, site visits, inspections and audits for construction projects. In

addition, the government should create a reward and punishment system. Moreover, the government should give trainings on health and safety related issues to all parties in the industry and taking into account the criticality of the issue, health and safety at construction places should be added to academic curriculum for students who are pursuing their studies in the construction field; for life, health and wellbeing of people comes before growth and development of a nation.

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Appendix I

ADDIS ABABA UNIVERSITY

School of commerce

Department of Project Management

Assessment of Construction Safety and Health Management Practice in Building Construction projects in Addis Ababa: In the case of ELMI OLINDO Construction P.LC.

Dear Participant

This Masters in Project Management (MPM) thesis research questionnaire is designed to assess the practice of health & safety management in building construction projects in Addis Ababa, in a case of ELMI OLINDO construction P.L.C. The main objective will be to assess the current safety and health management practice in building construction sites at ELMI OLINDO Construction PLC.

The information obtained will be used for academic purpose only; all information and feedbacks will be kept strictly confidential. Your expertise and educational background in the construction industry will greatly contribute to the success of this study and I believe this kind of study will be an input for the development of Ethiopian construction industry. So, I am kindly requesting you to respond to each and every question and I would like to thank you in advance for sharing your time and information with me. For further inquiry and if you have any question you can reach me at

Bitania Shiferaw

E-mail. Boniextra22@gmail.com

This questionnaire paper has five parts:

Part one: Information about respondents

Part two: Information about the project

Part three: Health and safety related issues on building construction sites.

Part four: Health and Safety management practices.

Part five: Safety and health performance factors evaluation.

You are not obliged to answer any of the questions which you do not want to.

Part one: information about respondents

Choose the most appropriate answer and Mark "X "on the space provided

1) Job title

Project Manager ☐ Project site engineer ☐ Project office engineer ☐ Human resource manager ☐

If other please specify……..

2) Educational background

PhD ☐ MSc/MA ☐ B.Sc./BA☐ TVET ☐

If other please specify……

3**)** Work experience in years

0-5 ☐ 6-10 ☐ 11-15 ☐ >16 ☐

4) Job type

Temporary ☐ Permanent ☐

Part two: Information about the project

5) Project Cost (ETB)

<500 Million ☐ 500Million-1 Billon ☐ 1 Billon -2 Billon ☐ >2 Billion ☐

6) Average number of employees

<100☐ 100-200 ☐ 201-300 ☐ >300 ☐

Part three: Health and safety related issues on building construction sites.

7) Which fatalities on work (years in 2009-2011 E.C) hold the highest number in your project?

☐ Death ☐ Disability ☐ Temporary injury

If other please specify……

8) Most of the accidents on your construction site are due to:

☐ Lack of safety guidelines ☐ Lack of Personal Protective Equipment (PPE)

☐ Management Carelessness ☐ Employee Carelessness

If other, please specify…….

9) The major reasons of accident that are attributed to the management is that the management:

☐ Failed to hire employee safety officer ☐ Failed to prepare employee safety policy and guideline

☐ Failed to provide safety training to the employees

If other, please specify……

10) The major reasons of accidents attributed to workers is that the workers:

☐ Do not have proper training on health and safety ☐ Do not have experience in using equipment and machineries

☐ Do not have safety culture ☐ Do not have motivation to protect themselves from injury

If other, please specify……

11) In your opinion, who should be held responsible for the accidents that occur during construction on site?

☐ The Workers ☐ The Consultants

☐ The Contractors ☐ The Clients ☐ The Government

If other, please specify……..

12) Frequency of causes of Injuries in construction sites. Please Mark "√" for the most appropriate question on the space provided

Item number	Description	Frequency of injury and fatalities		
		High	Medium	Low
1	Fall from heights			
2	Struck by object			
3	Excavations (slides, collapse, etc.)			
4	Scaffolding(falling from scaffolding during construction)			
5	Sudden dismantling of construction hoists and elevators			
6	Cuts and lacerations			
7	Crashes and collisions			
8	Exposure to loud noise			
9	Electrocutions			
10	Fire（from electric, fuel, chemical)			

Part four: Health and Safety management practices

13) Does the site have a health and safety officer?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Budget constraint ☐ Lack of human resource

☐ Lack of awareness ☐ Management carelessness

If other, please specify……

14) Is the site layout suitable for health and safety of workers?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ The natural setting of the site is not suitable

☐ There is no mandatory law related to this matter

If other, please specify……

15) Does the construction site have any formally written health and safety guideline?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of contractual agreement ☐ Top management commitment problem

☐ Lack of enforcing law ☐ Lack of awareness by all parties in the industry

If other, please specify……

16) Does the top management allocate budget for health and safety system?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of budget ☐ Top management commitment problem

☐ Lack of contractual agreement ☐ Lack of enforcing law

If other, please specify……

17) Does your project have a site-specific Health &Safety plan?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Budget constraint ☐ There is no contractual obligation

☐ No company Health & Safety policy in the firm

☐Upper level management and commitment problem

If other please specify…….

18) During construction period of your project, does Health & Safety related matters get audited periodically?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Budget constraint ☐ Upper level management and commitment problem

☐ No company Health & Safety policy in the firm ☐ Lack of skilled personnel

If other please specify…….

19) Do Managers encourage and support worker participation in Health &Safety activities?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Lack of awareness by all parties in the industry ☐ Upper level management and commitment problem

☐ No company Health & Safety policy in the firm D) ☐ Lack of Health & Safety policy implementation on projects

If other please specify…….

20) Is there adequate first aid and first aider(s) on your construction project site?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Budget constraint ☐ Upper level management and commitment problem

☐ There is no contractual obligation ☐ Lack of H&S policy implementation on projects

If other please specify…….

21) Does your firm provide Personal Protective Equipment (PPE)?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Budget constraint ☐ Lack of awareness

☐ There is no contractual obligation. ☐ There is no standard in the code of practice

If other, please specify…….

22) Is there any manual of instruction on how to use Personal Protective Equipment (PPE)?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of awareness ☐ Budget constraint

☐ There is no contractual obligation. ☐ There is no standard in the code of practice

If other, please specify…….

23) Is there any manual of instruction on how to use first aid tools?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of awareness ☐ Budget constraint

☐ There is no contractual obligation. ☐ There is no standard in the code of practice

If other, please specify…….

24) Does Material schedule data sheets provided for all hazardous materials on site?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Budget constraint ☐ Upper level management and commitment problem

☐ There is no contractual obligation ☐ There is no standard in the code of practice

If other please specify……..

25) Does Proper supervision by staff trained in Health & Safety get carried out on your project?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Budget constraint ☐ Upper level management and commitment problem

☐ Lack of educated personnel in the area of knowledge ☐ Lack of Health &Safety policy implementation on projects

If other please specify……..

26) Do specific Health & Safety inspections done regularly?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Upper level management and commitment problem ☐ lack of contractual obligation

☐ No company Health & Safety policy in the firm ☐ Lack of Health & Safety policy implementation on projects

If other please specify……

27) Do local authorities and Health &Safety enforcement agencies visit sites for inspection?

☐ Yes ☐ No

If your answer is "No", what do you think the reason is?

☐ Lack of attention from government ☐ Budget constraint

☐ Lack of skilled personnel ☐There is no standard in the code of practice

If other please specify……..

28) Are all the injuries and fatalities filled and reported to the concerned party?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of awareness ☐ There no contractual obligation

☐ There is no standard in the code of practice ☐ Lack of Health &Safety policy implementation on projects

If other please specify……..

29) Is there a governmental or non-governmental organization follow up and contribution in improving safety in the Construction projects?

☐ Yes ☐ No

If your answer is “No”, what do you think the reason is?

☐ Lack of attention from government ☐ Budget constraint

☐ Lack of skilled personnel ☐There is no standard in the code of practice

If other please specify……..

30) In which construction phase does safety and health management practice need more focus or emphasis? Rank them from 1 to 10 on the separate space provided

Item number	Construction Phase	Rank
1	Mobilization	

2	Demolition and site clearance	
3	Erection of hoardings, welfare facilities and so on	
4	Setting out	
5	Excavation and foundation installation	
6	Frame construction	
7	Cladding installation	
8	Roofing	
9	Lighting, mechanical and electrical system	
10	Utilities and other finishing works	

Part five: Safety and health performance factors evaluation

Please Mark "√" for the most appropriate answer on the space provided

Item number	**Factor description**	**Degree of impact**		
		High	**Average**	**Low**
1	Design complexity			
2	The project budget			
3	The project schedule			
4	Environmental condition			
5	Whether condition			
6	Work environment			
7	Personal protective equipment (PPE)			
8	Provision of first aid			
9	Safety signs, signals and barricades			
10	Safety and health inspection			
11	Accidents and incidents misreport			
12	Reward and punishment systems			

13	Safety and health policy			
14	Contractual specification on health and safety			

Appendix II


No riser on barricade shaft opening

No Edge protection Barricade

No Lighting