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St. Mary's University, Ethiopia

**ST. MARY'S UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
**DEPARTMENT OF PROJECT MANAGEMENT**

**ASSESSING THE RISK MANAGEMENT PRACTICES IN ADWA  
ZERO KILOMETER MEGA CONSTRUCTION PROJECT,  
ADDIS ABABA, ETHIOPIA.**

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**ST. MARY'S UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
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**Assessing the Risk Management practices in Adwa  
zero Kilometer Mega Construction projects, Addis  
Ababa, Ethiopia.**

**By: Fasil Neguse: - \_\_\_\_\_**

**A project work submitted to ST. Mary University School of Graduate Studies  
in partial fulfillment of the requirements for the Degree of Masters of Arts in  
project management**

**Advisor: Muluadam Alemu (Ph.D)**

**Jan, 2022**

**Addis Ababa, Ethiopia**

## DECLARATION

This This is to declare that the thesis, entitled "Assessing the Risk Management Practices in Adwa Zero Kilometer Mega Construction Projects, Addis Ababa, Ethiopia," was prepared by Fasil Neguse. I hereby affirm that the thesis is my original work conducted in partial fulfillment of the requirements for the Masters of Arts in project management. Literature used in the study was appropriately cited, and the author is acknowledged.

By: -Fasil Neguse

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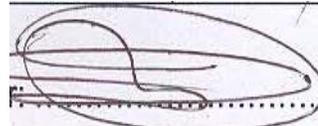
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Statement of Certification This is to confirm that Fasil Neguse worked under my supervision on the project " Assessing the Risk Management Practices in Adwa Zero Kilometer Mega Construction Projects, Addis Ababa, Ethiopia." This work is original, and it is sufficient for submission as partial fulfillment for a Masters of Art in Project Management degree.

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St. Mary's University

Addis Ababa January 2022

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## Acronyms and Abbreviations

- AZKMP:** Adwa zero Kilometer project
- AAMPCO:** Addis Ababa Mega Projects Construction Office
- APM:** Association for Project Management
- ECDSWC:** Ethiopian Construction and Supervision Works Corporation
- FY:** Fiscal year
- GDP:** Gross Domestic Product
- GTP:** Ethiopia Growth and Transformation Plan
- ISAP:** Increase Systems Availability Project
- ITIL:** Information Technology Infrastructure Library
- MoFED:** Ministry of Finance and Economic Development
- NAS:** National Academy of Sciences
- NBE:** National Bank of Ethiopia
- PMBOK:** Project Management Body of Knowledge
- PMI:** Project Management Institute
- PRM:** Project Risk management
- RMP:** Risk Management Plan
- SPSS:** Statistical Package for Social Sciences
- SWOT:** Strengths, Weaknesses, Opportunities, and Threats
- WASH:** Water, Sanitation and Hygiene Projects

## Abstract

*The purpose of this study was to assess the Adwa Zero Km Museum construction project's project risk management practices using the five project risk management processes identified through literature review: risk management planning, risk identification, analysis, response planning, and monitoring and controlling. The study employed a descriptive type and used a quantitative analysis. A survey was conducted using 50 semi-structured, closed-ended questions, and an interview was conducted with the project manager. Participants who were involved in completing the question were selected using purposive sampling. Descriptive statistics were used to summarize the quantitative data compiled by SPSS 25. The data were summarized using tables and percentages. Using the above-listed methods, the researcher found out that project risk management was not given enough attention in the Adwa Zero Km mega construction project, where there are many uncertainties. The project surveyed was generally recording poor performance in most crucial parts of the risk management process. However, risk was planned ahead of time, and cause and effect were assessed in a systematic manner. The study also reported that even though there was no training to develop employees' knowledge regarding risk, a responsible person or department was not assigned to handle it. The risk identification process in the project was one of the better-performed activities that was identified at the initial stage of the project. No enough attention is given to risk getting to channel the risk analysis, response, and monitoring and controlling concurrently with the project plan and objective. The study recommended that the project team members receive consistent training in project management knowledge areas, especially risk management, and their application. Continuous improvement based on lessons learned needs to be encouraged. In addition to improving risk management oversight and project risk management processes, ensuring the establishment of effective risk management standards, and involving key stakeholders during the planning and necessary phases, collecting and compiling project data for future reference.*

**Key words:** *Risk management, and Adwa zero kilometer project*

# Chapter One

## 1.Introduction

The first chapter gives insight into the key points of the research. This chapter's main discussion area includes the following topics: the study's background and the project's introductory section; the problem statement; the significance of the study; research objectives and questions; and the study's limitations and scope.

### **1.1. Background of the study**

Projects, by definition, are the temporary efforts undertaken by groups or companies in order to create a unique product, service, or result (PMI, 2017). These unique products and/or services are managed by groups of people in organizations such as universities, public organizations, and private companies. In order to create these unique products or services, this process should be managed meticulously by the owners, decision-makers, and project group members. The reason behind this meticulous effort is that the projects contain within themselves a risk element. This element may occur at the very beginning of the project, during the project, or even after the finalization of the project(frezewd,2016).

Megaprojects, which are much larger than normal projects, have risk elements since they are fundamentally different from regular projects in terms of aspiration, stakeholder involvement, lead periods, complexity, and impact (Shenhar & Holzmann, 2017). Megaprojects are typically presented for the benefit of society because they affect huge populations around the world. As a result, risk management in such initiatives becomes increasingly important in order for them to work correctly.

Addis Ababa, the capital of Ethiopia, is one of Africa's fastest-growing cities, accounting for 25% of the country's urban population (WB, 2015). It is the country's growth engine and a critical component of the country's objective of creating a middle-income, carbon-neutral, resilient economy by 2025. Despite its rapid economic growth, the city has significant development challenges. Furthermore, as a result of current physical growth trends, the cost of infrastructure delivery is rising. Addis Ababa is growing at a dizzying pace, with urbanization

outpacing population growth. As a result of this expansion, it is projected that 46 percent of the land is vacant or underutilized. Simultaneously, the city center has an extraordinarily high population density (up to 30,000 people per km), putting around 30% of the population on 8% of the land and resulting in generally poor living conditions (WB, 2015). Recognizing Addis Ababa's strategic importance, the government is launching steps to address important urban issues such as better land use by encouraging urban innovation such as mega building construction projects. Furthermore, as the city's population grows, so does the demand for mega-building construction projects. Mega construction projects, such as the Adwa Zero Km project, provide an opportunity to improve the city's image through well-thought-out planning and design (WB, 2015).

The project, which includes multipurpose units including the Adwa Memorial Museum, an amphitheater, libraries, and youth centers, is expected to be the biggest of its kind in the country. The Addis Ababa administration, which covers the 4.6-billion-birr cost of the project, expects the construction of the memorial center to be completed in two years. As a memorial center for the African victory, Adwa the Center is expected to serve as a platform for the reinvigoration of the spirit of Pan-Africanism. Addis Ababa City administration embarked on building Adwa Center today in the heart of the city. According to city officials, China Jiangsu International Economic and Technical Cooperation Group is undertaking the construction of the center, which will house a museum, a 2000-seat conference hall, a cinema hall, a library, a gymnasium, a 600-car parking space, green areas, and cafeterias.

The Adwa Zero Km Project was one of the megaprojects commissioned by the Addis Ababa administration, and it has a large number of stakeholders, a high level of aspiration by the government and the administration, a high level of complexity due to size, budget, experience, and know-how, and a significant impact on Ethiopia and other regional countries.

For each project, there are a variety of foreseeable and unforeseeable risk variables, and sadly, no contractor can handle all of the project's potential primary risks. As a result, risk identification, risk assessment, and risk mitigation ideas become increasingly critical for achieving healthy project outcomes (PMI, 2017).

In addition to this, construction projects are always unique, and risks arise from a variety of sources (Oyegoke, 2006). Mega-construction projects, in particular, are extremely complicated, requiring advanced technology and structures. As a consequence, they are rife with risk and uncertainty. In the context of construction project management, risk management entails identifying, assessing, and prioritizing risks by monitoring, controlling, and applying managerial resources in a coordinated and cost-effective manner in order to reduce the likelihood and/or impact of unfortunate events and maximize the achievement of project objectives (Dauglas, 2009).

Risk and uncertainty have the potential to be detrimental to construction projects. Safety hazards that result in worker accidents and injuries, an escalation in material costs, insufficient labor, damage or bribery of equipment and tools, misunderstandings among project stakeholders, poor quality, scope changes, poorly articulated contracts, force majeure, shortages and unavailability of inputs, and so on are all examples of construction project risks. Appropriate risk management helps the project's key stakeholders—the client, contractor or developer, consultant, and supplier—achieve the project's desired outcome based on their areas of expertise. While risks cannot be completely eliminated, construction projects can effectively manage them by identifying and assessing them early. A clearly articulated and practiced risk management approach is required in order to effectively cope with uncertainty and unexpected events, as well as to achieve project success not just by reducing negative effects but also by maximizing possibilities (Flanagan R et al., 2006).

Given the complexity of mega-construction projects, managing project performance risks is a vital strategic move for many significant construction projects in order to satisfy project objectives in terms of schedule, budget, and quality. Accordingly, the purpose of this study was to assess the risk management practices of mega building construction projects using Adwa Zero Km Construction Projects as a case study in order to identify major gaps and recommend the best and most effective project risk management methods.

## 1.2. Statement of the Problem

Prior research (Hussein & Karimin, 2006) has shown that building projects are among the riskiest of all projects due to the difficulty in coordinating diverse activities. Meeting the project's time, cost, and quality goals is critical to its success. Risk can manifest itself in a variety of ways in order to meet these objectives, including schedule overruns, budget overruns, financial losses, loss of life, environmental harm, and a variety of other failures. As a result, by analyzing the risks that are likely to have both positive and negative effects on the project, the project can be positively successful. Lack of systematic project risk management reduces efficiency, value, and time, as well as negatively affecting overall project performance, which raises construction project costs. Countrywide, risk management is a relatively new discipline; therefore, although construction project failure is a common practice, risk management consideration is not given priority and is not recognized as a solution for project failures. Risk management, on the other hand, has been shown to reduce the risk of failure by detecting and analyzing risks, as well as by enhancing the project management process and resource utilization (Vargas, 2008).

Through industrial transformation, Ethiopia aims to become one of the world's middle-income countries by 2025. An efficient and productive construction industry can boost national competitiveness while also creating a lot of jobs. The construction industry rose at a rate of 28.7% per year on average over the GTP I period, increasing its percentage of GDP from 4% in 2009/10 to 8.5 percent in 2014/15(NPC, May 2016). The government is making strenuous efforts to strengthen the construction industry as one of its subcomponents in accordance with the country's industrial transformation policy. As a result, mega-construction projects are now underway in both the public and private sectors. Even Nevertheless, more megastructures are likely to be constructed. Construction projects, on the other hand, are prone to a variety of risks, including inadequate project management, capacity constraints, financial difficulties, technological gaps, a lack of appropriate infrastructure, rent seeking, and a lack of proper governance. And, in order to manage project-related risks, the majority of Ethiopian construction enterprises lack well-articulated and implemented risk programs and response plans. As a result, proper risk management procedures have not been implemented in most construction projects, and project performance has been affected by several issue (Fetene, 2008).

Project Risk management practices in Ethiopia is at low level and it is more complex when it comes to mega projects. Majority of construction projects in Ethiopia face schedule delay and cost overrun. This problem not only relates to the working environment of the organizations but also mainly relates to the internal integration and management of critical PM knowledge areas which was risk management. As a result, the need to assess the project risk management practices of one of the highly budgeted mega projects in the city (Adwa Zero Kilometer Museum Project) it has been found to be critical and timely in order to bridge the research gap. Accordingly, this research tries to assess the project risk management practice of Adwa Zero Kilometer Museum Project under the Knowledge areas defined by the PMBOK risk management process.

### **1.3 Research Questions**

The research was being done to answer the following questions:

- How was risk management currently practiced in mega-construction building projects?
- How does project risk management affect implementation of projects in mega construction?
- Which project risk management practices need to be implemented and/or improved in the Adwa Zero Kilometer Museum project?
- What should be done to improve the risk management practices of mega construction building projects?

### **1.4. Objective of the study**

#### **1.4.1.General Objective**

The general objective of this project was to assess the risk management practice in Adwa Zero Kilometer Mega Construction Projects.

#### **1.4.2.Specific Objectives**

The specific objectives are:

- Which project risk management practices need to be implemented and/or improved in the Adwa Zero Kilometer Museum project?

- To assess the effects of project risk management on the execution of projects in Mega construction.
- To propose practical recommendation based on research findings in the Adwa Zero Kilometer Museum project.

### **1.5. Significance of the Study**

Conducting an assessment of project risk management practices in mega construction projects has both practical and theoretical significance. The study has the potential to be extremely significant for many businesses, particularly those looking to engage in megaprojects. If such businesses use disorganized and ineffective risk management, they may face a slew of issues with their projects, including schedule and budget overruns, financial losses, human life loss, and environmental harm, among other failures. As a result, the findings of this assessment can help those in the construction industry, such as owners, consultants, and contractors, comprehend the essence of modern risk management practices and their impact on project efficiency.

It would be of great importance to different project stakeholders project owners, project practitioners, and project managers and project teams undertaking similar projects to identify the gaps in the risk management practice and recommend ways of improvement.

Unlike the available literature on project risk management, there was a scarcity of literature and previous studies that provide detailed information on the risk management practices of mega construction building projects. Hence, undertaking this study is expected to contribute to the advancement of the existing theoretical coverage of project risk management practices in mega construction building projects. Also, the findings and conclusion of this study can lead to the initiation of further study by anyone who might be interested in the topic.

### **1.6. Scope of the Study**

The scope of the study was limited to the mega-building construction projects of the Adwa Zero Km Mega Construction Project, which is constructed by Chinese international contractors in Addis Ababa, Ethiopia. The rationale behind this delimitation was that the selected project is one of the most sophisticated and complex building construction projects in Addis Ababa that utilizes high-end technologies and massive investment. With regards to the selected project, its selection

was backed by the project's complex nature, and it's expected to be exposed to a high level of project risk. The study was done by questionnaire, interviewing the project manager and project team members, and reviewing secondary data (e.g., contracts, project charter, project performance reports, project management plan, and so on). As a result, extensive research, more time, detail information, and energy are required to investigate and reach consensus on all project risk management practices of mega construction projects.

### **1.7.The Organization of the paper**

The first chapter of this research paper contains an introduction with the study's and project's background, the statement of the problem, the significance of the study, the research objectives and questions, and the scope of the study. Chapter two is composed of a review of the relevant literature. Various literatures were reviewed to lay the foundation of the study and to provide theoretical, conceptual, and empirical frameworks. Chapter three contains the details of the research methodology and the steps used to gather and analyze the data from which findings are drawn. Chapter four contains the analysis of the data gathered by means of the data collection methods and instruments indicated in the methodology part. Chapter five discusses the summary, conclusion, and recommendation sections. The references used in the study are listed at the end. questionnaire was included in the appendix.

## CHAPTER TWO

### 2.REVIEW OF RELATED LITERATURE

#### 2.1.Introduction

By reviewing the existing theoretical and empirical literatures, this chapter compiles a review of the relevant literature to the concept of risk management. The chapter would also provide an overview of mega building project risks and management practices. This was an aid in the selection of the best approach and method for conducting an assessment of project risk management methods on the Adwa Zero Km Mega Building Construction Project.

#### 2.2.Theoretical Review

##### 2.2.1.What is Project Risk

The phenomenon known as "risk" is a concept that has an impact on project success. Risk is defined differently in different sectors of life, such as economics, finance, social issues, and politics. Risk, on the other hand, is a prevalent concept in project management and has a significant impact on all initiatives. Aziz, Munir, and Sufian (2018) provide the simplest and most straightforward definition of risk, which is essentially defined as the possibility of forfeiture and/or uncertainty. Different authors have defined project risk in several ways. Project risk is an uncertain event or set of circumstances that, ought it to happen, will have an impact on the achievement of the project's objectives. That is, because the future is full of uncertainty, it is impossible to predict exactly what will happen. And there are risks in every decision we make or action we take (APM, 2006). Risk is associated with both current activities and the project's future conditions. During the project life cycle, conditions can change and turn out to be advantageous or unfavorable. There is a considerable degree of uncertainty in the early stages of a project, which reduces as we gain more background knowledge (Flanagan & Norman, 1995). Such uncertainties or events may have an impact on the project's schedule, cost, quality, safety, security, and environmental goals. Fang et al. (2012) Many scholars, such as Adedokun et al. (2013) and Wang S.Q. et al. (2004), concur that project risk has both positive and negative consequences on project objectives. Risk is described by Perry and Hayes (1985) as an unpredictable event or circumstance that, if it occurs, has a positive or negative impact on a

project's goal. Others, on the other hand, argue that risk is intimately linked to uncertainty and is a phrase that is often used in a variety of settings but is most generally associated with a negative consequence of an occurrence. Hamzaoui F. et al. (2015) As a result of this bad outcome, losses occur, which are referred to as project risks (Webb, 1994). It is a measure of an activity's likelihood, severity, and exposure to all hazards (Sarkar & Panchal, 2015). Risk is defined by Jaafari (2001) as the exposure to loss, gain, or the probability of loss or gain multiplied by its magnitude. Risk is defined by Kartam and Kartam (2001) as the likelihood of certain uncertain, unpredictable, and even unfavorable events occurring that might alter the probability of a given investment.

"Risk" is defined as "an unpredictable occurrence or condition that, if it occurs, has a positive or negative effect on one or more project objectives" (such as scope, schedule, cost, and quality) (PMI,2013).

Project risk is a measure of the probability and consequence of not achieving a defined project goal. Risk has two primary components for a given event: a probability of occurrence of that event and the impact (or consequence) of the event occurring (amount at stake) (Danku, Agyekum, & Asare, 2020). To fully define risk, three elements are needed: a future event that, if eliminated or corrected, would prevent a potential consequence from occurring; the probability (or likelihood) assessed at the present time of that future event occurring; and the impact (or effect) of that future event (NAS, 2014).

A risk may have one or even more causes and, if it occurs, one or more consequences. A cause might be a given or probable requirement, assumption, limitation, or condition that allows for bad or good results (PMI, 2013).

### **2.2.2. What is Project Risk Management**

Project as are risk management has been defined in a variety of ways by various authors. Risk management is a method for determining the best course of action in the face of uncertainty by identifying, analyzing, acting on, and communicating risk issues (Berg, 2010). Identifying influencing factors that could negatively impact a project's cost schedule or quality baselines, assessing the possible impact of the detected risk, and adopting actions to manage and mitigate

the potential impact are all part of risk management in a project. The riskier the activity is, the costlier the consequences if the wrong decision is made (Mills, 2001).

Risk management is not a separate project office activity assigned to a risk management department, but rather one aspect of sound project management. Risk management should be intimately linked to important project activities such as overall project management, systems engineering, cost, scope, quality, and schedule, among others (Kerzner, 2009).

### **2.2.3. Benefit of Project Risk Management**

The aim of project risk management was not to completely eliminate risks but to improve the chance and impact of positive events while reducing the probability and impact of negative events. New techniques of efficiency, uniqueness, and competitiveness cannot be attained without taking risks, and the project risk process ensures that the cost of risk is weighed against the benefits it provides (PMI, 2013).

Correct risk management is proactive rather than reactive. As a result, proper risk management aims to lower the likelihood of an incident occurring and/or the degree of its consequences (Kerzner, 2009). Project risk management is a useful approach that may be applied to any type, size, or complexity of project inside a company. The proper amount of project risk management by the appropriate roles with a clear level of accountability will result in improved project scope, schedule, and budget management (Marchetti, 2012).

### **2.2.4. Project Risk Management Process**

Risk management includes several related actions such as planning, identification, analysis, response (handling), monitoring, and control (Kerzner, 2009).

(Adams, 2008) separated the risk management process into three sub-processes: risk identification, risk analysis and evaluation, and risk response and management. The risk management process was further broken down into more precise phases by Chapman and Ward (1997): define, focus, identify, structure, determine ownership, estimate, assess, plan, and manage. However, risk management is divided into six steps, according to the Project

Management Body of Knowledge 2000 edition: planning, identification, qualitative analysis, quantitative analysis, response planning, and monitoring and control. While this paradigm offers a holistic approach to issue resolution, its effectiveness is dependent on these processes' capacity to deal with the multidimensional uncertainty of risks, including risk identification, likelihood, impact, and occurrence. Traditional risk management tools and procedures were not designed to handle the systematic nature of risk uncertainty in modern projects (Alexandre, 2001:1).

#### 2.2.4.1. Project Risk Management Planning

A risk management strategy, according to Kerzner (2009), is the complete design of a risk management action plan. It is the process of making and recording an organized, comprehensive, and interactive risk management plan, as well as determining and allocating suitable resources to carry out the risk management strategy of a program. It is an iterative process that encompasses the full risk management process, including efforts to discover, assess, respond to, monitor, and control risks. It creates a risk management strategy that encompasses the project's process and implementation strategy. Early efforts should define the purpose and objective, assign responsibilities for specific areas, identify additional technical expertise needed, describe the assessment process and areas to consider, define a risk rating approach, define procedures for considering response strategies, establish monitoring and control metrics (where possible), and define reporting, documentation, and communication requirements. The risk management plan (RMP) is an important outcome of the risk planning process (Kerzner, 2009).

According to PMI (2013), "planning risk management" is the process of outlining how to undertake risk management activities for a project. The key advantage of this strategy is that it ensures that risk management is proportional to the risks and the project's relevance to the business. It is vital to interact with and obtain agreement and cooperation from all stakeholders to ensure that the risk management process is supported and carried out efficiently throughout the project life cycle. A Risk Management Plan is part of a project management plan. It details and summarizes the risk management activities for the project. The risk methodology, risk roles and duties, risk categories, likelihood and impact scales, risk tolerances, frequency of risk management activities and reporting, and risk management budget and schedule are all specified in the plan (PMI, 2013).

#### 2.2.4.2. Project Risk Identification

According Kerner (2009) defines "project risk identification" as the process of identifying and tracking the uncertainties that may impact project performance. Looking at each project aspect for potential risk or opportunity events and their core causes, commencing documentation, and laying the groundwork for further analysis and response are all part of risk identification, if needed. Risk identification often includes the following activities:

Firstly, determine who might be aware of project risks. Secondly, Gather and disseminate easily accessible information on project assumptions and constraints to those participating in the risk identification process. Thirdly, Examine the outcomes of previous similar programs' identification of risk. Fourthly, Determine the risk identification tools and procedures to use, if not already outlined in the risk management plan. Then, Identify and document risks. Finally, Proceed to the risk assessment.

Risk identification is crucial since other aspects of the risk management process, such as analysis and response, can only be successful if potential dangers are appropriately identified (Toakley and Ling, 1991). According to Chapman (2011), the purpose of this step is to identify both the risks to the business that have the ability to reduce or eliminate the chance of the firm achieving its objectives as well as the possibilities that could improve its performance.

The process of determining which risks may harm the project involves identifying and documenting risks and their characteristics. The documentation of existing hazards, as well as the knowledge and ability it enables the project team to have to predict events, are the primary benefits of this procedure (PMI, 2013). Risk register is a thorough record of the threats and opportunities that the project encounters. It is a component of the project management plan. It also includes additional information on each risk, such as its impacts, probability, risk response, budget, risk owner, and contingency and fallback plans (PMI, 2013).

#### 2.2.4.3. Project Risk Analysis

Kerzner, (2009) states that, risk analysis is a systematic process to estimate the level of risk for identified and approved risks. This involves estimating the probability of occurrence and consequence of occurrence and converting the results to a corresponding risk level. The

approach used depends upon the data available and requirements levied on the project. The goal is to acquire enough information about the risks to assess the chance of occurrence and the consequence of occurrence if the risk occurs, and then convert the resulting values to a risk level. Risk analyses are frequently based on detailed information derived from a variety of techniques, including but not limited to: analysis of plans and related documents, comparisons with similar systems, data from engineering or other models, experience and interviewing, modeling and simulation, relevant lessons-learned studies, test and prototype development results, sensitivity analysis of alternatives and inputs, specialist and expert judgments.

According to NAS, (2014), the purpose of the project risk analysis stage is to characterize and prioritize previously identified hazards by determining: How likely is the risk or opportunity and How big is the risk or opportunity (e.g., impact)?

By answering such questions, it is possible to categorize risks based on their importance to project success and to key stakeholders. Prioritizing risks in this way can help with later decision making and risk response planning (NAS, 2014).

#### 2.2.4.3.1. Perform Qualitative Risk Analysis

Perform Following risk identification, qualitative risk analysis prioritizes risks based on their likelihood of occurrence and potential impact on project objectives. Prioritization is required because risk identification reveals a large number of hazards that have the ability to influence project objectives in some way. However, many of those risks will be of such low priority or have such a minor impact that addressing them is not cost-effective, so quantity analysis helps the project team focus on the most critical risks (PMI, 2013).

The most popular qualitative approach is to utilize likelihood of occurrence and consequence of occurrence scales in conjunction with a risk mapping matrix to convert data to risk levels (Kerzner, 2009).

#### 2.2.4.3.2. Perform Quantitative Risk Analysis

Perform quantitative risk analysis, which is the process of numerically analyzing the effect of identified risks on overall project objectives. The key benefit of this process is that it produces quantitative risk information to support decision-making and reduce project uncertainty. Perform

quantitative risk analysis is applied to risks identified as potentially and significantly impacting the project's competing demands by the Perform qualitative risk analysis process. The Perform Quantitative Risk Analysis process analyzes the effect of those risks on project objectives. It is used mostly to evaluate the aggregate effect of all risks affecting the project. When the risks drive the quantitative analysis, the process may be used to assign a numerical priority rating to those risks individually (PMI, 2013).

Quantitative approaches include, but are not limited to, expected value (also known as expected(monetary) value for cost-based calculations], decision tree analysis (with branches specified by specific probabilities and/or distributions), payoff matrices, and modeling and simulation. Of key importance is the use of an approved, structured, repeatable methodology rather than a subjective approach that may yield uncertain and/or inaccurate results (Kerzner, 2009).

While the qualitative risk assessment is a good tool to analyze individual risks, the quantitative risk analysis analyzes the combined effect of the risks in the project. This is often the only accurate assessment of the overall risk exposure of the project and should be performed where necessary (Hillson, 2009).

#### 2.2.4.4. Plan Risk Response

According to Kerzner, (2009), Planning risk responses (risk handling) includes specific methods and techniques to deal with known risks and opportunities, identifies who is responsible for the risk or opportunity, and provides an estimate of the resources associated with handling the risk or opportunity, if any. It involves planning and execution with the objective of reducing risks to an acceptable level and exploiting potential opportunities.

Risk response occurs to eliminate, mitigate, deflect or accept the risk and logically will reflect the cost benefit of the risk management process (Fewings, 2005). According to (PMI, 2013), the key benefit of risk response is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed. Risk response defines the plan for altering the risk's likelihood and impact before it happens. It seeks to avoid or minimize the impact of negative risks if they arise. The response to positive risks aims to raise

the risk's probability or impact. Before a risk occurs, activities that support the risk response are undertaken.

According to PMI, (2013), identifies the following three different types of actions during risk response planning, naming, Firstly, Risk response defines the plan for altering the risk's likelihood and impact before it happens. It seeks to avoid or minimize the impact of negative risks if they arise. The response to positive risks aims to raise the risk's probability or impact. Before a risk occurs, activities that support the risk response are undertaken. Secondly, Contingency response / Contingency plan It specifies what actions will be taken in the event of a given occurrence or condition, as well as when those actions will complete. It aims to influence the impact of risk that is occurring. Finally, Fallback Plan it kicks in if contingency plan fails.

#### 2.2.4.4.1 Type of risk response

Different type of risk response. The response strategies, according to Kerzner, (2009), are to avoid, transfer, and minimize hazards or risks that may have negative impacts on project objectives if they occur. Exploit, share, enhance, and accept are the suggested answers to hazards having possibly beneficial consequences on project objectives.

PMI, (2013), further elaborates that type of risk responses mainly based on whether the risk is positive (opportunity) or it is negative (threat), It differentiates risk responses in the following manner; Avoid reducing the probability or impact of the risk to zero. Avoiding a risk entail taking a different course of action so that it does not resurface in the project's new circumstances. It should be noted that this is not the same as risk elimination. In reality, risk elimination is rare: if the need arises to return to the previous situation, the risk will resurface. The most extreme type of risk avoidance is to abandon the endeavor entirely. However, this extreme is rarely used in reaction to a single project risk issue. The other type was Mitigate. If risk cannot be avoided; steps can be taken to lessen the likelihood of the risk occurring or the impact if it does. Mitigation may reduce the likelihood and effects of an event (Fewings, 2005). Risk reduction is perhaps the most absorbing area of activity for anyone with a professional interest in risk management. The stakeholder is attempting to reduce risk in some way on purpose. It is rarely possible to lower the likelihood of natural risks, for example (although planning a project to avoid seasonal weather extremes is one approach). Contingency planning, quality assurance, separation or relocation of operations and resources, contract terms and conditions, and crisis

management and disaster recovery plans are among the mitigating techniques mentioned by (Cooper, 2005). The last type of risk Transfer. By means of a contract, insurance, warranty, guarantee, or performance clause, all or part of the risk is transferred to a third party. A project organization that chooses to transfer risk is attempting to shift the burden of a certain risk to another party. A project organization that chooses to transfer risk is attempting to shift the burden of a certain risk to another party. This is a common reaction in project scenarios where stakeholder supply chains or networks are immediately distinguishable, since attempts will be made to transfer risks gradually down the supply chain or to the network's more remote extremities. Risks are typically transferred from a project customer to a contractor, who then passes them on to subcontractors or suppliers.

Table 1 Summary of Risk responses options

Type of Response	Use for Risk or Opportunity	Descriptions
Avoidance	Risk	Eliminate risk by accepting another alternative, changing the design, or changing a requirement. Can affect the probability and/or impact.
Mitigation (control)	Risk	Reduce probability and/or impact through active measures.
Transfer	Risk	Reduce probability and/or impact by transferring ownership of all or part of the risk to another party, or by redesign across hardware/software or other interfaces, etc.
Exploit	Opportunity	Take advantage of opportunities.
Share	Opportunity	Share with another party who can increase the probability and/or impact of opportunities.
Enhance	Opportunity	Increase probability and/or impact of opportunity.
Acceptance	Risk and opportunity	Adopt a wait-and-see attitude and take action when triggers are met. Budget, schedule, and other resources must be held in reserve in case the risk occurs or opportunity is selected.

Source: Kerzner, (2009:784)

#### 2.2.4.5. Monitor and Control Risk

In a systematic manner, the monitoring and control process tracks and evaluates the performance of risk response mechanisms against established indicators. Risk monitoring results can also be used to create new risk response plans, update existing risk response methods, and reevaluate known hazards. Monitoring results may be used to identify new threats and modify some aspects of risk management in specific cases. The creation of a program-wide cost, technical performance, and schedule management indicator system that the program manager and other key employees may use to analyze the program's state is critical to the risk monitoring and control process. Risk monitoring and control, rather than being a problem-solving technique, is a proactive strategy for getting objective information on the progress achieved in lowering risks to acceptable levels (Kerzner, 2009).

Risk register updates, organizational process asset updates, change requests, project management plan updates, and project document updates were examples of Monitor and Control risk output.

#### 2.2.5. Project Risk Management in Construction Projects

Construction projects can be extremely difficult and unpredictable. Risk and uncertainty are inherent in all construction projects, regardless of size (Carr & Tah, 2001). There are many different types of risks and uncertainties, and no construction project is without them (Haimes, 2015). A project's complexity produces a network of interdependent risks (Fang & Marle , 2012), where complex phenomena that are difficult to foresee and control may occur (Fang & Marle , 2013). Construction projects begin in complex and dynamic environments, creating considerable levels of uncertainty and risk (Adedokun et al., 2013), (Hamzaoui et al., 2015) and (Zhen-Yu & Lin-Ling, July 27-31 ,2008). The possibility of uncontrollable, unpredictable, and unplanned events is especially crucial for large-scale project managers to consider since these unexpected risk events can occur at any time (Hamzaoui et al., 2015). In the context of construction project management, risk management entails identifying, assessing, and prioritizing risks by monitoring, controlling, and applying managerial resources in a coordinated and cost-effective manner to reduce the likelihood and/or impact of unfortunate events and maximize project objectives (Dauglas, 2009). When implementing successful project management strategies such as risk management, quality, money, time, and change control are all considered key supporting processes (Al-Shibly et al., 2013).

Risk and uncertainty in the building industry can have negative implications (Flanagan R et al., 2006). Project risk has a substantial impact on the cost, schedule, and quality of a construction project (Kululanga & Kuotcha, 2010). As a result, many construction projects fail to meet their time, money, and quality objectives (Tsegaye, 2009). These risks have a direct impact on the project's success. Cost overruns and timetable delays are common in many undertakings (Koushki et al., 2005).

Furthermore, the risks in developing countries' building industries, notably the Sub-Saharan region, are more severe than in established Western construction industries (Wang et al., 2004). The rapid economic growth in Ethiopia needs massive infrastructure and asset development. While this creates opportunities for project stakeholders, it is critical to use effective risk management methods to deal with risks associated with variable construction activities in order to complete projects on time, within budget, and with high quality, safety, and environmental sustainability (Andualem, 2019).

### **2.2.6 Mega Project Concept**

Projects, according to PMI (2013), are temporary endeavors to produce an end result such as products or services, with a start and end date due to their transient nature. While carrying out a project, resources and organizational structure are required due to the goal of producing an end product. In the project management literature, the phrase "mega-project" refers to undertakings that get progressively complex. According to Shenhar and Holzman (2017), megaprojects cannot be considered expanded versions of lesser projects. They differ in terms of long-term goals, stakeholder involvement, project duration, scope, and impact.

Aside from the reasons mentioned by Shenhar and Holzman, other research has highlighted other points. Megaprojects, according to Park et al. (2016), are investments with a budget of more than 500 million dollars and multi-purpose facilities based on a single plan. Furthermore, they argue that mega-projects are integrated undertakings that work in harmony with all of their roles. Similarly, Li and Guo (2011) define mega projects as large-scale initiatives requiring millions of hours of work, numerous stakeholders with a significant number of links, a project length of more than five years, and a high level of public attention. These are the factors that contribute to the complexities of megaproject performance.

Flyvbjerg(2011, 2014, 2016) presented a framework for analyzing megaprojects in a variety of studies. According to his research, megaprojects are large-scale, complex initiatives that cost a billion dollars or more, take a long time to develop and build, involve multiple stakeholders, and have an impact on millions of people.

Megaprojects are also studied and classified by the European Cooperation in Science and Technology because they have "high complexity both in technological and human aspects, as well as a long history of poor delivery" (Park et al., 2016: 2).

In addition to cost and complexity, the scope of megaprojects should be evaluated. According to this viewpoint, megaprojects are no longer limited to the construction industry and are being carried out in a number of sectors and industries. Furthermore, rapid technological breakthroughs have enabled us to execute previously unimaginable tasks. However, this presented significant challenges to the megaproject's responsible parties (Shenhar & Holzmann ,2017).

### **2.2.7. Complexity in Mega Projects**

When it comes to megaprojects, complexity is an unavoidable idea, as Kardes et al. (2013) points out. The enormity and scope of megaprojects, as well as the long project timeframe, the number of technological disciplines and technological breakthroughs, and the number of parties involved in the project, all contribute to their complexity (Van Marrewijk et al., 2007; Kardes et al., 2013).

While Kardes et al. (2013) examine the technical and social complications of megaprojects, concentrate on the complexity of managing mega construction projects (MCP), arguing that complexities in such projects are technical, social, and managerial in nature. Technical problems originate from project scale, and social complexity arises from interactions among all project participants, according to Kardes et al. (2013). The technical complexities of MCPs are the results of the design and technologies used during the design and construction process, the social complexities are the unintended consequences of megaprojects on the environment and social system, and the managerial complexities are the complexities related to the project's business or governance facet.

After a quick introduction to the complexities of megaprojects, it is acceptable to assert that traditional project management techniques cannot be used when dealing with such large-scale projects. According to Shenhar and Holzmann (2017), the most difficult component of

understanding managerial aspects of megaprojects is probable complexity. Megaprojects are extremely complex enterprises with massive quantities of complexity; nonetheless, only a few organizations understand how to measure the level of complexity and design management methods.

In other words, establishing solutions to manage a project's complexity necessitates management understanding the elements of each project and responding effectively to unique barriers using appropriate resources, equipment, organization, and technology (Shenhar & Holzmann, 2017).

## **2.3. Empirical Literature Review**

### **2.3.1. Project Risk Management in Ethiopia**

This section reviews the findings of numerous studies on project risk management in Ethiopia, the majority of which stated that project risk management was poorly handled.

Getnet (2019) conducted a study on "Project Risk Management Practices: The risk management plan was not included in the project management plan for the Commercial Bank of Ethiopia information technology infrastructure library (ITIL) project. As a result, there was no explicit policy to help the project team overcome project uncertainty. There were also no clearly defined roles and responsibilities for managing risk. As a result, the project team lacked experience in project risk management and was unable to generate uncertainty. As a result, risks were largely addressed by the project manager and consultant because there was no specific risk management department. In addition, no risk register was established, and no inherent project risks were identified. Furthermore, identified risks were not statistically analyzed in connection with the main objectives of the project, and project papers were not amended as a result of risk analysis. The risk response plan was insufficient to maximize opportunities while minimizing risks to project goals. Furthermore, risks were not audited and reviewed on a regular basis, and risk management was not examined throughout the project's lifespan.

Manalebih (2018) investigated project risk management practice: The Case of World Vision Ethiopia. Water, Sanitation, and Hygiene (WASH) Projects, the project risk management practice of the project under study was fairly good as compared to previous similar studies on

project risk practices in Ethiopia. The project's ability to manage project risk should be used as a best practice for future initiatives. The author of his inquiry revealed a well-developed risk management strategy with the engagement of all project stakeholders, as well as the availability of good and systematic risk management techniques. According to the study, the most commonly used elements of risk management were risk identification and assessment rather than response, and risk documentation and document evaluation based on previous initiatives were the project's primary risk identification tool. A check list and information collection were used to identify risks.

Furthermore, the organization's prior project expertise was best exploited in the risk identification process. The investigation also discovered that the procedures taken in the project to assess risks were in good condition, as indicated by an update to the project document following an examination of potential hazards in the project, followed by a risk measurement system. Furthermore, the project responded to risk using a well-developed risk mitigation approach, with the impact of the response taking budget, schedule, and resources into account. The investigation also uncovered a well-established risk register that contained numerous WASH construction project dangers at various stages of the project and classified the types of risks based on their source, such as financial, compliance, legal, and so on. The competent director or management created and documented the risk register. The survey discovered that risk management processes were examined and audited by internal auditors when it came to risk assessment (Manalebih, 2018).

However, there are some flaws in the study, such as a lack of project team participation in the risk identification process, a lack of project risk management training for project team members, environmental factors not being used as an input to plan uncertainties in the project plan, and a lack of proper consideration of risk characteristics before the project analyzes the identified risk. The study also discovered that risk management was used more in the project life cycle planning stage than in the implementation, conceptual, or closure stages, contradicting the conventional perception that risk management is most important in the conceptual phase (Frezewd, 2016).

Bisrat, (2018) According to the assessment of the Ethiopian Public Health Institute's risk management practices, risk planning is not included in the project plan. There was insufficient

risk management training for project members, and there was a big knowledge gap about what project risk management is and how it is done. Furthermore, the author observed that not all risk management stakeholders were represented in real-world practice. As a result, he advocated for risk management training for project team members, as well as participatory and inclusive risk management approaches in these projects.

There was no developed risk management plan or policy that explains and defines the project's risk management operations, according to a study on project risk management practice in the Batu and Dukem Town water supply project (Frezewd, 2016). As a result, no common risk methodology, risk roles and responsibilities, risk categories, likelihood and impact scales, risk tolerances, risk management frequency and reporting, or risk management budget and schedule existed. The study did not consider risk management as a continuous process, and it was largely employed during the implementation stage with no defined risk management function, duty, or ownership.

Andenet (2018) found that in the Bank of Abyssinia ISAP project risk management study, project stakeholders lacked adequate risk management knowledge and experience, and lessons learned from previous projects were not incorporated into the risk identification process due to the lack of a documented risk register. As a result, the institute's policy and procedure were insufficient in directing the project team through a disciplined risk management process, showing a lack of a well-established formal project risk management practice at the institute. As a result, the project teams were unable to build a meaningful link between business threat and opportunity analysis and project risk analysis.

### **2.3.2. Construction Project Risk**

According to a study on risk management in building projects conducted by Ally (2013), there are three sorts of hazards with extreme and high-risk levels: financial risks, construction risks, and physical risks. Financial risks with considerable degrees of risk include the availability of funds, cash flow problems caused by late payments and disagreements, and business disruption. Ground conditions, insufficient site inspection, insufficient document information, unforeseen issues, errors or omissions, additions to bills of quantities, and price inflation on supplies and

equipment are all instances of the construction category. Force majeure (acts of God) such as inclement weather, fire, landslides, and other natural catastrophes, pestilence or lethal disease, disease, and unexpected events or unforeseen scenarios, as well as death, are examples of physical threats with a high level of risk.

Nur Alkaf et al. (2012) studied "Significant Risk Factors in Construction Projects: According to the contractor's perception, the significant risk-contributing factors in construction projects discovered are a lack of material, late material deliveries, a lack of equipment, poor quality of workmanship, and cash flow difficulties.

## CHAPTER THREE

### 3. RESEARCH METHODOLOGY

#### 3.1. Introduction

This part focused on the research design, population and sampling, data sources, data collection methods, and data analysis methodologies, including data processing and data analysis methods.

#### 3.2. Research design

The term "research designs" refers to study plans and methods that range from general assumptions to specific data collection and analysis approaches (Creswell, 2009). This was a descriptive type of research since the study's objective was to describe a specific phenomenon at a certain point in time, which has a cross-sectional character. Descriptive studies seek to discover "what is." It entails collecting data that describes events (Glass & Hopkins, 1984). A descriptive research design is used to describe an event or a feature of things as it exists at present and is appropriate when the study is concerned in specific predictions, narrative of facts and characteristics concerning individuals or situations (Kothari, 2008). The research was conducted using the descriptive research method with a quantitative analysis. Creswell (2009) noted that quantitative approach employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield numeric data that can be analyzed using statistical procedures. It is advantageous as it, procedure, follow scientific approach, tests reliability and validity of the instrument. Primary data was acquired from employees directly involved in project work, support staff, management staff, and technical experts constructed from employees and professionals of AACGMPCO, ECDSWC, and China Jiangsu International on projects and at the organizational level. Additionally, secondary data was used from related journals, articles, books, and some project publications. To ensure the reliability of data on risk management practices in the Adwa zero km mega construction project in Addis Ababa, as much data as possible has been collected for analysis.

### **3.3.Sampling procedure**

In this study, a non-probability sampling design was used. Nonprobability sampling yields a case study that is rich in information, allowing you to analyze the research topic and gain a theoretical understanding (Saunders, Lewis, and Thornhill, 2009). Purposive sampling would be best suited for this study, as our sample size is relatively small. When working with a small population, we often use purposeful or judgmental sampling to select cases that best fit the research questions and objectives (Saunders et al., 2009). As a result, 55 responses were chosen based on their field of work, experience, and knowledge regarding project management practices that they can provide. They are chosen from the three organizations AACGMPCO, ECDSWC, and China Jiangsu International on the Adwa Zero Kilometer Museum project. Questionnaires are delivered to these participants since they are actively taking part in the Adwa Zero Km Mega Project and they have enough information about the project from the beginning to the end.

### **3.4.Data collecting method**

To achieve the study purpose, personally administered structured questionnaires were used based on the factors identified referring to the previous literature and based on objective of the study. The questionnaire was developed in response to the study questions. As stated by Sekaran (2003) questionnaire was a popular method of collecting data because researchers can gather information fairly easily and the questionnaire responses are easily coded. A portion of the interview questions were used and slightly modified to fit the organization under consideration. In addition to the questionnaire responses, interviews would be conducted to obtain further detail and supporting information. Firsthand information was gathered through questioning and interviews, and secondary data sources such as published and unpublished papers, office documents, and online material would be used as needed.

In addition, the respondents were asked to rate the degree of their agreement or disagreement on the factors identified for successful information technology project implementation based on a five-point scale. The rating scales used are as follows: 5= Strongly agree, 4=Agree, 3= Neutral, 2=Disagree and 1= Strongly disagree.

### 3.5. Validity and reliability

Validity describes how effectively the data collected covers the specific purpose of the study (Ghauri & Gronhaug, 2005). The definition of validity is "measuring what is intended to be measured" (Field, 2005). According to Yin (2008) validity of a research can be achieved in two steps they are internal and external validity. Internal validity is accuracy or the quality of the research work, external validity is the degree at which results or findings can be generalized. Given the fact that questionnaires were administered personally, the data collection method accurately measured what it is intended to measure and that the study convinced that the findings are what they professed to be about. As the theoretical framework developed is broad in sense and enabled to validate the survey internally and the respondent's answers enabled the study to observe the degree of external validity. The theoretical framework encompassed certain theories which enabled the study to validate the survey which is validated with other similar research within the domain of this thesis; hence we can say that the survey developed was validated to a certain extent as it was developed from several research works.

Thus, data collection techniques such as questionnaire observation were used collectively to fill the gaps of one technique with the others. These elements should work together to ensure the study's validity and reliability. The adviser reviewed the researcher's data and study instrument for unclear, ambiguous, and ineffective questions. Additionally, the adviser reviewed and approved the instrument's effectiveness in addressing the research's goal. Unwavering quality describes how well a marvel estimation provides consistent findings (Carmines & Zeller, 1979). Another facet of dependability is repeatability. A scale or test, for example, is said to be trustworthy if repeated measurements under constant conditions produce the same result (Moser & Kalton, 1989).

Testing for reliability is important as it refers to the consistency across the parts of a measuring instrument (Huck, 2007). A scale is claimed to possess high internal consistency and reliability if the items on it "hang together" and measure an equivalent construct (Huck, 2007, Robinson, 2009). The most commonly used internal consistency measure is the Cronbach alpha coefficient. It is viewed as the most appropriate measure of reliability when making use of Likert scales (Whitley, 2002; Robinson, 2009). Therefore, the Likert questionnaire was developed following

the research questions, and the interview questions were adopted and modified to fit the purpose of the study. Although there are no absolute rules for internal consistency, most experts agree on a minimum internal consistency coefficient of .70 (Whitley, 2002; Robinson, 2009).

Table 2 Project Risk Management Reliability Test

<b>Reliability Statistics</b>	
Cronbach's	
Alpha	N of Items
.841	28

### 3.6. Method of data analysis

To best meet the objective of the study Summary of statistics was organized in the form of quantitative measures by using frequencies and percentage. The questioner is designed in a structured way still containing an open ended questions and Likert scale indicating measurement used on the basis of survey 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree and other open ended questions as well. The analysis part of this study is conducted by Descriptive analysis depending on the type of data collected. Descriptive analysis is used to give a picture of the data and for a summary of the analysis. The collected data is prepared based on its relevance to the study. After the data were screened and refined, it was organized and summarized using formats. The format has helped to easily analyze the data and focus on significant points to the study. The data 50 analysis in this study comprised the coding, classification, and tabulation of evidence. In analyzing the quantitative data, the researcher follows the descriptive analysis. The data was analyzed by descriptive analysis using SPSS 25 software.

### 3.7. Ethical considerations

All participants were notified of their rights, according to the research's ethical guidelines. Participants were notified that their participation in this study is completely voluntary and anonymous. The data collection and processing operations were anonymous to safeguard confidentiality. Furthermore, the data were analyzed without the use of identifiers. The data collected was of an official nature and contained sensitive information; the questionnaire specified that all data obtained would be utilized strictly for research purposes.

## CHAPTER FOUR

### 4.RESULT AND DISCUSSION

#### 4.1. Introduction

This chapter presents a comprehensive analysis, interpretation & discussion of results acquired from the questionnaire survey distributed among the main stakeholders of the Adwa Zero Kilometer Museum project. Statistical procedures were used to examine the obtained data from the questionnaires distributed in accordance with the research's overall goal, using SPSS version 25 software. Descriptive statistics such as mean, frequency, standard deviation and percentage were employed to describe the results. The analysis and interpretation of the collected data is presented below.

The response rate of the questionnaire is described in the first section. The demographic profile of the responders is discussed in the second part. The results of the project's general project risk management issues are described in the next section.

#### 4.2. Response Rate

Among the total of 55 questionnaires distributed to the project stakeholders 50 questionnaires were appropriately filled and returned giving an 90.91% return rate which is assumed to be suitable for further analysis.

Table 2Response Rate

<b>Questionnaire distribution method</b>	<b>Number of distributed questionnaires</b>	<b>Number of returned questionnaires</b>	<b>Overall response rate (%)</b>
Physically via hard copy questionnaires	47	44	93.6
Via email and Telegram	8	6	75
<b>Total</b>	<b>55</b>	<b>50</b>	<b>90.91</b>

### 4.3. Demographic Data

The study attempted to determine the background information of the respondents involved in the study. The background information validates at the respondents' relevance for answering the questions. In order to provide the demographic information and composition of the population under study, the respondents were asked about their gender, age, education level, and years of experience in the organization.

Table 3 Basic information of the respondents

	Age	Frequency	Percent	Valid percent	Cumulative percent
Valid	20-30 years	17	34.0	34.0	34.0
	31-40years	25	50.0	50.0	84.0
	41-50years	8	16.0	16.0	100.0
	Total	50	100	100	
	Female	11	22.0	22.0	22.0
	Male	39	78.0	78.0	100.0
	Total	50	100.0	100.0	
	Experience				
		<3 years	1	2.0	2.0
3-7years		31	62.0	62.0	64.0
8-12years		18	36.0	36.0	100.0
Total		50	100.0	100.0	

Source: own survey, 2022

The analysis and interpretation of the collected data is presented below.

The result illustrates that 17 respondents (34%) are below the age of 30, 25 respondents (50%) are between the age of 31 and 40, 8 respondents (16%) are between the age of 41 and 50 there were no respondents above the age of 50.

Only 22% of the respondents were female while 78 % of the respondents were male, a situation testifying the findings of some researches like (Amaratunga, et.al, (2005)) as cited by Hadush that the construction sector is a male dominated sector. The respondents were from different levels of educational status of those 62% were BSC degree holders, 2% diploma holders and the remaining 36% were postgraduates.Regarding the respondents' educational background, it demonstrates that respondents are literate enough to accurately comprehend and reply to the research instruments, and respondents from various educational backgrounds are represented in the study

We can say that the respondents have reasonable experience in the construction sector 62% have experience ranging from 3 to 7 years, 36% worked 8 to 12 years and the remaining 2% have less than three years of experience.Therefore, all respondents had an extensive experience with minimum of three years.

The second part of the questioners directly related to the team and objective of the research. The introductory questions focus on general issues regarding risk management practices of the project under study. Five-point Likert scale choices were given where 1 represents strongly disagree, 2 =disagree, 3=uncertain, 4=agree and 5=strongly agree, for the respondents to express their thoughts about the risk management practices in the project they are involved.

Table 4 Perception of respondents on: General risk management practices

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
1	There is a policy or guideline that recommends how to manage unexpected uncertainties.	1(2%)	27(54% )	7(14%)	213(6%)	2(4% )	2.76	1.0
2	The project has a defined or standard risk management process.	2(4% )	11(22%)	2(4% )	26(52% )	9(18%)	3.58	1.14
3	Responsible person or	3(6% )	27(54%)	5(10% )	11(22% )	4(8% )	2.72	1.12

	department is assigned to handle risk.							
4	Risk management is treated as a continuous process in the project	1(2% )	7(14% )	1(2% )	30(60% )	11(22%)	3.86	0.99
5	Identified risks are documented to be used for future projects	2(4% )	15(30%)	3(6% )	20(40%)	10(20%)	3.42	1.23
6	Risk management is implemented at the implementation stage of the project	3(6% )	12(24%)	4(8% )	24(48% )	7(14%)	3.4	1.17

Source: own survey, 2022

The first question about general risk management practices for the project was There is a policy or guideline that recommends how to manage unexpected risks. It was found out that 54% of the respondents disagreed that There is no a policy or guideline that recommends how to manage unexpected uncertainties. Similarly, participants, who strongly agree and have neutral feeling account for 4% and 14% respectively, whereas, those, who agree by the statement are 26% of the total respondents. The mean and standard deviation for availability of policy or guideline, that recommend how to manage unexpected risks was 2.76 and 1.001 respectively. Therefore, from the above result we can see that the prevalence uncertainty among the staff that a policy or guideline exists however practically no policy or guideline exists. The standard deviation is small and shows that there is consistency among the finding and the data is closely clustered about the mean. This shows that there is no a policy and guideline recommend how to manage unexpected risks.

The study found out that the majority (52%) of the respondents agreed with the statement that there is defined or standard risk management process. On the other hand, participants who strongly disagreed and with neutral feeling have equal percentage (4%). The rest 18% of the participants strongly agreed with availability of defined or standard risk management process. This shows that there are defined or standard risk management processes. This means

that standard and common risk management process is one technique used by AZKMP to deal with risk.

Responses about responsible person or department assigned to handle risk scored were 54% disagree of responses clearly telling that there is no responsible body specifically assigned to entertain risk that will happen to the project. (Frezewd, 2016) Also mentioned that he noticed majority of the respondents disagree to the question implying there is no specific department or person who is assigned to the projects to manage risk. 22% and 10% of the respondents agreed and have neutral feeling. The rest have 8% strongly agreed, Similarly the project manager said that; mostly, people who are at the managerial level and people who work in management and planning department participate in all necessary steps of risk. This means, everyone in the company doesn't involve in risk management process and assignment of responsible person is one risk management technique.

The next question about general risk management practices of the project asking if risk management is treated in a continuous process the dominant responses was found to be 60% agree plainly showing that risk management is treated as a continuous process. As the finding by (Akintola A., et.al, 1997) risk management therefore should be a continuing activity in project development, from inception and throughout the life of the project. In addition to this project risk management practice assessment by (Manalebih, 2018) conducted on World Vision Ethiopia's Water, Sanitation and Hygiene (WASH) Projects, identified that risk management was treated as a contentious process by the particular institute.

Similarly, identified risk are documented to be used for future projects scored were 40% agree of responses. It is believed that documented of risks is important. This would help to act immediately and provide solution when similar risks occur.

Respondents were asked to find out if risk management is implemented at the implementation stage of the project and corresponding response for the specific question shows that 6% of the respondents strongly disagreed and 24% of them disagreed. Although 8% of the respondents were uncertain, majority of the respondents noticed the existence of the risk management implementation in the project which 48% agreed while 14% of the respondents strongly agreed

on this point. This result implies that majority of the respondents agreed that there was risk implementation in the AZKMP.

The question who mostly handles uncertainties that arise to the project during implementation shows that uncertainties within the project are primarily handled by the consultant and the client is the second frequent stakeholder involved handling risks, while the special team for risk management and all participating team members takes care of risks less frequently. From the above responses, it can be noted that consultants are the one that mostly handles uncertainties while client handles uncertainties sometimes however there the special team for risk management and all participating team members do not involve in the risk management.

Overall, the above results are implying that the risk management practice is not performed as one of the important issues in managing the project and that it is being implemented in a very random way.

Table 5 Perception of respondents on Risk planning practices

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
7	There is systematic approach or careful planning done to perform risk management in the project.	0(0%)	14(28%)	5(10%)	27(54%)	4(8%)	3.42	0.99
8	Relevant stakeholders are involved in the planning and performing of managing risk.	0(0%)	19(38%)	4(8%)	18(36%)	9(18%)	3.34	1.17
9	An expert judgment or meetings are considered while planning for risks that might occur in the project.	0(0%)	7(14%)	11(22%)	25(50%)	7(14%)	3.64	0.9
10	Environmental factors are included as an input to plan for uncertainties.	0(0%)	10(20%)	5(10%)	28(56%)	7(14%)	3.64	0.96

11	Team members within the project receive training or have enough knowledge about how to handle uncertainties.	3(6% )	27(54%)	4(8%)	15(30%)	1(2%)	2.68	1.03
12	Risk management plan is incorporated with the project plan.	10(20%)	13(26%)	0(0%)	20(40%)	7(14%)	3.48	0.97

Source: own survey, 2022

From the above table we can see that the majority of the respondents were agree (54%) to the question if there is a systematic approach or careful planning applied to perform risk management in the project. despite that 28% of the respondent said that there is no or poor systematic approach or planning performed to manage risks in the project. However, on contrary risk management practice assessment performed by (Getnet, 2019) and (Bisrat, 2018) showed related results.result found by (Frezewd, 2016) aligned to the result of this paper mentioning that there is no plan that is carefully designed on how to manage risk as most of the respondents disagreed. Similar studies performed by (Manalebih, 2018) and (Tefamichael, 2018) showed the existence of well - established project risk management plan that was integrated with the projects' plans.

Are relevant stakeholders involved in the planning performance of risk management was the next question asked, to this question the majorities of responses collected was 38% disagree giving an implication that relevant stakeholders are not involved exhaustively in the project or the planning is done by the project team. some recent similar studies including a study conducted by (Getnet, 2019),(Andenet, 2018) & (Bisrat, 2018) showed absence of relevant project stakeholders' involvement during risk management planning, other similar studies (Manalebih, 2018) & (Getachew, 2017) showed contrary result as their respective studies revealed the existence relevant stakeholders' participation during project risk management planning.

To identify which techniques are most used within the project, respondents were asked if expert judgment or meetings are considered while risk planning and the answer was 50% agree and only 14% were disagree figuring out that both meetings are held or apprehended that extensively useable knowledge could be gathered from experts while planning.Similar to this study, result of

the study (Frezewd, 2016) indicates that majority of the respondents agree to that meetings are held to gain / gather knowledge from experts in the area during planning in their respective companies.

The mean and standard deviation for consideration of expert judgment in planning of risk was 3.64 and 0.9 respectively. This means that the majority of the respondents agree regarding consideration of expert judgment in planning of risk. The standard deviation is small and shows that there is consistency among the finding and the data is closely clustered about the mean. This finding shows that experts meet and decide about risk management in advance than any lay person. Similar to this study, Milka (2016) found out that experts are involved in different stages of risk management process and various factors, including environmental are taken in to account.

Similar to this study, result of the study (Frezewd, 2016) indicates that majority of the respondents agree to that meetings are held to gain / gather knowledge from experts in the area during planning in their respective companies.

A majority response of 56% agree was found from the responses of the respondents on the issue of inclusion of environmental factors as an input for project plan. The mean value 3.64 shows that environmental factors are given enough attention while planning the risk management and the standard deviation is small and shows that there is consistency among the finding and the data is closely clustered about the mean. (Getachew, 2017) asserted in his study that it can be seen that majority of the respondents agreed that environmental factors were included in planning risk management.

Respondents were asked if team members within the project receive trainings and seminars to develop enough knowledge about how to handle uncertainties. Regarding this, the majority of the study participants disagreed (54%) that team members within the project receive trainings and seminars to develop enough knowledge about how to handle uncertainties.

The mean and standard deviation regarding provision of trainings and seminars to develop enough knowledge on major risks that might affect project objectives was 2.6 and 1.04 respectively. This means that the majority of the respondents disagree about identifying provision trainings to develop enough knowledge on about how to handle uncertainties. The standard deviation is small and shows that there is consistency among the finding and the data is

closely clustered about the mean. This shows that there is no training to update employee's risk identification and risk planning skill. This affecting handling of risk by the companies or due to lack of budget and other constraints. Similarly, Getachew (2014) found that most of the consultants understand risk management through reading and practice however insignificantly little no of clients try to understand risk management through reading.

The average response received for the question whether risk management plan is incorporated with the project plan has become 40% agree holding the meaning that project plan does incorporate project risk plans. Similar study by (Manalebih, 2018), showed different result, as it indicated the risk management plan (World Vision Ethiopia's WASH project) is incorporated with the project plan. However, similar study by (Getnet, 2019), Plans to manage risks are not included as part of the project plan.

Table 6 Perception of respondents on the process of Risk identification

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
13	Risks are identified at initial stage of the project or early in the project.	0(0%)	10(20%)	11(22%)	27(54%)	2(4%)	3.42	0.86
14	There is lack of professionals to identify risks early.	1(2%)	13(26%)	6(12%)	22(44%)	8(16%)	3.46	1.11
15	We use a structured and formal risk identification method.	7(14%)	10(20%)	7(14%)	23(46%)	3(6%)	3.1	1.21
16	The factors causing the risks have been identified in order to eliminate the risks from occurring.	3(6%)	8(16%)	13(26%)	18(36%)	8(16%)	3.4	1.12
17	The risks are identified when their effects are seen.	1(2%)	11(22%)	12(24%)	21(42%)	5(10%)	3.36	1.00
18	We have lost money, time, quality etc. Because we didn't	1(2%)	8(16%)	12(24%)	21(42%)	8(16%)	3.54	1.01

	asses impact of identified risks.							
19	we try to identify and reduce risks in our everyday work	4(8%)	3(6%)	8(16%)	31(62%)	4(8%)	3.56	1.01

Source: own survey, 2022

As it can be referred from abovetable, 54%% of the respondents agree,22% are neutral and 20% disagree, that identify risks at the initial stage or early in the project. Overall, this shows that risks are identified at the initial stage of the project.

Likewise, similar study conducted by (Getnet, 2019) on Commercial Bank of Ethiopia’s Information Technology Infrastructure Library (ITIL) Project and by (Bisrat, 2018) on Ethiopian Public Health Institute’s projects reveled risk identification process was identified at the initial stage of the project or early in the project. As we can say that the majority of the projects identified risks from their initial stage large sum also responded that they try to identify some risks early in the projects.

Not a few respondents also responded that they identify the risks as they occur. This was mainly the case, as per the respondents. This was mainly, as per the respondents, because there is lack of risk management understanding or absence of risk management expert in the enterprise and also project manager's negligence to incorporate detail risk aspect in the plan. Furthermore, there is also lack of awareness on the importance of proper risk management. 44% agreeand 12% neutral, 26% disagree that they manage risks as their effect is seen.

The mean and standard deviation for lack of professional to identify risks early was 3.46 and 1.11 respectively. This means that the majority of the respondents agreed aboutlack of professional to identify risks early. The standard deviation is small and shows that there is consistency among the finding and the data is closely clustered about the mean.

There are several formal risk identification methods mentioned in the theory part of this study. Majority of the respondents responded that employee these formal identification methods rather they mentioned they mostly use weekly performance review meetings to collect different suggestions from employees about risks and also, they use their experience to identify risks but are not aware of the different scientific risk identification methods. Therefore,46% agree, 14%

Neutraland 20% disagree that they use formal risk identification method. Unlike to this study, (Abdissa, 2003) affirmed the absence of some kind of structural and formal way in identifying project risks, but the outcome of the analysis reveals that the projects are still doing good in terms of identifying sources of risks, areas of impacts and their corresponding causes and potential effects. Most of the respondents that responded agree. Therefore, their responses can be summed up with those that responded they have formal risk identification method.

Identifying factors that are causing the risks is one step of eliminating risk occurrence and documenting these factors will minimize time and cost spent in factors identification for future projects. The majority of the respondents also responded that they document the risk causing factors. Additionally, they mentioned even though there is separate document to register the factors, they are found in weekly, monthly and quarterly reports. 36% agree, 26% neutral and 16% disagree that they register the factors.

The other thing mentioned in the literature review section as an impact assessment criterion was analyzing the time gap between the risk happening and the organization seeing the effect. This is done to estimate the exact amount of damage caused by existing but unknown risks. Such analysis requires deep understanding of risks and their impacts. And the organization under study has no professionals with such understanding. Although the respondents admitted the activity is not done with required detail, some said that from their experience they identify such gaps. The rest of the respondents say that they don't have knowledge of such concept. Thus, 42% of respondents agree, 24% are neutral and 22% disagree that they analyze the time gap between the risk happening and the organization seeing the effect.

Interview response also show insufficient attention given towards risk management. Risks are always dealt after their occurrence because there is clearly prepared risk register though.

Concerning lack of impact assessment 42% of the respondents agree, 24% are neutral and 16% disagree that they faced financial, schedule and quality impacts as a result of their risk assessment method. This shows that more than half of the respondents agree that their impact assessment method is costing the projects. This also indicates that, even though the project managers and consultants believe their experience is helping them a lot, their lack of in-depth risk management understanding has still created a gap.

Respondents were asked if they try to identify and reduce risk in their everyday work. 62% agree, 16% are neutral and 6% disagree. There is some degree of risk management understanding developed in the project as a result of conducting risk management consulting with high experienced project managers. Employees have a general but not deep understanding of risk issue. They try to raise risks they face in weekly meetings. Therefore, they somehow perform their daily activities being risk conscious. But there was no deep understanding of from where risks could arise what is the sign and how it can be solved fast. There are gaps created as a result of not having a dedicated and professional risk manager solely responsible for risk management.

Table 7 Perception of respondents on Risk analysis process

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
20	Characteristics of the risk are considered before analyzing the identified risk.	6(12%)	19(38%)	6(12%)	17(34%)	2(4%)	2.8	1.16
21	There is a measurement system to analyze the risk.	3(6%)	24(48%)	8(16%)	15(30%)	0(0%)	2.7	0.97
22	Project documents are updated after assessment of the risk that might occur	5(10%)	20(40%)	12(24%)	11(22%)	2(4%)	2.7	1.06

Source: own survey, 2022

Related to risk analysis some questions were incorporated in the questionnaire and the first was whether risk characteristics were considered before analyzing the identified risks where 38% of the respondents disagree, 8% uncertain and 34% agree presenting that risk characteristics are considered before analyzing the identified risks. However, on contrary risk management practice assessment performed by (Frezewd, 2016) we could see that risk characteristics are considered before analyzing identified risks.

For a question if there is a measurement system to analyze risks the 30% agree, 16% uncertain and 48% disagree testifying that there is absence/uncertainty/ whether measurement system

exists or not. (Akintola A., et.al, 1997) in his study mentioned that risk catalogue has been described as a combination of threat and vulnerability which occurs when the two conditions overlap. A threat is something which has an adverse effect on the activities of an organization. Vulnerability is characterized by a physical system which, while being independent of any specific threat, allows a threat to be exploited. The impact of risk from threat catalogue and the frequency of occurrence of risk from the vulnerability catalogue determine the level of exposure to risk.

Concerning updating of project documents after assessment of risks the respondents gave results where 22% agree, 24% uncertain and 40% disagree pointing that their uncertainty is prevalent whether documents are appropriately updated after assessments made to the risk identified or not.

Response on interview about documentation making hard to find historic data of relatively similar previous projects and hindering the learning process. Unavailability of experts with the expected qualifications in the area. Not having a worthy risk plan or a risk plan at all. However, previous findings from (Frezewd, 2016) mentions that updates are made to documents after probability of occurrence is assessed.

The interviewees also revealed that, the project did not use quantitative analysis techniques that involved the use of advanced statistical methods to determine, with a certain degree of confidence, whether the project will meet its cost or schedule targets given the combined effect of the identified project risks. Similarly, previous studies by (Getnet, 2019) and (Andenet, 2018) indicated that, although some projects used qualitative risk analysis techniques, they lacked using quantitative analysis techniques as identified risks weren't analyzed numerically based on their effect and financial impact on the overall project objectives. However, a study conducted by (Manalebih, 2018) revealed that there are projects that used more comprehensive and systematic techniques, i.e. both qualitative and quantitative risk analysis techniques to analyze their respective risks. Interview results speak loud that there is no risk analysis made on the ground as there are no identified risks and they have no defined measurement criterion.

Table 8 Perception of respondents on the process of Risk response selection

S/N	Questions	Strongly Disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
23	There is a well-developed strategy within the project to respond to risk.	5(10% )	26(52%)	6(12%)	11(22%)	2(4%)	2.58	1.07
24	Factors such as budget, schedule and resources are considered while responding to risk.	1(2%)	8(16%)	10(20%)	27(54%)	0%	3.5	0.93

Source: own survey, 2022

The majorities respondents said that 52% disagree, 12% uncertain and 22% agree was found from the responses of respondents regarding the question is there a well-developed strategy to respond to risks with an implication that there is no well-developed risk response strategy within the project or there is confusion(unclear) about the existence of formal strategies in response to risk. In her result (Yemaryam, 2018) found that unlike the result found here there is well-developed strategy with adequate options to handle risks that occur inside the projects.

Based on the project manager interviewees, it was discovered that risk response strategies of the project, acceptable mitigation steps of treating risk must be employed once the project risks have been known and analyzed. These mitigation steps are based mostly on the nature and potential consequences involved in the risk. There are a number of risk response strategies that determine or assist the success of construction project. Therefore, from the interviewee it could be inferred that risk control is primarily used risk mitigation strategy and transfer to the insurance company was the next used risk response strategy.(Salman A. & Rizwan U., 2014) stated in their findings that risk reduction is the popular and most frequently practiced method among building contractors in Alabama and after risk reduction the next favored method is risk elimination. Nevertheless (Williams, C. & Heims, 1989) revealed that risk avoidance in construction is generally recognized to be impractical as it may lead to projects not going ahead or a contractor submitting an excessively high bid for a project.

Concerning whether the risk response takes in to account factors like finance and schedule the responses found scored 54% agree, 20% uncertain and 16% disagree giving a clear figure that the mentioned and other factors are given enough attention in the risk response. Confirming the result found here (Frezewd, 2016) plainly described that budget, schedule and resources are considered while responding to risk. However, (Tesfamichael, 2018) indicated that there was not well- developed strategy that considered factors such as budget, schedule and resources and quality while responding to risk.

As per the interviewees, one of the issues grabbed was that some factors are considered while responding to risks. Of the factors budget is given the highest priority and schedule is a factor given a very less attention even in while responding to uncertainties.

Table 9 Perception of respondents on the practice of Risk monitoring and control

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree	Mean	S.D
25	Based on the current result of the project are risks monitored and controlled well.	7(14%)	31(62%)	4(8%)	7(14%)	1(2%)	2.28	0.94
26	The Project monitor, control and review the process for risk management to ensure that it complies with standards and procedures.	5(10%)	31(62%)	4(8%)	9(18%)	1(2%)	2.4	0.96
27	Information available or the history of the project is used to supplement to control risk.	7(14%)	25(50%)	1(2%)	15(30%)	0(0%)	2.6	1.17
28	Risks that occur within the project are controlled in a way that goes with the goal and	4(8%)	13(26%)	0(0%)	32(64%)	1(2%)	3.26	1.12

	objective of the project.							
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Source: own survey, 2022

In order to assess the risk monitoring practices some questions were incorporated in the questionnaire. The respondents gave responses with a 62% disagree, 8% uncertain and 14% agree revealing that there is no proper monitoring and control with regard to the current result. It supports the result the researcher found (Frezewd, 2016) found that project risks that may happen are not well monitored and controlled.

To the question about Project monitor, control and review the process for risk management to ensure that it complies with standards and procedures the results found gave an average value of 62% disagree, 8% uncertain and 18% agree with an implication that the majority of respondents were disagree about Project monitor, control and review the process for risk management to ensure that it complies with standards and procedures.(Frezewd, 2016) in his study found an adverse result which says that the monitoring, control and review process are not performed as to fulfill the standards and procedures.

When we look at findings in previous similar studies, we can identify major gaps in projects performance towards risk monitoring and controlling practices. A study conducted by (Andenet, 2018), (Tesfamichael, 2018) and (Bisrat, 2018) revealed there are also other projects that there were no proper monitoring and control with regard to the current result and response and the overall effectiveness of the risk managements system of the projects. However, some studies in contrary indicated the existence of proper risk monitoring and controlling in other projects (Manalebih, 2018).

From response on interview very poor evaluation and monitoring experiences all over the project. Monitoring and evaluation can help in identifying the conditions under which a project is likely to succeed or failure. It can serve as an early warning system for potential problems, and it can lead to ideas for potential remedial actions. As such, effectively delivered M&E results often provide the idea for improved deciding.

The average value researcher had from the responses collected regarding information availability or history of the project being used to supplement the risk control was found to be 62% disagree,

8% uncertain and 18% agree with giving an impression that information is available and the risk control process is supplemented by project history. Poor documentation making hard to find historic data of relatively similar previous projects and hindering the learning process. However, (Frezewd, 2016) found a result that aligns with result researcher found, confirming that past history and existing information are used as an input while controlling risk.

The last question raised on the questionnaire was whether risks occurring within the project are controlled in a way that goes with the goal and objective of the project and the average result received happened to be 64% agree and 26% disagree giving the image that the way risks are controlled is in alignment with the project goal and objective is found to be support that it goes with the goal of the project on. Similar study by (Manalebih, 2018), showed similar result, as it indicated the project (World Vision Ethiopia's WASH project) were controlled in a way that goes with the goal and objective of the project.

The result found by (Frezewd, 2016) again opposed the result researcher found in that it explains that the controlling mechanism that is being implemented to control risk does not comply with the objective and goal of the projects.

The very poor evaluation and monitoring experiences all over the project. Monitoring and evaluation can help in identifying the conditions under which a project is likely to succeed or falter. it can serve as an early warning system for potential problems, and it can lead to ideas for potential remedial actions. As such, effectively delivered M&E results often provide the basis for improved decision making

## CHAPTER FIVE

### 5.SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1. Introduction

This chapter presents a summary of the key findings derived from the data analysis. Later, the conclusion about the risk management practice of the project that is drawn from the data analysis and the recommendations that comprise further actions that the researcher proposes to enhance the risk management practice of the project are presented.

#### 5.2. Summary of Basic Findings

This study attempted to assess the risk management practices of the Adwa Zero Kilometer Museum's construction project based on the five risk management processes: risk planning, risk identification, risk analysis, risk response, and risk monitoring and controlling processes. Based on the data analyzed in Chapter 4, using a descriptive approach for quantitative data collected through a questionnaire, the researcher comes up with the following results:

Based on the finding obtained from the respondents, the general questions on project risk management practice of the projects, the analysis revealed that there is no policy or guideline that is stated for the projects, which directs uncertainty management. whereas, Standard and defined risk management process exist within the projects. From the analysis another issue grasped are that no person or department is particularly assigned to manage uncertainties within the projects that the consultant and/or the client take care of risks that may happen According to the analyzed result, however risk management is continuing process throughout the life cycle of the projects, it is not being performed as an iterative process and is usually applied at the conceptual and implementation stage of the project life cycle.

Based on the responses collected from respondents and the analysis made regarding the practice of project risk planning process, the next stated findings are inferred: Risk plan were well crafted appropriately designed for the projects to overcome or handle uncertain events that may arise and relevant stakeholders were not involved in the risk management planning process. The planning

either uses expert judgment or meetings. The other basic things, the team members having not enough knowhow about risk management or training arrangements to enhance their knowledge. All is all, the project did prepare project risk management plan that was integrated with the project plan.

Regarding process identification, the process was identified at the initial stage of the project. There was a lack of professionals to identify risks. The project used assumption and constraint analysis and documentation review as tools and techniques to identify risks. Nevertheless, it did not use SWOT analysis, checklist analysis, expert judgment, or diagramming techniques. Financial and human-related issues are observed to be the major sources of risks to and happenings in the project.

Major gaps observed in the project's risk analysis practices, risk characteristics were not considered before analyzing the identified risks, the analyzing process did not have its own measurement system, and the project documents were not updated in accordance with the assessment results.

Based on the findings, it was observed that the project did not perform well in terms of risk response planning. The project mainly used risk mitigation by referring to risk control and risk transfer strategies as responses to the identified negative risks (threats). However, as the project did not realize opportunities, responses for positive risks such as exploit, enhance, and share were not used in the project.

Findings on the monitoring and control practices throughout the project conveys that the project poorly performed towards the process of risk monitoring and controlling as well and the controlling mechanism was implemented evidently in a way that it complies with the objective and goal of the projects. Information that exists within the projects and history of the projects are not used as an input to take an action to control risks.

### **5.3. Conclusion**

The purpose of this study was to assess the actual project risk management practices of Addis Ababa's Adwa Zero Km Mega Construction Projects. In order to address the primary aim of the

research, the following key research conclusions are drawn based on the findings: According to the findings of the questionnaire and interview, project risk management was not given enough attention in the construction sector, where there are many uncertainties. The project surveyed was generally recording poor performance in most crucial parts of the management process.

Although there were poor experiences in developing a structured risk management process with supporting policies and procedures, the performance concerning planning was found to be very good. However, that was not performed systematically and carefully with the involvement of relevant stakeholders. The degree of involvement in risk management activities of members participating in the project was too low; nonetheless, the contractors handled most uncertainties.

The risk identification process in the project was one of the better-performed activities in that identified at the initial stage of the project. However, it primarily uses document review as a risk identification technique where there is very poor documentation and document preservation culture. Nevertheless, it did not use expert judgment, checklist analysis, SWOT analysis, or diagramming techniques.

The risk analysis process was one of the poorly performed activities in that it recognized the characteristics of risks prior to analysis and clearly specified the measuring criteria for the risk analysis. Besides, the risk response process is relatively weak as there is no well-crafted risk response strategy. The project mainly used risk mitigation by referring to risk control and risk transfer strategies as responses to the identified negative risks (threats).

Finally, risk monitoring, control, and documentation performances were wicked in the project under survey. Treatment of risk management as a reactive procedure rather than a proactive activity was the major challenge encountered as a result of very little knowledge and awareness about risk management among the staff, clients, and other stakeholders. In general, as the overall effectiveness of the project's risk management practice was poor due to the lack of a standard and formal risk management process, there should be significant work to be done to evolve the risk management practice of the project to the next level. The project did not regard risk management as an ongoing process that continues through the life of a project. Project risk management was not considered an important issue that required dedicated staff, resources, and appropriate training. Hence, the project's stakeholders did not receive formal risk management

training or guidance, and there was no special department or assigned person to handle uncertainties that occurred within the lifecycle of the project and that were equipped with adequate resources. Despite the project's effort to evaluate risk events that have already occurred, it lacked the ability to identify future uncertainties that will affect its project objectives; hence, project stakeholders were frequently surprised by poor project performance, such as project cost or schedule overruns.

#### **5.4. Recommendation**

As the major objective of the study was to identify the actual risk management practice of Adwa Zero Km Mega Construction Projects, the following recommendations are forwarded based on the findings mentioned above about the practice.

The project need to clearly establish the purpose and objective of project risk management and formally communicates it to all project stakeholders. Designing policies or guidelines will play an irreplaceable role in managing uncertainties in a smooth way. Hence, there should be a well-prepared policy or guideline to manage risks. There should also be a specific person or department in charge of risk management.

Planning should be granted adequate attention since an appropriate planning process will enable decision making related to identification, analysis, response mechanisms, and the monitoring, control, and reporting of risks throughout the project. An efficient and workable plan will smooth all the other activities by providing information regarding the goals and objectives of applying risk management.

The risk register, which is the output of the risk identification process and holds very detailed information about the identified risks, should be well documented. The project need set up an appropriate risk response plan for all possible risks, including positive risks (opportunities), and the existing response(s) to the project shall be properly documented. The project need use standard risk management processes (i.e., risk planning, risk identification, risk analysis, risk response planning, monitoring, and control) to be consistently followed within the projects.

The project team members shall engage in project risk management-related training or other knowledge-enhancing activities that are compatible with their functions and levels of

responsibility to increase the effectiveness of the project team to manage risks under their respective areas of responsibilities. There shall be a special department or assigned person to handle uncertainties that occur within the lifecycle of the project and that is equipped with adequate resources. Improving risk management oversight and project risk management processes, ensuring the establishment of effective risk management standards, and involving key stakeholders during the planning and necessary phases, collecting and compiling project data for future reference. A comprehensive monitoring and evaluation system is required and has been recommended for disseminating lessons learned.

### **5.5. Agenda for Future research**

Finally, the researcher recommends further research to include and relate other essentials of project management, such as performance. As the scope of the study was limited only to the Adwa Zero Km Mega Construction Projects site, the generalization of the result is limited. As a result, it is suggested that additional research be conducted on other project areas.

The study was limited to the Adwa Zero Km Mega Construction Project. Thus, the findings can only apply to a limited mega construction project and can't be fully generalized to the whole mega construction project in Addis Ababa. As a result, it is better if other researchers conduct their studies over a wider area by encompassing the experience of many mega construction projects in Addis Ababa.

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## Appendix A

### QUESTIONNAIRE

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PROJECT MANAGEMENT

#### Questionnaire

#### **Dear respondents,**

This is a survey questionnaire is designed to assess risk management practices in Adwa zero Km Mega Construction projects, Addis Ababa, Ethiopia. The study is being conducted as part of the MA in project management and your responses will be used for academic purposes. I kindly request your assistance in completing this questionnaire, which is entirely voluntary and greatly appreciated. Please provide thoughtful and honest responses, as your responses will be kept confidential.

Thank you in advance

You reach the researcher via +251 922446349 Email: [fasil4neguse@gmail.com](mailto:fasil4neguse@gmail.com)

#### Part I: General Information

Respond to the questions by ticking on the box only once that you prefer best

1. Age 20-30 years , 31 -40 year , 41-50 years , 51 – 60 years  above 60 years

2. Sex Female  Male

3. Level of Education: Diploma  Degree  Postgraduate

4. Years of work experience:

Below 3 years , 3-7 years , 8-12 years , 13-17 years , 18 years and above

**Part II:**

Please indicate your opinion by marking a circle on the appropriate number for the five-point scale questions and circle the letter of your choice for the multiple-choice questions that best describes how you perceive the project applies project risk management where:

Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4 and Strongly Agree = 5.

**GENERAL QUESTIONS ABOUT PROJECT RISK MANAGEMENT**

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly Agree
1	There is a policy or guideline that recommends how to manage unexpected uncertainties.					
2	The project has a defined or standard risk management process.					
3	Responsible person or department is assigned to handle risk.					
4	Risk management is treated as a continuous process in the project					
5	Identified risks are documented to be used for future projects					
6	Risk management is implemented at the implementation stage of the project					

**RISK PLANNING**

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
7	There is systematic approach or careful planning done to perform risk management in the project.					
8	Relevant stakeholders are involved in the planning and performing of managing risk.					

9	An expert judgment or meetings are considered while planning for risks that might occur in the project.					
10	Environmental factors are included as an input to plan for uncertainties.					
11	Team members within the project receive training or have enough knowledge about how to handle uncertainties.					
12	Risk management plan is incorporated with the project plan.					

### RISK IDENTIFICATION

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
13	Risks are identified at initial stage of the project or early in the project.					
14	There is lack of professionals to identify risks early					
15	We use a structured and formal risk identification method.					
16	The factors causing the risks have been identified in order to eliminate the risks from occurring.					
17	The risks are identified when their effects are seen.					
18	We have lost money, time, quality etc. Because we didn't asses impact of identified risks.					
19	we try to identify and reduce risks in our everyday work					

### RISK ANALYSIS

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
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20	Characteristics of the risk are considered before analyzing the identified risk.					
21	There is a measurement system to analyze the risk					
22	Project documents are updated after assessment of the risk that might occur					

### RISK RESPONSE

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
23	There is a well-developed strategy within the project to respond to risk					
24	Factors such as budget, schedule and resources are considered while responding to risk					

### RISK MONITOR AND CONTROL

S/N	Questions	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
25	Based on the current result of the project are risks monitored and controlled well.					
26	The Project monitor, control and review the process for risk management to ensure that it complies with standards and procedures.					
27	Information available or the history of the project is used to supplement to control risk.					
28	Risks that occur within the project are controlled in a way that goes with the goal and objective of the project.					

## APPENDIX B

### PART III: INTERVIEW GUIDE FOR THE PROJECT MANAGER

1. Can you please tell me about risk management system in the project? Is there a standard risk Management process, which is being followed with in the projects?
2. Is there a standardized or formal documented process on how to manage uncertainties within the project? What is the current practice of risk management within the project?
3. Do you have established risk management system?
4. Do you manage risks proactively? Are improvements are made before problems arise?
5. Are team members within the project aware on how to manage risk in a way that doesn't affect the objective or goal of the project?
6. Is there a special department or assigned person to handle uncertainties that occur within the life cycle of the project? At which stage of the project are risks managed in the projects?
7. Is planning done carefully on how to manage risk at your project? If yes, how do you plan and who is involved in planning process?
8. Are risks with a probability of happening identified early at startup phase? And what methods are used to identify them?
9. Are risks analyzed to assess their probability of occurrence and level of impact?
10. While taking action or responding to uncertain events within the project what factors are kept in consideration? Are factors such as schedule, budget and objective of the project considered?
11. Do Employees have enough training in risk management and understand the basics of risk management?
12. What challenges until now has the project faced due to unmanaged risk?
13. How do you think your current risk management process affected the projects? Is risk management monitored and reported as part of your normal management reporting system?
14. Do you think managing risk and project success are related? If yes, how?
15. What are the main areas of risk management that you need to develop?

## APPENDIX C

### RELIABILITY TEST TABLES

#### Project Risk Management Reliability Test

### Reliability Statistics

Cronbach's	
Alpha	N of Items
.841	28

### Mean and standard deviation of the overall data

List	Mean	S.dev	N
Project Risk Management	3.29	0.672	50
Risk Planning	3.37	0.7015	50
Risk Identification	3.41	0.585	50
Risk Analysis	2.7	0.971	50
Risk Response	3	0.788	50
Risk Monitoring and controlling	2.64	0.88	50

