

JIMMA UNIVERSITY

SCHOOL OF GRADUATE STUDY

JIMMA INSTITUTE OF TECHNOLOGY

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

MASTER OF SCIENCE PROGRAM CONSTRUCTION ENGINEERING AND
MANAGEMENT

Assessment of Risk and Safety Management on Building Construction
Project in Case of Jimma

A Master's Thesis Submitted to Jimma University Institute of Technology,
Department of Civil Engineering in Partial Fulfillment of Requirements for Degree
of Master's Science in Civil Engineering (Construction Engineering and
Management)

BY: Manaye Mosiye

November 2017

Jimma Ethiopia

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November 2017

Declaration

I declare that the information provided in this thesis is my original work and has not been submitted or presented to any other universities and all other source of material were duly acknowledged.

Name of candidate: Manaye Mosiye

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The undersigned confirmed that this thesis is an original work and conducted under my strict supervision and guidance.

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2. Moges Getahun(MSc.)

Signature: _____

ABSTRACT

Health and safety risky issues have always been a major problem and concern in the Construction industry. Due to its nature and complexity of the work and relatively labour intensive environment, construction works provide opportunities for occupation for a wide range of people skilled, semi-skilled and unskilled. Wherever reliable records are available, construction is found to be one of the most dangerous on health and safety criteria, particularly in developing countries. However, knowledge on how health and safety risks are managed in Ethiopia construction sites is limited.

This study therefore, aims to find out the current practice of health and safety risk assessment on building construction site in Ethiopia context specifically in Jimma town. The study was based on individual judgement, educational background, existing journals and available regulation. Questionnaires were designed and distributed to potential construction industry players, interview sessions and site observation have been conducted to meet the objective of the study. In addition, structured interviews were carried out with selected managers, daily workers and site engineers from a selection of government construction site. Descriptive analysis was used to summarize and interpret the data by using MS-excel and SPSS software.

Accordingly, the findings indicate that the most frequent factors of hazards on building construction project ranked as: inadequate site access, labor dispute, insufficiency equipment availability and lack of awareness. On the other hand, falling from height, foot and hand injuries, manual handling, bending and twisting and falling objects observed to be the most critical hazards on building construction project were identified from the finding. The study recommended that the government Procurement systems should be evaluated in terms of their impact on safety and health prior to their selection for projects. Contractors should not be placed on tender lists unless they can show competence in the management of safety and health.

Key words: Building, Construction industry, Health and Safety, Risk Management

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Acronyms

ELI	Ethiopia Labor Inspection
HSE	Health and Safety Executive
ILO	International Labor Office
MOLSA	Ministry of Labor and Social Affairs.
OSH	Occupational Safety and Health.
PLC	Private Limited Company
PPE	Personal Protective Equipment
UN	United Nation.
GDP	Gross Domestic Product
WSHA	Workplace Safety and Health Act

CHAPTER ONE

1.1 Background of The Study

Construction is and always has been the largest single sector in the industry of every country in the world, once there is any degree of industrialization with the development of an infrastructure. From then on it forms a vital sector in the country's economy and its prosperity is a measure of the economic progress of the country.

The construction industry normally constitutes between 7 and 15 per cent of a country's GDP. Because the industry is still labor-intensive, despite ever-increasing mechanization, its contribution to employment is substantially larger than such a percentage first indicates (kharbanda,1985)

The construction industry has invested much time, effort and money in trying to improve its health and safety performance. This investment has had success in the past in achieving significant improvements in the industry's record. However, these have not been maintained in recent years and now construction is one of the most dangerous industries (HSH,1998). The construction industry has generated this attention because, regardless of considerable efforts directed at reducing the number of deaths, injuries and ill health, construction has one of the highest rates of fatal and major injuries. When the number of fatal injuries are compared in all industries (1998/99 -2000/01) the construction industry accounted for 33% of all work related deaths.

In construction industry Construction workers are exposed to a variety of health hazards every day. The construction industry is a risk prone industry. Understanding the concept of risk itself the basic principles involved in risk management. The reasons construction is risky and prone to health and safety risks are because of the physical environment of the work, nature and complexity of the construction work operations, construction methodology, construction materials and equipment and physical properties of the construction project itself (Lingard and Rowlinson, 2005).

Construction projects are described as dynamic and complex because of their sites and high labor intensive. The current rapid economic development has brought changes in workplaces in developing countries, including Ethiopia. The organization of occupational health and safety services is not yet resilient enough to handle the growing demands for workers' health in the

context of industrialization. There is limited information on the gaps and needs of occupational health services in workplaces in Ethiopia (Abera K.,2016).

According to (John,2006) Safety is the absence of danger or a state of protection and condition not involving risk. Management of workplace health and safety is done together; in the same way the word safety is used to mean both.

The two words ‘hazard’ and ‘risk’ are generally used interchangeably and are sometimes confused with each other. However, there is, in fact, an important and slight difference between the two words and if the definition of ‘hazard’ is something with the potential to cause harm, then ‘risk’ is defined in British Standard No. 4778 as, A combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence. A risk is the likelihood of a substance, activity or process to cause harm. A risk can be reduced and the Hazard controlled by good management.

According to (Bunni ,2005) Risk is as a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence. Hazard is also defined as follows in the British Standard: 4778, a situation that could occur during the life time of a product, system or plant that has the potential for human injury, damage to property, damage to the environment, or economic loss. So Risk could be a loss or gain. There is no pure risk loss or pure gain benefit. Risk may or may not happen. It is a probability of its occurrence that lead same to its occurrence or its non-occurrence. If it occurs loss may result, and if not occur or benefit will result.

Risk management by definition is therefore the process whereby decisions are made to accept a known or assessed risk and/or the implementation of actions to reduce the consequences or probability of occurrence (British Standard-4778). After risk assessment and following other risk management processes, allocation of risk comes in to picture. Such allocated risk, sharing of same, determines ownership of risk either by the employer or the contractor under the construction contract. That is contractually important for its treatment under the relevant standard conditions of contract.

Risk assessment is the process to look at the conditions workers are exposed to the hazards and determine whether the hazards likely to cause any harm to the workers. Assessment of risks may be made by considering factors such as:

- ❖ The air concentration of fumes, vapor's and dust generated from the work processes;
- ❖ The effectiveness of ventilation on site to control the air contaminants;
- ❖ The likelihood of skin or eye contact with corrosive/irritating substances;
- ❖ The exposure of the workers to hazardous physical agents, e.g. noise, heat and radiation;
- ❖ The ergonomic factors, e.g. repetitive tasks and manual handling.

Both the immediate risks, e.g. being overcome by fumes in a confined space, and the long term health risks, e.g. skin cancer from prolonged contact with pitch, should be assessed. The assessment should be reviewed when new hazardous substances and physical agents are used and when there is a significant change in the working environment. Workers in a construction site may be exposed to various hazardous substances and physical agents, e.g. asbestos, lead, silica dust, organic solvents, sewer gases, welding fumes, radiation, noise and vibration. Excessive exposures to these substances/agents may result in acute injury, chronic illness, permanent disability or even death. Loss of concentration at work and fatigue arising from poor health conditions may increase the risk of accidents. Construction work is featured by high labor turnover, constantly changing work environment and conditions on site, and different types of work being carried out simultaneously by several contractors. These features would further increase the health risks of workers (OHS,2004).

1.2. Statement of The Problem

The construction industry has consequently earned the character of being a dangerous or highly hazardous industry because of the suspiciously high incidence of accidents and fatalities that occur on construction sites around the world (Smallwood, 2008). Similarly, (Sohail, 1997) labels construction industry as very hazardous. 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.

Unfortunately, safety and health and the environment are often neglected on construction sites and rarely managed in developing country. Currently in Ethiopia especially in the construction industry there is less information on the risk and safety within the construction industry. As a result, the safety of construction activities puzzles the government, policy makers and regulators, international development financiers, and practitioners in the field considerably. According (Sermolo, 2014) in all over Ethiopia, millions of daily laborers work in big constructions in unsafe working environment and without supportive and protective equipment: viz, protective caps, hand gloves, eye glasses, working clothes, shoes and so on. They work on high rise buildings standing on old and inclined wooden scaffolds and ladders; they even transport heavy construction materials on it. Additionally, the constructions do not have safety nets, restraint and fall arrest systems. As a result, a dozens of daily laborers lose their life. From International Labor organization, (ILO,2005) Ethiopia Labor Inspection (ELI) Audit described that, with the booming of construction industry in Ethiopia, many fatal construction site accidents are taking place but most of them were not documented.

In the study area the problem of health and safety assessment risky management and its adverse impact on the building construction project is a sensitive issue, which is areas surrounding Jimma town. These are also the other problems that need the attention to conduct a research on the existing practices of safety management on building construction project. To identify the major factors affecting the safety practice in building construction project and to analyze the effect of safety and health practice in building construction project. According to MOLSA report During the assessment, five years' data was collected on the insurance coverage for compensation of Workmen's Compensation (WC) and Group Personal Accident (GPA). Accordingly, 104,848,225 ETB was paid in the form of claim by one public and two privately owned insurance companies.

1.3 General Objectives

The general objective of the study was to assess the health and safety risk management on building construction project in Jimma town.

1.4 Specific Objectives

The Specific objective this study was:

- ❖ To identify the major factors affecting the safety and health practice in building construction project.
- ❖ To analyze the effect of safety and health practice in building construction project.
- ❖ To recommend remedial measurement and to reduce hazard in the building construction project site.

1.5 Research Questions

For achieving the aim of the study, the following research questions were developed;

1. What are the factors affecting safety and health building construction project?
2. What are the causes of hazards and adverse impact on building construction project in relation to construction safety and health practice?
3. What are the mechanisms to minimize the occurrence of hazards in building construction project?

1.6 Scope and Limitation of the Study

The aim of this study was to assess the risk and safety management for building construction project in Jimma. However, assessing the risk and safety management for building construction project covers wide concepts and very difficult to address in a single study. Therefore, based on the ownership there are two basic type of construction project across the world; public and private projects. According to (Splitter and Mc craken,1996) the public sector projects normally have more complexity than private sector. The research did not cover all construction due to some limitations like time, budget and others so the study emphasis only on vertical or buildings structure because the researcher believed that vertical structure was more rendering to hazards than horizontal. From the above point of view, the study was focused on the identification of risk practically facing in the G+1 and above public building construction project in Jimma town.

1.7 Significance of the Study

As large as research reach the mission in which it was aimed the result of the final findings were having been the following significances.

This study is very interested for the writer's workplace because it emphasizes the importance of incorporating risk management planning in to a construction project.

There is very little literature relating directly to the safety on construction sites in developing countries like Ethiopia. Existing publications tend to suggest how accidents may be prevented but assume that a strong regulatory body exists to enforce legislation cited by, (Sermolo, 2014) Therefore, this study may contribute to the literature of risk and safety in developing countries. In Ethiopia it serves as a spring board for future researchers in the area.

It further enlightens the impacts of risk and safety management for building construction project. This was a massive significance for the stakeholders to take the atypical circumstances of the area into account in conveying and implementing policy and it may increase the awareness of safety on construction site.

Furthermore, the findings of the study may serve as an input for other researchers to conduct detail further study in the area and may initiate them to fill the gap of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Health and safety definition

Before a detailed discussion of health and safety issues can take place, some basic health, hazard and safety definitions are required as well as the legal framework for health and safety because it seems important to have a clear understanding of the nature and working conditions in the construction industry and safety organization's to develop an efficient tool for health and safety issue.

Health is the protection of the bodies and minds of people from illness resulting from the materials, processes or procedures used in the workplace (OSHA,2004)

Safety is the protection of people from physical injury. The borderline between health and safety is ill-defined and the two words are normally used together to indicate concern for the physical and mental well-being of the individual at the place of work. Welfare is the provision of facilities to maintain the health and well-being of individuals at the workplace. Accident is defined by the Health and safety Executive as any unplanned event that results in injury or ill health of people, or damage or loss to property, plant, materials or the environment or a loss of a business opportunity (HSE,2003).

Risk assessment; (OSHA, 2004) define is the process to look at the conditions workers are exposed to the hazards and determine whether the hazards likely to cause any harm to the workers.

Hazard and risk means integral potential of any machine, material, or ambient factors to cause illness or injury from contact with or exposure to construction (Ethiopian Building Code Standards., 2013).

OSHA defines hazard is any work place condition or condition or a person's "state being" that could cause an injury or illness to an employee.by "state of being" we mean his psychological, emotional and physical state.

Hazard can be ranked relative to other hazards or to a possible level of danger. A risk is the likelihood of a substance, activity or process to cause harm. The Health and Safety Executive defined risk as the chance high or low that somebody will be harmed by the hazard (HSE,1998. (Hertz,1983) stated the definitions of risk which taken from the Random House College Dictionary as exposure to the chance of injury or loss. The Health and Safety Commission (1995) defined risk as the likelihood that harm will occur (Jannadi,2002). According to (Lim,2003) risk is defined as either, the probability of unwanted event, combination of hazard, unpredictability, and partiality of the actual result differ from expected result, loss uncertainty, or probability of loss. However, risk in this study is defined as the chance or probability, high or low, of harm actually being done. Risk will be apparent at all stages of the life cycle of a construction project at appraisal, sanction, construction and operation (Perry,1985). One of the most severe risks in construction industry is in the safety and health aspect. It is also the promotion of an environment where each person in the project construction hierarchy has a role and responsibility for safety and health.

2.2 Causes of Accidents on Building Construction

As the growth of construction industry blooms throughout in Ethiopia this also causes an increase in competition of projects to execute between construction firms which are however achieved at the expense of the workers well-being and their safety. Therefore, pinpointing the various causes and effect of accidents on building construction sites and suggesting ways and means of reducing these accidents should be accredited.

Accident don't just happen, they are caused. According to Ridley 99 per cent of the accident are caused by either unsafe acts or unsafe conditions or both (Ridley, 1986). As such, accidents could be prevented. Similarly, (Sermolo,2014) suggested that Poor working conditions/environment and lack of personal protective equipment (PPE) are the cause of accidents in construction industry.

The unsafe action is a damage of an accepted safe procedure which could bring the occurrence of an accident. The unsafe condition is a hazardous physical condition or circumstances which could directly permit the occurrence of an accident. Most accident results from a combination of contributing causes and one or more unsafe acts and unsafe condition.

In order to understand the sources of hazard and subsequent injuries, researchers have attempted to develop theories of why accidents occur. Accidents are viewed as originating from a technical

or human error (Chi, 2005);(Murie F. , 2007). The multiple accidents causation theory postulates that there are many contributory causes leading to an accident (Heinrich, 1980). 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, 2004)A similar view is held by (Lubega, 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, 2004)agrees 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 reckless 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. 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 centered 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.

2.3 The Effects of Accidents Costs On Construction Site

Accident statistics represent not only the terrible human tragedies but also substantial economic and psychological costs. Accidents can result in the following:

- ❖ damage to plant and equipment,
- ❖ damage to work already completed,

- ❖ loss of productivity work time while debris is also cleared and damaged work rebuilt,
- ❖ reduced work rate until normal site working rhythm and morale are restored, disruption while investigations are carried out by the company safety department, the insurers, inspectors from HSE and sometimes representatives from the trade unions,
- ❖ legal costs and, in some case, fines,
- ❖ Loss of confidence and reputation.

In the other way the cost of accidents can be considered as being either direct or indirect costs. direct costs; tend to be those associated with the treatment of the injury and any unique compensation offered to workers as a consequence of being injured and are covered by workmen's compensation insurance premiums (Pillay and Haupt,2008). The direct costs of injuries are those that are most observable and are typically referred to as insurable costs. Direct costs may include: medical cost, premiums for compensation benefits, liability, and property losses. The direct costs can generally be quantified with reasonable accuracy. Indirect cost; -which are borne by contractors, include reduced productivity for both the returned worker(s)and the crew or workforce; clean-up costs; replacement costs; stand-by costs; cost of overtime; administrative costs; replacement worker orientation; costs resulting from delays; supervision costs; costs related to rescheduling; transportation, and wages paid while the injured is idle.

(Pillay and Haupt,2008) Indirect costs of accidents are more difficult to measure. Indirect costs are essentially all non-insurable costs incurred as a result of an injury. The indirect costs are those which are hidden and for which no historical record is kept. Indirect costs include: reduced productivity for both the returned workers and the crew or workforce, clean-up costs, replacement costs, stand-by costs, cost of overtime, administrative costs, replacement worker orientation, costs resulting from delays, supervision costs, costs related to rescheduling, transportation, and wages paid while the injured is idle (Hinze, 2005); (Smallwood, 2008): (Heinrich, 1980) identified indirect costs associated with accidents as:

- ❖ Cost of lost time of injured employee.
- ❖ Cost of work stoppage of other employees.
- ❖ Lost supervisory time.

- ❖ Cost of time spent on the case by first-aid attendant.
- ❖ Cost of damage to the machinery tools, or other property.

According to (Davies V.J. and Tomasin K., 1996) The most serious accidents that occur during the erection and assembly of structural steel or pre-cast frameworks are;

- ❖ Erectors falling from heights when at their places of work, going to or returning from them;
- ❖ The collapse of the whole or part of the framework causing workers to fall or striking those at lower levels; and
- ❖ Workers at lower levels being struck by tools or materials falling or being thrown down.

Studies have shown that the ratio of indirect costs to the direct costs can range from 4 to 1 up to 7 to 1 (Robinson, 1979). It is possible that these ratios are based on incomplete data and therefore the economic impact is underestimated.

According to (Heinrich, 1980) conducted a study of a large number of injuries and concluded that the indirect costs of injuries were approximately four times the direct costs. The safety profession appears to have embraced the ratio of four to one, which Heinrich postulated. However, this ratio of indirect to direct costs is not universally accepted in the construction industry.

To conceptualize the above literatures study's, the researchers, categorize the construction accident cost in to two major parts direct and indirect costs.

2.4 Factors Affecting Safety and Health On Construction Projects

Unfortunately, safety, health and the environment are often neglected on construction sites and rarely managed especially in developing countries but those developing countries are young in fulfilling the infrastructure with in the country so this sector needs series attention in health and safety from responsible body. Safety and health is often discussing in management meetings as a priority, while in reality safety and health takes a low priority to budget and time discussions.

According to (Hinze, 2005) Health and safety is vitally important, not just cost, quality and time but also a worker has been permanently disabled or killed, then a project is not a success.

(Enshassi) argued that the benefits of safety and health improvements include: reduced accident costs, increased productivity, improved human relations and enhanced firms' image.

I. Human factor

The socio- cultural attitude explores how meanings of risk are constructed within social groups and how a person understands and perceptions of risk are shaped by social factors and experiences. The main argument of this attitude is that risk assessment, judgment and communication are not formed independently from the social context. They are part of an evolving social debate about feelings, knowledge, power relations, past experiences, and the culture of the society. The social theory of risk has been adopted in this ideology and both individualism and conceptualism play an important role. This people attitude responds to risk on the basis of what they have been adopted in their culture, personality, knowledge and experience them have (Rayner, 1992).

For instance, in the legal context, occupational health and safety laws in many developed countries place the primary responsibility for health and safety on employers whose degree of willing compliance with occupational health and safety law may vary according to their conception of risk relation to health and safety.

According to (Healey, 2006) Specific human factors contributing to major accidents include;

- ❖ Poor management practices e.g. inadequate supervision
- ❖ Pressure to meet production targets
- ❖ Inadequate safety management systems
- ❖ Failure to learn lessons from previous incidents
- ❖ Communication issues e.g. between shifts, between personnel and management etc.
- ❖ Inadequate reporting systems
- ❖ Complacency
- ❖ Violations/ non-compliance behavior
- ❖ Inadequate training e.g. emergency response, fire and safety
- ❖ Lack of competency
- ❖ Excessive working hours resulting in mental fatigue
- ❖ Inadequate procedures
- ❖ Modification/ updates to equipment without operator knowledge and/or revised risk assessments
- ❖ Inadequate/ insufficient maintenance

- ❖ Maintenance errors

II. Environment factor

Before any project commencement there should be apply environmental impact assessment in order to make sure the project is free from any harm to the environment.

Assessment of risks may be made by considering the work place environment factors as stated (OSHA, 2004) state the following five factors:

- ❖ The air concentration of fumes vapor's and dust generated from the work processes;
- ❖ The effectiveness of ventilation on site to control the air contaminants;
- ❖ The likelihood of skin or eye contact with corrosive/irritating substances;
- ❖ The exposure of the workers to hazardous physical agents, e.g. noise, heat and radiation;
- ❖ The ergonomic factors, e.g. repetitive tasks and manual handling.

According to (Johor Bahru,2003) on Hazards at Construction Sites finding work place environment cover item such as access, guard rail, condition of opening, temporary structures, site tidiness, waste disposal and visibility.

To summarize the above literature views construction safety factors can be divided as follow; human factors, legislative laws, technical factors, environment factors and management factors and others factors.

2.5 Challenge in Developing Countries Related with Ethiopia Conditions

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 enhancing the economy of any country, especially in developing country. It provides the infrastructure required for other sectors of the economy to flourish.

Many studies, such as (Coble, 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)

On the other hand, it is generally believed that the construction industry is a good source of employment at various levels of skills, from a general labor to professional workforce.

Other major areas that impact on this sector are lack of research and development, lack of trade and safety training, customer's 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 by (Datta, 2000) cited in (Sermolo,2014).Moreover, this sector also demonstrates poor performance in respect of health and safety due to the absence of any rigid safety and construction laws. International labour organization(ILO, 1987) characteristics 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; (Kartam, 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 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 may/not exist at all if exist; and when they apply, they are inappropriate, ineffective, out of date and based on conditions that prevailed while the country was still being colonized because they are just simple copy. 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, 1999).

Generally, to summarize the above literature review with relation to construction health and safety in developed and developing countries, there have been two main differences that can be identified. The first is the existence of legislation and its effective implementation; the second is hazard awareness.

2.6 Occupational Safety, Health and Working Environment with Ethiopian Context

OSH, legislative framework the issue of governing safety and health at work on legal basis in Ethiopia dates back to 1940s when the first legal instrument Proclamation No. 58/1945 was publicized. The origin of this legislation was a result of the advent of industrialization that took place in the country. This legislation was framed itself on the basic principles underlined by the two notable ILO conventions on Labor Inspection. A more comprehensive legislation on occupational Safety and Health management replaced this in 1964 i.e.

Proclamation 232/1964 in order to address the change occurred. All the laws of that period were adopted from most of the European countries especially of the British taking in to account of the prevailed condition of the country's industrialization and the pre maturity of the development of Labour administration system. Recent efforts have also been made to bring the legislation in to conformity with the current phenomena and concerns including the principles underlined by international standards. The same effort has culminated in to strengthening the existing legal frame-work with putting in place of more comprehensive and technical legal instruments.

Lab our proclamation No 377/06, 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, work places 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 and notified concerning the hazards of their respective occupations and the pre cautions necessary to avoid accident and injury to health.
- ❖ Ensure that directive is 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 deemed 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.

With the same proclamation in Article 93, in this article the law provides the obligations of workers pertaining to the required co-operation and putting in to practice of the regulation and instruction given by the employer in order to ensure safety health and working conditions at work places. The following are the major obligation set by the law for workers to abide with; To co-operate in the formulation of work rules to safe-guard the workers' health and safety and implement these are:

- ❖ To inform the employer of any defects related to the appliances used and injury to the health and safety of workers, he/she discovers within the company.
- ❖ Report to the employer any situation, which he/she may have reason, to believe could present a hazard and which he/she cannot avoid on his/her own or any accident or injury to health which arises in the course or in connecting with work
- ❖ To make proper use of all safeguards, safety devises and other appliances furnished for the protection of the health and safety of others.
- ❖ To obey all the health and safety instructions issued by the employer or by competent authorities. In the same law it is clearly stipulated that no worker may interfere with remove, displace, damage or destroy any safety devices or other appliances furnished for his/her protection or the protection of others and may not obstructs any method or process adopted with a view to minimizing occupational hazard.

2.7 Construction Health and Safety Responsibilities

Construction health and safety should be of primary concern to employers, employees, governments and project participants (Kheni ,2008). Thus the main parties responsible for construction health and safety are the client, main contractor, regulatory agencies and employees.

- ❖ Health and safety duties of state and regulatory agencies:

Government regulatory agencies often enact regulations to help ensure that a construction project is safe to build, safe to use, and safe to maintain and delivers you good value. Good health and safety planning also helps to ensure that a project is well managed and that unexpected costs and problems are minimized.

- ❖ Health and safety duties of employer:

Clients have a big influence over how work is done. Where potential health and safety risks are low, clients are required to do little. Where they are higher, clients need to do more. Employers must assess the work being undertaken and the environment his employees will operate in when determining the appropriate PPE to be worn.

- ❖ Health and safety duties of main contractor:

Main Contractors must check that all subcontractors are conforming by providing PPE for all their employees (those who are self-employed for tax reasons, but who otherwise work in an employee – employer relationship are also entitled to receive PPE) free of charge.

- ❖ Health and safety duties of employees:

Employees should be made aware of their responsibility to wear the PPE appropriately, take care of equipment and report any defects. They should also be informed that if they do not wear or misuse any PPE that has been appropriately issued that this could lead to disciplinary action. This equipment is provided for their protection (HSE, 2009); (Lingard and Rowlinson,2005).

Therefore, in order to assure safety and health of the working environment for workers (men's and women's) by empowering enforcement of the standards developed under the act. For these reason, the Health and Safety at Work Act 1974 (HSW, 1974) is the basis of British health and safety law. It summaries the lawful requirements of the employers and the other people that many be included. A significant section of the act is the forming of the HSE (Health and Safety Executive) and the (Health and Safety Commission). The act created by both Health and Safety Executive and the Health and Safety Commission (HSC) to attained the intended goal.

According to (Tam, 2004), in China the ministry of Construction takes the overall responsibility in administration the construction industry in which the roles include such as;

- ❖ Implementing the new strategies and policies such as preparing development programs,
- ❖ Regulating construction markets and
- ❖ Construction institutions and monitoring construction safety

In Kuwait the practice of health and safety is controlled by two government agencies, Kuwait Municipality (KM) and Ministry of Public Work (MPW) in addition to the High Committee for Safety and Security at the state level (Kartam and Bouz,1998).

Unlike many countries, in Ethiopia Labour proclamation No 377/06 states that there is one comprehensive labour law that is Ministry of Labour and Social Affairs (MOLSA) the Federal Governmental Agency who's operating in order to address all aspects of ensuring labour relation to be governed with basic fundamental rights and obligation focusing on industrial peace in all work places. The establishment of the services has the objective of preventing injuries, diseases, creating of harmonious and peaceful industrial relations where there are no strikes and industrial unrest.

Within the ministry, administratively, there is the Department of Occupational Safety, Health and Working Environment dealing with the two inspection functions i.e. commonly called the technical and non-technical labour Inspections. The capacity of the service has been continued to improve and made to go through various structural and administrative changes.

2.8 Evaluation of Project Safety Programs

Three key approaches to evaluate the safety program in construction projects were identified in the literature, which are accident statistics, workplace inspection and evaluation of documented safety program (Hislop, 2000); (Jannadi and Al-Sudairi, 1995) ;(Kavianian and Wentz, 1990).

1. Accident statistics:

Accident statistics are the most commonly used measures of safety performance. Occupational injury rates in terms of frequency and severity over a specific period of man-hours worked provide a relative measure of the effectiveness of the safety program in place. Nevertheless, injury statistics only provide a retrospective analysis of injury experience and it is an indicator of how effectively a safety program was managed.

2. Workplace inspection:

Workplace inspection is a more effective mean of evaluating the safety program than relying only on statistics. Through inspections, the assessor can determine the degree of influence being exercised over site conditions, the control of hazards, the enforcement of safety standards, the use of required personal protective equipment and the degree to which safe work practices are being applied. This approach is also referred to as safety auditing.

3. Evaluation of documented safety program:

The new Workplace Safety and Health Act (WSHA,2006) of Singapore, which repeals the Factories Act enforces two regulations, viz:

- ❖ The contractor shall submit together with the tender document for approval by the client, the contractor's proposed safety management system for the project, which complies in all aspects with the WSHA 2006 and the Singapore's Code of Practice for Safety Management Systems for Construction Sites (SPSB,1999).
- ❖ Unlike the previous Factories Act whereby the contractor is accountable for any accidents on a construction site, the new WSHA 2006 will hold responsibility on the client, consultants and the contractor for any accidents on construction sites, as the case may be.

Therefore, the contractor's proposed safety management system is expected to be evaluated exactly by the employer and the consultants at the tendering stage and to be followed up during the construction stage. Hence, the external safety assessor for a construction project may evaluate the proposed/documented safety program and assess its effectiveness.

The WCI is underwritten at the bidding stage when the contractor has not setup yet the necessary safety program on the site. Thus, it is hard to adopt a workplace inspection approach for the project to be insured. However, the insurer may inspect a similar project of the contractor and infer a project safety index for the new project. Alternatively, the insurer may evaluate the documented safety program for the project and derive a project safety index. It is also applicable to use a combination of safety auditing of a current project and evaluation of the documented safety program for the new project. In any scenario, a methodical approach for performing the audit or evaluation must be set forth (Hess-Kosa, 2006).

According to (HSE,2006) on Construction Design and Management Regulations 1994 (CDM) require that health and safety is taken into account and managed throughout all stages of a project, from conception, design and planning through to site work and subsequent maintenance and repair of the structure.

2.9 Elements of Construction Safety Management System

The new workplace safety and health act (WSHA,2006) lists six key obligations of contractors with regards to construction safety, viz (MOM, 2006):

- I. Providing and maintaining a workplace that is safe, without risk to health, and adequate as regards to facilities and arrangements for the workers' welfare at work;
- II. Ensuring that adequate safety measures are taken in respect of any machinery, equipment, plant, article or process used by the workers;
- III. Ensuring that the workers are not exposed to hazards arising out of the arrangement, disposal, manipulation, organization, processing, storage, transport, working or use of things in their workplace or near their workplace under the control of the contractor;
- IV. Developing and implementing procedures for dealing with emergencies that may arise while the workers are at work;
- V. Ensuring that every work person has adequate instruction, information, training and supervision as is necessary for that person to perform the work; and
- VI. Giving the workers all necessary information about the way the activities and operations on site are conducted as might affect their safety or health while they are on site.

The key elements of a construction safety management system to meet contractors' obligations under the WSHA 2006 were identified from the (WSHA ,2006), (SSCP ,79:1999), (Rowlinson ,1997) and (Teo et al.,2005), and described below.

1.Project safety organization: The contractor shall appoint the following persons to ensure safety, health and welfare of all persons on site:

A workplace safety and health officer or co-coordinator approved by the commissioner for workplace safety and health. A workplace safety and health auditor approved by the commissioner, whose duties shall be to audit:

- i. The safety and health management system on the site;
- ii. The risk assessment of all works undertaken on the site; and
- iii. Any of the work processes carried out and the site itself.

A workplace safety and health committee comprising representative of workers, subcontractors and the main contractor of the site to:

- i. Keep under review circumstances at the workplace, which affect or may affect the safety or health of persons at the workplace;
- ii. Promote co-operation between the management and employees in achieving and maintaining safe and healthy working conditions;
- iii. Carry out from time to time inspections of the scene of any accident or dangerous occurrence in the interests of the safety and health of the workers; and
- iv. Exercise such other functions and duties as may be prescribed or conferred on the committee.

2.Risk assessments and management: The contractor shall establish procedures to identify and analyze all existing and potential risks to workers. The risk assessment method shall include: (1) identification and recording of existing and potential risks; (2) identification of persons exposed to the risks; and (3) development and implementation of preventive or control measures.

3.Safe work practices: The contractor shall establish and maintain procedures for the safe execution of works based on codes of practice. These practices will encompass: (1) safe procedures; (2) permit-to-work systems; and (3) personal protective equipment use systems.

4. Safety training and competency of people involved: The contractor shall establish procedures to identify training needs and provide adequate safety training to management personnel, supervisors and workers.

- I. All management personnel shall be trained in safety policy, safety management system, safety organization, statutory requirements on safety and their duties and responsibilities in safety.
- II. All supervisors shall be trained so as to achieve a better understanding of the safety aspects of the work operations and to ensure that the operations are carried out safely.

III. All workers shall be trained in-house, before they commence works, in safe work practices.

5. Safety inspection system: The contractor shall establish and maintain a documented procedure for safety inspection to ensure that unsafe conditions and practices at the worksite are identified and corrective measures are implemented promptly and effectively. Regular and thorough site inspections shall include: (1) construction operations; and (2) site condition (housekeeping).

6. Machinery and tools use and maintenance regime: The contractor shall inspect that all machinery and tools brought to the site are tested and certified and they are in good condition for use. The contractor shall also implement an effective inspection and maintenance program to ensure a safe and efficient operation of machinery and tools on site.

7. Sub-contractors' safety systems: The contractor shall perform an evaluation of sub-contractors' safety performance before selecting them. The evaluation shall encompass: (1) company's safety management system; (2) safe work practices; (3) training records of managers, supervisors and workers; (4) status of construction machinery and tools; and (5) safety track records.

The contractor shall also: (1) establish an effective on-going program to evaluate the safety performance of sub-contractors; (2) carry out periodic inspections to ensure sub-contractors' compliance with safety requirements; (3) review safety training records of sub-contractors; and (4) evaluate the status of construction machinery and tools.

8. Emergency management system: The contractor shall establish an emergency plan and an emergency committee as well as conduct drills for any emergency situations that may arise on site. The emergency plan shall include: (1) procedure for notification and rising of alarms and communication to relevant authorities such as police, civil defense force, etc.; (2) initial response procedures and site layout plans for various emergency situations; (3) an effective evacuation plan; and (4) procedures and means of loss control such as first aid and emergency equipment, etc.

2.10 Summary of Literature Review

The literature review was done through previous studies, internet, construction management books, standards and engineering journals. By referring to the previous literature, the information from the causes of construction health and safety, factors of construction safety and health, some OHS and WSHA adaptation of different countries of construction observed. This would be used

to develop the questionnaire survey in order to collect data from the targeted respondent. Health is the protection of the bodies and minds of people from illness used in the workplace. Safety is the protection of people from physical injury. It may be caused by any party to the and may be a direct result of one or more circumstances. Lack of safety on construction site have adverse effects on construction party generally, the owner and contractor (either in the form of lost revenues or extra expenses) and were as the employees may damage, disable or loss he's or her life during the time of work especially who are working on site.

To generalize the different literature review of above on causes of accidents and ill-health problems on construction sites, it is observed that the causes of construction accidents can be classified into five parts namely, site conditions, equipment and materials, human, management and job factors.

The responsibility body of construction safety and health were differing from country to country due to socio political, geographical and others case. For instance, in China the ministry of Construction takes the overall responsibility in administration the construction industry. But In Kuwait the practice of health and safety is controlled by two government agencies, Kuwait Municipality (KM) and Ministry of Public Work (MPW) in addition to the High Committee for Safety and Security at the state level.

Literatures found that in Ethiopia there is only one comprehensive labour law that is Ministry of Labour and Social Affairs (MOLSA) the Federal Governmental Agency who's operating in order to address all aspects of ensuring labour relation to be governed with basic fundamental rights and obligation focusing on industrial peace in all work places. The establishment of the services has the objective of preventing injuries, diseases, creating of harmonious and peaceful industrial relations where there are no strikes and industrial unrest.

Since construction is more hazardous areas than others, so accident occur in every construction project and the magnitude of these accident varies considerably from project to project. Some horizontal construction projects are fewer number of hazards occur than others vertical construction projects. So it is essential to define the actual causes of hazards on building construction project in order to minimize and avoid the accident on building construction project. There is a wide range of views for the causes of hazards for engineering and construction projects. Some are attributable to a single party, others can be qualified to several quarters and many relate

more to systemic faults or deficiencies rather than to group or groups. The successful execution of construction projects and keeping the site working environment safe and health.

In Ethiopian context the problem of construction health and safety are all most neglected and they are thinking it's irrelevant for all party. This indicates that this problem didn't receive enough attention by both researchers and responsible authorities. Even if few researches are made in health and safety in Ethiopia, these researches are focused mainly on general construction projects in case of Addis Ababa only. By taking this in to consideration this thesis mainly focuses on the assessment of health and safety on building construction project in case of Jimma and Nekemte town

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter deals with description of the study area, the research theory, Method Adopted by this Study and Justification, Study Population and Sampling Techniques, Data Sources and Collection and method of data analysis for the study. The overall procedure followed for conducting this study is summarized.

3.2 Research theory

Research theory has been defined as a systematic and logical procedure for solving a problem with the support of (Yin, 2003).(Creswell, 2003) argue that research theory is a set of interrelated constructs (variables), definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining natural phenomena. Meanwhile, Fellows and (Liu,2003) provide that there are two principal theories to research namely; qualitative and quantitative. Nevertheless, (Creswell, 2003)identified a third theory which he calls the mixed method theory. The following section discusses the details of each method.

3.2.1 Quantitative Research Approach

The quantitative research method adopts a deductive and objective view, which is characterized by tangible data such as counts, weight, mass, and other physical measures (Fellows and Liu, 2003). The approach involves the generation of data in quantitative or numerical form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion (Kothari,2004,). Similarly, (Creswell,2009) states that, in the quantitative approach the researcher use survey or experiment to collect data needed to see cause and effect relationship among variables of interest. The quantitative approach follows deduction in that it tests existing theories to verify them.

The major benefit of the quantitative approach is that it enables the researcher to utilize statistical techniques to make generalization about the population. The major weakness of a quantitative research is that the researcher knows only about the collective or average experience of study participants but not their individual experiences (Dann,1999).

3.2.2 Qualitative Research Approach

(Creswell, 2013) observed that qualitative data provide depth and details through direct quotations and a careful description of programs, situations, events, people, interactions and observed behaviors. states that the qualitative method (Yin, 2003) gives the respondent the opportunity to speak freely, which can provide important data that would not be obtained by the quantitative method. Qualitative data are not numerical nor are they usually subjected to statistical methods of analysis. Rather they are examined in their raw form (D., 1999). Creswell further considers that the qualitative inquiry employs different knowledge claims, strategies of inquiry and methods of data collection and analysis. Among the strategies associated with the qualitative approach are case study, content analysis, interview and observation, as well as guide theory and literature. This study opted for the questionnaire survey in the qualitative strategy of inquiry as opposed to the other strategies, based on the justification that is subsequently explained.

3.2.3 Mixed Research Approach

The mixed research approach is a combination of both quantitative and qualitative approaches to data collection, the analysis of data and other phases of the research process (Creswell and Clark, 2007; Morgan, 2006). This approach tends to base knowledge claims on pragmatic grounds, whereby research problems can be understood better by employing both methods rather than by using only one method (Creswell, 2003). The mixed method approach involves collecting both numeric and text information, either simultaneously or sequentially, so as to best understand research problems, with the final database representing both quantitative and qualitative information (Creswell and Clark, 2007). (Baker, 2010) further debates that the mixed methods approach is better than either method alone because it provides not only more information but also better quality of information. Therefore, in the mixed methods approach the research has both quantitative and qualitative behaviors characteristics approaches together at the same research.

3.3 Method Adopted by This Study and Justification

This research uses Survey research approach because as cited in ((Achenef f., 2012) enables to describe the nature of existing conditions (i.e. to describe the nature of existing practice of health and safety in Ethiopian Construction Industry) efficiently, to represent a wide target population, to generate numerical data, to provide descriptive, and explanatory information and to manipulate key factors and variables to derive frequencies. It seeks to develop a clear understanding of how

health and safety risks are managed at construction sites. It seeks to explore how risk is assessed, and identify the causes and type of hazard and controlled at construction sites and what factors are associated with the process of risk management at construction sites.

The purpose of these study to assess the risk and safety management techniques for building construction project. Based on the features, strengths and weaknesses of different research approaches and other reasons discussed above, the researcher found the qualitative methods approach to be suitable for this study in order to achieve the stated objective in well manner. Mainly primary data was used in this study. More specifically, the researcher used questionnaire survey. In addition, interview and site observation were also being used in order to substantiate results obtained from different data sources and types.

3.4 Study Population and Sampling Techniques

The target population were having been contractors, owners, engineers, construction managers and Foreman. Generally, 12 local construction contractors, 2 foreign contractors, 5 government construction institution and 10 employers of the population were selected. The sampling techniques used to select representative of the population were purposive sampling.

Purposive sampling on the other hand, is a useful sampling method consisting of getting information from a sample of the population that one thinks knows most about the subject matter (Walliman, 2005).

3.5 Data Sources and Collection

In this study, both primary data and secondary data were used. The primary data was collected through questionnaire survey, interview and observation while secondary data were collected from internet, journals, books, thesis and standard guides.

The questionnaire survey mainly contains close-ended questions because close ended questions are often easier and quicker for the researcher to record and code the responses obtained from the Respondents, and are also easier and quicker for the Respondents to fill (tick) the responses. This reduce the number of questionnaires to be returned.

Limited numbers of open ended questions also include in the questionnaire because open ended questions allow Respondents to include additional information including feelings, attitudes and

understanding of the subject and enable Respondents to raise new issues. This allows the researcher to better access the Respondents' true feelings on an issue under study and to access extra information from Respondents. In addition, interview and observation were included in the primary data collection in order to make reliable the data.

Interview; In-depth interview was the primary data collection method used in this study. (Yin, 2003) argues that interviews are a very effective method of gathering a large volume of data. In-depth interviews were conducted by the author with three parts of informants. The first part were individuals involved at the construction sites, who were the site manager, supervisors, Health and safety committee, labor's and design team (supervision team). The main issue regarding this group was to look at their role in terms of risk assessment, source of hazard and control.

The interview was less formal as it was adjusted according to the activity and role of each group. The second part of interview was conducted with the organization/company management, to find out how it facilitates the process of health and safety risk assessment and control. Interviews were conducted with the managers of the government organization. The main information required from this group concerned how are they facilitate and enforce health and safety risk management at construction sites.

All interviews were conducted in local language (Afan Oromo and Amharic). Most of them were photo and translated into English. Observation; Observation was another method chosen for the research study. According to (Stake,1995), the qualitative case study researcher spends the majority of the time personally in contact with the activities and operations of the case. Observational techniques are therefore very relevant for those doing case study. The existing study adopted the non-participant observation technique.

The researcher was introduced to staff on project sites on the first visit, which gave her the opportunity to develop relationship with both site management staff and technicians. Observation was made in order to describe the physical features of the construction sites, job site organization, work practices the equipment and tools being used, the nature of activities performed on the construction sites, workers' risk behavior, such as adhering to rules and wearing PPE and how statement took place on the sites. Recording of observations involved writing field notes and taking photographs.

3.6 Method of Data Analysis

Data analysis is a critical study by which the researcher extracts information from the given data. Data has to be analyzed with reference to the purpose or objective of the study. This research used two types of data analysis methods, to analyze the sample data. The descriptive statistical (SPSS) analysis was used to analyze the means of the data collected through the close-ended questions of the questionnaire. The data collected using observation and open-ended questions of the questionnaire were analyzed using qualitative data analysis techniques together with the results of the descriptive statistics in order to supplement one by the other.

Descriptive statistical and SPSS software were used to analyze and present the data obtained from the questionnaires, interview and observation.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1 Introduction

This part of the research deals with the analysis and discussion of the data collected from questionnaire survey, site observation and interview. The questionnaire was developed from the literature review. Questionnaires Analysis and Findings presented in section 4.2; The findings obtained from the interview are presented in section 4.3; the data collected from the questionnaire survey is analyzed and discussed in section 4.4; the findings obtained from the observation are presented in section 4.5.

4.2 Questionnaires Analysis and Findings

4.2.1 Questionnaire Response Rate

For assessing the current practice of risk and safety management on building construction project in Jimma town. A total of 44 questionnaires were distributed in both towns out of which 38 (86.36%) were duly completed and returned. The total 42 questioners were collected from 15 contractor companies and 8 consultants. As presented in table 4.1 from the 15 contractor companies the respondents were; 15 managers, 21 labor/site workers and the remaining 8 respondents were from consultants.

Table-4.1: Questionnaire Response Rate

Respondents	Questionnaires Distributed		Questionnaires duly completed and Returned		Response Rate (%)
	No.	Percent (%)	No.	Percent (%)	
project Manager	15	34.09	13	34.21	86.67
Consultant/Engineer	8	18.18	5	13.16	62.5
Labor/site workers	21	47.73	20	52.63	95.24
Total	44	100	38	100	

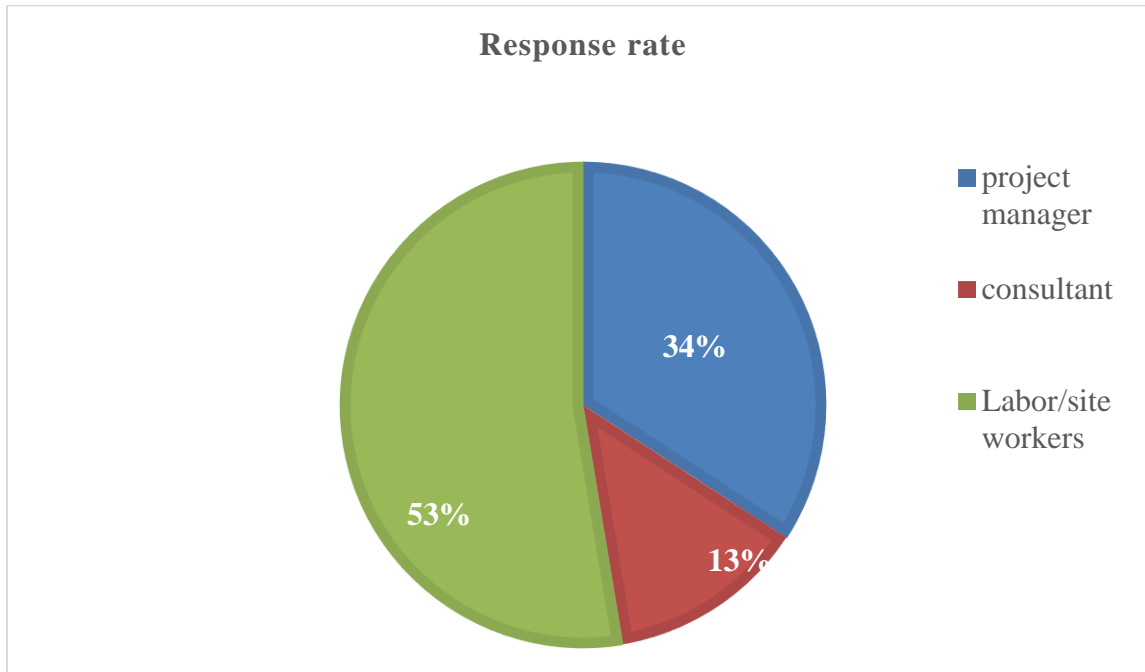


Figure 4.1: Response rate

4.2.2 Respondents' Personal Information

I. Respondents' age group

Table 4.2 presents the summary of personal information of respondents. The table contains the frequency and percentage of each age category.

Table -4.2: Age of the respondents

	Frequency	Percent	Cumulative Percent
20-35	28	73.7	73.7
36-45	10	26.3	100.0
Total	38	100.0	

28(73.7%) of the respondents were within the age group of (20-35) and 10 (26.3%) of the respondents were within the age group of (36-45). none of the respondents were above 36 years old. This indicates that, most of the workers are youngsters.

II. Respondents' educational background

The educational background of the respondents in construction were as show in the table 4.3.

	Frequency	Percent	Cumulative Percent
primary	5	13.2	13.2
vocational skill	4	10.5	23.7
secondary	9	23.7	47.4
college	7	18.4	65.8
university	6	15.8	81.6
others	7	18.4	100
Total	38	100.0	

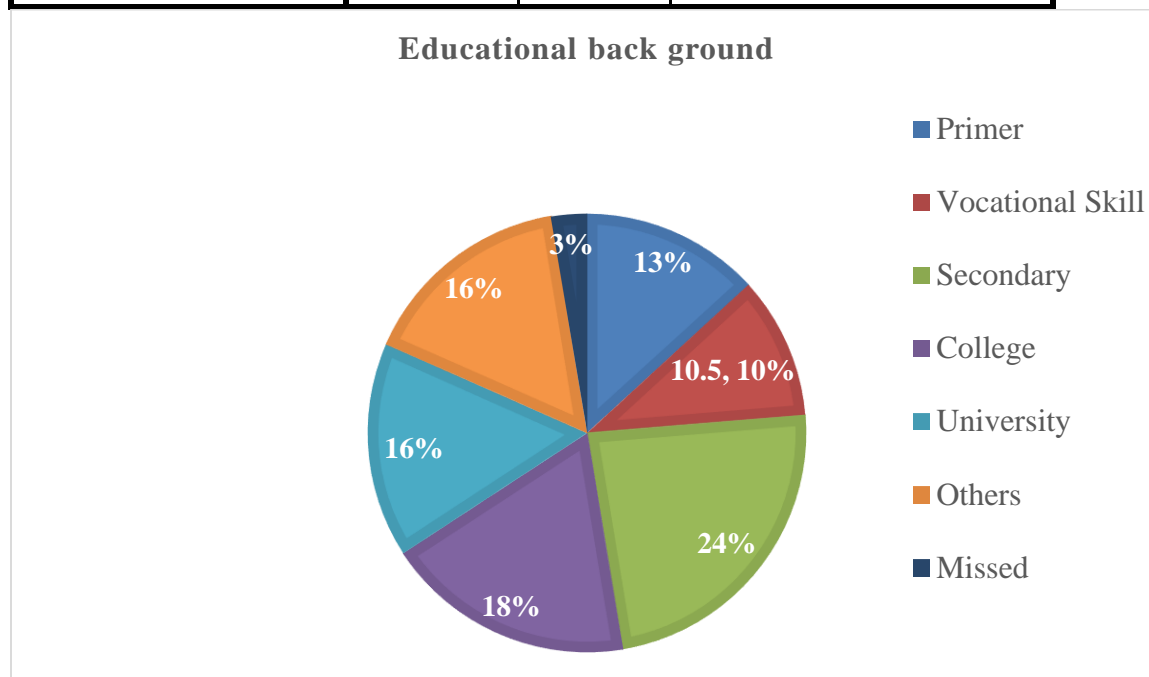


Figure 4.2: Educational back ground

As the Table 4.3 and fig 4.3 indicate that, 12 (31.6%) of the respondents have got first degree and above, and 26(68.4%) of respondents had not attain eve first degree. these indicate that, the educational status of the worker is not sufficient for construction professionalism.

III. Respondents' skill knowledge and experience.

The information regarding to the skill knowledge and experience of respondents in construction are were presented in table 4.4. and fig 4.3below.

	Frequency	Percent	Cumulative Percent
with employer	10	26.3	26.3
on site	24	63.2	89.5
missed data 3	4	10.5	100.0
Total	38	100.0	

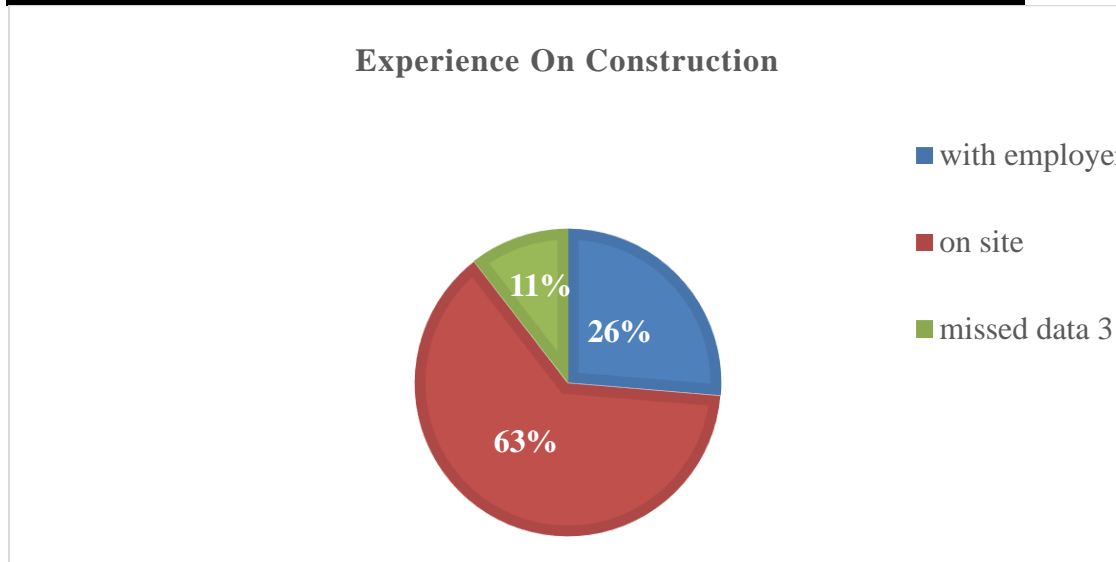


Figure 4.3: Respondents' skill knowledge and experience

As stated in the table 4.3 and figure 4.3 above, 24 (89.5%) of the employees had worked in the construction sector on site and 10(26.3%) of the employee had worked as officer and the remaining 4(10.5%) were missed data. This indicates that, most of the employees had sufficient experience in construction environment.

4.3 Interview Results

The 20 interviewees were asked the same questions and finally each of their answer were summarized. As indicated in the research methods interviews were focused on site workers who are working on building construction project. According to the researcher perception, construction groups spend most of their time at construction sites, they are exposed to a higher probability of injury or death so the first offended are those who are working on the site.

The interview was on the nature and source of health and safety hazards at Jimma building construction sites. The results are indicated accordingly.

Interview Questions;

1. Does your company have a Health and Safety policy? The question designed to determine if the companies had a health and safety policy which is considered an important document as it outlines main risks and hazards on site and the required preventive actions. 10% of respondents stated having a health and safety policy.
2. Does your company provide Health and Safety training to employees? Since I have discussed in the above only 10% safety policy at all, this question found out if the companies provided their employees with health and safety training as to develop their health and safety awareness. There was only 10% training given to the workers at all.
3. Does your company carry out risk assessment to determine risks and hazards on site? This question scanned if your companies take risk assessments to determine risks and hazards on construction site and ways to minimize these hazards. only 10% of respondents are confirmed taking risks assessments because the company are not influenced set by the law.
4. Does your company have a Health and Safety committee? This question examined about the existence of any organization within the building construction projects, such as health and safety department, which was in charge of health and safety matters of the companies. According to interviewees 10% of respondents of the companies that participated in the questionnaire indicated that they have a health and safety committee.

4.3.1 Summary of Accident Records from Construction Company Accidents On Building Construction Sites.

There were only two construction companies were selected due to their experience and had conducted different types of construction projects: G.Varnero construction P.L.C and Afro Tsiyon construction P.L.C

4.3.1.1 The Researcher Was Taking Daily Worker Accident Recorded from Varnero P.L.C.

The interviewer asked whether the company has a health and safety policy and found that it have informal policy. However, the company has a health safety officer/coordinator who is permanently employed and works with site managers on the sites to foresee any health and safety issues. At the company level it was revealed that all necessary health and safety welfare facilities and PPE are provided by head office.

According to varnero construction company safety officer Ato Meseret Biyaddgling report the safety department day to day activity were as follow:

- ❖ Giving awareness about safety to the workers:
by answer what is safety? Safety means free from accident, protecting against injury and etc.
- ❖ Why we need safety?
To protect human health
To protect environment pollution
To protect physical injury
- ❖ Safety rule
A little care makes an accident maker
Avoid falling objects
Loading to kill

The safety officer responsibility of the company

- ❖ Put warning tape a place where hazard exposed and put warning tape a place accident happen
- ❖ Put scatter material in appropriate place
- ❖ Replace the detach electric cable
- ❖ Maintain the equipment

- ❖ Remove unwanted material from the site
- ❖ Give priority for safety
- ❖ Put some PPE symbols



Figure-4.4: Eye and face protection



Figure-4.5: Safety harness



Figure-4.6: warning tape

As shown in the above figures (pic.4.4, pic.4.5 and pic.4.6) the pictures were taken from the Varnero construction site at Jimma University. According to the safety officer of the site, figures 4.4 and 4.5 show that for the workers, this equipment was needed to use and must be used. Figure 4.6 shows that the warning tape indicates that "not allowed to enter or touch".

According to (Johor Bahru, 2003) on Hazards at Construction Sites, findings of the work place environment cover items such as access, guard rail, condition of opening, temporary structures, site tidiness, waste disposal and visibility.

- Condition of holes and openings still require proper guard rail to prevent falls
- Site tidiness during construction
- Arrangement for collecting and disposing of waste material still lacking after construction completed.

Table -4.5: Accident Records for Varnero Construction P.L.C, from 21/05/09 to 09/07/09

No	Type of Hazard	Consequences	Possible source	Frequency
1	Hand or foot injured	falling object, sharp material (nail) and metal sheet.	not using PPE, lack of awareness and miss communication	9

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2	Manual handling	Muscles pain, back pain	Working for long time, twisting, bending, Congested sites for movement/equipment Carrying over loads,	3
3	Falling from height	inadequate site access, old wood scaffold and ladder	Luck of awareness, Inattention of the worker's, safety, improperly fixed scaffolding and ladder Not using PPE (not available by management or available but workers not using it)	2
4	Winding and twisting	skeleton disorder	Bending and twisting for long time and Heavy manual handling	4

According to Table 4.5 Varnero construction, Jimma University construction site accident record show that total of 18 minor accidents were occurred from 21/05/09 to 09/07/09 E.C.

The above accident record show that out of 18 accidents 9 (50%) of the accident records was Hand or foot injured hazards ,3(16.67%) of the accidents records shows were manual handling,2(11.1%) of the accidents were due to falling from height and 4(22.2%) of the accidents were due to winding and twisting. As it has been discussed in previous literature review (Sermolo,2014) suggested that Poor working conditions/environment and lack of personal protective equipment (PPE) are the main cause of accidents in construction industry

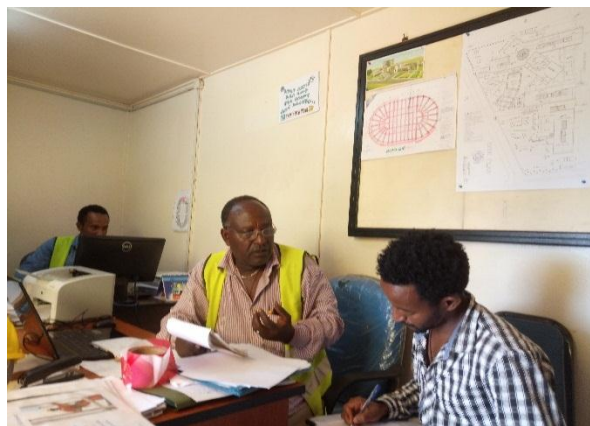


Figure-4.7: Interview with safety officer

As shown in figure 4.7 interviewee of result the safety officer of Varnero construction site declares as follow:

The investigation of the first accident at the Varnero construction P.L.C safety department site revealed that the worker fell from a height (4th floor to ground floor). The worker was doing plastering work and was under a sub-contractor the company had sub-contracted activities. The worker was given all the necessary PPE (hard hat, safety boots and safety harness). He was in a rush and he wanted to do something quickly a few minutes before lunch, and did not use his safety harness. He fell over platform and the person was hospitalized for Some months and recovered, however he has a small problem with his muscles (partial disability).

The second accident was a person injured using equipment. The person was cutting the reinforcement by machine and on the other side his coworkers was pulling the reinforcement, the grinder machine was chopped one fingers off his left hand and he stayed away from work for weeks. He is now partially disabled, without one fingers on one of his hands.

Based on the two accidents, both accidents were the fault of the individuals as they were given PPE but did not wear it and according to the company safety officer data clarify that the company were also invite gusts and given training to workers two times from Addis Ababa head office in 2009 E.C.

Similarly, as it has been discussed in literature review Employees should be made aware of their responsibility to wear the PPE appropriately, take care of equipment and report any defects. They should also be informed that if they do not wear or misuse any PPE that has been appropriately issued that this could lead to disciplinary action. This equipment is provided for their protection (HSE, 2009);(Lingard & Rowlinson, 2005)

4.3.1.2 The Researcher Was Taking Daily Worker Accident Recorded from Afro-Tsiyon Construction P.L.C.

Table -4.6: Accident sample record from Afro-Tsiyon Construction P.L.C, date of recorded from 10/06 2009 to 27/12/09 E.C

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No	Type of Hazard	Consequences	Possible source	Frequency
1	Hand or foot injured	falling object ,sharp material(nail) and metal sheet.	not using PPE, lack of awareness and miss communication	30
2	Manual handling	Muscles pain, back pain	Working for long time, twisting, bending, Congested sites for movement/equipment Carrying over loads,	20
3	Flying particles causing eye	eye trachoma and pain	not using PPE or not available by management or available but workers not using	7
4	Working at a height	physical injury	Luck of awareness, Inattention of the worker's, safety, improperly fixed scaffolding and ladder Not using PPE (not available by management or available but workers not using it)	21
5	Equipment/Plant/Tools	Crushed/cut by objects	Not well operating the machine, trained not given for operator especially for new machine and Improper maintenance	13
6	Cement and dust	Health problems such as headaches, eye irritation, dizziness, faintness, sleepiness and etc.	Present on demolishing site , Excavation works, concrete mixing takes, Material specification, cement and paints, decontamination pesticide, timber treatment chemicals	8
7	Noises	Health problem such as hearing loss	Equipment noise, activity noise such as excavation, drilling, welding, piling, roofing, Grinding and cutting, concreting	3
8	Winding and twisting	skeleton disorder	Bending and twisting for long time and Heavy manual handling	12

According to Table 4.6 Afro Tsiyon construction, Jimma Sport construction site accident record show that total of 114 accidents occurred from 10/06/09 to 27/12/09 E.C.

The above accident record show that out of 114 accidents 30 (26.3%) of the accident records was Hand or foot injured hazards were due to not using PPE, lack of awareness and miss communication between workers.21(18.4%) of the accidents records shows were Working at a height this was due to Lack of awareness, Inattention of the worker's, safety, improperly fixed scaffolding and ladder Not using PPE (not available by management or available but workers not using it) and followed by 20(17.6%) of the accidents were due to manual handling this was due to Working for long time, twisting, bending, Congested sites for movement/equipment Carrying over loads especially for those young workers.

As it has been discussed in previous literature review (Sermolo,2014) suggested that Poor working conditions/environment and lack of personal protective equipment (PPE) are the main cause of accidents in construction industry.

Table 4.6 accident shows that 13(11.4%) of the accident were Equipment/Plant/Tools this was due to Not well operating the machine, trained not given for operator especially for new machine and Improper maintenance followed by 12(10.5%) of the accidents were Winding and twisting this was due to Bending and twisting for long time and Heavy manual handlings.

According (WSHA, 2006) were identified Machinery and tools use and maintenance regime: The contractor shall inspect that all machinery and tools brought to the site are tested and certified and they are in good condition for use. The contractor shall also implement an effective inspection and maintenance program to ensure a safe and efficient operation of machinery and tools on site.

Table 4.6 shows that, 8(7%) of the accidents was Cement and dust this were due to Present on demolishing site, Excavation works, concrete mixing takes, Material specification, cement and paints, decontamination pesticide, timber treatment chemicals and 7(6.2%) of the accident was due to Flying particles causing eye due to not using PPE or not available by management or available but workers not using.

According to (Davies V.J. and Tomasin K., 1996) described that the risk in demolition works is influenced by four variables, viz:

- ❖ Volume/size of demolition;
- ❖ Type of structure;

- ❖ Method of demolition; and
- ❖ Level of site supervision

4.4 Sites Observation Results

During the questionnaire survey in construction sites the researcher also made personal observation of site in some selected site like demolishing and constructing construction site. With workers like the concreting, reinforcement and demolishing group. These groups were selected because they were directly exposed to falling from a height and manual handling problems, at the same time interview was conducted while they were working. The results of site observations for different selected work groups and supported by photo as well.

4.4.1 Concreting work

This band involved so many workers, even if it depends on the nature and complexity of the activities on the site. They mix concrete, transporting it to the required walls, columns and slabs and compact the concrete. These concrete work are carried out by daily labors which are highly exposed to site hazard because most of them are not educated. Workers are involved in carrying concrete and sand in buckets, bending when compacting, and carrying heavy loads manually such as cement bags and the like from the ground to the highest level which are exposed to bending and twisting of the body in addition to that the access or ladder also may not safe. For this concrete work group, it was observed that most of the tasks were done manually which require workers to be materially suitable these are danger to the healthy in the long time. Despite very few mechanical assistances like mixer and geneneter vibratos were used to assist the concreting process; in future workers were exposed to manual handling hazards.

4.4.2 Demolishing work

As the researcher site observation result show that demolition is one of the high-risk activities of the construction industry with a fatal and major injury incidence more than expected rate of that for the whole of the construction industry. Some of the most hazards observed by the researcher from Jimma town special place of Merkato Awash International bank demolishing buildings as follow;

- ❖ Falling from heights;
- ❖ Falling objects

- ❖ Being hit or trapped by falling objects;
- ❖ Vibration from hand-held pneumatic tools;
- ❖ Respiratory hazards from dust which may contain toxic substance
- ❖ Flying particles causing eye and skin injuries; and
- ❖ Electric power cable;
- ❖ Foot and hand injuries
- ❖ Over pulling of the waste concrete and other materials by using simply by rope and like without using any PPE.

These result indicate that the major causes were falling from height, being hit by falling object and cuts due to poor scaffolding, no guardrails and toe boards, and on many occasions push or movement of scaffolding pole is left at the same place.

According to labor proclamation Article 41 no. 75377/2003 of the FDRE that states the employer is obliged to provide workers with the appropriate personal protective equipment besides the employer is responsible for the maintenance of the PPE.

On the other hand, many noisy machines or hand-operated tools also transmit vibrations to the body – pneumatic rock drills or concrete breakers are common examples. In this way they can cause muscles and joints, and affect blood circulation. At the same time the observation reveals that toxic substances can cause both serious effects resulting from exposure for a long period.

Dusts from many sources are also a projecting hazard in construction. Silica and asbestos dust can permanently damage the lung tissue, whereas lead in dust is absorbed into lungs and enters the blood stream causing poisoning. Cement mixes is also a well-known cause of skin disease. As all you know Lead is also found in electricity cables and pipes gutters this is will affect absorption causes constipation, abdominal pain, weak muscles and kidney failure problems in long term.

According to (Davies V.J. and Tomasin K., 1996) described that the risk in demolition works is influenced by four variables, viz:

- ❖ Volume/size of demolition;
- ❖ Type of structure;
- ❖ Method of demolition; and
- ❖ Level of site supervision

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Accidents occurred in the Varnero construction P.L.C, were disclosed to Nyla insurance company Addis Ababa kera branch for compensation purpose for the years 2009 E.C. The table shows the type of accident, the amount of money paid in terms of Birr by the insurance companies.

Amount of money paid calculation were based on the agreement of both party:

For permanent disablement paid=monthly salary*12month*5years*7%

First person paid= $6600.72 * 12 * 5 * 7\% = 27,723.02$ ETB

Second person paid= $58.86 * 26 * 5 * 7\% = 6427.51$ ETB

Total insurance payment= $27723.02 + 6427.51 = 34150.53$ ETB

The pictures below were taken in construction sites located in Jimma during the questionnaire survey.



Figure -4.8: Building construction in Jimma



Figure-4.9: Building construction in Jimma

The above two pictures (pic.4.8 and pic. 4.9) were taken from building construction sites located in jimma, Merkato. According to international occupational safety and health standards Construction work should be fenced off to protect people from site dangers. As the picture show that men's were working on the top at the same time there was also boutique merchants and shoes cleaner beside construction however, these contractors were executed their works without any barrier.

Additionally, pictures 4.8 observed that workers were not wearing set of PPE however, the electric cable were suspended on the head of worker's these contractors were executed their works without any safety. The reasons pointed out by workers were that PPE was not provided by the site management or that it was uncomfortable wearing PPE while working on their tasks.

On the other hand, contractor said that PPE were provided by the contractor but the worker was not willing to wear.



Figure-4.10: Demolishing and construction site in Jimma



Figure-4.11: Demolishing and construction site in Jimma

The above two pictures (pic.4.10 and pic. 4.11) were taken from Awash international bank building construction sites located in Jimma, Merkato. According to labor proclamation Article 41 no. 75377/2003 of the FDRE that states the employer is obliged to provide workers with the appropriate personal protective equipment besides the employer is responsible for the maintenance

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of the PPE. As observed from the above figure that workers were not wearing a full set of PPE. Some of them have only a hard hat and safety shoes, others have only a hard hat or safety shoes or did not wear any PPE at all. Since as the above figure observed that there was demolishing work from the top of roof to the first floor of the building and at the same time there was construction from the ground floor because the foundation was not demolishing.



Figure-4.12: Building construction in Jimma



Figure- 4.13: Building construction in Jimma

The above two pictures (pic.4.12 and pic. 4.13) were taken from building construction sites located in Jimma. According to (Johor Bahru,2003) on Hazards at Construction Sites finding work place environment cover item such as access, guard rail, condition of opening, temporary structures, site tidiness, waste disposal and visibility. As observed from the above figure that workers were not wearing a full set of PPE or did not wear any PPE at all. However, men were working on the top of roof without any safety and also working under bad weather or rain season. some of the worker's answer were the contractor was run with his time not worried about worker's life.

4.5 Results of Questionnaire for Causes and Factors of Hazard's on Building Construction Project

The causes and factors of hazards on building construction project from the questionnaire survey are identified based on respondents' response on each variable causes and factors. For example, main causes of Hazards identified by the different researchers, as indicated in the literature review part of this thesis, might not be major causes of hazard on building construction projects for the Jimma town construction industry cases, therefore it is important to ask the respondents for their agreement on each particular variables of Causes and factors of hazards, then this is accompanied by identification of causes of hazards based on their occurrence. To clearly identify the most common causes of hazard and factors of health and safety on building construction projects, it is important first to identify the causes of hazards for both towns and then identify their frequency of occurrence.

4.5.1 Knowledge on health and safety risk on construction site

Workers were asked about their awareness of health and safety risks on building construction project, and the results are indicated in table.

Table 4.5: knowledge related health and safety risk

No	Questions	yes		No		Total	
		Freq.	Per.	Freq.	Per.	Freq.	Per.
1	Does your company have a health and safety policy?	17	44.7	21	55.3	38	100
2	Does your company have a health and safety committee?	14	36.8	24	63.2	38	100
3	Are all accidents recorded?	16	42.1	22	57.9	38	100

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4	Do you think under-reporting is a critical problem in the government construction?	18	47.4	20	52.6	38	100
5	Do you think that identifying the critical factors that influence the success of accident reporting system is crucial?	20	52.6	18	47.4	38	100

As Table 4.6 verified that 21 (55.3%) of the respondents in the questionnaire indicated that did not have a written health and safety policy and 17(44.7%) reported have a health and a safety policy. But only 14(36.8%) of respondents confirmed having Health and Safety committee in their construction site and 24 (63.2%) stated they did not have health and safety committee on the other side 22(57.9%) of respondents do not record all accidents to employees whereas 16(42.1%)of companies record all accidents that occur to their employees ,20(52.6%) of construction companies reported that they did not consult the accidents report and 20(52.6%) of respondent had agreed knowing the critical factors is one of the way of success to reporting the accident and 18(47.4%) do not.

4.5.3 Discussion on Section 4.5.1 and Section 4.4 Results

According to analysis result of the questionnaire survey shown in table 4.6 and on interview analysis section 4.4 on the bases of the standard of safety and health in the building construction site.

The analysis revealed that the health and safety standard on building construction project in Jimma town is not satisfactory. As the analysis witnesses by daily workers, contractors and engineer's suggests on OSH questions frequency show that 51.3% questioners survey and 90% of the interviewees respondents of construction companies do not have written healthy and safety policy. This indicate that contractors and subcontractors have not given care and the government also not follow up the contractor performance starting from the tender stage up to the accomplishment of the works.

But the laws states as discussed in literature review conflicting to this, Article 37 of the labor proclamation no. 377/2003 of the FDRE requires that employers should have written safety and health policy and this should be communicated to employees.

By the same token, as the questioner's survey and interview analysis show that attention is not given by the construction companies regarding safety committee (63.2%) and safety training.

This indicate that there is no harmonized guide legally required concerning safety management for those persons engaged in OSH services in national levels including such as safety officers, safety committees, safety inspectors and so on.

Similarly as it has been discussed in literature (Kartam, 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. As table 4.6 analysis shows 57.9% of respondents of the companies do not record all accidents to employees while 42.1% of companies record all accidents that occur to their employees.

With regarding to the use of accidents reports to prevent similar accidents from taking place in the future, only 42.1% of construction projects, stated they consulted the reports and revised their method statements to include preventive measures. On the other hand, the remaining 57.9% of construction projects reported that they did not consult the accidents report.

According to (Lingard and Rowlinson, 2005) states that on reporting of an incident can help to evaluate the effectiveness of prevention strategies and is an essential first step in future incident prevention. As table 4.6 discussed that 52.6% of respondents had agreed knowing the critical factors is one of the way of success to reporting the accident and 47.4% did not agreed.

4.5.4 Risk Perceptions

Site managers, supervisors and workers were asked to indicate qualitatively the probability of health and safety problems occurring when working in a hazardous situation. The degree of occurrence:

1= Not likely to occur, 2= Moderate 3= Very likely to occur

Table- 4.6: Type of hazards

No	Type of hazard	3		2		1	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
1	Walking at height	25	65.8	13	34.2	-	-
2	Overcrowded site	12	31.6	26	71.1	-	-
3	Noise (using block/brick cutting machine)	18	47.4	20	52.7	-	-
4	Dust (mortal/ cement)	21	55.3	17	44.7	-	-
5	Bending, twisting while laying blocks/ bricks	25	65.8	13	34.2	-	-
6	Falling from height (Serious injury of fatal injury)	33	86.8	5	13.2	-	-
7	Falling object (blocks, bricks, debris) heating head body including feet	25	65.8	13	34.2	-	-
8	Workers crushed or sucked by moving vehicles, focal lift	12	31.5 7	18	47.4	8	21.1
9	Inhalation of dust from cement-cancer, respiratory system	9	28.9	11	28.9	18	47.4
10	muscular skeleton disorder, back pain due to(manual handling)	29	76.3	9	28.9	-	-

Table 4.7 show that 33(86.8%) of the respondents declare that falling from a height were very likely to occur on construction sites followed by, 29(76.3%) manual handling.25 (65.8%) of the respondents declare that due to bending and twisting while laying blocks and bricks as well as 25(65.8%) falling objects and 25(65.8%) of the respondents were also very likely to occurs due to working at height.

Table 4.7 indicate that 26(71.1%) the respondents of the company point out that Overcrowded site occurs and 20(52.7%) hearing loss or noise and 18(47.4%) of the respondents of site declare that crushed by moving object falls were moderate to occur on construction site and finally 18(47.4%) of the respondents were agree Inhalation of dust from cement-cancer, respiratory system not likely to occur.

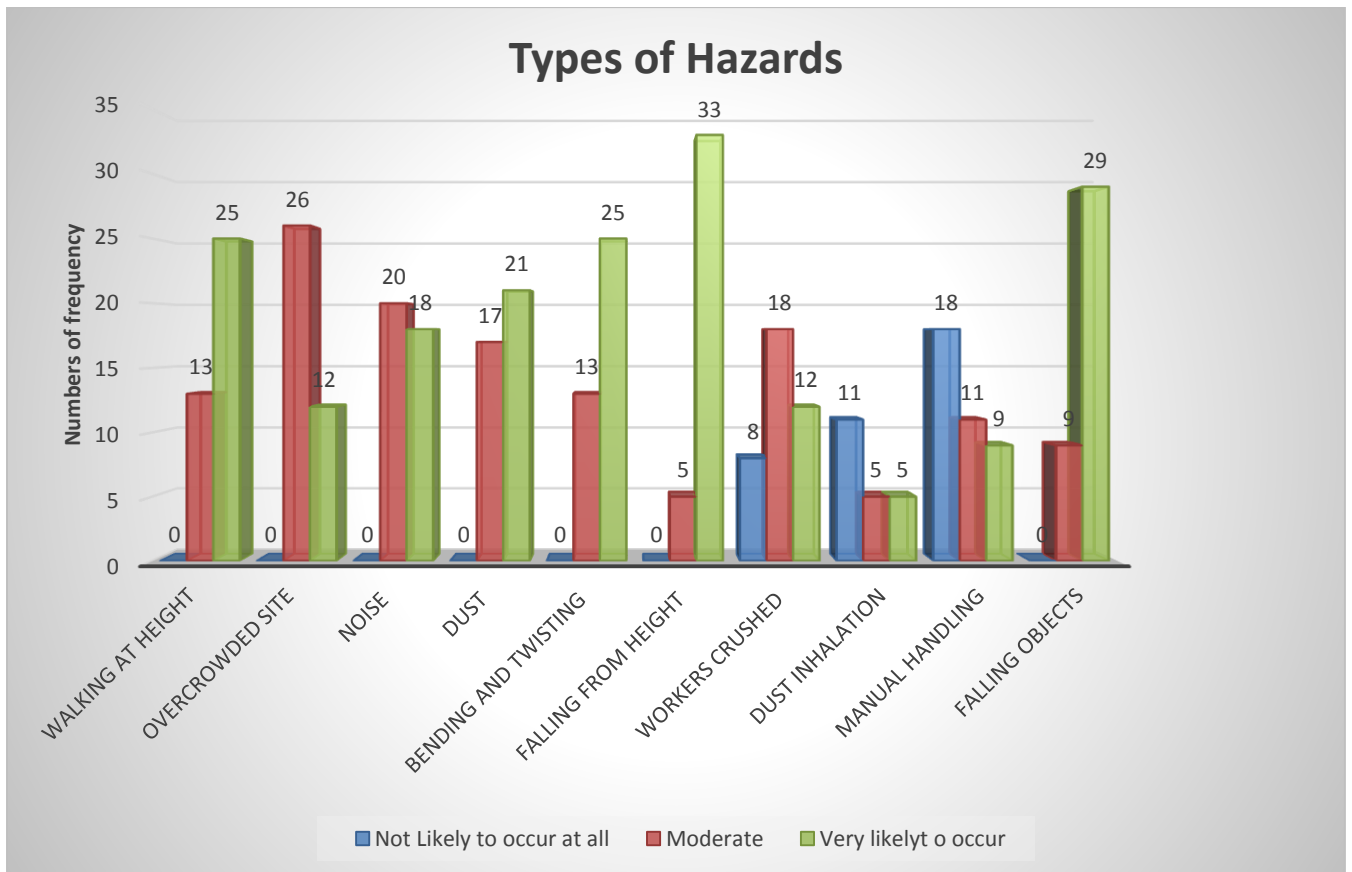


Figure-4.14: Type of hazards

Figure 4.14 result were identifying based on the degree of occurrence as follow, very likely to occur were identified:

- ❖ Falling from a height with (86.8%)
- ❖ Manual handling with (76.3%)
- ❖ Falling objects with (65.8%)
- ❖ Bending and twisting (65.8%)
- ❖ Working at height with (65.8%)

Similarly, according to (Murie, 2007) 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.

- ❖ Moderate to occur were identified;
 - Overcrowded site with (71.1%)
 - Hearing loss or noise and with (52.4%)
 - Crushed by moving object falls with (47.4%)
- ❖ Not likely to occur;
 - Inhalation of dust from cement-cancer with (47.4%)

According to Lab our proclamation No 377/06, 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, work places are safe, healthy and free of any danger to the well-being of workers.

4.5.5 With Relation to The Factors Risk and Safety Management in Building Construction Project,

The degree severity of factors outcome 5-extremely frequent factor,4-very frequent factor,3-frequent factor,2-less frequent factor,1-not factor.

Table 4.7: Factors risk related

No	Factors related to risk and safety on bcp	5		4		3		2		1	
		frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent
1	Technical risk related										
	1.1 Inadequate Site	13	34.2	8	21.2	9	23.7	8	21.2	-	-
	1.2 Storage and Handling	10	26.3	15	39.5	7	18.4	6	15.8	-	-
	1.3 Poor Jointing Machine Parts	10	26.3	6	15.8	14	36.8	4	10.6	4	10.6
	1.4 Maintenance and Repairing	6	15.8	5	13.2	3	7.9	17	44.7	7	18.4
2	Logistic Risk related										
	2.1 Insufficiency of equipment availability	12	31.6	11	28.9	5	13.2	8	21.1	2	5.3
	2.2 Insufficiency of transportation facilities	5	13.2	12	31.6	7	18.4	11	28.9	3	7.9

	2.3 Non-availability of maintenance facility	6	15.8	7	18.4	9	23.7	12	31.6	4	10.6
3	Management Risk related										
	3.1 Primarily Planning	9	23.7	13	34.2	8	21.1	8	21.1	-	-
	3.2 Co-ordination with sub – ordinates	13	34.2	9	23.7	11	28.9	5	13.2	-	-
	3.3 Communication	8	21.1	12	31.6	9	23.7	9	23.7	-	-
4	Environmental related										
	4.1 Weather Implication	10	26.3	15	39.5	7	18.4	6	15.8	-	-
5	Socio-Political Risk related										
	6.1 Govt. Policies	7	18.4	12	31.6	9	23.7	10	26.3	-	-
	6.2 Law	13	34.2	9	23.7	7	18.4	5	13.2	4	10.5
6	Other related										
	7.1 Improper Roles of Staff	13	34.1	11	28.9	8	21.1	6	15.8	-	-
	7.2 Insufficient Skill Staff	11	28.9	14	36.9	13	34.2	-	-	-	-
	7.3 Labor Disputes	14	36.8	7	18.4	12	31.6	5	13.2	-	-

1) Technical risk related

As Table 4.8 show that 13(34.2%) of the respondents of the company highlighted that Inadequate Site is the most frequent factor on building construction sites followed by 15(39.4%) of the respondent’s storage and handling were under very frequent factors. Were as 14(36.9%), of the respondents Poor Jointing Machine were moderate frequent factors and 17(44.7%) of the respondents Maintenance and Repairing categorized under frequent factor.

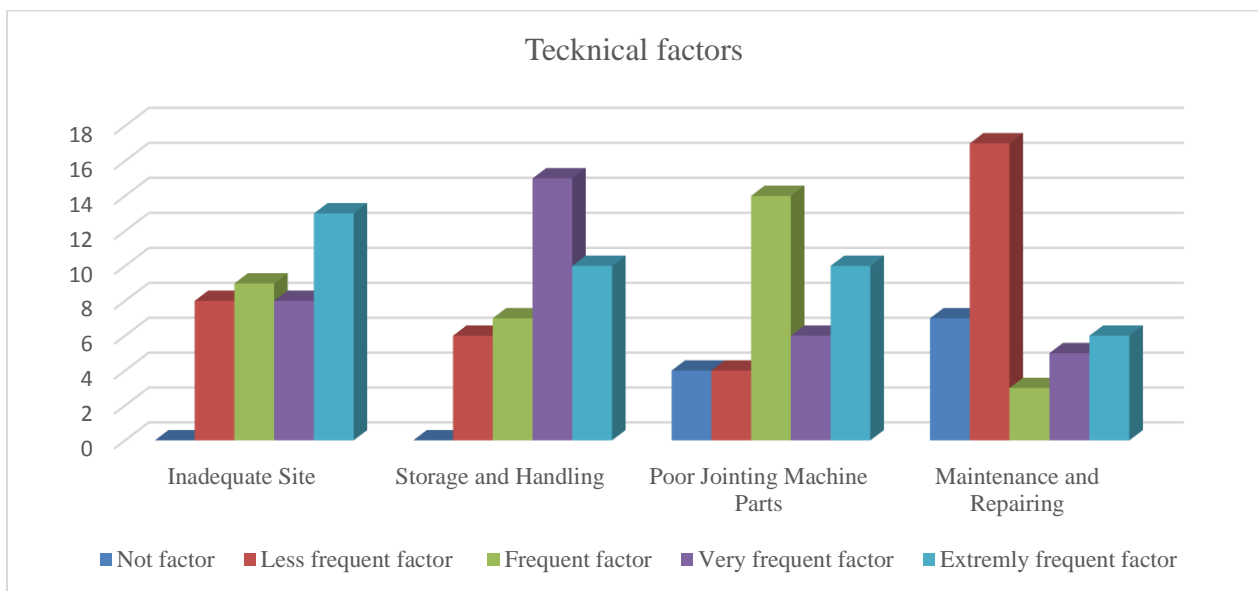


Figure-4.15: Technical risk related

As figure 4.15 analysis result show that inadequate site conditions can impact those who work at elevated heights in several ways. for example, construction site falls include roof-related falls, scaffolding falls, ladder falls, falls resulting from holes in flooring, and falling objects. This were due to defects in the work surface, such as unprotected walkways, improper guardrails, slippery or sloped surfaces. The culture of construction material handling and storage usage also can affect the workers' health directly and indirectly.as well as concreting and excavation works due to poor jointing machine and wrong maintenance and repairing.

According to (Johor Bahru,2003) on Hazards at Construction Sites finding work place environment cover item such as access, guard rail, condition of opening, temporary structures, site tidiness, waste disposal and visibility.

- Condition of holes and opening still require proper guard rail to prevent falls
- Site tidiness during construction

2) Logistic Risk related

As Table 4.8 show that 12(31.6%) of respondents Insufficiency of equipment availability is the most frequent factor and 12(31.6%) of respondents Insufficiency of transportation facilities is very frequent factor of construction hazards were as 12(31.6%) of the worker's construction site Non-availability of maintenance facility is frequent factor risk.

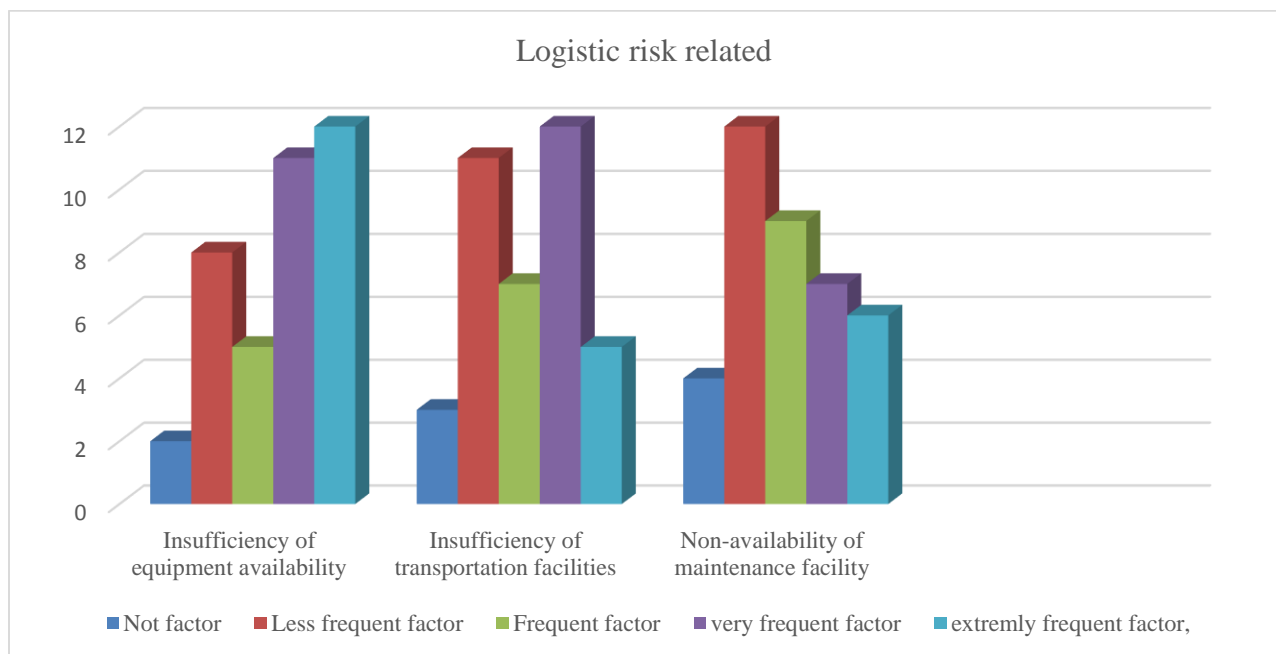


Figure-4.16: Logistic risk related

According to figure 4.6 result highlighted that there are some listed under logistic related risk factors, as the result established that their degree of factor is varied.

Before the start of construction there is mobilization activities carried out such as supplying of material and equipment to site, the worker has the chance to exposed to risk due to Insufficiency of equipment availability, Insufficiency of transportation facilities and Non-availability of maintenance facility accordingly. Tools, machines and equipment are in many cases old-fashioned, poorly designed or badly maintained. Many operatives on construction sites are unskilled. As a construction worker, you know the difference between a tool that is well suited for you and for the job, and one that is not.

According (WSHA, 2006) were identified Machinery and tools use and maintenance regime: The contractor shall inspect that all machinery and tools brought to the site are tested and certified and they are in good condition for use. The contractor shall also implement an effective inspection and maintenance program to ensure a safe and efficient operation of machinery and tools on site.

3) Management Risk related

Table 4.8 show that 13(34.2%) of respondent's co-ordination with subordinates is the very frequent factors, 13(34.2%) of the respondents primary planning were moderate frequent factor followed by 12(31.6%) of the answer of respondents were communication among all stakeholders of the construction.

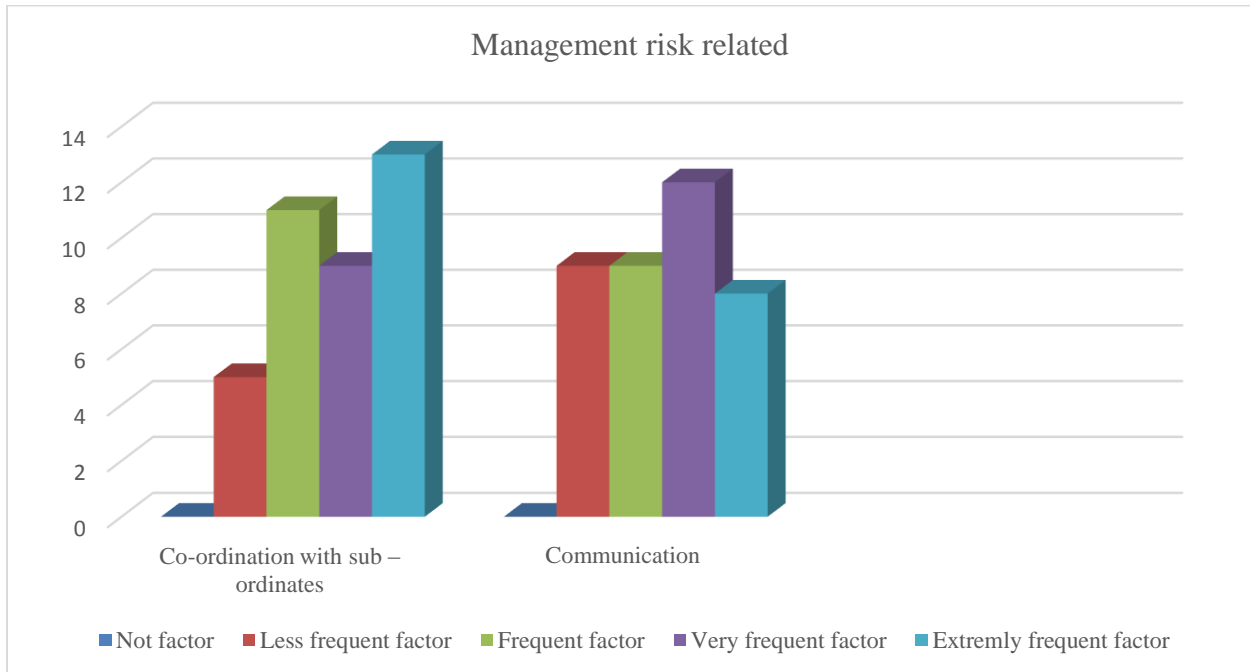


Figure-4.17: Management risk related

Figure 4.17 results of respondents believed that since construction projects is the labor intensive industry. Therefore, identifying the miss management risk related problem were a must in order to minimize risk happen due to co-ordination with subordinates as well as lack of good communication among workers as well.

4) Environmental related risk

As table 4.8 show that, 15(39.5%) of the respondents believed that Weather Implication were very frequent factors.

Table 4.8 result show that the environment could poses risk on the construction site. Workers on construction sites are often exposed to hazards due to unexpected bad weathers during working time. For example, here in Jimma town it's difficult to construct or demolish at summer season, due to the bad weathers of the towns workers who are working under rain could be exposed to several hazards.

5) Socio-Political Risk related

As table 4.8 show that ,13(34.2%) of the respondents believed that laws of the country is the most frequent factor and 12(31.6%) of the respondents were government policy were very frequent factors to the health and safety of the construction project.

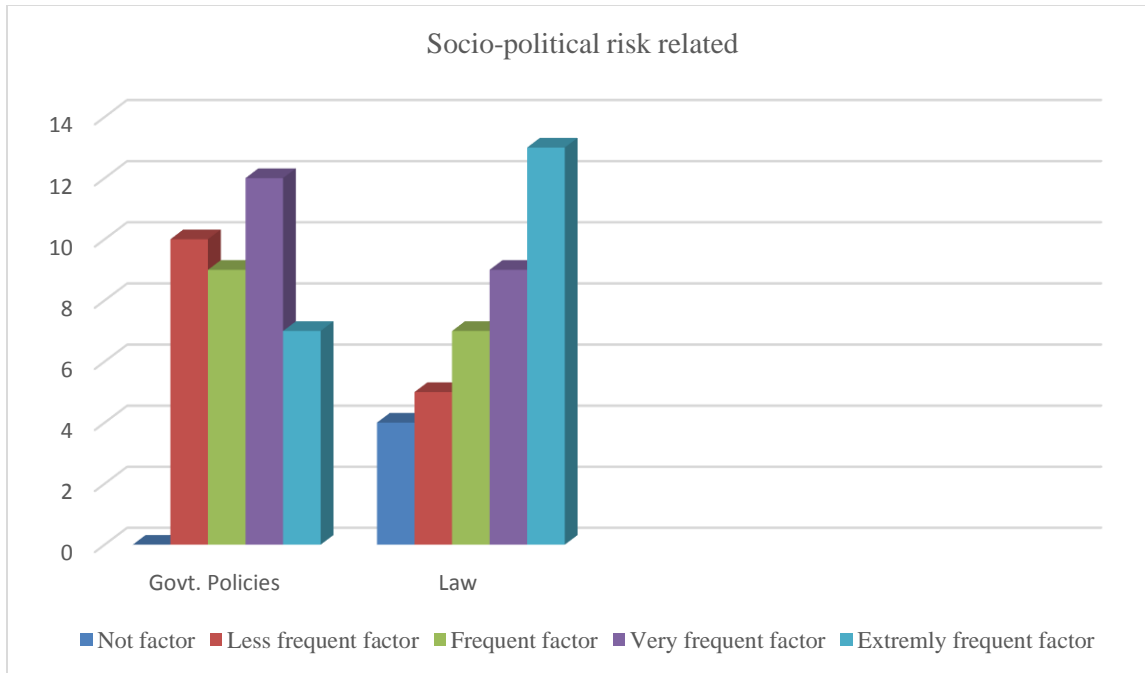


Figure 4.18: Socio-Political Risk related

Figure 4.18 results point out that the social and political situation of the country can affect the construction safety policy. This indicate that if the government policy regarding safety and healthy were weak in order to implement and enforce the law.

According to (Datta, 2000) cited in (Sermolo,2014) noted that , this sector also demonstrates poor performance in respect of health and safety due to the absence of any rigid safety and construction laws.

6) Others related risk factors

Finally, Table 4.8 show that,14(36.8%)of the respondents agreed that Labor Disputes of were the most frequent factors of the construction projects site followed by ,13(34.2%) of the respondents were due to Improper Roles of Staff and 14(36.9%) of the respondents were believed that very frequent factors that Insufficient Skill Staff of the company.

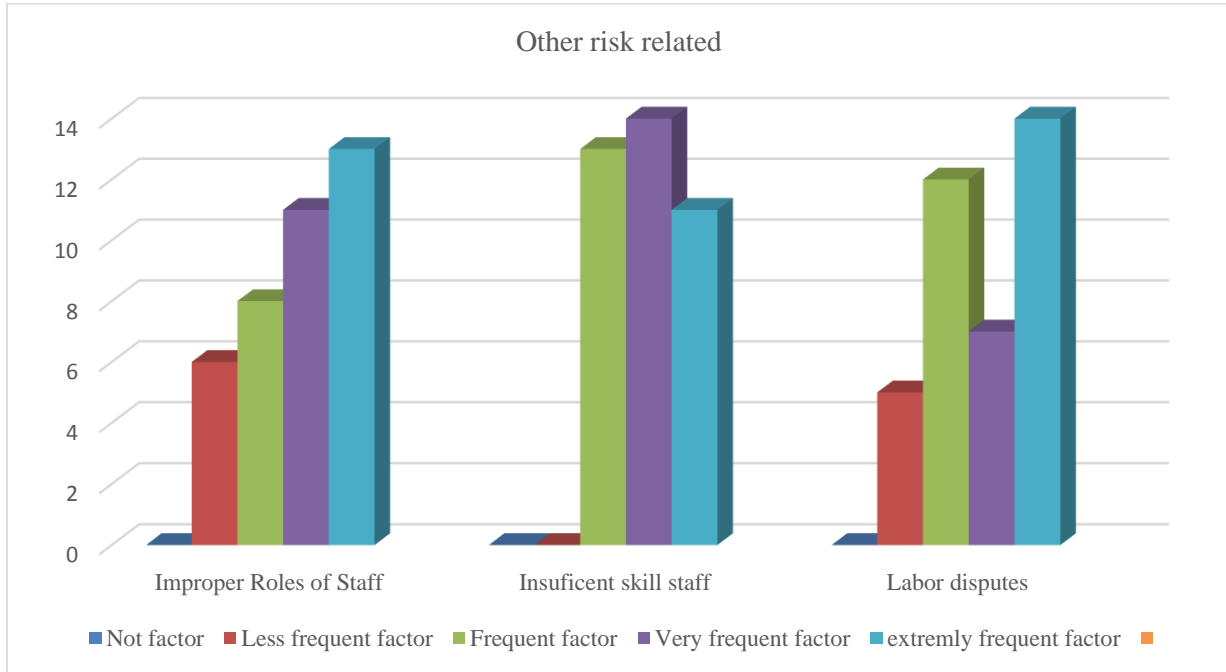


Figure 4.20: Other risk related

Figure 4.20 result of the finding states that with in construction site if the working environment is not safe these leads to labor dispute as well as occurrences of risk were high due to improper role of staff and finally the sometimes unfit person allocated to miss much place these were due to insufficient skill staff of the construction company.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study demonstrates the assessment of safety and health on building construction project and highlights the factors affecting safety and the major causes of hazards on building construction projects.

Most of the results are consistent with the former literature in other developing countries the researcher draws the following conclusions:

- ❖ The most frequent factors of safety and health on building construction project ranked as follow: inadequate site access, labor dispute, insufficiency equipment availability, lack of awareness, and labor dispute of the company were identified from the result.
- ❖ The assessment revealed that risks were assessed by questioners, interview (brainstorming), site observations by researcher and health and safety regulations, individual judgement were depending on age, experience educational background and knowledge of health and safety regulations. Falling from height, foot and hand injuries, manual handling, bending and twisting and falling objects observed to be most critical hazards on building construction project. However, Government and contractors take place to be the main responsible for accidents on construction sites and daily labors are the major victims of construction sites accidents.
- ❖ The assessment revealed that 90 % of the construction companies do not have OHS mechanisms like written safety policy, safety officer, health and safety committee, hazard identification and reporting record, and properly placed safety signs with in construction project site. If the construction company have implement OHS within the company all stockholders will benefits of safety and health improvement include: reduced accident costs, increased productivity improved human relations and make awareness to all construction stakeholders workers.

5.2 Recommendation

- ❖ Safety and health should be included as a project parameter, which means it should be considered during all phases of a project. Procurement systems should be evaluated in terms of their impact on safety and health prior to their selection for projects. Prospective contractors should not be placed on tender lists unless they can show competence in the management of safety and health.
- ❖ To ensure a safe and accident free construction site, management must understand, undertake and implement all or some of the following measures which are regular supervision and inspection by safety officials and leaders on site, constant training on the use of tools and equipment, proper use of safety items and attire, signs and notices should be provided on construction sites and should be located at strategic areas on site, training programs should be provided regularly.
- ❖ The researcher suggest that no hazard consequences should be completely ignored, therefore government should give priority to reducing the risks associated with the above most discussed, From this perspective the most consequence hazardous needs in-depth study in the future study.

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APPENDICES

QUESTIONNAIRE SURVEY

Appendix A

Section A: Demography

Dear Sir/Madam,

I am Mr. Manaye Mosiye a master's student at Jimma University, Jimma institute of technology in construction engineering and management. As part of my research I am writing to invite you to participate in a questionnaire survey project on assessment of risk and safety management on building construction project in case Jimma Town.

The main purpose of this survey is related to identify the major factors affecting the safety and health practice in building construction project. I request your cooperation to fill up the attached questionnaire. I believe that your participation is critical for this study and will significantly contribute to better understanding of health and safety performance. The data collected will be used for academic purpose. I would really appreciate if you could complete the questionnaire and send back the questionnaire once completed.

Thank you for your cooperation and interest in making this research success.

Yours Sincerely,

Mr. Manaye Mosiye

Appendix B: Please answer all the questions by putting “√” in the boxes where applicable.

Main questionnaire

Section A

- 1) Are you Male Female?
- 2) Your age
20-35 36-45 46-55 above 55
- 3) Are you employed on the basis of?
Part Time Full Time Temporary (daily?)
- 4) Type of employer
Main Cont. Sub-Contractor Other (specify) _____
- 5) Job title (trade/description) Masonry (block layers) concrete others (specify).....
- 6) Experience on construction: (6.1) with employer ----- (6.2) on site
- 7) Education background; Primary education Primary education with vocation skills
Secondary education College university other (specify).....

Section B: Knowledge on health and safety risk

Please answer all the questions by putting “√” in the boxes where applicable.

		yes	No
1	Does your company have a health and safety policy?		
2	Does your company have a health and safety committee?		
3	Are all accidents recorded?		
4	Do you think under-reporting is a critical problem in the government construction?		
5	Do you think that identifying the critical factors that influence the success of accident reporting system is crucial?		

6) If any specify.....

Section C: Risk Perceptions

Site managers, supervisors and workers were asked to indicate qualitatively the probability of health and safety problems occurring when working in a hazardous situation. The degree of occurrence:

1= Not likely to occur, 2= Moderate 3= Very likely to occur

Table- 4.6: Type of hazards

No	Type of hazard	3		2		1	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
1	Warking at height						
2	Overcrowded site						
3	Noise (using block/brick cutting machine)						
4	Dust (mortal/ cement)						
5	Bending, twisting while laying blocks/ bricks						
6	Falling from height (Serious injury of fatal injury)						
7	Falling object (blocks, bricks, debris) heating head body including feet						
8	Workers crushed or sucked by moving vehicles, focal lift						
9	Inhalation of dust from cement-cancer, respiratory system						
10	muscular skeleton disorder, back pain due to(manual handling)						

Assessment of Risk and Safety Management on Building Construction Project

2) From your experience, which one of the following are the factors risk and safety management in building construction project? Please indicate also to what extent these factors?

Outcome 5-extremely frequent factor,4-very frequent factor,3- frequent factor,2-less frequent factor,1-not factor. Table 4.7: Factors risk related

No	Factors related to risk and safety on bcp	5		4		3		2		1	
		frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent
1	Technical risk related										
	1.1 Inadequate Site										
	1.2 Storage and Handling										
	1.3 Poor Jointing Machine Parts										
	1.4 Maintenance and Repairing										
2	Logistic Risk related										
	2.1 Insufficiency of equipment availability										
	2.2 Insufficiency of transportation facilities										
	2.3 Non-availability of maintenance facility										
3	Management Risk related										
	3.1 Primarily Planning										
	3.2 Co-ordination with sub – ordinates										
	3.3 Communication										
4	Environmental related										
	4.1 Weather Implication										
5	Socio-Political Risk related										
	6.1 Govt. Policies										
	6.2 Law										
6	Other related										
	7.1 Improper Roles of Staff										
	7.2 Insufficient Skill Staff										
	7.3 Labor Disputes										

Appendix C Interview Guides

- 1) Does your company have a Health and Safety policy?
- 2) Does your company provide Health and Safety training to employees?
- 3) Does your company carry out risk assessment to determine risks and hazards on site?
- 4) Does your company have a Health and Safety committee?

Table -4.5: Accident Records for Varnero Construction P.L.C, from 21/05/09 to 09/07/09

No	Type of Hazard	Consequences	Possible source	Frequency
1	Hand or foot injured	falling object ,sharp material(nail) and metal sheet.	not using PPE, lack of awareness and miss communication	9
2	Manual handling	Muscles pain, back pain	Working for long time, twisting, bending, Congested sites for movement/equipment Carrying over loads,	3
3	Falling from height	inadequate site access, old wood scaffold and ladder	Luck of awareness, Inattention of the worker's, safety, improperly fixed scaffolding and ladder Not using PPE (not available by management or available but workers not using it)	2
4	Winding and twisting	skeleton disorder	Bending and twisting for long time and Heavy manual handling	4

Agreement form between Nyla Insurance S.C. and Varnero Construction P.L.C

ቀን: 19/09/2009

የኢንሹራንስ ካሳ ክፍያ መተማመኛ ሰነድ።

ይህ የኢንሹራንስ ካሳ ክፍያ ውል ሰጪ ተብሎ የሚጠራው የኒያላ ኢንሹራንስ አ.ማ. የጅም ቅርንጫፍ (አድራሻ ጅም ከተማ ክፍተኛ 02 ቀበሌ 01 የቤት ቁጥር አዲስ የፖ.ሳ.1000) እና ከዚህ በታች ውል ተቀባይ ተብለው የሚታወቁት አቶ ቢሆነኝ ፈንቱ ሽታሁን አድራሻ አ.አ ፣አራዳ ክ/ከተማ ፣ወረዳ 1 በ 19/09/2009 ዓ.ም ከዚህ በታች በተገለጸው መሠረት ተፈፅሞአል።

1. የ ቫርኔሮ ጅም ዩኒቨርሲቲ ግንባታ ላይት ሰራተኛ የሆኑ አቶ ቢሆነኝ ፈንቱ ሽታሁን ከ ውል ሰጪ ከ ኒያላ ኢንሹራንስ አ.ማ ቁራ ቅርንጫፍ የሰራተኛ ጉዳት ካሳ የዋስትና ሽፋን የተሰጣቸው፣ በ 03/06/2009 ዓ.ም በሰራ ላይ እያሉ በ ቀኝ እግራቸው የጭን መገጣጠሚያቸው ላይ የአካል ጉዳት ደርሶባቸዋል ይህም በ ህክምና መረጃ ተረጋግጧል።
2. በዚህም መሰረት ለደረሰው የአካል ጉዳት (7 %) በ ደሞዛቸው ተሰልቶ 6,600.72 *12*5*7% ሙሉ የካሳ ክፍያ ብር 27,723.02 (ሃያ ሰባት ሺህ ሰባት መቶ ሃያ ሶስት ከ 02/100 ብቻ) ውል ሰጪ ለተገኝው ለመክፈል የተስማማ ሲሆን ይህንኑ የካሳ ክፍያ ውል ተቀባይ ለደረሰው ጉዳት ሙሉ የካሳ ክፍያ መሆኑን አምነው ለመቀበል ተስማምተዋል።
3. ውል ተቀባይም የካሳ ክፍያው ለደረሰው የአካል ጉዳት ሙሉ የካሳ ክፍያ መሆኑን ተገንዝበው ከአሁን በኋላ ከዚህ አደጋ ጋር በተያያዘ የሚጠይቁት ጥያቄ እንደማይኖር ተስማተዋል። በተጨማሪም በዚህ ካሳ ለመቀበል በተስማሙበት ጉዳይ ላይ ያገባኛል የሚል ማንኛውም ሌላ ወገን ቢመጣ ወይም ቢቀርብ ውል ተቀባይ ሃላፊነቱን ለመውሰድ ፈቅደው እና ተስማምተው የመተማመኛ ፊርማቸውን አኑረዋል።
4. ውል ተቀባይም በዚህ ውል ውል ሰጪውን የኒያላ ኢንሹራንስ ኩባንያን ሆነ ደንበኞችን ጊም ሻርኔሮ አ.ማን ከማንኛውም አይነት ተጠያቂነት ነፃ ማድረጋቸውን ተስማምተው ከላይ የተጠ ቀሰውን ሙሉ የካሳ ክፍያ ብር 27,723.02 (ሃያ ሰባት ሺህ ሰባት መቶ ሃያ ሶስት ከ 02/100 ብቻ) ምስክሮች ባለ-በት ሲፒዎ ቁጥር 399494 መቀበላቸውን በፊርማቸው አረጋግጠዋል።

<p><u>ሰለ ውል ሰጪ</u></p> <p>ስም <u>ገጠ-ጌሳ ቸሮ</u></p> <p>ፊርማ <u>[Signature]</u></p> <p>ቀን <u>19/09/2009</u></p>	<p><u>ውል ተቀባይ</u></p> <p>ስም <u>ቢሆነኝ ፈንቱ</u></p> <p>ፊርማ <u>[Signature]</u></p> <p>ቀን <u>19/09/2009</u></p>
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	<u>ምስክሮች</u>	
	<u>ፊርማ</u>	<u>ቀን</u>
1. <u>[Signature]</u>	<u>[Signature]</u>	<u>19/09/2009</u>
2. <u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>
3. _____	_____	_____
4. _____	_____	_____

The Researcher Was Taking Daily Worker Accident Recorded from Afro-Tsiyon Construction P.L.C.

Table -4.6: Accident sample record from Afro-Tsiyon Construction P.L.C, date of recorded from 10/06 2009 to 27/12/09 E.C

No	Type of Hazard	Consequences	Possible source	Frequency
1	Hand or foot injured	falling object ,sharp material(nail) and metal sheet.	not using PPE, lack of awareness and miss communication	30
2	Manual handling	Muscles pain, back pain	Working for long time, twisting, bending, Congested sites for movement/equipment Carrying over loads,	20
3	Flying particles causing eye	eye trachoma and pain	not using PPE or not available by management or available but workers not using	7
4	Working at a height	physical injury	Luck of awareness, Inattention of the worker's, safety, improperly fixed scaffolding and ladder Not using PPE (not available by management or available but workers not using it)	21
5	Equipment/Plant/Tools	Crushed/cut by objects	Not well operating the machine, trained not given for operator especially for new machine and Improper maintenance	13
6	Cement and dust	Health problems such as headaches, eye irritation, dizziness, faintness, sleepiness and etc.	Present on demolishing site , Excavation works, concrete mixing takes, Material specification, cement and paints, decontamination pesticide, timber treatment chemicals	8

Assessment of Risk and Safety Management on Building Construction Project

7	Noises	Health problem such as hearing loss	Equipment noise, activity noise such as excavation, drilling, welding, piling, roofing, Grinding and cutting, concreting	3
8	Winding and twisting	skeleton disorder	Bending and twisting for long time and Heavy manual handling	12

Photo Taken Accident Record Data From Afro-Tsiyon Construction P.L.C

የትራንስፎርሜሽን ስራ ላይ የሚከናወኑ የሥራ ሰዓት ለመደብዳት የሚያገለግል ማህበራዊ ሰነድ

ቀን	የሥራው ስም	የሥራው ሰዓት		የሥራው አይነት	የሥራው ቦታ	የሥራው ስም	የሥራው ሰዓት	የሥራው ሰዓት	የሥራው ሰዓት	የሥራው ሰዓት	የሥራው ሰዓት	የሥራው ሰዓት	የሥራው ሰዓት
		ግራ	ሰዓት										
22/6/09	ሰለጣን ሙሉ-ክ	✓		ፈረድ	ጀርባ	የመጀመሪያ ሆስፒታል	09:420	-	ጉሰራተኛ	-	-	-	-
24/6/09	ከሌላ ሰማን	✓		ሚስጣር	አጣር	TAT	10:30	-	በራሪ	-	-	-	-
25/6/09	አለጣኝ ሰብረ	✓		ሚስጣር	አጣር	TAT Claxa	11:05	3ቀን	አጣር	-	315	-	-
25/6/09	የሥራው አገልግሎት	✓		ፎንጋይ	አይን ስር	TAT Claxa	04:16	2ቀን	ፈላጊ	-	240	-	-
26/6/09	የሥራው ሰዓት	✓		ሚስጣር	አጣር	TAT Claxa	03:33	-	ጉሰራተኛ	-	-	-	-
26/6/09	ሰለጣን አገልግሎት	✓		ሰበ	አጣር	የመጀመሪያ ሆስፒታል	02:49	5ቀን	ሰብረ	-	575	-	-
27/6/09	ሰለጣን ጋላይ	✓		አገልግሎት	አጣር	የመጀመሪያ ሆስፒታል	08:10	-	በራሪ	-	-	-	-
28/6/09	የሥራው ሰዓት	✓		ራስ ምታት	ራስ	Parasitamol	09:30	-	ጉሰራተኛ	-	-	-	-
28/6/09	ፍቃዱ በጉደ	✓		ወደቆ	አጣር	የመጀመሪያ ሆስፒታል	08:30	-	ጉሰራተኛ	-	-	-	-
29/6/09	ለይላ ይማም	✓		ቆርቆሮ	አጣር	Claxa	10:50	-	ጉሰራተኛ	-	-	-	-
30/6/09	ላይላ አገልግሎት	✓		ሚስጣር	አጣር	TAT Claxa	07:49	-	ጉሰራተኛ	-	-	-	-

የዘጋጀው: Str Senait የረገጠው: [Signature] የሰጠው: _____

Assessment of Risk and Safety Management on Building Construction Project


አፍሪቃን ኮንስትራክሽን ኃ/የተ/የግል ማህበር
ጅም የኒሽርስቲ አለፖርት ማዘውተሪያ ፕሮጀክት በስራ ላይ እያሉ አይጋ የደረሰባቸው ታካሚዎች ፎርም

የየተት ጦር 2009ዓ.ም

ቀን	የሰራተኛው ስም	የጉዳቱ ለይነት		የጉዳቱ ለይነት	የተገዳው የሰውነት ክፍል	ከፕሮጀክት ስራ ላይ የተገኘው ሰዓት	አይጋ የደረሰበት ሰዓት	በጉዳቱ ያገኘበት የተለዩ ለይነት	የሰራተኛው ስም	በሰዓቱ ላይ የተደረገው ስራ	የሰዓቱ ላይ የተደረገው ስራ	የሰዓቱ ላይ የተደረገው ስራ	የሰዓቱ ላይ የተደረገው ስራ	የሰዓቱ ላይ የተደረገው ስራ
		ቀላል	ከባድ											
10/6/09	አሰቲአገሮው ተክሌ	✓		ሚስማር	ጀርባ	TAT Claxa	09:45	-	ረ/ፎርማ	-	-	-	-	-
11/6/09	አወል አ/ፈ/ጣ	✓		መደብ	አገር ጣቅ	TAT Claxa	3:50	-	አናጂ	-	-	-	-	-
11/6/09	ዘውዴ መሀመድ	✓		ሚስማር	አግር	የመጀመሪያ ህክምና	05:46	-	አናጂ	-	-	-	-	-
11/6/09	አወል አብዲሳ	✓		ሚስማር	አግር	TAT Diclofine	03:20	-	ጉሰራተኛ	-	-	-	-	-
11/6/09	አሴም ሸፍድን	✓		ብሎኬት	ጭንቅላት	Claxa	10:50	-	ረ/ሰላኝ	-	-	-	-	-
13/6/09	አብነት ንጉሴ	✓		ወድቆ	አገር	TAT Claxa	02:50	-	ሰላኝ	-	-	-	-	-
✓ 13/6/09	አሁመድ መሀመድ	✓		ሚስማር	አግር	Diclofine	02:56	5ቀን	ጉሰራተኛ	-	200	-	-	-
14/6/09	ጅም አወል	✓		ሚስማር	አግር	TAT Claxa	03:20	-	ጠራቢ	-	-	-	-	-
14/6/09	ሰይጅ አብደላ	✓		ወድቆ	አግር	የመጀመሪያ ህክምና	04:20	-	ጠራቢ	-	-	-	-	-
15/6/09	ታደሰት ታምራት	✓		ሚስማር	አግር	TAT Claxa	04:49	-	ብራሪ	-	-	-	-	-
15/6/09	ጣይር አ/ጅሀይ	✓		አንጨት	አፍንጭ	የመጀመሪያ ህክምና	08:16	-	ጠራቢ	-	-	-	-	-
16/6/09	ዛሪ አ/መዳኔ	✓		ሚስማር	አግር	TAT Claxa	11:10	-	ጉሰራተኛ	-	-	-	-	-
16/6/09	ሳቢት መሀመድ-ሳኒ	✓		አንጨት	አገር ጣቅ	Diclofine	03:16	-	ጉሰራተኛ	-	-	-	-	-
16/6/09	አልሞላ ጠይብ	✓		መሮ	ግንባር	TAT Claxa	03:50	-	ብራሪ	-	-	-	-	-
17/6/09	አለውያ ሀሰን	✓		ብሎኬት	አገር	Claxa	04:06	-	ሰላኝ	-	-	-	-	-
17/6/09	ነጋ አ/ቦር	✓		ሚስማር	አግር	TAT Claxa	11:00	-	ጉሰራተኛ	-	-	-	-	-
17/6/09	መላኩ ጫኔ	✓		መደብ	ጣቅ	TAT Claxa	02:45	-	ኪም	-	-	-	-	-
17/6/09	መደሙና አ/ቦር	✓		ሚስማር	አግር	TAT Claxa	10:40	-	ሰላኝ	-	220	-	-	-
17/6/09	ሚስኩ አ/ገላ	✓		ቆርቆሮ	አግር	TAT Claxa	09:05	-	ጉሰራተኛ	-	-	-	-	-
17/6/09	ወርቅነህ አ/ራያ	✓		ሚስማር	አግር	TAT Claxa	08:18	-	ጉሰራተኛ	-	-	40	-	-
18/6/09	በሀይሉ በዛብሀ	✓		ሚስማር	አግር	Diclofine	09:23	1 ቀን	ጉሰራተኛ	-	-	-	-	-
18/6/09	ራያ አ/መዳኔ	✓		ድንጋይ	ግንባር	TAT Claxa	11:16	5ቀን	ጉሰራተኛ	100	1200	-	-	-
22/6/09	መሀመድ ከድር	✓		መደብ	ጣቅ	TAT Claxa	09:16	-	ሰላኝ	-	-	-	-	-

የዘጋጀው: S.Y. Semayt የረገጠው: [Signature] የፀደቀው: _____

Assessment of Risk and Safety Management on Building Construction Project



AFRO-TSION
Construction Plc.

Afro - TSION Construction PLC

Jimma University Sport Court Projct

ተገቢ	የሰራተኛው ስም	የተገቢ ለይነት		የአድራሻ ስም	የገዢ ስም	የገዢ አድራሻ	የገዢ ስልክ	የገዢ ክልል	የገዢ ወጪ	የገዢ ስም	የገዢ አድራሻ	የገዢ ስልክ
		የገዢ ስም	የገዢ አድራሻ									
10.6.09	ጌትጌታ ተገቢ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
11.6.09	ጌትጌታ ተገቢ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
11.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
11.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
13.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
13.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
14.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
15.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
15.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
16.06.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
16.06.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
17.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
17.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
18.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
17.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
17.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
18.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
18.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
19.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ
20.6.09	ጌትጌታ ጌትጌታ	✓		ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ	ጌትጌታ

Checked By _____