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DEPARTMENT OF PROJECT MANAGEMENT

**ASSESSMENT OF CONSTRUCTION SAFETY AND HEALTH
MANAGEMENT IN HIGH RISE BUILDING IN THE CASE OF
FINANCIAL INSTITUTIONS IN ADDIS ABABA**

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, THE SCHOOL
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REQUIREMENT FOR THE DEGREE OF MASTER OF PROJECT
MANAGEMENT**

BY

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ADDIS ABABA, ETHIOPIA

DECLARATION

I, undersigned person declare that the thesis entitled “Assessment of Construction Safety and Health Management in High Rise Building - The case of financial institutions in Addis Ababa” is my original and submitted for the award of Master Degree in Project Management, St. Mary University at Addis Ababa and it hasn't been presented for the award of any other degree. I have conducted the study independently with the guidance and comments of the research advisor. Under this study, fellowship of other similar titles of any other university or institution of all sources of material used for the study has been appropriately acknowledged and notice.

Fiktor Belachew

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ENDORSEMENT

This is to certify that Fiktor Belachew carried out his thesis on “Assessment of Construction Safety and Health Management in High Rise Building - The case of financial institutions in Addis Ababa” and submitted in partial fulfillment of the requirements for the award of the degree of Masters of Art in Project Management at St. Marry University with my approval as university advisor.

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AsfawYilma (PhD) – Advisor

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LIST OF ACRONYMS

CSFs:	Critical Success factors
EU:	European Union
HEEPO:	Human, Equipment, Environment, Product and Organization
HSE:	Health and Safety Executives
ILO:	International Labor Organization
ISO:	International Standard Organization
PPE:	Personal Protective Equipment
UK:	United Kingdom
USA:	United States of America

Abstracts

The construction industry is an important part of the economy in many countries and is often seen as a driver of economic growth especially in developing countries. Owing to its relatively labor intensive nature, construction works provide opportunities for employment for a wide range of people skilled, semi-skilled and unskilled. Despite its importance, construction industry is considered risky with frequent and high accidents rates and ill health problems to workers, practitioners and end users particularly in the current high rising building construction sites. However, knowledge on how health and safety risks are managed on high rising construction sites is limited in Ethiopia. This study therefore, aims to find out the current practice of health and safety management in high rising building construction firms in Addis Ababa. The research used qualitative and quantitative research approach. Data was collected from high rising construction company project managers, site engineers, safety engineers, residential managers and foremen. The collected data was presented using charts and tables and analyzed using descriptive statistical tools such as frequency and percentages. The results of the study revealed that objects falling from a height, workers falling from scaffolding during construction and stairways and ladders collapse are the major causes for fatal individual injuries as well as death in high rising construction sites. The study also explored that health and safety management in high rising building construction site not satisfactory. The major predicaments and challenges facing the high rising building construction sector health and safety management are inadequate health and safety orientation and training, low enforcement of existing rules and regulations issued related to construction safety and health management in the country, lack of top management commitment and support to health and safety management in construction sector and complexity of buildings design and structure. In line with the major findings, strengthening the enforcement of the country construction health and safety rules and regulation by safety and health agency and local authorities, safety first as a motto in construction firm and management commitment and support for health and safety in high rising building construction site were among the recommendations forwarded.

Key words: *High rising building construction, Health and safety hazards, Health and safety management, Health and safety management challeng*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Construction industry is an important part of the economy in many countries and often seen as a driver of economic growth especially in developing countries. Typically, construction industry contributes to 11% of gross domestic products (GDP) in most developing countries (Giang and Pheng, 2010). As Ethiopia is among the developing country striving to combat poverty, currently the construction industry is booming more specifically in the capital city Addis Ababa and this situation create greater job opportunity for daily laborer who gathered from different parts of the country as well as contributing for economic enhancement in the country. However many construction activities are inherently health and safety risks such as working at height, working underground, working in confined spaces and close proximity to falling materials, handling load manually, handling hazardous substances, noises, dusts, using plant and equipment, fire, exposure to live cables, poor housekeeping and ergonomics. In an urban context, health and safety accidents are relatively higher due to the fact that high rise buildings remain predominant with the fast-growing complexities of domain-wide construction projects to cope with modernizing cities arena and high demand for housing, offices, services and other infrastructures due to the high urbanization.

Despite its importance, therefore, construction industry is considered as being risky with frequent and high accidents rate and ill-health problems to workers, practitioners and end user. The construction industry has therefore earned the reputation of being a dangerous or highly hazardous industry because of the disproportionately high incidence of accidents and fatalities that occur on construction sites around the world (Smallwood and Haupt, 2008). The authors went saying that internationally, construction workers are two to three times more likely to die on the job than workers in other industries while the risk of serious injury is almost three times higher. Health and safety therefore is an economic as well as humanitarian concern that requires proper management control. One of the most common myths that have plagued this industry is that health & safety comes at a cost. Construction managers tend to believe that introducing and executing measures that ensure health and safety in construction sector will lead to higher cost,

and hence lower profitability. However, it has been proved that investment in construction health and safety actually increases the profitability by increasing productivity rates, boosting employee morale and decreasing attrition (Mohammed, 2003). Construction safety and health management therefore deals with actions that managers at all levels can take to create an organizational setting in which workers will be trained and motivated to perform safe and productive construction work. The system should delineate responsibilities and accountabilities. It should also outline procedures for eliminating hazards and identifying potential hazards before they become the contributing factors to unfortunate accidents. Cognizant with this fact the purpose of this research is to explore the safety and health management practice in high rising building construction in Addis Ababa.

1.2 Statement of the Problem

According to Mohammed (2003), the construction industry is concurrently recognized as a major economic force and one of the most hazardous industries. Accidents not only result in considerable pain and suffering but marginalize productivity, quality, and negatively affect the environment and consequently add to the cost of construction.

Considering the adverse impacts of accidents, construction health and safety management is of genuine concern to all stakeholders in the construction industry. Nevertheless developing countries like Ethiopia seems negligent in managing health and safety in construction industry. To this end Adane, et al. (2013) argued that developing countries like Ethiopia are striving hard to improve their basic services by building schools, hospitals, housing complexes, shops, offices, highways, power plants, industries, bridges and other infrastructures which are carried out by unskilled labor forces due to this fact occupational injuries and accidents among these workers are high due to illiteracy, poverty, lack of health and safety training and information on health hazards and risks at the work place. In this regard, Mbuya and Lema, (2002) pinpoint that in most developing countries, health and safety consideration in construction project delivery is not given priority and employment of safety measures during construction is considered a burden. Hence health and safety need to be identified as a parameter along with the traditional parameters: cost, quality and time, to measure the success of projects.

The reasons for considering safety and health are human factor, legislation and financial issues (Adan, 2004). Unfortunately, health, safety and the environment are often neglected on

construction sites and rarely managed. Safety and health is often discussed in site management meetings as a priority, while in reality safety and health takes a low priority to budget and time discussions. The Daily Nation (23rd June 2011) reported that the construction industry in Kenya is under siege following the recent collapse of two buildings in Nairobi while still under construction. This is also a common phenomenon in Addis Ababa as it was witnessed by the collapse of buildings and bridges under construction victim the lives of many. Thus, many questions have come up on the different roles played by all the construction players and whose fault it may be that buildings were collapsing. Adan (2004) argues that lack of information and experience limit the intervention process of improving healthy and safe working environment in the construction sites. Although many accidents and ill-health problems remain unreported in Ethiopia, there is concern that existing situation is alarming. The situation is further compounded in construction projects in Ethiopia by the extremely diverse range of people with different levels of education, cultural background among the workers as most laborers migrates from rural to urban, cultural differences between employer (contractor) and workers, performing the actual work in the construction sites and have different levels of health and safety awareness and requires different ways of training and communication.

A general observation in the construction industry indicates that adequate measures for health and safety in the sites have not been put in place and also various challenges are encountered in the management of health and safety in construction. This manifests itself on construction sites as numerous accidents/ injuries, health problems which result to hospitalization and absenteeism. In view of the above this paper investigated the real contemporary health and safety issues of workers in construction industry. Thus, the focus of this study therefore lies in the health and safety of work environment during the construction process and is concerned with the management of health and safety particularly the measures that are put in place and the challenges encountered in the health and safety management in high rising building construction in Addis Ababa.

1.3 Research questions

This research intends to answer the following research questions.

1. What are the major safety and health hazards associated with high rising building constructions?

2. What looks like the current safety and health management practice in high rising building construction in in Addis Ababa?
3. What are the challenges in managing safety and health in high rising building construction in Addis Ababa?

1.4 Research objectives

The research has the following general and specific objectives:

1.4.1 General objectives

The overall objectives of this research are to assess safety and health management practice in high rising building constructions in financial institution in Addis Ababa.

1.4.2 Specific objectives

- To identify the major safety and health hazards associated with high rising building construction in in Addis Ababa.
- To explore the current level of health and safety practice in high rising building construction in in Addis Ababa.
- To identify challenges in managing safety and health in high rising building construction in in Addis Ababa.

1.5 Significance of the study

As high rising building construction is new for Ethiopia and the chance of having disastrous hazards in the industry is inevitable. Nevertheless efforts made by the various players not enough to mitigate safety and health risks in the construction industry. Thus this study help all stakeholders to understand the need for managing the risk of safety and health in high rising building constructions as it affects lives of many individuals and the task of minimizing the hazard requires collaborative effort.

Since research conducted in past that focused on construction safety and health of construction industry in Ethiopia is so rare particularly in high rising buildings that the country is currently experiencing, this study can bridge the gaps in literature as well as it ignites academic discussions, debates and future research in the field to enhance safety and health management in the Ethiopia construction industry.

1.6 Scope of the study

There are numerous high rising building construction in Addis Ababa, however conducting research in all these high rising building construction site becomes difficult due to time and resource constraints. Thus this research was conducted only on international high rising building construction companies particularly in financial institutions sites around Mexico due to their geographical proximity and accessibility.

1.7 Organization of the paper

The paper was organized in to five chapters. The first chapter of the study deals with the introduction which includes background of the study, statement of the problem, significance of the study, scope of the study, definition of terms and organization of the study, The second chapter presents the review of related literature, The third chapter deals with the research design and methodology, The fourth chapter deals with presentation interpretation and data analysis, The fifth chapters present the summary of findings, conclusion drawn from the summary of findings and recommendation.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Concepts and definition of Health and Safety in the Work Place

Occupational health and safety has been defined by the International Labor Organization (ILO), 2005 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 work place 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. A high level of occupational health and safety contributes to the achievement of material and economic objectives and provides high quality and performance in working life. In spite of this, conditions at work and in the work environment for many occupations and in many countries still involve a distinct and even severe hazard to health that reduces the well-being, working capacity and even the life span of working individuals.

2.1.2 Global Situation of Health and Safety Hazard on Construction Sites

Construction health and safety risks are always a grave concern for both practitioners and researchers all over the world. Thus, construction has been regarded as the most hazardous place in which to work with a high level of health and safety risks (ILO, 2005, Lingard and Rowlison, 2005; Smallwood et al 2008). ILO estimates that at least 60,000 fatal accidents happen in a year on construction sites around the world, which is one in six of all fatal workrelated accidents. In the same vein, occupational health and safety statistics presented by different researchers (Lingard and Rowlison, 2005, Smallwood et al, 2008, Hinze, 2005), revealed that, the injury and fatality rate in construction projects is very high in comparison with other sectors of industry in the majority of countries. Moreover, it has been acknowledged that 25–40% of fatalities in the world’s occupational settings are contributed to by construction (ILO 2005). Based on fatality

statistics, different countries show that the construction industry produces 30% of fatal industrial accidents across the European Union (EU), yet it employs only 10% of the working population. In the United States of America (USA) the sector accounts for 20% of fatal accidents and only 5% of employment, and in Japan construction fatalities account for 30-40% of industrial fatal accidents (ILO, 2005). In the developing world, the risks associated with construction work are much greater. Available data would suggest they are 3–6 times greater (Jason, 2008). In comparison with developed countries, construction sites in developing countries are ten times more dangerous (Hämäläinen et al. 2006). Other research conducted in developing countries corroborates evidence of this relatively high proportion of accidents on construction projects (ILO 2005, Murie 2007). However, there is a challenge of reporting accidents in developing countries (ILO, 2005).

From this perspective, health and safety is a global issue which needs a different approach to solve it. Improving health and safety in the construction industry therefore continues to remain a priority.

2.1.3 Sources of Accidents and Ill-health Problems on Construction Sites

In order to understand the sources of accidents and subsequent injuries, researchers have attempted to develop theories of why accidents occur. Accidents are viewed as originating from a technical or human error (Murie 2007). The multiple accidents causation theory postulates that there are many contributory causes leading to an accident (Taylor et al., 2004). The causes are categorized into behavioral and environmental factors. Behavioral factors include attitudes, skills and knowledge. Environmental factors include worksite hazards and procedures that contribute to injuries (Taylor et al., 2004). A similar view is held by Lubega et al. (2001), who found that the causes of construction accidents in Uganda include a lack of knowledge about safety rules, engaging an inexperienced workforce, and lack of respect for safety. Tam et al. (2004) concurs with this view and suggests that the main factors affecting safety in China were managers' poor safety awareness, lack of training, reluctance to commit resources to safety, and irresponsible operations. Furthermore, Dejus (2007) conducted a study in the Lithuanian Republic and identified that the major reasons for serious and mortal accidents are inexperienced employees, lack of qualifications and understanding risk on a construction site.

Rahim et al. (2008) carried out a survey in Malaysia to identify the causes of accidents on construction sites; they found that unsafe methods, including incorrect procedures, knowledge level, and disobeying procedures are the most frequent reasons for accidents on construction sites. In addition to these causes, Holt (2001) argued that, secondary causes of accidents centred on management pressures, such as financial restrictions, lack of commitment, inadequate policy and standards, deficient knowledge and information, restricted training and task selection, and poor quality control systems. He further emphasized that incomplete structural connections, temporary facilities, tight work areas, varying work surface conditions, continuously changing work-sites, multiple operations and crews working in close proximity are common causes of construction-related deaths and injuries.

2.1.4 Types of Health and Safety Hazards on Construction Sites

Various researchers have divided health and safety hazards into two categories, namely the physical injury hazards and the ill-health hazards (Murie, 2007). Hazard of physical injury include death consequences. Hazard of ill-health can only be notified after a long period and shall cause sickness or death after a certain period of time (Murie, 2007). The following are common hazards on construction sites irrespective of the physical injury or ill-health problems.

2.1.4.1 Height

The main hazards associated with working at height are people and objects falling onto people below. Falls from height have been viewed as the one of the most frequent killers of the workers on construction sites. Statistics indicate that nearly 1,000 construction workers are killed each year at their work places. Of these, one-third or over 300 deaths are a result of construction site falls (ILO, 2005). The study from different countries for example, New Zealand, indicates that, falls from heights are the leading cause of occupational injuries on construction sites (Bentley et al., 2006). In China's construction industry, falls account for approximately 51% of injuries (Yung, 2009). In Hong Kong, work-related falls from heights represented more than 47% of all fatal incidents (Chan et al., 2008). Chi and Wu (1997) reported that more than 30% of fatalities in Taiwan can be attributed to falls. As a result, falls are the most costly occupational hazard in many countries. Common construction site falls include roof-related falls, crane falls, scaffolding falls, elevator shaft falls, falls resulting from holes in flooring, and falling objects. These may occur as a result of inadequate edge protection, or from objects in storage being poorly secured.

Workers at risk of falling from a height include painters, masons, decorators and window cleaners and those who undertake one-off jobs without proper training, planning or equipment (Murie, 2007).

2.1.4.2 Slips and Trips

Slips and trips are seen as the most common workplace hazards and contribute to over a third of all major injuries (Hughes and Ferret, 2011). They occur in almost all workplaces and 95 % of major slips result in broken bones (HSE, 2004). According to statistics from the Health and Safety Executive (HSE), slips and trips are the single most common cause of injuries at work, and account for over a third of all major work injuries (HSE, 1998). They cost employers over £512m a year in lost production and other costs and account for over half of all reported injuries to members of the public. The study done by Lipscomb et al (2008) on the USA revealed that slips account for 18% of all injuries and 25% of workers' compensation payments. Slips contributed to 85% of falls on the same level and over 30% of falls from height as well as a significant number of musculoskeletal injuries sustained after slipping (Ibid). They can also be the initial cause of a range of other types of accidents, such as falls from heights. Slips and trips are caused when materials are scattered everywhere haphazardly, the floor is wet or greasy, inappropriate footwear is worn, mainly by casual employees and visitors, something large or heavy is being carried, reducing one's balance, and when the lighting is poor.

2.1.4.3 Equipment

Machinery, Tools and Transport Vehicles are necessary for transporting goods and people. However, many people die and are injured due to being struck and crushed by equipment and machinery at construction sites, especially by reversing machinery, site machinery falling in the excavation area, machines overturning due to travelling down a steep slope, and material falling from construction equipment especially haulage trucks, hitting people behind it or nearby (HSE, 2004). Crush injuries can have a wide range of serious effects, including fractures, internal injuries, head and brain injuries, and back injuries. In some cases, a crush injury may result in amputation and permanent disability of the affected worker. Meanwhile, many people are injured due to being chopped and cuts by equipment and hand – held working tools such as chisels, screwdrivers, knives, saws, hammers, nails and drilling machines. The greatest hazards posed by hand tools results from misused and improper maintenance.

2.1.4.4 Electricity

Electricity is widely used on construction sites but has the potential to be very hazardous with possible fatal results. Someone coming into contact with a live electrical conductor will get a shock that may lead to injuries or even death. In the UK, for example, 2% of all fatalities at work are caused by electric shocks (Huges and Ferrett, 2011). Most injuries and deaths from electricity are due to, using poorly maintained electrical equipment, working near overhead high tension lines or domestic electricity supplies, contact with underground power cables during excavation work and working without appropriate safety gear.

2.1.4.5 Fire

Fire is one of the many hazards that construction workers could face on site. Although fire hazards are not seen as such as a high risk compared with falling from a height and slipping, tripping and falling, fire hazards need to be considered at all stages of the building process (HSE, 2000).

Every year on many construction sites, workers are killed or injured as a result of fire. There are about 400 construction fires annually in United Kingdom (UK) and about 100 of them cause over £50,000 worth of damage and can result in the incomplete dislocation of the project schedule (Hughes and Ferret, 2011). According to the author's point of view, fires on site are caused by braising work carried out by plumbers, gas lines for underground work, power lines, power leads and tools, machinery requiring petrol and diesel, and hazardous chemicals.

2.1.4.6 Manual Handling

Manual handling is defined as the movement of a load by human effort alone (Hughes and Ferret, 2011). It can include any activity requiring the use of force exerted by a person to lift, push, pull, carry or otherwise move or restrain any moving or stationary object (HSE, 1998). It has been argued that lifting bricks, cement blocks and cement bags weighing 50 kilos has been regarded as risky activities on construction sites (Hughes and Ferret, 2011). Back injuries and emasculatory disorders, sciatica, hernias and slipped discs are often the most serious of construction site injuries (Ibid). In the study by Smallwood (2008) it was revealed that in construction, 25% of injuries are back injuries. Almost 30% of all construction workers complain of back pain that requires over thirty days off. The average number of days of work missed by a construction worker is higher than in other fields of employment.

2.1.4.7 Noise

Occupational noise-induced hearing loss is defined as hearing impairment arising from exposure to excessive noise at work, which is also commonly known as industrial deafness the NOHSC National Code of Practice (2004).

Exposure to hazardous noise levels is so widespread as to be routine, and occupational deafness is very common among building workers. Some activities on construction sites are notoriously noisy, for example, rock breaking during demolition work or the operation of a jack hammer. The use of vibrating wacker plates, electric tools, explosive powered nail guns and vibrators during concrete pours; all cause specific noise problems for the operators and workers in the vicinity in relation to maintaining their hearing ability. Noise comes from the operation of plant, machinery and power tools, the movement of vehicles and deliveries of materials (HSE, 1998).

2.1.4.8 Chemicals Substances

Construction activities involve using chemicals which pose health and safety risks to workers. For example solvents of many different kinds are used in paints, varnishes, pesticides used to treat timber, bonding agents, lacquers and adhesives (HSE, 1998). At the construction site, workers might be exposed to chemicals by breathing them in, ingestion and absorption through the eyes or skin (Murie, 2007). Chemicals at work sites can cause headaches, eyeirritation, dizziness, faintness, sleepiness and affect judgment and coordination. They can damage to the central nervous system and can harm the skin, liver, kidneys and cardiovascular system. Some solvents increase the likelihood of cancer (Huges and Ferrett, 2011). Solvents can also cause reproductive problems. They can reduce fertility and cause birth defects and miscarriages (Murie, 2007). Some paints and varnishes, bonding agents and resins, can cause asthma and dermatitis. Welding fumes – which may include a cocktail of metal fumes, can cause serious health problems in the long term. The respiratory system is affected and, as chemicals are absorbed, they can slowly affect the brain and internal organs (Huges and Ferrett, 2011).

2.1.4.9 Dust

Dust is a common hazard on roads and building works at many sites. The health risks associated with a dusty jobs depend on the type of dust (physical, chemical and mineralogical), which will determine its toxicological properties, and hence the resulting health effect; and the exposure, which determines the dose. If dust is released into the atmosphere, there is a good chance that

someone will be exposed to it and inhale it. If the dust is harmful, there is a chance that someone will suffer an adverse health effect, which may range from some minor impairment to irreversible disease and even life-threatening conditions (Huges and Ferrett, 2011). There are higher death rates from respiratory disease and from lung and stomach cancers in dusty trades. At construction sites cement, silica and wood dust and dust from medium-density fiber board poses particular risks.

2.1.4.10 Aggression, Violence and Bullying

Aggression and violence occurs when people are verbally abused, threatened or assaulted in circumstances relating to their work. At construction sites aggression and violence are manifested through the use of foul language and physical attacks (HSE, 1998). Where there is aggression and violence, human dignity is debased (Huges and Ferrett, 2011). Violence and aggression may come from superiors or workmates. Bullying occurs when workers feel that they are being singled out for unfair treatment by a boss or colleague. For example, a worker is constantly criticized instead of being instructed, being demoted and being shouted at by workmates or superiors. Aggression, violence and bullying can contribute to other risks such as stress (Huges and Ferrett, 2011).

2.1.5 Risk Management System

There are no fixed rules about how occupational health and safety risk assessment, communication and control should occur. However, there are some general principles that should be followed. Several researchers have developed risk assessment methodologies to suit their requirements (HSE, 2004; Lingard and Rowlinson, 2005; Huges and Ferret, 2011). However, regardless of the differences in approaches or industries, most of the risk assessment methodologies are similar in terms of basic that include work analysis, hazard identification, risk estimation and risk evaluation.

Some risk assessment methodologies include risk control as part of risk assessment, but this study considers that risk control is a separate part from risk assessment. The complexity of risk assessment, risk communication and risk control depends to a major extent on factors such as the size of the organization, the workplace situations within the organization, and the nature, complexity, and significance of the risks to which the organization is exposed (Rwamamara, 2007). However it has been argued that, it is critical that risk should be assessed at every stage in

the life of a construction project, and that the input of key stakeholders and project participants is sought (HSE, 2004; Lingard and Rowlinson, 2005). These authors further state that, involving designers in health and safety risk assessment exercises can provide opportunities to “design out” features of a building or structure that pose a threat to health and safety of crews during the construction phase. In the same vein, Rwamamara (2007) commented that an effective risk management process should be managed by a cross-disciplinary team, and be supported by free and open communication and consultation between the project stakeholders.

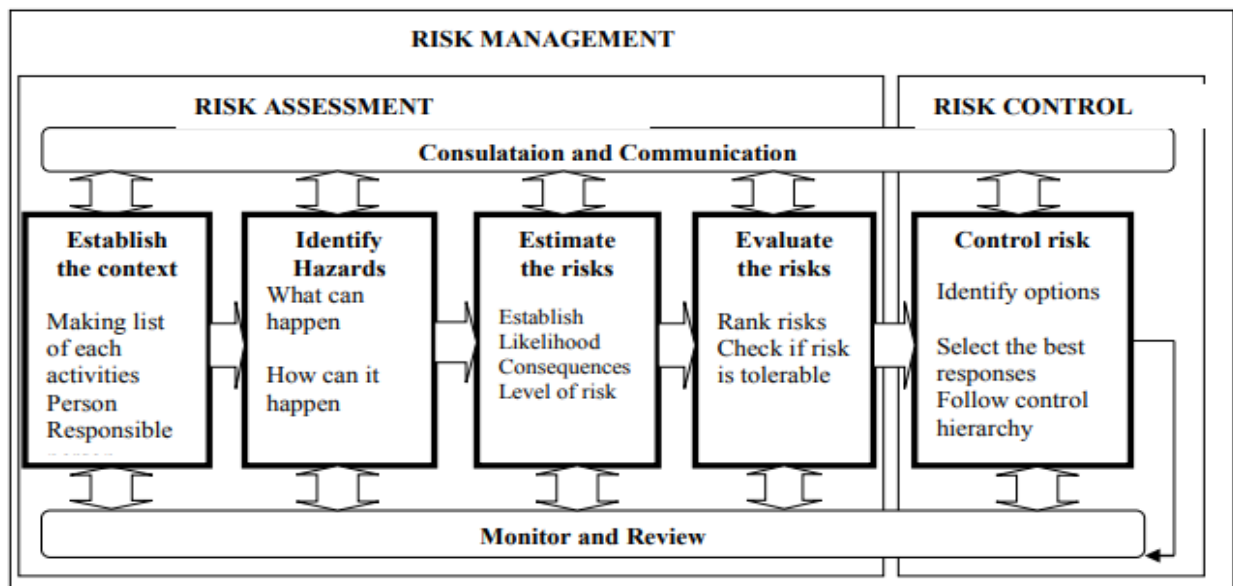


Figure 2.1- presents risk management system. Adopted and modified from the Australian and New Zealand Standards Management (2004).

Figure 1 above presents the four stages of risk assessment, which are establishing the context, identifying the risk, estimating the risk, evaluating the risk and controlling/responding to the risk. Assessing risk is a step-wise process consisting of interrelated but distinct phases. Thus the context must be established first before the hazard is identified. The same is true for estimation of the risk stage, in that it cannot start until finishing identification of the hazard stage. Figure 1 also indicates that risk assessment, risk communication and risk control is not a linear process that is undertaken once. It is cyclical in nature where at each stage there is communication, monitoring and a review of the process. The cyclical nature is particularly important in the constantly changing construction environment, in which new or emergent risks must often be

assessed, and the changing construction environment in which new or emergent risks must often be assessed and controlled. The following sections discuss the details of each stage of management.

Establish the context.

The first stage in the process of risk assessment is to establish the context of the work or analysis of the work activities. At this stage the work activities can be analyzed by making a list of the tasks that are relevant to each area of responsibility, such as excavations, concreting, brick/block layering, scaffolding, handling, loading and unloading, roofing, steel

Various types of information might be used in this initial exercise, including organizational charts and records, interviews and a ‘walk-through’ survey of the work areas involved. One of the most effective ways of ensuring that all activities are listed is to walk around the workplace and see what is going on as it is possible that a hazard could be overlooked without a site visit (Huges and Ferret, 2011).

Hazard Identification

Having established the tasks the assessor(s) must then identify what hazards are present, who might be harmed and how. Hazard identification is aimed at determining potential risks associated with any given assignment to be performed by an employee. In addition, it involves identification of locations and processes associated with the risk, as well as employees who are exposed, or people who might be exposed to it such as visitors, employees or contractors. It has been argued that risk identification is the most important stage of the risk assessment (Carter and Smith, 2006). In risk identification “HEEPO, which stands for Human, Equipment, Environment, Product and Organization” has been used (Carter and Smith, 2006; Huges and Ferret, 2011). Thus hazard identification should consider hazards associated with humans, such as hazards from equipment, hazards from the work environment, for example, the condition of the site, hazards from the product such as the design and specification of the materials, hazards from the organization such as management styles and leadership.

According to HSE (2004), it is emphasized that the process of hazard identification should encompass the whole work system. The process of hazard identification is based on direct

observation of the site and all available hazard data, as well as observations made on the walk-through survey. Detailed information on equipment and raw materials, systems of work and human factors should be available, together with a sketch of the working area.

There are a number of tools and techniques for identifying the health and safety hazard which have been categorized in three groups as: intuitive, inductive or deductive. However, generally, the methods include brainstorming, expert opinion, structured interviews, questionnaires, checklists, historical data, previous experience, testing and modelling and evaluation of other projects (Simu, 2007, Carter and Smith, 2006; Lingard and Rowlinson, 2005).

Risk Estimation and Characterization

In this step of the process, risks are estimated from the hazards identified in the preceding stage. The consideration is made concerning how many people are exposed to each hazard and for how long. Thus, the probability and severity of harm that can be caused by a hazard is considered. To establish the probability and severity of harm, it has been argued that the estimator should have an appreciation of the flow of the typical workday activities of construction activities. Meanwhile, knowledge of the regulations and safety standards under which the facility operates is also important, as some of the regulations provide guidelines on how risk should be assessed and some potential hazards which may be encountered at construction sites. Furthermore, experience is also important as some expert judgments may be required to estimate risk (Lingard and Rowlinson 2005). Based on the methods used to determine or estimate probability and severity, it has been argued that they are divided into qualitative terms, quantitative terms and semi-quantitative terms (Ayyubu, 2003; Lingard and Rowlinson, 2005; Huges and Ferret, 2011). Qualitative estimate uses descriptive terms to define the likelihood and consequences of risk events. The process relies on an individual's collective judgment in assessing the magnitude of the risks considered, which often uses risk identification terms of low, medium or high risk characteristics. To rank various risks in order of importance, a risk matrix has been used. (Jeong et al, (2010) argued that the matrix is typically used to compare risk levels for different events and to set priorities for taking action. They further emphasise that the greater the magnitude of risk, the greater the efforts that should be made to control it and the greater the urgency to control the risk and take action. Table 2.2 shows the Matrix for estimating qualitative risk.

Risk evaluation

The purpose of risk evaluations is to decide whether or not a risk is tolerable (Lingard and Rowlinson, 2005; Huges and Ferret, 2011). If the risk is regarded as acceptable as indicated it may be enough to control the risk instead of reducing it. However, if the risk is regarded as unacceptable different risk reduction options have to be analyzed and compared so that the best risk reduction option can be identified. The evaluating stage of the risk-assessment process involves assessing the team making decisions on the most appropriate risk control strategies. Once a level has been established for the risk estimated, the levels are compared with previously established risk criteria to create a prioritized list of risks to be controlled. It may become an important task to identify and select the relevant specific risk criteria for specific estimated risks in a specific country and/or industry. Selecting risk criteria may also depend on the results of the risk analysis and how risks are estimated. There are different principles described in the literature for evaluating risk and it is important that the principle used is openly communicated and accepted by the stakeholders involved. The evaluation principles form the basis for defining risk tolerability (Barnard, 2005).

Risk control

A control measure is part of a facility, including any system, procedure, process or device that is intended to eliminate hazards, prevent hazardous incidents from occurring or reduce the severity of consequences of any incident that does occur (Lingard and Rowlinson, 2005.). Control measures may be proactive, in that they eliminate, prevent or reduce the likelihood of incidents, or they may be reactive, in that they reduce the consequences of incidents (Huges and Ferret, 2011) The information on control measures can be obtained from Codes of practice, Industry or trade associations, specialists, and other publications including those of manufacturers and suppliers. In the occupational health and safety context, risk control is categorized according to hierarchy, often simply called the “risk control hierarchy.” This hierarchy helps people to decide on which risk control to implement. Risk control options at the top of the hierarchy are preferred more than those at the bottom of the hierarchy. The preferred options are the most effective means of controlling risks because they are much less reliant on people to do something and they can protect a larger number of people. Therefore, control measures should be considered and adopted in the order presented.

Consultation and Communication

Consultation and communication is both a key component of the risk management process and a major beneficial side effect. Risk management decision makers have both legal and moral responsibility to provide information to people exposed to risks. Successful risk management relies on achieving a high level of creative input and involving all parties in achieving a successful outcome of the project or business process being addressed. According to Hampel, (2006) risk communication is not a task where bits of information are transported from the sender to the recipient of the communication but a process, where both sender and recipient interact in order to develop a common frame for an understanding of the problem. In both the planning and execution of the risk management process, it is essential to ensure that all those who need to be involved are given an adequate opportunity to do so and are kept informed of developments in arriving at an understanding of the risks and the measures taken to deal with them. One important part of risk communication is how to present the risk information. Slovic (2001) pointed out that different ways of presenting the same risk information can lead to different evaluations and decisions, even though they are logically equivalent. Risk research has shown that the basic understanding of risks differs within societies. The fact that people's perception of risk differs is one of the reasons why risk communication is complicated. According to Bohrmann (2000), effective communication depends greatly on the characteristics of the messages distributed, the conveying authority, the receiving audiences and the context in which the communication process occurs. This communication must be understandable by the audience and may require the use of photographs, diagrams or a translator. On construction sites different tools can be used to send information, such as induction training, handbooks, team briefings, toolbox talks, supervision meetings or other management meetings, specific or general instruction or training sessions and hands-on training (HSE, 2010). People in interaction with each other tend to communicate in different ways, either formally or informally Bohrmann (2000). Formal communication is communication that is spontaneous, structured, interactive and rich, conveyed through communication channels while informal communication is interaction between individuals without rules, or hierarchy (Ibid).

2.1.6 Safety Management Program

The objectives of safety programs in construction firms were identified by Rowlinson (2004) as to:

- (1) Prevent unacceptable behavior that may direct to accidents;
- (2) make sure the improper behavior are discovered and reported; and
- (3) Ensure accidents are reported and handled accordingly.

Safety programs contain many elements such as safety policies, safety committees, safety training, accident investigations, in house safety rules, safety incentives programs, control of subcontractors, personal attitude and perception, personal protection equipment, emergency planning, safety promotions, safety record keeping, and job hazard analysis (Rowlinson 2004).

Within the construction context, a great deal of research has been conducted to identify critical factors associated with safety management. Aksorn ; Hadikusumo (2008), revealed 16 critical success factors (CSFs) related to construction safety programs implementation in Thai and highlighted Management Support as the most dominant factor. Following Aksorn and Hadikusumo (2008), Al Haadir, S. and K. Panuwatwanich (2011) classified these factors into four groups, namely:

- (1) Worker participation;
- (2) Safety prevention and control system;
- (3) Safety arrangement; and
- (4) Safety commitment.

2.1.7 Health and Safety Integrated Management Systems

Research suggests integrating the health and safety management function of a business with other management functions could enhance the overall performance of the business (Koehn and Datta 2003, Taylor et al. 2004). Besides, the benefits to be derived from such an integrated management systems. Gibb and Ayoade (1996) have pointed out client pressure, cost reduction, legislation and total project management as factors promoting their adoption.

Many management systems, especially health and safety, environment and quality have many identical elements. For instance, policy, training of personnel, auditing, responsibility for task and controls are common elements in all three areas of management. This, therefore, makes it possible to integrate them as a single management system. Proponents of integrated systems argue that such an integrated system will lead to management effectiveness, reduced duplication, and elimination of conflicting responsibilities and harmony of objectives (Douglas and Glen 2000, Scipioni et al. 2001).

Dias (2000) examined the possible integration of the elements of families of standards, ISO 9000, ISO 14000 and a similar standard in health and safety in construction. Many elements of the three standards were found to be candidates for possible integration.

Hamid et al. (2004) investigated the integration of safety, health, environment and quality in the construction industry. Their findings indicate that safety, health, environment and quality have many common grounds which make integration possible. Based on the similarities in many areas of these management functions, the authors proposed a model of integrated management system for the construction industry. Similarly, Kirbert and Coble (1995) explored the integration of health and safety regulations with environmental regulations in the construction industry. Arguing that environmental issues are safety issues, the authors suggest a single administrative procedure for safety and environment via an environmental safety plan. The benefits of such a procedure include fewer processes involved in regulatory agency reviews and workers benefiting from training in both environmental and safety aspects of their work environment.

Integration of Health and Safety with Project Management Studies in construction accidents suggest many accidents on construction sites could be prevented by taking appropriate steps in all phases of the project life. Thus, participants in a project have a role to play in improving the health and safety performance of construction sites and completed projects. Current thought on health and safety in construction put emphasis on integrating health and safety management into the entire construction process. This view of health and safety management is, at least to some extent, largely driven by developments in health and safety legislation in Europe and USA. This view of integration of health and safety management into construction processes requires responsibility for health and safety to be equitably shared between the key participants in a construction project. This view therefore requires project participants to “think health and safety”

throughout the phases of a project. As 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. Similarly, owners' involvement in construction safety could reduce cost of safety to minimum. In the UK and other countries which are members of the European Union, the European Directive on Temporary and Mobile Construction Sites calls for health and safety to be considered during the early stages of a project. However, maximum benefits can be derived from considering health and safety at the early stages of project if procurement routes are adopted which facilitate coordination and team spirit (Kheni , 2006).

Integration of health and safety into project planning has been promoted by authors such as (Cameron and Duff (2002), Pavitt et al. (2004), Gibb and Pendlebury (2005) and Hare et al. (2006). 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, 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.

2.1.8 Health and Safety Challenges in Developing Countries

Approximately 45% of the world's population and 58% of the population over 10 years of age belong to the global workforce, i.e. 60-70% of the adult male and 30-60% of the adult female population of the world (Chandrasekar, 2011). There is a wide variation in economic structures, occupational structures, working conditions, work environment, and the health status of workers in different regions of the world, in different countries and in different sectors of the economy. Therefore the mechanization of the construction industry is not uniform throughout the world. However, as stated earlier, the construction industry plays a vital role in boosting the economy of any country, especially a developing country. It provides the infrastructure required for other sectors of the economy to flourish. Many studies, such as Coble and Haupt (1999) have shown that construction industry reflects the level of economic development within the country. The construction sector everywhere faces problems and challenges. However, in developing countries, these difficulties and challenges are present alongside a general level of socio-economic stress and a lower productivity rate when compared to developed countries (Ofori,

2000). Nevertheless it is generally believed that the construction industry is a good source of employment at various levels of skills, from a general labor to semi-skilled, skilled and specialist workforce. Other major areas that impact on this sector are lack of research and development, lack of trade and safety training, client dissatisfaction, and the continuously increasing construction costs (all of which result in less profitability). Construction within developing countries often fails to meet the needs of modern competitive businesses in the marketplace and rarely provides the best value for clients and taxpayers (Datta, 2000). Additionally, this sector also demonstrates poor performance in respect of health and safety due to the absence of any stringent safety and construction laws. International labour organization (ILO, 2005) attributes the poor health and safety records in construction projects within developing countries to:

- The high proportion of small firms and the high number of self-employed workers;
- The variety and comparatively short life of construction sites;
- The high turnover of workers;
- The large proportion of seasonal and migrant workers (1998) found that, in most developing countries, for example like India, there are no training programs for staff and workers; therefore, no orientation for new staff or workers is conducted; hazards are not pointed out; and no safety meetings are held. Employees are expected to learn from their own mistakes and experience.

In adopting different approaches to health and safety in developed and developing countries, two main differences can be identified. The first is the existence of legislation and its effective implementation; the second is hazard awareness. In developed countries, many safety acts and legislation exist and are implemented effectively. Nominated safety officers promote hazard awareness with the help of regular safety training sessions. In developing countries, however, safety rules barely exist at all; and when they do, they are inappropriate, ineffective, out-of date and based on conditions that prevailed while the country was still being colonized. Additionally, the regulatory authority is usually very weak in implementing rules effectively, and work hazards are either not perceived at all, or perceived to be less dangerous than they actually are (Larcher et al., 2016).

2.1.9 Construction health and safety rules in Ethiopia

The fundamental law of the state which is the Constitution of the Federal Democratic Republic of Ethiopia, the Civil Code (Proclamation # 165/1960) together with the Labor Code (Proclamation No 377/20003) is the general legal basis for health and safety rules in Ethiopia. Numerous articles/provisions are provided under these general laws regarding health and safety of people. Labor Code ensures worker-employer relations and enables workers and employers to maintain industrial peace. It strengthens and defines the powers and duties of the organ charged with the responsibility of inspecting labor administration, particularly labor conditions, occupational safety, health and environment. The following provisions are set:

Article 92 clearly spells out the fundamental obligations of an employer with regard to putting in place of all the necessary measures in order to ensure, workplaces are safe, healthy and free of any danger to the well-being of workers. In the same article the employer is obliged to take, in particular the following measures to safeguard the health and safety of the workers:

'To comply with the occupational safety and health requirements provided for in the proclamation; take appropriate steps to ensure that workers are properly instructed is notified concerning the hazards of their respective occupations and the pre cautions necessary to avoid accident and injury to health. Ensure that directive are given and also assign safety officer, establishes an occupational, safety and health committee, provides workers with protective equipment, clothing and other materials and instruct them of its use, obliged to register and notify to the nearest labor inspection services occupational accident and diseases) arrange according to the nature of the work at his/her own expense, for the medical examination of newly employed workers, and for those workers engaged in hazardous work as may nearly, take appropriate pre-executions to ensure that all processes of work shall not be a source or cause of physical, chemical, biological, ergonomically and psychological hazards to the health and safety of the workers'

Article 93 provides the obligations of workers pertaining to the required co-operation and putting into practice of the regulation and instruction given by the employer in order to ensure safety health and working conditions at work places. The law has clearly stipulated about occupational injuries with all other related provisions.

2.2 Empirical review

Alex Kojo Eyiah, Nongiba Alkanam Kheni, Peter David Quartey (2019) on Occupational Health and Safety Regulations in Ghana Construction Industry. The findings of the study suggest that

the existing occupational health and safety legal and regulatory framework is barely effective. Stakeholders were aware of the existence of some laws and regulations but mostly could not identify the specific laws and their relevant contents. Consequently, compliance is found to be irregular. The key recurring factors affecting effectiveness of occupational health and safety laws and regulations include: negligence and lack of priority for occupational health and safety, lack of training, lack of funds for occupational health and safety, lack of capacity of regulatory and supervisory institutions, and lack of occupational health and safety education within construction firms.

Lucy Fekele, Prof. Emer T. Quezon, Yolente C. Macarubbo (2016) conducted a study on Health and Safety Practice in Building Construction in Addis Ababa. The top three factors identified that affect safety and health management in construction were: (1) Non availability of a clear company Health and safety policy; (2) Inadequate enforcement of the existing building rules and regulations; and (3) Safety awareness of the company's top management.

Fasil Argaw (2017) made an assessment of Construction Safety and Health Management in High Rise Building in Addis Ababa. The study revealed that projects that are constructed by international Chinese contractors have relatively better practice of HS management, whereas the projects of local grade one contractors have a poor practices. In addition Objects falling from height & scaffolding & ladders cause injuries and fatality highly. Further Attitude of Owners & Role of government & engineering society affects the performance of health & safety in construction very highly.

Tadesse (2018) conducted a study on construction safety in Addis Ababa focusing on grade one contractors. Findings of the research indicate that the major consequences in not meeting construction safety standards are material loss, loss of human life, harm to the public and environment which arise from use of poor quality material, lenience in supervision, poor workers safety awareness and poor workmanship.

Sara (2012) conducted a study on health and safety risk management of Tanzania construction. The findings of the study show that all responsibility on risk management is with the contractor, and it is carried out only during construction phase. The study also show that no systematic method is used for risk assessment, but rather risks are assessed based on individual judgment

guided by experience, educational background and existing regulations. Meanwhile, risk information is communicated through toolbox meetings, informal discussions, and controlled by using personal protective equipment (PPE). The study also reveals that, the regulatory system, the organization/company system, the individual system and the work environment have impact on health and safety risk management. Further findings of this study show that, site location, site configuration, procurement system and complexity of design are the main challenges hampering health and safety risk management.

Table2.1 Summary of empirical studies

Author and year of the Research/ Study	Title of the Research/Study	Findings of the Research/Study
Alex Kojo Eyiah, Nongiba Alkanam Kheni, Peter David Quartey (2019)	Occupational Health and Safety Regulations in Ghana Construction Industry	The existing occupational health and safety legal and regulatory framework is barely effective. Stakeholders were aware of the existence of some laws and regulations but mostly could not identify the specific laws and their relevant contents. Consequently, compliance is found to be irregular. The key recurring factors affecting effectiveness of occupational health and safety laws and regulations include: negligence and lack of priority for occupational health and safety, lack of training, lack of funds for occupational health and safety, lack of capacity of regulatory and supervisory institutions, and lack of occupational health and safety education within construction firms.
Lucy Fekete, Prof. Emer T. Quezon, YolenteC. Macarubbo (2016)	Health and Safety Practice in Building Construction in Addis Ababa	The top three factors identified that affect safety and health management in construction were: (1) Non availability of a clear company Health and safety policy; (2) Inadequate enforcement of the existing building rules and regulations; and (3) Safety awareness of the company's top management.

Fasil (2017)	Argaw Construction and Management in High Rise Building in Addis Ababa.	Safety and Health Management in High Rise Building in Addis Ababa.	The study revealed that projects that are constructed by international Chinese contractors have relatively better practice of HS management, whereas the projects of local grade one contractors have a poor practices. In addition Objects falling from height & scaffolding & ladders cause injuries and fatality highly. Further Attitude of Owners & Role of government & engineering society affects the performance of health & safety in construction very highly
Tadesse (2018)	Construction safety in Addis Ababa focusing on grade one contractors.		Findings of the research indicate that the major consequences in not meeting construction safety standards are material loss, loss of human life, harm to the public and environment which arise from use of poor quality material, lenience in supervision, poor workers safety awareness and poor workmanship.
Sara (2012)	Health and Safety risk management of Tanzania construction		The findings of the study show that all responsibility on risk management is with the contractor, and it is carried out only during construction phase. The study also show that no systematic method is used for risk assessment, but rather risks are assessed based on individual judgment guided by experience, educational background and existing regulations. Meanwhile, risk information is communicated through toolbox meetings, informal discussions, and controlled by using personal protective equipment (PPE). The study also reveals that, the regulatory system, the organization/company system, the individual system and the work environment have impact on health and safety risk management. Further findings of this study show that, site location, site configuration, procurement system and complexity of design are the main challenges hampering health and safety risk management.

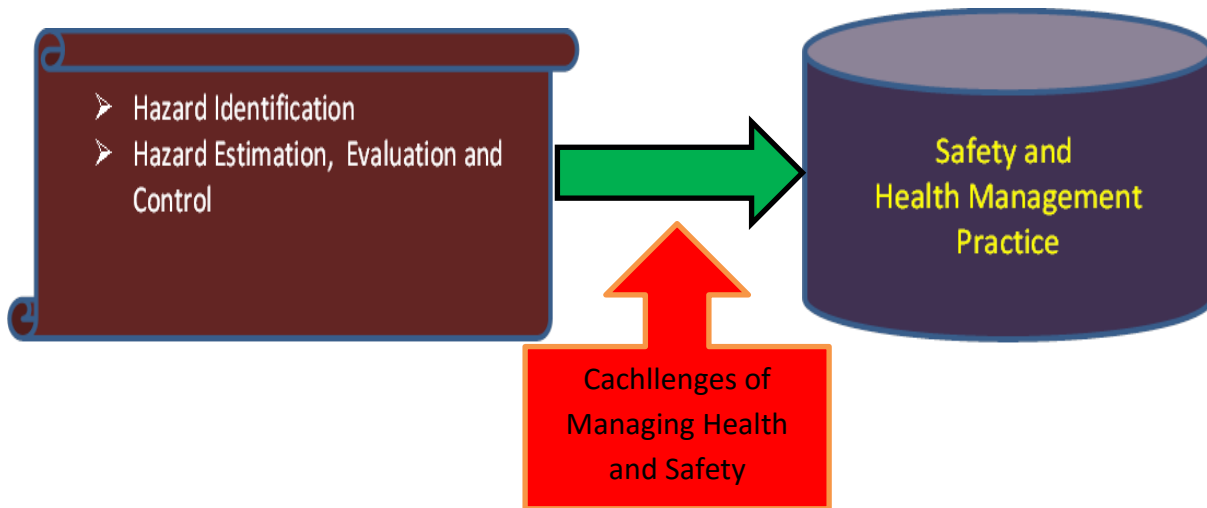
Source: Compiled by the researcher based on literature review

In cognizant with the above facts this research will be conducted to evaluate the current safety and health management in high rising buildings in financial institutions in Addis Ababa so as to provide an insight on safety and health of high rising building construction as well as to suggest how to mitigate the challenges faced in high rising building construction sites safety and health management.

2.3 Research conceptual framework

Based on the theoretical and empirical literature review the following research conceptual framework is laid down to provide a practical shape to the research endeavor.

Figure 2.2: Construction Safety and Health Management framework



Source: Own construct, developed based on Rwamamara (2007) Risk management process.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the systematic way of dealing with the research problem successfully and finding out the scientific way of conducting a research. It helps the researcher to be aware of the choice of steps usually adopted to study research problem together with the underlying logic behind them (Rajasekar, et al., 2013). Accordingly this chapter deals with the research methodology which integrates the various techniques that were used for the study for the purpose of achieving the research objectives. It takes into account issues such as the research approach, research design, research population, sample size, sampling technique, data collection procedure, and finally the data analysis.

3.2 Research approach

There are two main research approaches by which social science research including business studies is conducted. These are qualitative and quantitative research approach.

3.2.1 Qualitative Research

Based on the opinions of authors, qualitative research has many definitions. Some draw attention to the research purpose and focus while others stress on epistemology perspective. According to Merriam (2009), qualitative researchers are interested in understanding the meaning people have created in particular how they make sense of their world and the experience they have in the world. However, Parkinson and Drislane (2011) perceive qualitative research as using methods such as participant observation or case studies which result in a narrative, descriptive account of a setting practice. In the applied research context, Nkwi et al. (2001) emphasize that qualitative research involves any research that uses data that do not indicate ordinal values. This implies that the defining decisive factor is the type of data generated or used. In a nutshell, qualitative research involves collecting and/or working with images, text, or sounds which allows for the inclusion of variety of data collection and analysis technique in addition to the diversity of theoretical and epistemology frame that are associated with it (Merriam, 2009).

3.2.2 Quantitative research

Aliaga and Gunderson (2000) define quantitative research strategy as explaining phenomena by

collecting numerical data that are analyzed using mathematically based methods. Therefore, this definition implies that quantitative research is essentially about collecting numerical data to explain a particular phenomenon. Similarly, Bryman (2004) explains this as an approach that places on measurement, collection and analysis of data. It is useful when working on a large scale needs assessment or baseline survey.

3.2.3 Mixed methods

Nowadays, the use of both quantitative and qualitative methods (triangulation) in social science research in the study of the same phenomena has received significant attention among scholars and researchers. Tashkkori and Teddlie, (2003), prove the attention it has received, by stating that some researchers consider it to be a third research method in addition to quantitative and qualitative methods. Different names have been given to this new research method including multi-strategy and mixed methods (Creswell, 2003). Combining the two methods help researcher to increase the study credibility compare to what would be achieved by using a single method.

Taking into consideration the significance of applying mixed method in modern research, the researcher used mixed method which combines quantitative and qualitative techniques for the reasons of achieving credibility of result, for better interpretation of result, to offset the weaknesses associated with using one method and to achieve corroboration between the two methods (triangulation).

3.3 Research design

According to Burns and Bush (2002), research design is defined as a set of advance decisions that make up the master plan specifying the methods and procedures for collecting and analyzing the needed information. This helps the researcher to formulate the sort of data to collect for the study. These are some of the main types of research design namely exploratory, explanatory, descriptive and cross-sectional. The study adopted descriptive design. Descriptive research enables the researcher to provide an accurate description of observations of phenomena as the objective of most descriptive research is describing the state of affairs at the time of study. According to Marsh (1982), it deals with what question rather than answering questions about how/ when/ why the phenomena occurred and its most distinguishing feature is that, the researcher has no control over variables.

3.4 Research population

Saunders (2007) defines research population as the full set of cases from which a sample is taken. In line with this, Cohen et al. (2000) state that, population is a group of people who are subject to a piece of research. The target population for this study were United bank, Abyssinian bank, Nib bank, Zemen Bank, Oromia International bank, Cooperative bank of oromia, Abay bank, Amara credit and saving and Nyala insurance.

3.5 Sampling technique and sample size

With regard to selecting respondents for the research census sampling method was adopted as the total number of project manager, site engineer, safety engineer foreman and residential engineer in United bank, Abyssinian bank, Nib bank, Zemen Bank, Oromia International bank, Cooperative bank of oromia, Abay bank, Amara credit and saving and Nyala insurance are 90 which are quite manageable. Thus, all participate in providing the required information for the study. This gave equal chance to participate in the research and increase representativeness of respondents. Table below show tile and number of respondents:

Table3.1 Respondents job position and number

Job position	Number
Project manager	10
Safety engineer	10
Site engineer	25
foreman	17
Residential engineer	28
Total	90

Source: Company profile

3.6 Source of data

Data required for this study was obtained from primary and secondary sources. Primary data was gathered from project manager, site engineer, safety engineer foreman and residential engineer of United bank, Abyssinian bank, Nib bank, Zemen Bank, Oromia International bank, Cooperative bank of oromia, Abay bank, Amara credit and saving, Nyala insurance and Nile insurance; whereas secondary data collected documents from the mentioned offices related to safety and

health management.

3.7 Data collection methods

The primary data essential for this research gathered from employees through using closed ended and open ended questionnaire. The questionnaire was designed based on Likert rating scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The data needed for this study also collected from secondary sources through reviewing the offices project safety and health manuals and reports.

3.8 Data analysis

Statistical Package for Social Sciences (SPSS) was used to facilitate data analysis. First, data collected from the questionnaires edited, coded and keyed into the Statistical Package for Social Sciences (SPSS). Data collected through questionnaire in the form of Lickert scale ranging from 1 strongly disagree-to-5 strongly agree has a quantitative nature. Accordingly, quantitative data analysis which is descriptive statistics tools was used. The collected data presented graph, table and frequency distribution and percentages computed.

Content analysis approach was used to analyze open ended responses. Hsieh and Shannon (2005) posit that qualitative content analysis is a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns. According to Babbie, (2001), it is the study or interpretation of recorded human communications, and it is used to carrying out social investigation (Titscher et al. 2000). Simply, content analysis is the method for analyzing the content of qualitative material for the purpose of achieving reliability and validity of result to support argument.

3.9 Reliability

Cronbach's alpha is a reliability measure designed by Lee Cronbach in (1951). It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. For testing the reliability of the data instrument, Cronbach's alpha coefficient of reliability calculated to test the reliability of the research instruments. According to Lombard (2010), Coefficients of 0.90 or greater are nearly always acceptable, 0.80 or greater is acceptable in most situations, and 0.70 may be appropriate in some exploratory studies for some indices. Therefore for this study R-value equal to 0.70 or greater was accepted. The following table depicts the results of reliability test.

Table3.2 Test of reliability

Variables	Number of Items	Cronbach's Alpha
Major health and safety hazards	12	0.91
Health and safety management Practice	18	0.87
Major challenges of health and safety management	9	0.76

Source: Survey questionnaire

Since the value of Cronbach's alphas for this study is above 0.70 for all scale variables, the data collected from respondents was reliable and consistent. In other words the result confirmed the reliability and consistency of the data collection instruments.

3.10 Validity

To achieve validity questionnaires were included a variety of questions. Questions were developed based on information gathered during the literature review to ensure that they are representative. Content validity was further ensured by consistency in administering the questionnaires. To this end questionnaires distributed to subjects by the researcher personally. Moreover the questions were formulated in simple language for clarity and ease of understanding and clear instructions will be given to the subjects. In order to improve the strength of questionnaires, research advisor comments and pilot test feedback was used so as to make all the necessary amendments such as reorganization of questions along research questions, eliminating of unnecessary questions, and eliminating of grammatical errors was made.

3.11 Ethical considerations

In the research, every person involved in the study was entitled to the right of privacy and dignity of treatment, and information obtained held in strict confidentiality by the researcher. All assistance, collaboration of others and sources from which information were drawn were acknowledged. In general the following ethical considerations observed in this research. a) Fairness. b) Openness of intent. c) Disclosure of methods. d) Respect or the integrity of the individuals e) Informed willingness on the part of the subjects to participate voluntarily in the research act.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

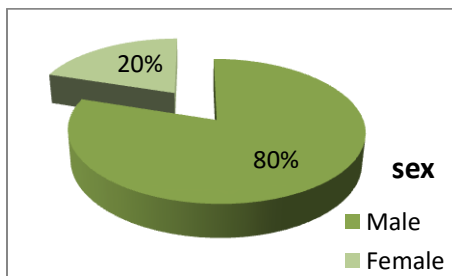
The purpose of this study is to assess construction safety and health management in high rising building construction sites in Addis Ababa. Accordingly this chapter of the study deals with presentation, analysis and interpretation of data collected for the purpose of the study. The Data presentation, analysis and interpretation organized and presented according to the objectives of the study. The collected data were edited, coded and entered in to SPSS statistical software. The collected data analyzed using descriptive statistics: accordingly data was presented in charts and table and frequency distribution, mean value and standard deviation were computed. A total of 90 questionnaires were distributed to employees working in the selected high rising building construction company, out of which 87 questionnaires was properly responded and collected by the researcher (response rate is 97%).

4.2 Demographic characteristics of respondents

This section shows the distribution of the study respondent’s demographic characteristics. The study analyzed respondent’s demographic data to see its implications to the data collection instrument. Accordingly respondent’s capability to understand the requirement of the data collection instrument and respondents capacity to provide matured responses is judged. The study analyzed demographic characteristics as gender, age category, and educational qualification, work experience and respondents position as presented under here.

4.2.1 Gender

Figure4.1 Respondnts gender distribution

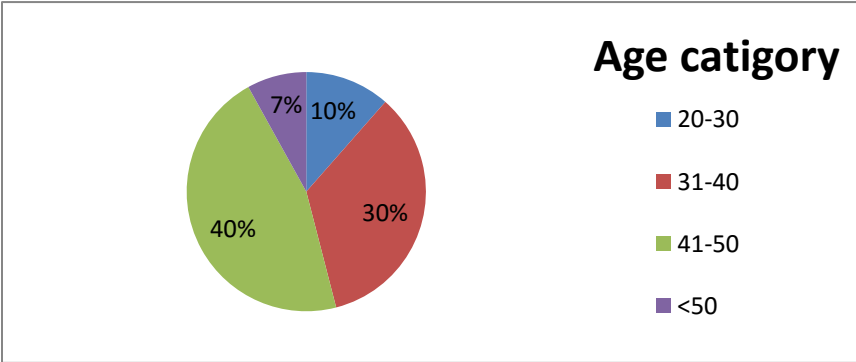


Source: Questionnaire survey, 2020

The above figure depicts that out of 87 respondents 80% are male and 20% are female employees. This implies that gender proportion inequity in the construction sector as the numbers of female engaged in the construction sector are very small as compared to number of male employees working in construction sector. Thus this situation not enables the construction sector to take advantage of female employee’s contribution to the safety and health in the construction sites as females are generally considered as more meticulous than males.

4.2.2 Respondent’s age

Figure4.2 Respondents age distribution

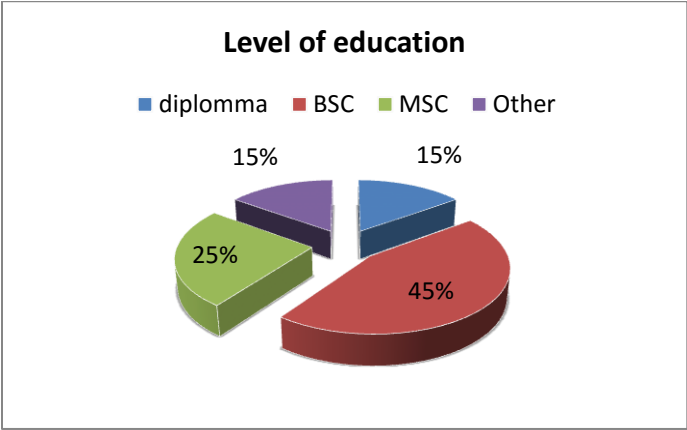


Source: Questionnaire survey, 2020

With regard to age of respondents 40% are 41-50 years old, 30% are 31-40 years old, 10% are 20-30 years old the rest of respondents are above 50. As majority of respondents that is 77% are above 30 years old this indicate their maturity to provide genuine response to the research questions.

4.2.3 Respondent's education status

Figure 4.3 Respondents level; of education

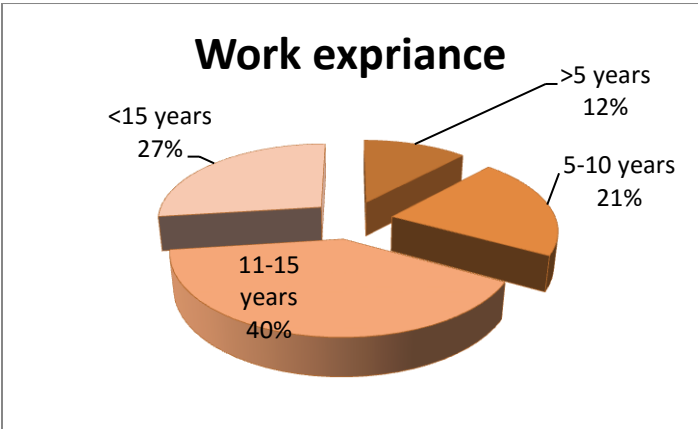


Source: questionnaire survey: 2020

Concerning to respondents education status, 45% achieved BSC, 25% are MSC holders, 15% are diploma holders and 15% are others. The implication with regard to level education of respondents is that, as majority of respondents (above 70%) are achieved BSC or above they have the ability to understand the questionnaire and they can provide professional response to inquiries posed related to safety and health in construction.

4.2.4 Work experience

Figure 4.4 Respondents work experience

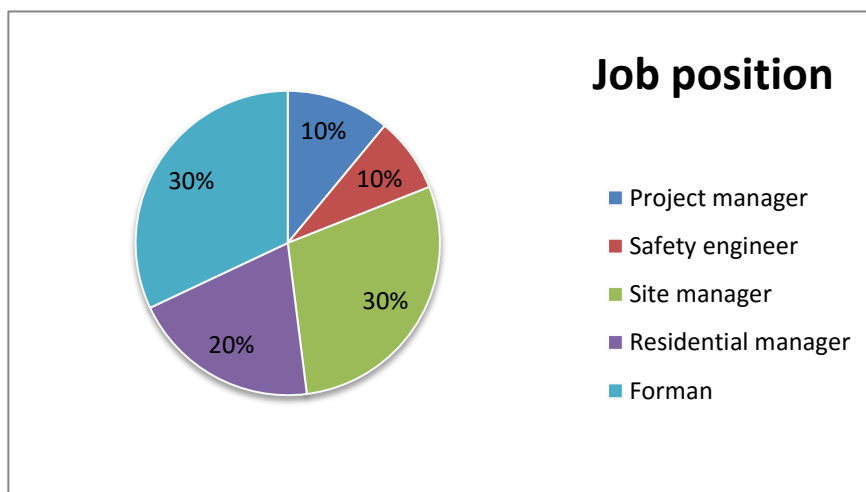


Source: Questionnaire survey, 2020

When we observe the respondents work experience in construction sector, 27% have work experience more than 15 years, 40% have 11-15 years' work experience in the field, 21% served 5-10 years and 12 have less than five years work experience in construction work. As majority of respondents (88%) have 5 and above work experience in the construction work coupled with their level education they can provide pertinent information about safety and health management practice in high rising building construction sites.

4.2.5 Job position

Figure 4.5 Respondents job position



Source: Questionnaire survey, 2020

The above figure depicts respondents' job positions in construction sites. Accordingly, 30% are site engineers, 30% are foremen, 20% are residential engineers, 10% are safety engineers, and 10% are project managers. This indicates that all construction sites have a safety and health engineer. Moreover, respondents fairly represent all professionals playing a role in the management of safety and health in the construction industry.

4.3 Data related to safety and health management in high rising building construction

This section presents and discusses data collected for the purpose of achieving the research objectives. Accordingly, major safety and health hazards in high rising building construction, the current safety and health management practices, and major challenges in managing health and safety in high rising building construction sites are presented and discussed here under.

4.3.1 Major safety and health hazards associated with high rising building construction

A construction site can seem like a scary place for those without much experience. There's all kind of sharp, blunt and heavy metal objects constantly in motion, sometimes dangling over people's heads even falling from height. It's no wonder why there are so many safety precautions and procedures observed every day on a worksite. Whether it is workers using heavy equipment and vehicles or just ascending scaffolding, there's an inherent danger involved in nearly everything that goes on. No matter how much construction experience someone might have, there's always a risk of serious injury or even death if care is not taken. Particularly the current booming high rising and complex building construction practice make more difficult the management of safety and health in construction industry as high rising buildings increased the risk of workers injury and death. As a result in this part the major safety and health hazards associated with high rising building construction sites in Addis Ababa are identified and discussed as follows.

Table4.1 Safety and health hazards in high rising building construction sites

Health and safety hazard	N	High	Medium	Low	Insignificant	Category
		(4) F & %	(3) F & %	(2) F & %	(1) F & %	
Falling (Objects falling from a height)	87	69 (80%)	10 (12%)	7 (8%)		A
Scaffolding (Falling from scaffolding during construction)	87	65 (74%)	12 (14%)	5 (6%)	5 (6%)	A
Stairways and ladders	87	63 (73%)	15 (17%)	8 (9%)	1 (1%)	A
Excavations (Slides, collapse, not shored protection...etc.)	87	10 (12%)	15 (17%)	55 (63%)	7 (8%)	C
Electricity (Electric power Accidents)	87	18 (21%)	19 (22%)	50 (57%)		C
Construction Hoists & Elevators and Cranes & Derrick	87	19 (22%)	51 (58%)	10 (12%)	7 (8%)	B
Hazardous substances (Inhalation of dust from cement-cancer, respiratory system)	87	11 (13%)	25 (29%)	51 (59%)		D
Tools and Machinery (Drilling, Grinding, Bending machine...etc.)	87	19 (22%)	49 (56)	18 (21%)	1 (1%)	B
Fire (from electric, fuel, chemical etc.)	87		10 (12%)	21 (24%)	56 (64%)	D

Noise (using block/brick cutting machine) which cause hearing loss	87	8 (9%)	47 (54%)	26 (30%)	6 (7%)	B
muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks	87	12 (14%)	17 (20%)	53 (60%)	5 (6%)	C
Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury	87	1 (1%)	13 (15%)	8 (9%)	66 (75%)	D

Source: Questionnaire survey, 2020

Key to the hazard category

- A-High safety and health hazard
- B- Medium safety and health hazard
- C- Low safety and health hazard
- D- Insignificant safety and health hazard

Table above shows the major hazards in high rising building construction sites, for simplicity the hazards in building high rising building construction sites are labeled as A, B, C and D based on respondents score.

Accordingly, Objects falling from a height, Scaffolding (Falling from scaffolding during construction) and Stairways and ladders collapse are labeled as ‘A’ which represents the major hazard in building high rising constructions. Thus objects falling from a height, workers falling from scaffolding during construction and stairways and ladders collapse are causing fatal individual injuries as well as death in high rising construction sites.

Based on respondents response score, the second alarming safety and health hazard in high rising construction sites that are labeled as ‘B’ are Construction Hoists & Elevators and Cranes & Derrick, Tools and Machinery (Drilling, Grinding, Bending machine...etc.), Noise (using block/brick cutting machine) which cause hearing loss. This are also found causing substantial injuries and death in high rising building construction sites so far.

The third category labeled as ‘C’ based on respondents response but still considered as a potential area for safety and health hazard in the constructions of high building construction sites includes: Excavations (Slides, collapse, not shored protection...etc.), Hazardous substances (Inhalation of dust from cement-cancer, respiratory system), Electricity (Electric power

Accidents) and muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks. Thus this category of high rising building construction hazards need attention as they put at risk employees life and delaying construction activity.

The fourth category that are labeled as 'D' in accordance with respondents response are Fire (from electric, fuel, chemical etc. and Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury.

4.3.2 Safety and health management in Addis Ababa high rising building construction

Health and safety is an important issue in construction works. A building construction site is a construction site where major construction activities take place, requiring the issue of health and safety to be taken into serious considerations. Hazards on building construction sites need to be defined and eliminated through effective health and safety measures. Hazards as one of the characteristics natures of work on a construction site raises the issue of health and safety on building construction site as one of the numerous problems facing the building industry. Health and safety at construction sites deals with both physical and psychological well-being of workers on construction sites and other persons whose health is likely to be adversely affected by construction activities. It is of primary concern to employers, employees, governments and project participants. Health and safety therefore is an economic as well as humanitarian concern that requires proper management and control. Accordingly respondent's reflection on current health and safety management practice in the high rising building construction sites in Addis Ababa is presented under here. For the purpose of simplicity and better understanding of the finding respondent's response are organized in to health and safety policy, management commitment and support to health and safety management and prevention and reporting of health and safety hazards in construction sites.

Table4.2 Health and safety management policy

Statements	N	SDA	DA	UD	A	SA
		F & %	F & %	F & %	F & %	F & %
your construction firm have Health & Safety policy	87			12 (14%)	43 (49%)	32 (37%)
your construction firm have a written in house Health & Safety rules & regulations and implementation	87		10 (11%)	5 (6%)	52 (60%)	20 (23%)
your construction projects/sites have a Safety Officer	87				57 (66%)	30 (34%)
your firm coordinate its Health & Safety policies with other human resource policies to ensure wellbeing of workers	87	20 (23%)	35 (40%)	15 (17%)	17 (20%)	
your firm provide awareness with written information about Health & Safety procedures to its workers	87		13 (15%)	15 (17%)	43 (50%)	16 (18%)
Workers undergo induction on Health & Safety before commencing work on a particular site	87	31 (36%)	31 (36%)	25 (28%)		

Source: Questionnaire survey, 2020

Table above present’s respondent’s response related to health and safety policy and communication. Accordingly the first question posed to respondents was whether in the construction firm they are currently working have health and safety policy in place to guide the health and safety management effort. To this end, 43(49%) agree and 32(37%) strongly agree with the stated statement. Nevertheless 12 (14%) respondents found doubtful about existence of safety and health policy in the construction firm they are working in. This means majority respondents witnessed that the construction firm developed and implemented health and safety management policy to provide direction to the management of safety and health in high rise building construction sites. A research conducted by Facil (2017) revealed similar finding in high rising building construction firm in Ethiopia concerning to health and safety policy.

The second question asked to respondents in this category was to ascertain that the construction firm has a written in house Health & Safety rules & regulations so as to help the firm to put in to practice in safety and health policy. Consequently, 72(83%) of respondents confirmed that the

construction company has written health and safety rules and regulations that need to be followed by members of the construction workers in day to day operation. Whereas 10(11%) disagree and 5(6%) remain neutral in relation to health and safety rules and regulation availability in high rising construction sites. As majority of respondents witnessed the high rising building construction firms have rules and regulations in place so as to implement their safety and health management policy. A research conducted by Fasil (2017) support the findings of this research in high rising building construction firm in Ethiopia as it showed that majority of Chinese high rising contraction company has safety and health plan.

Without health and safety officer, having in place safety policy, rules and regulations cannot guaranty health and safety in construction site. Therefore, respondents were asked whether their construction project/site has a health and safety officer or not. For this inquiry, all respondents (100%) unanimously replied that their construction project/ site have health and safety officer to coordinate and monitor health and safety management in high rising building construction sites.

To make safety and health management to take deep root in to organization culture it has to be incorporated to the human resource policy. Hence respondents were asked if their firm integrate its Health & Safety policies with other human resource policies to ensure wellbeing of workers. To this end 55(63%) respondents replied that the health and safety policy of their construction firm is not integrated with its human resource policy. The rest 15(17%) of respondents undecided and 17(20%) of respondents replied that their firm integrate safety and health policy with its human resource policy. The finding shows that health and safety management policy is not linked to the human resource policy of high rising construction firms to reinforce health and safety management practices in construction sites.

Communicating health and safety policy and procedures of the firm to employees is important to raise their consciousness about the benefits of safety measure. In line with this respondents were asked that ‘your firm creates awareness using written document about Health & Safety procedure to workers’. For this inquiry 43(50%) agree with the statement and 16(18%) of the respondents strongly agree with the statement, while 15(17%) neither support nor against the stated statement and 13(15%) respondents decline the statement. As majority of respondents confirmed the high

rising building construction site used written leaflets to aware their workers about health and safety procedures.

The last question posed to respondents on the health and safety policy and communication in high rising construction site was that ‘Workers undergo induction on Health & Safety before commencing work on a particular site’. Accordingly majority of respondents that is 72% disagree with the stated statement and 25 (28%) remain neutral. This indicates that workers not provided with health and safety orientation before involving in hazardous construction activity in high rising construction sites.

Table4.3 Management commitment & support to health and safety

Statements	N	SDA	DA	UD	A	SA
		F & %	F & %	F & %	F & %	F & %
Managers encourage and support training of employees in Health & Safety	87	12 (14%)	43 (49%)	15 (17%)	17 (20%)	
Managers ensure that the Health & Safety budget is adequate	87	52 (60%)	10 (11%)		5 (6%)	20 (23%)
Managers encourage and support worker participation, commitment and Involvement in Health & Safety activities	87	34 (39%)	25 (29%)		28 (32%)	
Managers actively monitor the Health & Safety performance of their projects	87	10 (11%)	21 (24%)	13 (15%)	43 (50%)	

Source: Questionnaire survey, 2020

Providing training employees on health and safety play a pivotal role on health safety management of a construction site. As confirmed by 55(63%) of respondents management commitment is low in giving training on health and safety management in construction site. What is paradox in the construction firms in Ethiopia is that even though such kind of preventive measures are very effective in managing health and safety and significantly minimize the risk of safety and health hazard, they focus on curative measures that are reactive rather than proactive. Moreover what worsen the situation is that responsible bodies of health and safety on construction sites less negotiate on budget required for safety and health management and control with the concerned body as it was witnessed by 71% of respondent’s response rate. A number of scholars deemed that construction health and safety cannot come without cost, so it

becomes important to negotiate and ensure the availability of adequate safety and health budget to high rising buildings by managers to ensure workers wellbeing in the construction sites.

Health and safety in the construction site require active involvement and participation of workers and workers effort need to be recognized and rewarded by managers, however 68% respondents witnessed that managers not recognize and encourage employee’s effort on the health safety management.

The last question posed to respondents was that ‘Managers actively monitor the Health & Safety performance of their projects’. To this end 50% respondents agree, 24% disagree, 11% strongly disagree and 15% of respondents undecided with the stated statement. This situation indicates that managers moderately monitor construction site health and safety performance which is not adequate to ensure safety and health in high rising building construction projects.

Table4.4 Prevention, inspection and reporting of hazards

Statements	N	SDA	DA	UD	A	SA
		F & %	F & %	F & %	F & %	F & %
Layout of the site consider Health & Safety aspects	87			10 (11%)	45 (52%)	32 (37%)
There is adequate first aid and first aider(s) on your construction projects/sites	87		10 (11%)	5 (6%)	52 (60%)	20 (23%)
Your firm Provided personal protective equipment (PPE)	87				26 (30%)	61 (70)
Your firm Provided right tools, equipment and plant to execute construction	87			7 (9%)	50 (57%)	30 (34%)
Your firm Provided good welfare facilities such as showers, canteens, toilets	87			20 (23%)	41 (47%)	26 (30%)
Health & Safety inspections done regularly	87	34 (39%)	22 (25%)	12 (14%)	19 (22%)	
Local authorities and Health & Safety enforcement agencies visit sites for inspection	87	27 (31%)	36 (41%)		24 (28%)	
All accidents, injuries and fatalities compiled & reported to the concerned body	87		21 (24%)	10 (11%)	49 (56%)	7 (9%)

Source: Questionnaire survey, 2020

In this sub section hazard prevention measures, inspection and reporting accidents and fatalities in high rising building construction sites investigated. The first preventive measure to be taken in construction site is considering safety and health during layout of the site. To this end majority

high rising building construction layout prepared by taking in to consideration health and safety of workers and other victims as witnessed by 83% of respondents response. Moreover as respondent's response confirmed unanimously (100%) construction firms provide personal protective equipment (PPE) to all construction workers. In addition to the above health and safety prevention measures, the construction firms provide the right tools, equipment and plant to execute construction as well as good welfare facilities such as showers, canteens, toilets to workers as confirmed by majority of respondent's response of (91%) and (77%) respectively. The research also identified that high rising construction sites have first aid points and adequate number of first aid workers on construction sites as witnessed by 83% of respondent's response. Nevertheless, respondents observed that safety and health inspection in the construction sector is not conducted regularly in the construction sector as majority respondents confirmed by 64% response. Moreover from respondents response identified that local authorities and Health & Safety enforcement agencies visit sites for inspection rarely as confirmed 72% of response. This indicates that health and safety management rules and regulation enforcement in the country is very weak as a result construction sectors became negligent in designing and implementing a sound health and safety management and control system in construction site.

Health and safety statistical records and reporting hazards is important in managing health safety in construction industry. This research identified that keeping statistical records and reporting to the concerned body about health and safety hazard is only an average as confirmed by 65% of respondent's response. The implication is that quite substantial amount of accidents, injuries and deaths in the construction site were not reported in the country.

Table4.5 Challenges in managing health and safety in high rising building construction sites

Statements	N	SDA	DA	UD	A	SA
		F & %	F & %	F & %	F & %	F & %
Complexity of design and structure	87			12 (14%)	43 (49%)	32 (37%)
Absence of a clear company Health and safety policy	87	55 (63%)	32 (37%)			
Lack of top management commitment and support	87		10 (11%)	5 (6%)	52 (60%)	20 (23%)
Inadequate Safety and Health Training and orientation	87				57 (66%)	30 (34%)
Low enforcement of the existing building rules and regulations	87		10 (11%)		38 (44%)	39 (45%)
Inadequate Personal Protective Equipment provision	87	33 (38%)	34 (39%)	20 (23%)		
Work force negligence and inexperience	87	14 (16%)	25 (29%)	3 (4%)	30 (34%)	15 (17%)
Absence of reward and punishment system	87	21 (24%)	23 (26%)		25 (29%)	18 (21%)
Weather condition	87	19 (21%)	17 (20%)	13 (15)	25 (29%)	13 (15%)

Source: Questionnaire survey, 2020

The major challenges facing the high rising building construction sector are inadequate health and safety orientation and training, low enforcement of existing rules and regulations issued related to construction and health management in the country, lack of top management commitment and support to health and safety management in construction sector and complexity of buildings design and structure.

The secondary challenge to the management of health and safety in high rising construction sites are work force negligence and inexperience and absence of reward and punishment system in the construction firm to reinforce health and safety management in the construction sites.

CHAPTER FIVE

MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Major Findings

The findings of the study identified gender proportion inequity in the construction sector as the numbers of female engaged in the construction sector are very small as compared to number of male employees working in construction sector. Thus this situation not enables the construction sector to take advantage of female employee's contribution to the safety and health in the construction sites as females are generally considered as more meticulous than males.

Majority of respondents that is 77% are above 30 years old this indicate their maturity to provide genuine response to the research questions. Moreover as majority of respondents (above 70%) are achieved BSC or above they have the ability to understand the questionnaire instruments and they provide professional response to inquiries posed related to safety and health in construction.

The research identified that all construction sites have a safety and health engineer and respondents are fairly represents all professionals that are playing a role in the management of safety and health in construction industry. Moreover majority of respondents (88%) have 5 and above work experience in the construction work they can provide pertinent information about safety and health management practice in high rising building construction sites.

The first of objective of the research was to identify major health and safety hazards associated with high rising building construction sites in Addis Ababa. Accordingly the major hazards in high rising building construction sites were identified as workers hit by objects falling from height, workers falling from scaffolding during construction, and stairways and ladders collapse.

The second objective of the research was to explore the current level of health and safety practice in high rising building construction in in Addis Ababa. To this end the research findings revealed that all construction companies engaged in constructions of high rising building have health and safety management policy as well as rules and regulations in place. Moreover all construction firms provide personal protective equipment and make available first aid stations and adequate first aid workers as well as providing welfare facilities. However the research findings shows

that less management commitment and support to health and safety in high rising building construction sites, low level of enforcement of construction site health and safety rules and regulations by the concerned government authority are hindering the effectiveness of health and safety management practice in the country.

The third research objective was to explore major challenges facing the high rising building construction. To this end the major challenges in the management of health and safety in high rising construction firm are identified as inadequate health and safety orientation and training, low enforcement of existing rules and regulations issued related to construction and health management in the country, lack of top management commitment and support to health and safety management in construction sector and complexity of buildings design and structure.

5.2 Conclusions

Objects falling from a height, workers falling from scaffolding during construction and stairways and ladders collapse are the major causes for fatal individual injuries as well as death in high rising construction sites.

The second alarming safety and health hazard in high rising construction sites are Construction Hoists & Elevators and Cranes & Derrick, Tools and Machinery (Drilling, Grinding, Bending machine. etc.), Noise (using block/brick cutting machine) which cause hearing loss.

Majority respondents witnessed that the construction firm developed and implemented health and safety management policy to provide direction to the management of safety and health in high rise building construction sites and majority of respondents witnessed the high rising building construction firms have rules and regulations in place so as to implement their safety and health management policy. Moreover the construction firm's used written leaflets to aware their workers about health and safety procedures. The research identified that workers rarely undergo work place health and safety orientation before the first day of their work.

Management commitment and support is crucial in managing health and safety in high rising building construction sites. Nevertheless this study explored that management commitment to health and safety management is less as workers were not provided health and safety training as well as not assigning adequate health and safety budget. Moreover managers not encourage construction workers to play active role in the management of health and safety in high rising

building construction sites and their monitoring of health and safety performance of their project is moderate just to show compliance to the rules and regulations.

The high rising building construction company found performing a promising job in managing health and safety in construction sites in terms of considering health and safety issues during design stage, in making available first aid points as well as adequate first aid workers, providing sufficient personal protective equipment's and making available welfare facilities to workers. Nevertheless work place health and safety inspection is rarely conducted, accidents injuries fatalities recording and reporting to the concerned body is not done adequately and supervision by local authorities and Health & Safety enforcement agencies is quite less in high rising building construction site which results poor health and safety management performance.

The major predicaments and challenges facing the high rising building construction sector are inadequate health and safety orientation and training, low enforcement of existing rules and regulations issued related to construction and health management in the country, lack of top management commitment and support to health and safety management in construction sector and complexity of buildings design and structure.

5.3 Recommendations

To improve the current safety and health management in high rising construction the following measures are suggested by the researcher.

Construction health and safety directives and rules issued by the country should be strictly enforced their application in construction sites as majority of health and safety management negligence are due to low enforcement. To this end health and safety enforcement agency and local authorities need to make regular construction site health and safety supervision and inspection and take measures on construction firms that not protect the health and safety of their construction workers. Moreover the construction health and safety enforcement agency should demand timely and accurate health and safety report from high rising building construction firms as this report and record serve as a data source for further research in the field to come up with better health and safety measures in country .

‘Safety first’ should be a slogan or a motto in all high rising building construction sites so as minimize hazards happening to workers due to lack of knowledge and negligence. To this end it is pivotal to design construction layout and structures in a manner that minimize the risk of health and safety, providing orientation and training to workers about on health and safety of construction work site, strengthening the culture of providing personnel protective equipment and making available first aid stations.

Managers in the construction sites are generally considered as captains of the health and safety management. Thus all construction managers need to demonstrate their firm commitment to the health and safety of high rising building construction projects through allocating adequate budget, providing adequate health and safety orientation and training, overseeing, recording and reporting of all kinds of accidents to the concerned authority to bring change in the health and safety management of the country construction industry.

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ST MARY UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Questionnaire prepared for employee

Dear Respondent, I would like to express my sincere appreciation and deepest thanks in advance for your generous time and frank and prompt responses.

The purpose of the research is to examine safety and health management in high rising building construction in Addis Ababa, Ethiopia.

I want to assure you that this research is only for academic purpose. Thus, your ideas and comments are highly honored and kept confidential. For your free and genuine responses, you are not required to write your name.

Contact Address: If you have any query, please do not hesitate to contact me. I am available at your convenience on Tel. ----- -- or e-mail your questions to -----

Part one: Respondents general information

1. Sex
 - A. Male
 - B. Female
2. Age in year _____
3. Education status
 - A. Diploma/ advanced diploma
 - B. BSC
 - C. MSC
 - D. Other, specify _____
4. Your work experience in construction sector _____
5. Your current job position
 - A. Project manager
 - B. Site engineer
 - C. Safety engineer
 - D. Foreman
 - E. Residential engineer

Part two: Safety and health related inquires

2.1 Major safety and health hazards

Please rate the major Health & Safety hazards to be considered in construction of high rise building projects

Health and safety hazard	High (4)	Medium (3)	Low (2)	Insignificant (1)
Falling (Objects falling from a height)				
Scaffolding (Falling from scaffolding during construction)				
Stairways and ladders				
Excavations (Slides, collapse, not shored protection...etc.)				
Electricity (Electric power Accidents)				
Construction Hoists & Elevators and Cranes & Derrick				
Hazardous substances (Inhalation of dust from cement-cancer, respiratory system)				
Tools and Machinery (Drilling, Grinding, Bending machine...etc.)				
Fire (from electric, fuel, chemical etc.)				
Noise (using block/brick cutting machine) which cause hearing loss				
Handling heavy load				
muscular skeleton disorder, back pain due to Bending, twisting while laying blocks/ bricks				
Manual handling (carrying cement bags or bricks/blocks) Neck, back or arm injury				
Workers crushed or by moving vehicles, focal lift				

2.2 The current Safety and health management practice in high rising building constructions

Please indicate your level of agreement to the current safety and health management in high rising building construction sites

Items	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
your construction firm have Health & Safety policy					
your construction firm have a written in house Health & Safety rules & regulations and implementation					
your project have a site-specific Health & Safety plan					
your construction projects/sites have a Safety Officer					
your firm coordinate its Health & Safety policies with other human resource policies to ensure wellbeing of workers					
your firm provide awareness with written information about Health & Safety procedures to its workers					
your firm prepare written circular/brochure that aware workers about the risk identification associated with their work					
Workers undergo induction on Health & Safety before commencing work on a particular site					
Layout of the site consider Health & Safety aspects					
Managers encourage and support worker participation, commitment and Involvement in Health & Safety activities					
Managers encourage and support training of employees in Health & Safety					
Managers actively monitor the Health & Safety performance of their projects					
Managers ensure that the Health & Safety budget is adequate					
There is adequate first aid and first aider(s) on your construction projects/sites					
Your firm Provided personal protective equipment (PPE)					
Your firm Provided right tools, equipment and plant to execute construction					
Your firm Provided good welfare facilities such as showers, canteens, toilets					
Health & Safety inspections done regularly					
Local authorities and Health & Safety enforcement agencies visit sites for inspection					
all accidents, injuries and fatalities filed & reported to the concerned body					

2.3 Challenges of safety and health management in high rising building construction projects

Items	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
Complexity of design and structure					
Poor safety awareness of company's top management					
Lack of a clear company Health and safety policy					
Absence of Safety and Health Training and orientation					
Inadequate enforcement of the existing building rules and regulations					
Inadequate Personal Protective Equipment					
Work force negligence					
Absence of reward and punishment system					
Employee experience					
Weather condition					
Lack of recording and reporting daily safety issues (safety audit)					