



**ST. MARY'S UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**ASSESSING THE RISK MANAGEMENT PRACTICE OF TOLL  
ROADS EXPANSION PROJECTS IN ETHIOPIA**

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Advisor: Dejene Mamo (PhD)**

**5/30/2022**

**Addis Ababa, Ethiopia**

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**A PROJECT WORK SUBMITTED TO ST. MARY'S  
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### **DECLARATION**

I hereby declare that the study which is being presented in this thesis entitled “*ASSESSING THE RISK MANAGEMENT PRACTICE OF TOLL ROADS IN ETHIOPIA*” is original work of my own. It had not been presented for a partial fulfillment for any educational qualification at this university or other universities, and the resources materials used for this thesis had been accordingly acknowledged.

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**Daniel Aragaw**

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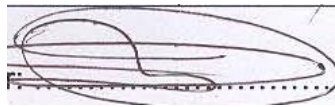
**Date**

## **CERTIFICATION**

This is to certify that the project work entitled —ASSESSING THE RISK MANAGEMENT PRACTICE OF TOLL ROADS EXPANSION PROJECTS IN ETHIOPIA undertaken by Daniel Aragaw in Partial fulfillment of the award of Master’s degree in Project Management at St. Marry University is an original work and not submitted earlier for any degree either at this University or any other University.

Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the project work (paper) to the department.

**Dejene Mamo (PhD)**

A handwritten signature in black ink, appearing to read 'Dejene Mamo', written over a horizontal dotted line.

**30/05/2022**

**Name of advisor**

**Signature**

**Date**

### **ACKNOWLEDGEMENTS**

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My honor and love go to my parents whom I have no fair words to describe my true feelings and have great share in my achievement.

## ACRONYMS/ABBREVIATION

ETRE.....	Ethiopian toll roads Enterprise
GRMP.....	general risk management practice
PMBok.....	Project Management Body of Knowledge
PMO.....	Project Management Office
PRM.....	Project Risk Management
PRP.....	Project Risk Planning
PRI.....	Project Risk Identification
PRA.....	Project Risk Analysis
PRCR.....	Project Risk Control and Response
PS.....	project successes
SPSS.....	statistical package for social science
SWOT .....	strength weakness opportunity treats

## **ABSTRACT**

Building projects are one-of-a-kind and extremely complicated, involving sophisticated technology and structures that are plagued with danger and uncertainty. As a result, having a well-articulated and experienced risk management technique is critical for project success, not just in terms of reducing negative outcomes but also in terms of maximizing opportunities. The goal of this study was to evaluate the project risk management practices of the Ethiopian toll roads Enterprise expansion building construction projects using the five project risk management processes identified through literature review: risk management planning, risk identification, analysis, response and controlling. The study employed a descriptive research design and a qualitative research approach, with semi-structured interviews serving as the primary data source and documentation analysis serving as the secondary data source. As a data collection tool, the study used semi-structured interviews and purposive sampling as a sample technique. This study revealed the significant weaknesses in the project's real risk management practice based on the analysis. This project work is not included on impact scales, risk appetite and tolerance limits, and frequency of risk management activities and reporting which needs further research on future.

**Keywords:** risk, project risk management process, Ethiopian toll roads Enterprise



## Table of Contents

DECLARATION .....	iii
ACKNOWLEDGEMENTS .....	v
ABSTRACT.....	vii
List of Figures .....	3
List of tables.....	4
CHAPTER ONE .....	1
1.1 INTRODUCTION .....	1
1.2 Back ground of the Organization .....	3
1.3 Statement of the problem .....	4
1.4 Research Question .....	5
1.6 Objectives of the Study.....	5
1.7 Significance of the study.....	5
1.8 Scope of the study .....	6
1.9 Limitation of the study.....	6
1.10 Organization of the report.....	6
CHAPTER TWO .....	7
2.1 Literature Review.....	7
2.1.1. Theoretical Review .....	7
2.2.1 Project Risk Management Process .....	9
2.2.1.1 Risk Management Planning .....	10
2.2.1.2 Risk Identification.....	13
2.2.1.3 Risk Assessment .....	14
2.2.1.4 Risk Response Strategies .....	15
2.2.1.5 Risk Monitoring and control .....	18
2.2.2 Benefits of project risk management practices .....	19
2.3 Empirical Review.....	19
2.4 Research gap analysis .....	20
2.5 Conceptual framework.....	21
CHAPTER THREE: .....	22
3.1 Research Methodology .....	22
3.2 Research Approach .....	22
3.3 Research Design.....	22

3.4 Population of the Study.....	23
3.5 Sampling Technique .....	23
3.6 Sampling Size .....	23
3.7 Method of Data collection .....	23
3.8 Validity and Reliability of the Data .....	24
3.9 Ethical Consideration.....	25
CHAPTER FOUR.....	26
4.1 RESULTS AND DISCUSSION .....	26
4.1.1 Introduction.....	26
4.2 Response Rate.....	26
4.4 General Overview of ETREs Risk Management Practices (GRMP).....	29
4.5. Project risk planning in ETRE Projects .....	31
4.6 Project Risk Identification .....	33
4.7 Project Risk Analysis.....	35
4.8 Related to Risk Response, Control and monitoring.....	37
4.9 Related to former Project Success .....	39
4.10 Summary of Descriptive analysis .....	41
CHAPTER FIVE .....	42
5.1 Summary, Conclusions and Recommendations.....	42
5.2 Summary of basic findings .....	42
5.3 Conclusion .....	43
5.4 Recommendation .....	44
5.5 Limitations of the research work .....	45
References.....	46
Annex.....	48

## List of Figures

Figure 2:Gender profile of respondents .....	27
Figure 3:Educational level of respondents.....	28
Figure 4:Job tittle of respondents.....	28
Figure 5:years of experience on the project work.....	29

## List of tables

Table 1:Reliability value in each category.....	25
Table 2:Table total reliability value .....	25
Table 3:General overview of ETREs risk management practices (GRMP).....	30
Table 4:commonly exposed risk types.....	31
Table 5:Project risk planning Assessment .....	32
Table 6 ETREs assessment on identified risk.....	34
Table 7:Way of identifying risk ETREs .....	34
Table 8:project risk analysis .....	36
Table 9:strategy to respond and control risks that affects project.....	37
Table 10:awareness of respondents' in risk impact .....	39
Table 11:project completion success .....	40
Table 12:descriptive statistics .....	41

## **CHAPTER ONE**

### **1.1 INTRODUCTION**

The rate of urbanization in major cities is increasing, resulting in a significant demand for upgraded infrastructure and a large housing project. Ethiopia is investing hundreds of millions of dollars in road improvements. With an annual urbanization rate of roughly 4.5 percent, significant transportation links, particularly roads, are required. Currently in Ethiopia, numerous projects are under construction, and the government has allocated billions of dollars to the sector. So, utilizing this much budget for on under developing country is very essential. The currently existing AddisAdama Expressway as part of Ethiopia's infrastructure expansion program. What makes this project even more exciting is that it will be part of a 10,000-kilometer pan-African motorway connecting Cairo in the north to Gaborone and Cape Town in the south. Ethiopia is embarking on a massive undertaking according to Ethiopian toll roads enterprise annual report 2013 E.C.

As a result, the government has approached a variety of international financial institutions and firms for assistance with the road's funding, design, and construction. Ethiopia has received a \$370 million loan from the World Bank to enhance its transportation infrastructure. The Modjo-Hawassa Expressway has received a share of the funds. The China Railway Seventh Group, a subsidiary of the state-owned China Railway Engineering Corporation, has contributed \$171 million to the route's construction. The African Development Bank and the Korean Exim Bank are two more sources of finance for the route. Ethiopia's construction industry is a major driver of economic development. According to a report in (2018) G.c ,by Ethiopia's National Bank, the construction industry accounted for 71.4 percent of the country's industrial output in 2018, up 15.7 percent from the previous year, demonstrating the sector's dominance. Massive government investment in infrastructure and residential construction projects has enabled the sector to grow and create jobs, as well as raise living standards.

Unfortunately, schedule delay and cost overrun beyond the contractual time is a critical problem that the industry and many construction projects are facing. According to Koshe,; Jha, 2016, Investigating Causes of Construction Delay in Ethiopian Construction Industries Civ. Constr. Environ. Engineering stated on their research that only 8% of construction projects in Ethiopia are completed on time, whereas the remaining 92% are delayed by up to 352% of the contractual time. Tadewos and Patel reported that none of the Addis Ababa highway projects were completed on time. Similarly, Kebede.; Zhang, (2020), Enforcement of legal remedies against construction projects time overrun in Ethiopia: A critical appraisal. Heliyon also stated that one of the most common inefficiencies in the industry is the construction schedule delay. All projects are intrinsically dangerous, according to APM, since they are unique, restricted, complex, founded on assumptions, and carried out by people. As a result, project risk management should be integrated into project management and applied throughout the project lifecycle.

Many projects fail because organizations think that all initiatives will succeed, therefore they fail to identify, analyze, and mitigate or provide contingencies for the project's risk aspects. With the quick pace of change and rising competition, this is especially true. To improve the odds of a proposed project succeeding, the organization must first analyze potential risks, then methodically and quantitatively assess these risks, predicting their causes and effects, and then choose effective techniques for dealing with them (Mobey, and Parker, (2002) Risk Evaluation and Its Importance to Project Implementation. Work Study, 51,). The risk process must be expressly embedded into the decision-making process to guarantee that any potential risks are effectively managed.

By identifying and minimizing potential risks before a project begins, risk management concepts assist quality improvement and improve cost estimation. Risk management establishes procedures to ensure that management receives organized risk information early enough to implement corrective actions that allow for realistic schedule and cost estimates and ensure project success (Tinnirello, 2000). By providing a means for reporting possible concerns and boosting the team's stake in the project's overall success, risk management concepts improve team involvement.

Risk embedding is a long-term effort to ensure that risk is taken into account during the decision-making process (Hodge, 2002). Failure to comprehend risk issues may give rise to serious consequences which bring the companies project becomes unsuccessful.

## **1.2 Back ground of the Organization**

### **Ethiopian Toll Roads Enterprise (Addis Ababa-Adama expressway)**

Ethiopian toll road enterprise was formed in 2006EC by parliament proclamation to maintain and administrate toll highways constructed in Ethiopia. In September of 2007, the company began operations by accepting its first toll road (the Addis Ababa-Adama highway). Later the enterprise continued hand over the Dire Dawa-Dwelle expressway in 2011E.c. And the Modjo-Hawassa expressway in 2014E.c. Since this project works lay on the Addis Ababa-Adama expressway it only focusses on the first branch. AAE (Addi Ababa-Adama expressway) has a root starting Addis Ababa and links Dukem, Bishoftu, Modjo and Adama. The root has a great advantage in economic and social impact because it is located in the country's Import-Export corridor. The AAE Expressway is designed & constructed in a new alignment covering a total length of 78 km and constructed by China Communications Construction Company Ltd and supervised by a consultancy called Beijing Expressway Supervision Co., Ltd.

The source of finance for road construction was covered by both Ethiopian government which had 43% coverage and the rest is covered by Export-Import Bank of China in the form of loan and in a total of 620 million USD dollar invested. The road construction Project period starts in April 21, 2002 E.c and finished in April 20, 2006E.c and the Design Life of the project is **20** years. The Expressway's Design Speeds are:120 Km/Hr for Flat section and 100 Km/Hr for Rolling section .The Design and Construction is based on the Chinese Design Standard with 3 Lanes each 3.75m wide in each direction; with 2 m Tree Planting median and roadway width is 31m, including 2.5m Asphalt Shoulder in each side.

As new enterprise, the company has doing an expansion projects like service station buildings, fuel stations, unground water drilling and other construction projects. Most of these projects are outsourced to local contractors with national bidding process.

### **1.3 Statement of the problem**

Ethiopia's toll road enterprise aspired to be Africa's first toll road in terms of quality service by 2025 G.c. To meet its objectives, the service must be well-organized and standardized in accordance with international standards. The service stations that provide hotel and motel services for customers and others should be included in the customer service. Similarly, fuel stations must be established because it is difficult for cars to obtain fuel after they enter the toll highways. Garage service is also essential for vehicles that have traveled a long distance. As a result, these services are critical in attracting additional clients. As a result of this understanding, management decides to complete the service and award it to local contractors. When we look at the success of the projects, only two of them were completed, while the rest of the significant projects, such as the fuel station and service station, were put on hold for more than a year after the contract period ended which is noted on contract and design document of the enterprise signed in (2018).

According to a research done by Yimam (2014), the risk management maturity survey indicates that practically there is little or no risk management practices in projects undertaken in Ethiopia. As stated on theoretical literature researches show that only 8% of construction projects in Ethiopia are completed on time, whereas the remaining 92% are delayed by up to 352% of the contractual time, stated by Kebede, Zhang, (2020) enforcement of legal remedies against construction project time overrun. Tadewos and Patel reported that none of the Addis Ababa highway projects were completed on time. Similarly, when we look at the ETRE projects (the fuel station and service station construction) time delay has been 200% and the financial escalation goes up to 100% and yet not finished. When we look at the store construction project it was completed after 115% time and overrun cost goes up to 66.6%. So, project risk management is not implemented which led to failed of success on the enterprise.

For future projects the enterprise should asses the last projects performance in order develop the gap created on the risk management process. Project success on the enterprise has a great impact on the profitability of the company because initially the company established on the loan and any extra cost will be difficult to compensate the budget. Researches show that adopting risk management strategies has a considerable positive impact on project success. They also indicate that having a risk manager on board has a beneficial impact on project success. Look-in to the



ETRE experience there has not been any risk managers that control the activities. As a result, we can conclude that risk management is critical to project success. In order to move forward on the project that has been stalled, it will be unavoidable to assess the company's risk management.

#### **1.4 Research Question**

- What are the major project risk management processes implemented and identify critical risk types that faced in the ETRE projects?
- What are the effective response strategies for the identified critical risks?
- What are the general risk control and related practice with ETRE building construction projects?

#### **1.6 Objectives of the Study**

##### **General Objective**

The general objective of the research is to assess building construction projects risk management practice in Ethiopian toll roads Enterprise.

##### **Specific Objectives**

- To assess and to categorize the major risk management process and practice that was implemented in ETREs projects and identify possible risks;
- To allocate risk response strategies for the identified critical risks;
- To examine recommendations for improved risk control management associated with building construction projects;

#### **1.7 Significance of the study**

As several studies and real-life examples illustrate, Ethiopian enterprises in general have a poor track record of completing projects on time, on budget, and with high quality. Extensive schedules, cost overruns, and poor quality are the key obstacles of our countries' megaprojects. The fundamental cause for this is a lack of risk management strategies. This has a direct impact on the success of the businesses.

Because the company (ETRE) is a new expanding industry that will open new toll roads in various regions, improving its project management will boost its profitability and help to pay off the loan on which it was built. So this research helps in fulfilling the project risk management

practice during expansion project implementation period while saving the cost ,time and confirming the necessary quality .As a result, this study will aid in the resolution of the ETREs project management handling for future projects by taking into account the necessity of risk management practice.

### **1.8 Scope of the study**

The study limited its scope on the construction projects undergoing on the ETRE specifically to Addis Adama expressway (first branch) in addition the study focused only in assessing the risk management practice on the project. Thus, this study will not consider the role of other success factors for those projects nor would it investigate the role of project risk management in other organization or other sectors.

### **1.9 Limitation of the study**

Ethiopian toll roads enterprise is now expanding its new toll roads like Modjo-Ziway expressway meanwhile most of the expansion projects are done on Addis Adama express way So due to time and budget constraint the study focuses only on the first branch (Addis- Adama express way) projects. In addition to the uniqueness of the sector the study findings didn't have the same effect for other companies.

### **1.10 Organization of the report**

The research was divided into five sections. The background of the study, the statement of the problem, the purpose of the study, the research objectives, the research questions, the significance of the study, the limitations, the delimitation, the assumptions, the conceptual framework, the definition of terms used, and the organization of the study were all included in Chapter One. By evaluating various literatures, publications, articles, and other sources, Chapter Two looked at the available literature on the role of project risk management strategies for project success. The study's research technique is covered in Chapter Three. The research design, research approach, target population, sample procedure, data collection methods and methodologies, data analysis, and ethical issues were all covered in this chapter. Data presentation, data analysis, data interpretation, and discussion are all covered in Chapter 4. Finally, Chapter Five discusses the study's findings, conclusions, recommendations based on the findings, and areas for future research.

## **CHAPTER TWO**

### **2.1 Literature Review**

By evaluating the existing theoretical and empirical literatures, this chapter compiles a review of the relevant literature to the notion of risk management. The chapter will also provide an overview of the hazards associated with building construction projects and how to manage them.

This will assist in selecting the appropriate technique and method for assessing project risk management procedures on a certain projects in ETRE.

#### **2.1.1. Theoretical Review**

##### **What Is Project Risk?**

There are many literatures on risk management (RM) where authors defined RM as uncertainty management in a way that risk itself an uncertain thing (Carbone & Tippett, 2004). The most two popular definitions of RM are published by Project Management Institute (PMI) and Association for Project Management (APM): “The systematic process of identifying, analyzing and responding to project risk. It includes maximizing the probability and consequences of positive events and minimizing the probability and consequences of adverse events to project objectives” (PMI, 2016). “A process whereby decisions are made to accept known or assessed risk and/or implementation of actions to reduce the consequences or probability of occurrence” (APM, 2012). Project risks are categorized as cost, schedule and performance risk, and also other type of risks

such as governance, strategic, operational, market, legal and external hazard risks (Project Management, 2017; Jaber, 2019).

Ward and Chapman (2003) found in their article five types of risk sources that cause uncertainty. Miller and Lessard (2001) developed a list of examples of some common risks faced by different project types, according to the nature (social acceptability risk, market risk, social risk, institutional risk, technical risk).

By Mohammad Shakilur Rahmana and Tasminur Mannan Adnan, Risk management and risk management performance measurement in the construction projects of Finland, journal of project managemen,5(2020).

Risk is always present when making decisions on the basis of assumptions, expectations and estimates of the future. It characterizes situations where the actual outcome for a specific event or activity is likely to deviate from the estimated value (Raftery, 1994). The definition of risk is diverse and can be assessed in terms of fatalities and injuries, sample of a population, in terms of probability and reliability or in terms of the likely effects on a project. One can distinguish uncertainty from risk by defining risk as being where the outcome of an event is possible to predict on the basis of statistical probability. This implies that there is knowledge about a risk as a combination of circumstances as opposed to the term uncertainty in which there is no knowledge which is stated by Smith et al., (2006).

The Project Management Institute in their Guidelines for Project Management Body of Knowledge (PMI-2008) stated that: Project risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective. Objectives can include scope, schedule, cost, and quality. A risk may have one or more *causes* and, if it occurs, it may have one or more impacts. A cause may be a requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcome.

### **Project risk management**

The purpose of project risk management is to minimize the risks of not achieving the objectives of the project and the stakeholders with an interest in it, and to identify and take advantage of opportunities. In particular, risk management assists project managers in setting priorities, allocating resources and implementing actions and processes that reduce the risk of the project not achieving its objectives.

### **Types of risks in projects**

There are many types of project risks. These risks can lead to cost, scheduling, or performance issues and may create other types of adverse consequences for the organization. According to project management institute (2018), the most common risks in projects are as follow:

Cost risk: usually escalating project costs due to low accuracy costs estimation and scope increase and according some scholars the percentage increases up to 16%. Program risk (calendar), the risk that the activities will take longer than expected. The reductions of the program usually increase the costs and also delay the receipt of the benefits of the project, with a

possible loss of the competitive advantage and it is common up to 19%. Performance risk, the risk that the project will not produce results in accordance with the project specifications and it is common up to 15%. Governance risk refers to the performance of the administration regarding the company's ethics and reputation. Strategic risks which result from errors in strategy, such as choosing a technology that cannot be operated. Operational risk includes risks due to poor implementation and process problems, such as procurement, production, and distribution. Market risks include competition, foreign exchange, commodity markets, and interest rate risk, as well as liquidity and credit risks. Legal risks arise from legal and regulatory obligations, including contractual risks and litigation against the organization. Risks associated with external hazards, including storms, floods and earthquakes; vandalism, sabotage and terrorism; labour strikes; and civil unrest. Most environmental risk assessment methods are based on scoring and comparing with the average of the variables considered. Depending on the analysis indications, each method has applicability in a particular geographical area or country.

### **2.2.1 Project Risk Management Process**

The systematic process of recognizing, analyzing, and responding to project risk is known as risk management. It entails optimizing the likelihood and impact of favorable events while decreasing the likelihood and impact of negative events on project goals.

**Project risk management process** provides an overview of the following major processes:

1. Risk Management Planning—deciding how to approach and plan the risk management activities for a project.
2. Risk Identification—determining which risks might affect the project and documenting their characteristics. It is the process that aims to find risks that might affect any project objective. People involved in this process are project members, external stakeholders and external personal with skills in a specific area. However, according, A Guide to the project management body of knowledge (PMI guide,2018) fourth edition. Solna: Gruppen Broma, all people in the project are encouraged to reports any risk. This process is an on-going progress throughout the whole project, because when more information becomes available, new risks may arise. How often the process is repeated depends on the project scope and complexity

3. Qualitative and Quantitative Risk Analysis—performing a qualitative analysis of risks and conditions to prioritize their effects on project objectives and measuring the probability and consequences of risks and estimating their implications for project objectives. The purpose of this process is to rank risks for further analysis or action. It's done by combining the likelihood of a risk event to occur, and what consequences it may generate for the project goal. The most effective way to work with risks is to focus on the ones with the highest risk index. The risk tolerance of in a project or organization is reflected on how tight deadlines, costs and quality are estimated.

#### 4. Risk Response Planning

The purpose of this process is to develop options and actions to enhance opportunities to achieve project objectives, and to reduce the threat that exists against them. It's during this process that a person becomes a risk owner, and managed by priority. Necessary resources are allocated and scheduled into the budget, time schedule and the project plan. According Solna: CM gruppen broma, Project management institute. (2008). A Guide to the project management body of knowledge, (PMI guide,2018) fourth edition, the inputs needed for this process are risk list and Risk Management Plan.

#### 5. Risk Monitoring and Control

The processes that aims to implement plans for; risk response, follow up identified risks, identify new risks, and evaluating the risk process during all phases. In this process risks are reviewed, reconsideration also still relevant and if the risk index has changed. Risk audits measure effectiveness of risk response for documented risks, and if they have enough documentation. Budget- and time reserve are evaluated and compared against the project's progress, in order to determine if the reserve enough.

##### 2.2.1.1 Risk Management Planning

The process of selecting how to approach and plan risk management activities for a project is known as risk management planning. To ensure that the amount, kind, and visibility of risk management are commensurate with both the risk and the value of the project to the business, it is critical to plan for the risk management processes that will follow. (Project Management

Institute, Newtown Square, Pennsylvania, USA, A Guide to the Project Management Body of Knowledge (PMI Guide 2000).

Risk management planning according to (PMI,2000) is the systematic process of deciding how to approach, plan, and execute risk management activities throughout the life of a project. It is intended to maximize the beneficial outcome of the opportunities and minimize or laminate the consequences of adverse risk events. Inputs to project risk planning includes Project charter: according to definition of (PMI 2000) project charter is a legal document that formalizes a project's approval. It should state the business requirement that the project was created to fulfill, either explicitly or through references to other documents. The project charter should be provided by a management who is not involved in the project and at a level that is appropriate for the project's demands. It gives the project manager the power to use organizational resources to complete project tasks. Similarly, The risk management policies of the organization. Some businesses may have established risk analysis and response procedures that must be adjusted to a specific project. The other input is roles and responsibilities are clearly defined. Planning will be influenced by predefined roles, responsibilities, and authority levels for decision-making. In addition the other input is k tolerances of stakeholders Varied companies and individuals have different levels of risk tolerance. These might be stated in policy statements or demonstrated via actions. Risk management plan template for the company. Some companies have created templates (or pro-forma standard) for project teams to use. Based on its use and utility in the project, the organization will continue to enhance the template (PMI,2000).

Work breakdown structure (WBS) according to (PMI,2000). A work breakdown structure (WBS) is a deliverable-oriented grouping of project components that organizes and defines the project's overall scope; work not included in the WBS is considered outside the scope of the project. The WBS is frequently used to build or confirm a common understanding of project scope, just as the scope statement is. Each successive level denotes a more complete explanation of the project deliverables. Tools and technic for risk management planning

Plan meeting: To establish the risk management plan, project teams undertake planning sessions. The project manager, project team leaders, anyone in the company with responsibility for risk planning and execution activities, important stakeholders, and others, if needed, are all expected

to attend. They make use of risk management templates and other information as needed. Outputs from Risk Management Planning includes

According to PMI (2000), During the project life cycle, the risk management plan outlines how risk identification, qualitative and quantitative analysis, response planning, monitoring, and control will be structured and carried out. The risk management strategy does not address individual risk responses; instead is handled by the risk response plan. The following items may be included in the risk management plan: Methodology is the scientific method. Defines the risk management methodologies, tools, and data sources that may be used on this project. Depending on the project stage, the amount of information provided, and the risk management flexibility left, different types of assessments may be applicable. Responsibilities and roles for each type of action in the risk management plan, the composition of the lead, support, and risk management teams is defined. Risk management teams that are not part of the project office may be able to do more independent and unbiased risk analysis of the project than those from the sponsoring project team. Budgeting: Establishes a risk management budget for the project. Timing is everything. The frequency with which the risk management procedure will be carried out throughout the project life cycle is defined. The results should be created in a timely manner so that they can influence decisions. During the project's execution, the decisions should be reassessed on a regular basis. Scoring and interpretation are both important aspects of the game. The scoring and interpretation techniques that are appropriate for the type and time of the qualitative and quantitative risk assessments. To maintain uniformity, methods and scoring must be defined ahead of time. Thresholds: The criterion for determining which hazards will be addressed, by whom, and in what way. The risk threshold for the project owner, customer, or sponsor may be different.

The acceptable threshold serves as a benchmark against which the project team will assess the risk response plan's success.

Formats for reporting which defines how the project team, internal and external stakeholders, sponsors, and others will be informed about the findings of the risk management processes. Observation: Documents how all aspects of risk actions will be documented for the current project's benefit, future needs, and lessons gained. Documents whether or not risk processes will be audited and how they will be audited.



### 2.2.1.2 Risk Identification

Risk identification is widely regarded as the most important step in the risk management process (Banaitene & Banaitis, 2012). The goal isn't to make flawless predictions about what will happen in the future; rather, it's to identify prospective risk sources that could have a big influence on a project if they happen. It is difficult to detect all conceivable dangers, and that should not be the goal (Smith et al., 2006).

As a result, the purpose of identifying and assessing risks is to guarantee that potential hazards are assessed and managed in a way that allows for the achievement of the overall objectives. Due to the ever-changing nature of risks throughout the life cycle of a project, risk management must be a continuous effort (Potts, 2008).

The descriptions of most risk management processes emphasize the need to identify the risks early in the process. Chapman and Ward (2003) discusses the need to identify sources and associated possible responses as well as secondary sources that arise from these responses.

The quality of the primary identification phase within the risk management process has a big impact on the success of later phases within the process (Chapman R. , 2001). The initial step at the early phase of the project should form the basis by which strategies, policies, uncertainties and risks are established when it comes to management and allocation (Potts, 2008).

However, given that all risks are not completely recognizable before the start of a project and the fact that additional risks might arise during the implementation of the project, the identification of risk must be implemented in a manner that is in line with the progress of the project as well as being forward-looking (Schieg, 2006).

Risks that may affect the project for better or worse can be identified and organized into risk categories. Risk categories should be well defined and should reflect common sources of risk for the industry or application area. Categories include the following:

- Technical, quality, or performance risks—such as reliance on unproven or complex technology, unrealistic performance goals, changes to the technology used or to industry standards during the project.

- Project-management risks—such as poor allocation of time and resources, inadequate quality of the project plan, poor use of project management disciplines. Organizational risks—such as cost, time, and scope objectives that are internally inconsistent, lack of prioritization of projects, inadequacy or interruption of funding, and resource conflicts with other projects in the organization.
- External risks—such as shifting legal or regulatory environment, labor issues, changing owner priorities, country risk, and weather. *Force majeure* risks such as earthquakes, floods, and civil unrest generally require disaster recovery actions rather than risk management

### 2.2.1.3 Risk Assessment

The identification of risk is merely the first step; some of the dangers detected may be more serious and require further investigation. Before moving on to response management, the next step is to quantify their significance. The goal of risk assessment and analysis is to describe and prioritize risk scenarios as completely as possible (Schieg, 2006).

In general, the literature on risk assessment distinguishes between two broad categories: qualitative and quantitative analysis. The former entails interviews, checklists, and brainstorming, whilst the latter is carried out using a data-driven methodology (Banaitene & Banaitis, 2012).

Risk assessment uses quantitative analysis to determine the impact of each risk on a scale of high to low, as well as the likelihood of occurrence. Whereas qualitative risk assessment frequently entails the appraisal of effect and the creation of lists in order to further study the highlighted issues, quantitative risk assessment does not ( Zou et al., 2007).

Both methods of analysis should be used to assess hazards on an individual level as well as the interrelationships between their consequences (Schieg,2006).

**Qualitative risk assessment:** The effect and likelihood of the detected risks are assessed, and prioritized lists of these risks are developed for further analysis or immediate mitigation.

Each identified risk is evaluated by the project team for its likelihood of occurrence and impact on project goals. To assess the risks in their respective domains, project teams may enlist the

help of subject matter experts or functional units. The following examples of qualitative risk analysis are frequently used: As a preliminary risk assessment or appraisal of the project. When a rapid evaluation is required.

When a thorough and/or lengthy quantitative analysis is not required, this is the preferred method for some simpler and smaller projects.

**Quantitative Risk Analysis** is a way of numerically estimating the probability that a project will meet its cost and time objectives. Quantitative analysis is based on a simultaneous evaluation of the impacts of all identified and quantified risks. The Strategic Analysis and Estimating Office (SAEO) at WSDOT offers several tools for quantitative analysis of risk.

#### **2.2.1.4 Risk Response Strategies**

Following the identification and examination of the project's risks, an effective risk response strategy is implemented in order to take the necessary steps to reduce risk's negative consequences on project objectives. The nature and potential effects of the risk will serve as the foundation for determining mitigation actions.

The main goal is to minimize the expected harm as much as possible while increasing risk control. The greater the control over one mitigation measure, the more effective the measure is on that risk (Wang et al. 2004).

Furthermore, Banaitiene & Banaitis (2012) proposed four potential techniques for dealing with risks in a construction project: risk avoidance, risk transfer, risk mitigation, and risk acceptance.

The proper management of risks necessitates that they be identified and assigned in a different manner. Risk event conditions and risk treatment capabilities can be actual if agreed bodies grasp their risk duties. Following the identification of all risks that occur or may occur in the project, activities should be taken to provide explicit responses to each identified risk.

Risk handling, according to Fairley (2005), encompasses all four types of risk response strategies: avoidance, transference, mitigation, and acceptance.

## **A. Avoidance**

This strategy entails refraining from engaging in risky activities. While avoiding risks may appear to be the best option, it also implies foregoing the possible advantage that accepting (retaining) the risk would have provided. Risk avoidance is defined as eliminating activities with a high possibility of loss by making it difficult for risk to occur, or by executing the project in a different method that achieves the same goals but insulates the project from the risk's effects.

Some of the examples of risk avoidance include: more detailed planning; alternative approaches; improved designs and systems engineering, or adoption of enhanced design standards; procedural changes; work permits; protection and safety systems; preventive maintenance; formal processes and quality assurance procedures; operations reviews; regular inspections and audits; and training and skill enhancement.

## **B. Transference**

Risk transference is the process of transferring a portion or all of a risk to a third party by choosing another stakeholder to handle risk activities with a low probability of repetition but a high financial impact. With risk transference, this section analyzes the numerous variables and their references to literature.

Risk transfer should include passing hazards to people who are better positioned or capable of maintaining control or influencing the risk's outcome. Transference should never be seen as a risky reaction. Its goal isn't to deflect blame by putting the blame on someone else. It should also not be used as a deterrent to other project participants in a punitive or disciplinary manner. An incentive may be required to adequately manage risks.

To avoid delays, cost overruns, change orders, and design omissions and errors caused by unforeseen contingencies, extensive knowledge exchange on the nature of the risks discovered and evaluated can be used to shift risks to another phase of the project (Rodriguez et al., 2010). This runs the risk of not managing the problem at the source and instead moving it to a later phase, where the level of risk may increase or change. In this regard, Chan and Au (2007) claim that when risk is transferred, there is usually a time overrun in the project since the team members and nature of the job in the altered phase may be different.

### **C. Mitigation**

Mitigating risk is easier and faster when it is able to shift risk after making a well-thought-out decision and clearly explaining the impact to all potential parties (Zofi, 2012). Mismatches in the expectations of associated parties can lead to the formation of new risks when risk transfer is not seamless and appropriately reported.

For cost-effective risk management, these risks must be reviewed and appraised. Mitigation of risk is the process of lowering a risk's impact in order to make it more acceptable to the project or organization. As risk response options, Tesch et al., (2007) offer many mitigation measures.

Funding is essential for conducting risk mitigation operations and restoring the system's normal operation (Hecker, 2002). Cost of time overruns are inextricably linked to funding shortages. Infrastructure projects are more likely to have funding shortfalls than initiatives in the manufacturing or construction industries (Little, 2010). According to Goble & Bier (2013), project risks can be mitigated by communicating risk assessment results on a regular basis.

### **D. Acceptance**

Risk acceptance is defined as recognizing that residual risks (i.e., risks that persist after a risk response has been taken) will exist and responding either actively by assigning appropriate contingencies or passively by doing nothing but monitoring the risk's status. Johnstone (2000) identifies three ways for ensuring effective risk factor appraisal and acceptance.

Risk acceptance would also imply that taking no action in the face of risk was a well-considered option.

As a result, risk acceptance strategy can be defined as a decision not to take any action in response to an existing risk and instead accept it as is (Fairley, 2005). If top management does not oversee and inspect risk acceptance, it might be a double-edged sword. If it exceeds a predefined threshold level, it becomes a possible threat to organizations, creating various types of risks. Acceptance strategies are divided into two categories:

**1- Active Acceptance:** The most typical active acceptance technique is to create a contingency reserve, which includes time, money, or other resources to deal with the threat or opportunity. Some replies are only activated if specific events occur.

In this situation, the project team develops a reaction plan, also known as a "Contingency Plan," that will only be implemented under specific preset conditions known as "triggers."

**2- Passive acceptance.** No action is required, leaving the project team to deal with dangers and opportunities as they arise. The difference between a workaround and a contingency plan is that a workaround is a recovery plan that is done if the event occurs, but a contingency plan is implemented if a trigger event indicates that the risk is very likely to occur. The prior responses' goal is to reduce project uncertainty and, as a result, improve the base estimate to reflect the project's more assured nature. However, this does not mean that the remaining concerns may be overlooked. They should, in fact, be subjected to appropriate monitoring, control, and management to ensure that they stay within the contingency allowances provided.

#### **2.2.1.5 Risk Monitoring and control**

The process of keeping track of identified risks, monitoring residual risks, recognizing new risks, assuring the execution of risk strategies, and evaluating their success in decreasing risk is known as risk monitoring and control. Risk monitoring and control keeps track of the risk indicators that come with putting contingency plans in place.

Risk management and control is a continuous procedure that lasts the duration of the project. As the project progresses, new risks emerge, and previously predicted hazards vanish. Successful risk monitoring and control systems give information that aids in making effective decisions prior to the occurrence of the risk. Communication with all project stakeholders is required to assess the project's risk level on a regular basis.

The goal of risk monitoring is to see if Risk responses were done according to plan, weather risk response actions as effective as they should be, or should additional responses be developed? And the assumptions made during the project are still valid. In addition, its analysis trends, risk exposure has changed from its previous state and considers if there has been a danger trigger and other.

Choosing alternate tactics, developing a contingency plan, taking corrective action, or re-planning the project are all examples of risk management. The risk response owner should update the project manager and the risk team leader on the plan's efficacy, any unanticipated consequences, and any mid-course corrections required to minimize the risk on a regular basis.

### **2.2.2 Benefits of project risk management practices**

Risk management in projects is currently one of the most popular areas of discussion among researchers and practitioners in the field of project management. Williams cites 241 references in a recent review of the literature on the subject. The Project Management Institute, the largest professional organization dedicated to the project management field, has identified risk management as one of the eight primary topics of the Project Management Body of Knowledge (PMBOK).

Furthermore, most project manager training programs include a risk management course. Project risk management (PRM) is a process that follows a project from its conception through its planning, execution, and control phases to its completion and closure, according to the widely held view of project management as a life cycle process. Here are the benefits to establishing, maintaining and improving a project risk management plan and overall enterprise program by, Compiling data of Higher Quality for Decision-Making, Fewer Surprises in the Project, by bring budgets becomes more precise, by Increases the level of communication and others

### **2.3 Empirical Review**

According to a report by Ethiopia's National Bank released in 2018, the construction industry accounted for 71.4 percent of the country's industrial output, up 15.7 percent from the previous year, demonstrating the sector's dominance. Massive government investment in infrastructure and residential construction projects has enabled the sector to grow and create jobs, as well as raise living standards.

Unfortunately, schedule delay and cost overrun beyond the contractual time is a critical problem that the industry and many construction projects are facing. According to Koshe; Jha, (2016), Investigating Causes of Construction Delay in Ethiopian Construction Industries. J. Civ. Constr. Environ. Engineering stated on their research that only 8% of construction projects in Ethiopia are completed on time, whereas the remaining 92% are delayed by up to 352% of the

contractual time. Tadewos and Patel reported that none of the Addis Ababa highway projects were completed on time. Similarly, Kebede.; Zhang, (2020), Enforcement of legal remedies against construction projects time overrun in Ethiopia: A critical appraisal. Heliyon also stated that one of the most common inefficiencies in the industry is the construction schedule delay. As a result, risk analysis and management are still an important part of construction project management today, in order to cope effectively with uncertainty and unexpected events and achieve project success. According to Koshe and Jha, Investigating Causes of Construction Delay in Ethiopian Construction Industries, (2016). According to data published in Civ. Constr. Environ. Eng.2016, just 8% of construction projects in Ethiopia are completed on time, while the remaining 92 percent are delayed by up to 352 percent of the contractual time. The findings revealed that insufficient schedules, equipment, and labor productivity (construction risks), payment delays, submittals, and approvals of construction documents (financial risks), price inflation (economic risk), bribe and corruption (political risk), differences in design practices and standards (design risk), and the engineer's power, project supervision, and subcontractors' performance (management risks) are the major risks in Ethiopian construction projects.

Similarly, according to Yimam (2014), risk management is a very new and immature technique in Ethiopia. Getachew (2014) conducted a study on the practice of construction risk management through insurance in Ethiopian federal road projects, and found that formal risk management is not well practiced. "Risks associated with road building are not handled by a systematic risk management system. Risk management is, however, done on a regular basis. Even while these ancient techniques help with risk management, they don't follow the official risk management processes, which include risk management planning, identification, assessment, response planning, and monitoring. The following discussion of theories and review of outcomes from related studies clearly demonstrate the importance of project risk management practice in guiding projects to success by limiting the negative impact of risks and uncertainties.

## **2.4 Research gap analysis**

As we can see from the theoretical literature, several studies on project risk management have been undertaken in various domains; however, there is no published project risk management practice in the case of Ethiopian toll roads. As I stated in the problem statement, project



management lacks risk management practices, and this research gave a step forward for enterprise project management.

## **2.5 Conceptual framework**

This conceptual framework is a framework that the researcher believes best explains the natural course of the subject under investigation. It is linked to the researcher's conceptions, empirical study, and essential theories for advancing and systemizing his or her expertise (Peshkin, 1993). A conceptual framework for evaluating the impact of risk management practices on project risk management processes and finding the links between project risk management processes and successful project outcomes has been developed based on the literature review.

## **CHAPTER THREE:**

### **3.1 Research Methodology**

This chapter explains the methodologies used in this study, including the selection of specific research designs, data types and sources, research approach, data gathering technique and instruments, sampling and sampling techniques, and data analysis techniques, as well as the justifications for each approach.

### **3.2 Research Approach**

This research study's typology can be considered from three perspectives: from the point of view of the research study's application, from the point of view of the research study's objective, and from the point of view of the research study's mode of inquiry (research process). This research focuses on the applied research approach, which assesses the present Ethiopian toll road enterprise project practices and identifies the significant risk areas, based on the application. Similarly, the research is descriptive in nature, with the primary goal of describing the current condition of affairs without the need for personal intervention, based on surveys and fact-finding inquiries. When looking for information, the research employs both quantitative and qualitative methods. Quantitative research is used to study phenomena that are quantifiable and can be expressed numerically. The focus of qualitative research is on qualitative phenomena. A qualitative study is one that seeks to understand how individuals feel or think about a certain topic. In the behavioral sciences, where the goal is to find fundamental causes for human behavior, qualitative research is very significant.

This study gathered information from interested parties about risk management practices in some of Ethiopian toll roads enterprise projects.

### **3.3 Research Design**

The research design utilized in this work was descriptive type. The study is descriptive in nature, since it seeks to address the question of how risk management strategies and practices were implemented in the Ethiopian toll roads enterprise various projects. The descriptive section of the study also shows the success rate of the projects in the study in terms of completing them on time, on budget, and to the promised quality level through project risk management process.

### **3.4 Population of the Study**

A target population is a group of individuals or an object for which questions can be asked or observations made in order to develop the necessary data structures and information (Hair et al. 2010). As a result, the study's target demographic was mostly projects carried out by the Ethiopian toll roads enterprise at similar time. The analysis used a sample of projects from the ETRE's overall project portfolio. Then, from among the sample projects chosen for the study, project team members were asked to fill out a research questionnaire.

### **3.5 Sampling Technique**

Non-probability sampling is a method of collecting data that is based on the deliberate selection of some universe units. It's the point at which some aspects are more likely to be chosen than others. In other words, in non-probability sampling, the investigators purposefully chose certain units of the universe to make up a sample on the assumption that the little mass they choose out of a large one will be typical or representative of the entire universe.

Among different non probability sampling purposive sampling type was applied for this study. According to (Creswell, 2009), while using purposive sampling respondents were chosen based on their convenience and availability. So, in this research, Because of this expertise knowledge is used for selecting units.

### **3.6 Sampling Size**

As a result, the stakeholders involved in the ETRE's building construction project were the target demographics for this study. As a result, the research sample size was since the population is small in size it was taken as cense population by using a purposive sampling technique to identify people who were suitable for the study, and the questioner was conducted with a project managers and other members of the project team who are experts in the field. So, the total sample size will be according to the enterprises structure project handling peoples taken as cense population taken those participating on the project.

### **3.7 Method of Data collection**

A survey research is a common approach of gathering information about a target population. There are many distinct types of surveys, as well as numerous various ways to administer them

and many different sample methodologies. Questionnaires are one of the most important aspects of a survey study: they are a set of questions that are used to collect data from individuals.

Multiple approaches are valuable, according to Tashakkori and Teddlie in Saunders, et al., (2007), if they provide a greater opportunity for you to answer your research questions and if they allow you to better evaluate the extent to which your research findings and inferences may be believed. As a result, the research used both qualitative and quantitative data collection methodologies to balance out the flaws of each.

To address the necessary information from diverse individuals of the project team area, I collected both primary and secondary data. To have a better understanding of the subject under study, various enterprise project materials, including archived records, will be analyzed. The questionnaire consists of some pages and was developed as a research tool for this study and it of closed questions. The questionnaire is developed in English and consist of the following sections; rich questions. Structured questioners and some semi-structured interviews will be used.

### **3.8 Validity and Reliability of the Data**

The degree to which an instrument measures what it claims to measure is known as validity. The degree to which an instrument measures what it is designed to measure based on objective is referred to as validity. It relates to the relevance, usefulness, and appropriateness of evidence used to support interpretations (Cooper & Schindler, 2003). Validity of the questionnaire is determined through conversations with my adviser in order to reduce errors caused by questioner selection and design. The consistency with which an instrument measures the construct or content area it is designed to measure is referred to as reliability.

Reliability refers to the trend toward consistency exhibited in repeated measurements (Carmines & Zeller, 1979). By delivering the same test to the same people or asking the same questions in different ways in different parts of the interview and questionnaire, the research was able to determine the instruments' dependability. This was accomplished by rephrasing the same question at a later date or in different sections of the questionnaire. The consistency of the data between the two measurements was used to assess the instrument's reliability. In addition to

check the questionnaire item’s internal consistency, the research used Cronbach ‘s alpha test coefficient using SPSS software its reliability value of total becomes 0.906.

Categories of Questioners	Cronbach's Alpha Value
General Overview of ETREs Risk Management Practice	0.900169496
Project Risk Planning	0.898125343
Project Risk Identification	0.901569186
Project Risk Analysis	0.906006713
Project Risk Control and Response	0.90391328
Project Completion Success	0.905577046

Table 1:Reliability value in each category

The total reliability value by taking the average shown is below:

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
0.908	23

Table 2:Table total reliability value

### **3.9 Ethical Consideration**

The purpose of research ethics is to ensure that no one is hurt, biased, or experiences negative repercussions as a result of study. Through verbal explanations, all participants were sufficiently informed about the study's goal. At all times, the researcher had adhered to the highest ethical standards moments during the research participants' engagement

## CHAPTER FOUR

### 4.1 RESULTS AND DISCUSSION

#### 4.1.1 Introduction

This chapter is on data analysis, which is the act of critically reviewing the data collected in the subject of research. In order to answer the study questions, a total of 30 questionnaires were personally administered to team members of projects performed by the Ethiopian toll roads enterprise, as detailed in the research methodology in Chapter Three. The questioner is adopted from Addis Ababa university published paper (Gudeta kuma,2018, ''*The Role of Project Risk Management Practices for Project Success*:).

Face-to-face interviews with some team members were held in addition to administering the questionnaires, and some firm records were studied in order to gain a general picture of the matter under examination. The interview data is subjectively analyzed and is not discussed separately; rather, it is utilized to supplement the information gathered through the questionnaire. The first section attempts to assess the response rate as well as the demographics of the respondents in terms of gender, education, job title, and experience. The second section is to show the results of the questions posed to assess the overall risk management practice of Ethiopian toll roads. The third section covers risk management procedures (risk planning, risk identification, risk analysis, and risk control and reaction), while the last section evaluates the previous project's cost, schedule, and quality.

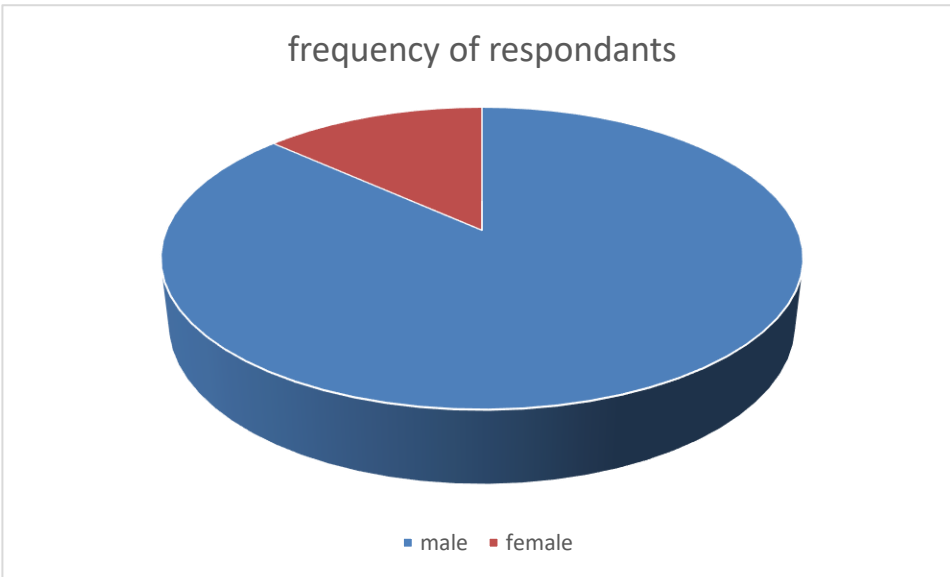
#### 4.2 Response Rate

The response rate was deemed adequate for the study's purposes. According to Mugenda (2003), a response rate of 50% is satisfactory, 60% is good, and more than 70% is rated very well. A total of 37 people was surveyed for the study. All 30 respondents completed and returned the questionnaires to the researcher, but seven of them had missing data and were therefore excluded from the study. Therefore, the response rate is found to be 81.67% which is rated —very well. Furthermore 4 respondents from different job title were successfully interviewed by the researcher in order to fill the gaps in the analysis of the findings from the questionnaires.

### 4.3. General questions on demographic characteristics of respondents

This section contains general information about the study participants, such as their gender, age, educational level, and experiences in the Ethiopian toll roads enterprise of project management office. As a result, the information is provided in the graphs below

Figure 1: Gender profile of respondents



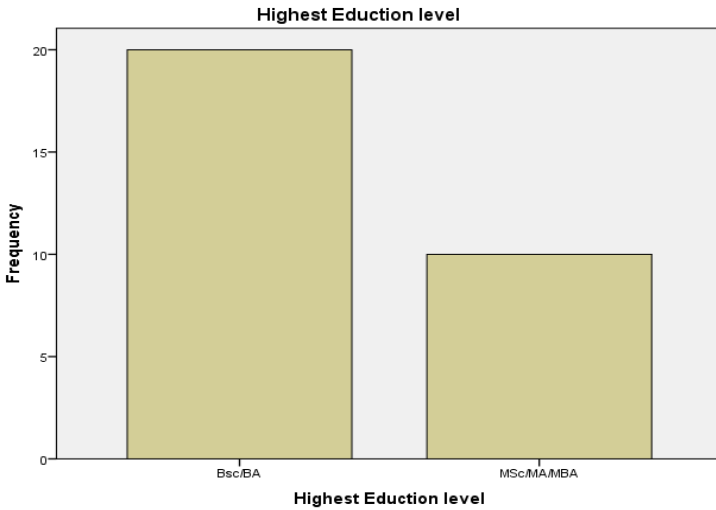
Source, survey data, 2022

It can be seen that over 86.7% of the responders are male, while only 13.3% are female. This supports Nuanthip and Tanit's (2012) assertion that the construction business is related with male dominance, as evidenced by physical strength, adaption to severe outdoor working circumstances, and aggressive language.

Furthermore, the table demonstrates that males dominate decision-making roles in Ethiopian toll roads enterprise projects (project manager and project management team members).

With regards to education levels: 66.7% of the respondents have Bsc/BA degrees and 33.3% of the respondents have MSc/MA/MBA degrees.

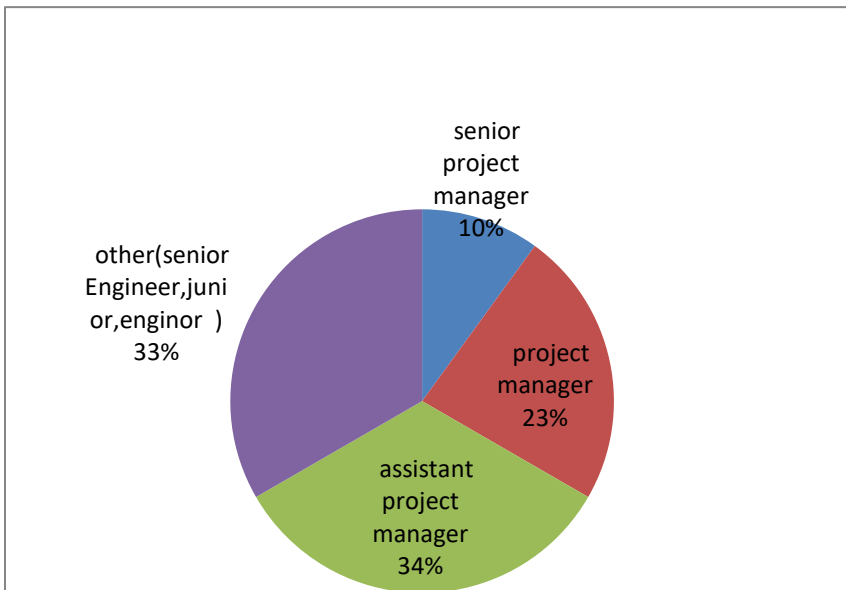
Figure 2: Educational level of respondents



Source, survey data, 2022

When we look at the job titles of the respondents, we find that 10 percent are senior project managers, 23 percent are project managers, 34 percent are assistant project managers, and 33 percent have other titles, mostly site engineer and office engineer. From the respondents job title perspective, almost all of them are close to the project related information .

Figure 3: Job title of respondents

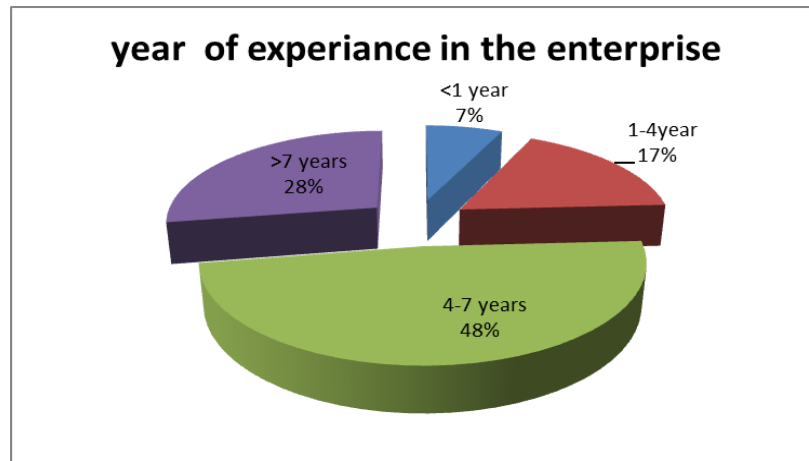


Source, survey data, 2022

The figure below gives a highlight of the experience of the respondents in the construction industry



Figure 4:years of experience on the project work



Source, survey data, 2022

The enterprise is new for the sector which has 8 years of experience since the establishment so the employees represented on the project have relatively good experience.

#### 4.4 General Overview of ETREs Risk Management Practices (GRMP)

In this section, this research tried to assesses general overview of risk management practices which generally includes the standard risk management process, the way of continuous treatment, the police and guideline they use and the representation of the responsible person on the project. In addition, the type of risk encounter mostly also included. Based on the questioner respondents 38.8% of them only agreed in having the overall standard of risk management practices.

Table 3:General overview of ETREs risk management practices (GRMP)

General overview of risk management process		The projects had a defined or standard risk management process.		Risk management is treated as a continuous process in the project		there is a policy or guideline that recommends how to manage unexpected uncertainties.		There is a responsible person or department assigned to handle risk when it occurs.		In general, the responsibility of risk management is completely understood in your Project	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Valid	Strongly Disagree	4	13.3	4	13.3	4	13.3	2	6.7	2	6.7
	Disagree	11	36.7	8	26.7	6	20.0	4	13.3	8	26.7
	uncertain	5	16.7	2	6.7	19	63.3	8	26.7	6	20.0
	agree	6	20.0	12	40.0	1	3.3	16	53.3	14	46.7
	strongly agree	4	13.3	4	13.3						
	Total	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0
Mean value		2.833333		3.13333		2.56666		3.266667		3.06666	

Source, survey data, 2022

Standard risk management process has a great impact in overall risk handling which influences the project success. Based on the respondents 33.3% of them are agreed that the enterprise has standard risk management procedure, which shows a great gap in the system. Similarly, treating risk management process as continuous process shows 53.3% respondents are agreed and 40% are disagreed which shows ambiguous attitude among the employees of the enterprise.

Assessing the company’s guideline that recommends how to manage unexpected/ uncertainties the mean value (2.56) shows it companies least practice which needs more improvement.

The enterprise implements its own project and similarly outsource the project according the procedure, the research assessed that weather the enterprise assigned responsible person/department for the project risk it occurs. The mean value (3.2) show that still it is unsatisfactory unclear experience existed. In addition, employees’ attitude is assed that risk management is completely understood in the project work and response show that (mean value-3), there is uncertainty exist.

Specifically, when we look up the type of risk encounter, the most commonly types of risks (financial, technical, market, operational and others) which are mentioned on the questioners, according to the respondents ETRE has face 3 major types of risks (operational, technical and

financial risks) among them operational risk composes 43% of major risk, which indicates the company should evaluate its internal working environment.

Table 4:commonly exposed risk types

		Frequency	Percent
Types of risks	Financial	7	23.3
	Technical	8	26.7
	Market	2	6.7
	Operational	13	43.3
	Other		
	Total	30	100.0

Source, survey data, 2022

In addition, in the interview result, it is confirmed that the enterprise has not a well-organized and standard risk management process, meanwhile most risk is managed during the projects implementation period when they occurred. Since the enterprises establishment time is short relatively to other similar sectors, the experience is immature which is mostly taken as a reason for lack of standard risk management.

However, it is clear that a large number of project managers still believe that risk management involves a great deal of work, for which they do not have time, and this is particularly common in projects addressed by SMEs (Marcelino-Sádaba *et al.*, 2014). This is clearly reflected on ETREs project where employees were loaded with other additional work which specifically shown that most of the company’s risk type is operational risk.

#### 4.5. Project risk planning in ETRE Projects

The first and most important step in the risk management process is project risk planning. In this assessment study, I attempted to determine whether risk management planning had been adopted in the enterprise project prior to its launch. In addition, stakeholders' participation in risk planning and environmental issues are included in this category to contrast the firms' practices. On order to evaluate the employees’ attitude towards to what extent they agree that effective risk planning at the beginning of the projects contributes to the success of the projects also included

Table 5:Project risk planning Assessment

project risk planning	Risk management planning was implemented in the enterprises project before the project is launched		Relevant stakeholders are involved in risk management planning		Environmental factors are taken into account during risk planning		Risk management planning in ETREs project communicates the intended actions		To what extent ETRE agree that effective risk planning at the beginning of the projects contributes to the success of the projects		
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Valid	Strongly Disagree	8	26.7	2	6.7	2	6.7	6	20.0	3	10.0
	Disagree	5	16.7	5	16.7	6	20.0	5	16.7	4	13.3
	uncertain	3	10.0	14	46.7	11	36.7	7	23.3	6	20.0
	agree	14	46.7	9	30.0	11	36.7	12	40.0	13	43.3
	strongly agree									4	13.3
	Total	30	100.0	30	100.	30	100	30	100	30	100.
Mean Value	2.7666		3		3.0333		2.8333		3.3666		

In this category, the first question was to assess whether enterprises implement risk planning before the project is launched. And the 46.7% respondents were agreed that the company utilize the risk planning which shows that it has a great gap on this practice area. Similarly, stockholder’s involvement is assessed on the risk planning respondents replay show that still there is unclear or uncertain result. So as shown in the literature review stockholders involvement has a great impact in risk planning before the project launch. Taking environmental factor into account has also essential part in planning risk before the project is launched. The respondents mean value result show that, there is uncertainty or unsatisfactory practice. Which the company should take SWOT (strength, weakness, opportunity and treat) analysis to identify the environmental factors. The other question covered in this survey was to check whether the enterprise considers risk management planning communicates as intended actions. So according to Respondents only 40% are agreed that it is considered as intended action. If the risk management planning is not considered as intended action it becomes very difficult for other risk management process so the enterprise should revise project handling procedure. Finally, in this

questioner category, employees' attitude was assessed toward effective risk planning would bring project success. So only 53.6% respondents are agreed on the issue which needs attitude building should be given. The interviewers reflect that risk planning is not directly implemented on the project but they mentioned that it is considered in the technical specification, which is unclear and not procedural.

Based on the literature review planning for risk management had a significant positive impact on project success. In his study, Cooke-Davies (2000) discovered that risk management planning has a beneficial impact on project success. "You notify project team members what you want to do by completing risk management planning.; you state that risk management is critical...". So, the enterprise should work more on risk planning by considering the importance.

#### **4.6 Project Risk Identification**

Like other project risk management process, the main purpose of project risk management is to protect the project from overrun budget, schedule dalliance and standard quality output. So, the risk should be analyzed before likelihood of occurrence. So, in the ETRE context only 60% respondents agreed Structured and formal risk identification is practiced in ETRE projects. Similarly, the company's practice was assessed whether it identify sources of risks, areas of impacts, and their corresponding causes and potential effects in the project. And the response show that (mean value,2.3) it has poor practices.

Also, employees' attitude is assessed towards effective identification of risk contributes to the success of the project, shows that 70% of them are agreed. Which indicates employees have positive feedback on it.

Table 6 ETREs assessment on identified risk

project risk identification	Structured and formal risk identification is practiced in ETRE projects		Sources of risks, areas of impacts, and their corresponding causes and potential effects were identified in the project.		effective identification of risk contributes to the success of the project?		
	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Validity	Strongly Disagree	3	10.0	4	13.3	1	3.3
	Disagree	9	30.0	14	46.7	6	20.0
	uncertain	16	53.3	10	33.3		
	agree	2	6.7	2	6.7	7	23.3
	strongly agree					16	53.3
	Total	30	100.0	30	100.0	30	100.0
Mean Value	2.566667		2.333333		4.03		

Source, survey data, 2022

In general, as mentioned in the literature review the purpose of identifying and assessing risks is to guarantee that potential hazards are assessed and managed in a way that allows for the achievement of the overall objectives. In the research of assessing ETREs way of identifying the project risk is summarized below.

Table 7:Way of identifying risk ETREs

How does ETRE identify risks					
Way of identifying risk		Frequency	Percent	Valid Percent	Cumulative Percent
		Brainstorming	4	13.3	13.3
Expert judgment	14	46.7	46.7	60.0	
From previous project	10	33.3	33.3	93.3	
Delphi techniques	2	6.7	6.7	100.0	
Total	30	100.0	100.0		

Source, survey data, 2022

Concerning to the last enterprises project experience, how the company identify the risk encounter is categorized based on the brainstorming, expert judgement, Delphi technique, or

from previous project lesson learning. The respondents replay show that 46.7% is based on the expert judgment. Expert judgment will have a good impact in the identification of risk on the risk management process. But it might not involve employees and other stakeholders' involvement. So according to scholars, the quality of the primary identification phase within the risk management process has a big impact on the success of later phases within the process (Chapman, 2001). The initial step at the early phase of the project should form the basis by which strategies, policies, uncertainties and risks are established when it comes to management and allocation (Potts, 2008).such practice is not well defined in the enterprise experience because as shown on the result it has undefined structural and formal practice around identifying risk.

Similarly, the result and the purpose of identifying and assessing risks is to guarantee that potential hazards are assessed and managed in a way that allows for the achievement of the overall objectives. Due to the ever-changing nature of risks throughout the life cycle of a project, risk management must be a continuous effort (Potts, 2008). From the result of ETREs experience the risk management is not considered as a continues process which clash with the literature review. Likewise, according to Chapman and Ward (2003) discusses the need to identify sources and associated possible responses as well as secondary sources that arise from these responses. Nevertheless, ETREs practice in identifying possible risk source is insufficient.

Similarly, during the interview I held on project risk identification, mostly implemented when there is a sign for uncertainty is happening. They mentioned that there are no guidelines that support early identification of risk. In addition, since most projects are initiated urgently project managers don't get time to identify the risk.

#### **4.7 Project Risk Analysis**

The identification of risk is merely the first step; some of the dangers detected may be more serious and require further investigation. Before moving on to response management, the next step is to quantify their significance. The goal of risk assessment and analysis is to describe and prioritize risk scenarios as completely as possible (Schieg, 2006).

Table 8:project risk analysis

project risk analysis		ETRE Assessed likelihood of occurrence and impact magnitude on project success		ETRE asses impacts of identified risks fast enough to see its impacts on project success		Project documents and risk register are updated after assessment of the risk that might occur was undertaken.		Effective risk analysis contributes to project success	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%
Valid	Strongly Disagree			6	20.0			3	3.3
	Disagree	11	36.7	6	20.0	14	46.7	13	13.3
	uncertain	7	23.3	6	20.0	12	40.0	13	13.3
	agree	2	6.7	12	40.0	4	13.3	23	23.3
	strongly agree	10	33.3					47	46.7
	Total	30	100.0	30	100.0	30	100.0	100	100.0
Mean Value		3.36667		2.8000		2.6667		3.9667	

Source, survey data, 2022

In this research paper the enterprises risk analyze practice with respect to their likelihood of occurrence and impact magnitude on project success, its quick response and how well Project documents and risk register are updated after assessment is included.

The enterprise experience in assessing risk before likelihood occurrence and determining impact of magnitude evaluated and 40% respondents are agreed. Which shows the rest have not clear convention or not agreed on the issue.

Also assessing risk in right time fast enough to see the impact on the project success shows that (mean value, 2.8) it has poor efficiency. Similarly, Project documents and risk register are not well updated after assessment of the risk that was undertaken.

In the survey respondents' attitude was assessed towards effective risk analysis contributes to project success, and it suggest that employees have positive feedback on it.

During the interview, it is confirmed that project risk analysis is not directly included in the project documents so that the magnitude of the impact is not prioritize. Individually the employees are aware about the importance of risk analysis but since most of them are loaded with other subordinate work they give less credit.



Bannerman (2008), Raz et al. (2002), and Voetsch et al. (2004) looked into the numerous actions that take place within the risk management process for various types of projects. They've come to the conclusion that the steps of identification, analysis, answers, and evaluation are in the right order. But according to Voetsch and colleagues It is done in practically all of the projects, according to al. (2004). Risk analysis, on the other hand, is rarely carried out. Similarly, According to Besner and Hobbs (2006), project managers do not consider risk analysis to be important. Particularly quantitative risk analysis has the potential to be useful. This gap is similarly reflected in the enterprises risk analysis practice.

#### 4.8 Related to Risk Response, Control and monitoring

The identification and examination of the project's risks, an effective risk response strategy is implemented in order to take the necessary steps to reduce risk's negative consequences on project objectives.

Table 9: strategy to respond and control risks that affects project

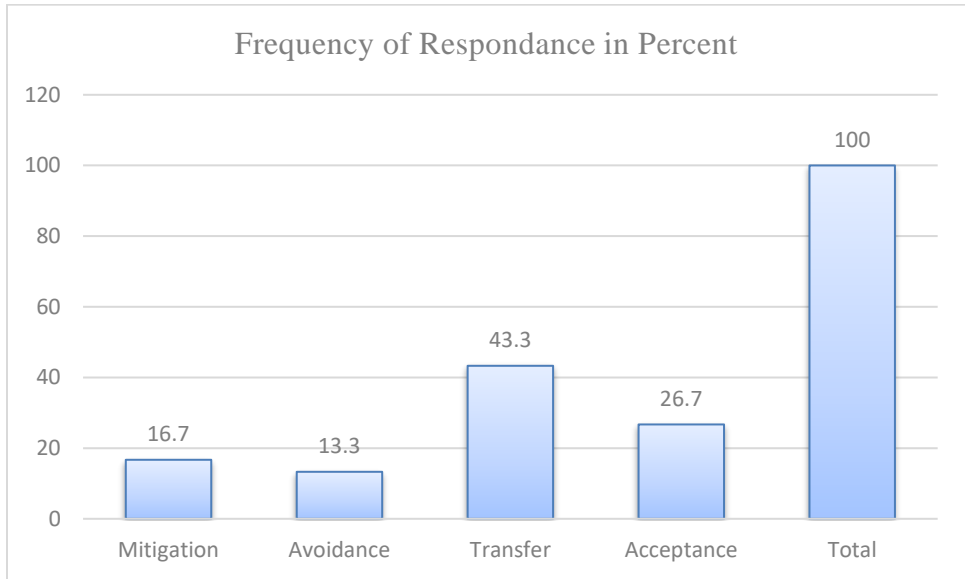
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	23.3	23.3	23.3
	Disagree	8	26.7	26.7	50.0
	Uncertain	9	30.0	30.0	80.0
	Agree	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

Source, survey data, 2022

In the project implementation period project risk response and control will be executed according to the project risk plan. The past ETREs project experiences show that the enterprise has very poor project response and control based on the respondents' agreement. (20% only agreed).

In the literature review part, I discussed different types of project response strategies and in the ETREs scenario respondents replay their view as follows

Figure:5 types of response



Source, survey data, 2022

Among the four major project risks response strategies the respondents replay almost even distribution. But the 56.7% of them agreed that risk transfer strategies is mostly implemented. Banaitiene & Banaitis (2012) proposed four potential techniques for dealing with risks in a construction project: risk avoidance, risk transfer, risk mitigation, and risk acceptance. Based on the survey result the enterprises uses risk transfer mostly which is relevant to avoid delays, cost overruns, change orders, and design omissions and errors caused by unforeseen contingencies, extensive knowledge exchange on the nature of the risks discovered and evaluated can be used to shift risks to another phase of the project (Rodriguez et al., 2010). This runs the risk of not managing the problem at the source and instead moving it to a later phase, where the level of risk may increase or change. Similarly, Chan and Au (2007) claim that when risk is transferred, there is usually a time overrun in the project since the team members and nature of the job in the altered phase may be different which is clearly reflected on ETRs project.

Table 10: awareness of respondents' in risk impact

To what extent ETRE agree or disagree with the statement "The response taken to different risk have an impact on project success"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	16.7	16.7	16.7
	Uncertain	4	13.3	13.3	30.0
	Agree	13	43.3	43.3	73.3
	strongly agree	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

Source, survey data, 2022

Since the respondents are directly related to the enterprises project assessing their attitude concerning to "the response taken to different risk have an impacts on project success" 70% of the strongly agreed and agreed to the impact of risk responses on the project work success which shows the involved personnel has good awareness on it.

To fulfill the questioner, I interview some of the project members that how they manage the control and responded on risk when it occurred and the replay show that the enterprise mostly transfers the risk to the contractors and subcontractors through written contract agreement. In addition, the goal of risk monitoring is to see if Risk responses were done according to plan, weather risk response actions as effective as they should be, or should additional responses be developed? And the assumptions made during the project are still valid which is no totally implemented in the enterprise.

#### 4.9 Related to former Project Success

Risk management assists project managers in setting priorities, allocating resources and implementing actions and processes that reduce the risk of the project not achieving its objectives as mentioned by Benha University, January (2012), project risk management. So, among the most typical constraints of project management, cost, schedule, and quality, this article examined the overall performance of ETRE's most recent completed project.

Table 11:project completion success

		Completed in scheduled time	Completed in budgeted cost	Completed in specified quality
Valid	Strongly Disagree	13.3%	10%	0
	Disagree	46.7%	16.7%	0
	Uncertain	0	26.7%	20.0%
	Agree	33.3%	41.6%	66.7%
	strongly agree	6.7%	5%	13.3%
	Total	100.0%	100.0	

Source, survey data, 2022

From the above table, the 40% of respondents are agreed that the completed projects are done in scheduled time where as 60% of the disagreed that the projects are on the right time. This shows that the company's projects have been completed in extended time. similarly, according to respondents 46.6% of agreed that the projects are completed within budgeted. Whereas 26.7% of them are disagreed and 26.7% were uncertain about it. So still shows the company overall project budgeted cost is unsatisfactory. When assessing the quality of project delivery 80% of them agreed that the project completion is in the specified quality which shows companies good quality control system.

The use and application of a formal project management processes will ensure that the institution delivers valuable projects on a consistent basis (Kohlbacher & Gruenwald, (2011) Calabrese, (2016) Gardiner, (2016). So, the enterprise valuable project delivery based on cost, schedule and quality, which the enterprise should work in saving time and overrun budget.

#### 4.10 Summary of Descriptive analysis

The mean score for each of the six variables was derived to generalize the findings of the descriptive analysis, as shown in the table below:

Table 12:descriptive statistics

<b>Descriptive Statistics</b>					
	N	Minimum	Maximum	Mean	Std. Deviation
General overview of risk management process	30	1.20	4.00	2.9733	.87688
Project risk management planning	30	1.60	4.20	3.0000	.86463
Project risk identification	30	2.00	4.00	2.9250	.59506
Project risk analysis	30	1.75	4.00	3.2000	.68983
Project risk control and response	30	1.67	4.00	2.8778	.68079
Valid N	30				

Source, survey data, 2022

The entire enterprise general risk management procedures were assessed in the project risk management process, as indicated in the table, and the response is unsatisfactory. Similarly, respondents are still unsure about project risk planning with a mean value (3), and the risk identification method requires more detail work for the organization. In comparison to other processes, the risk analysis practice has insufficient approach, which needs more improvement. When we examine risk control and reaction, the mean value (2.8) reveals that it has the least amount of enterprises practice.

## CHAPTER FIVE

### 5.1 Summary, Conclusions and Recommendations

The important findings derived from the data analysis are summarized in this chapter. Following that, the researcher presents his conclusions regarding the project's risk management practice based on data analysis, as well as recommendations for additional activities that the researcher offers to improve the enterprises project's risk management practice.

### 5.2 Summary of basic findings

The role of risk management practices on project success was examined in this study using sample projects from the Ethiopian toll roads enterprise. By researching various literatures and discussing practical experiences in real projects, the study's findings provide a good knowledge of the practice of each risk management process group (Risk planning, Risk Identification, Risk Analysis, and Risk Control and Response).

The summary of results of the study includes

- According to the response obtained with respect to the general overview of the practice of risk management in the projects, most of the respondents replied that the project they participated has lack of well-defined standard in project risk management process and also concerning to the representation of responsible person for project, respondents replied even if there is ,un distinguished duty and responsibility existed. Relating to the type of risk encounter, from the past projects and ongoing projects operational risk will held almost half from other types of risk.
- The ETREs habit of generating an effective risk management plan in projects is ranked below average. Similarly, as a reaction of the survey participants, stakeholder involvement and including external factor also limited.
- Risk identification is below average in the ETREs sample taken projects. Based on the respondents' t expert judgment was used to identify project risks in the example projects. The risk identification procedure was not completely participated in by project team members.
- The response developed to the risk that may encounter the project is not also well developed and is not analyzed before the like hood to occur. Similarly, the project documents and risk registered are not update after the assessment.

- According to the respondents', the project control and response is unsatisfactory with respect preparing control and response strategy. From the project participated responds reflected mostly the enterprise uses risk transfer.
- General overview respondents with respect to cost, quality and schedule, which is base for project success, were assessed in the survey. And according to the result cost overrun and schedule delay were the major impact seen after the completion of the project.

### **5.3 Conclusion**

This study has been conducted in the assessment of the practice of project risk management on Ethiopian toll roads enterprises projects. Project success, according to the Project Management institute (2008), is completing a project on time, under budget, and to agreed-upon quality.

In the general overview of risk management process practice the enterprise project handling was assessed and based research result it has lack of standard risk management process similarly there is no clear policy and guideline that how to manage uncertain events occurs on the project. During the interview and likewise on the questioner, the responsible person for the project handling will not fully dedicated, even if the person is dedicated there is no clearly define duty and responsibility set up. And the mostly reflected type of risk is operational risk which the stakeholders' and the top management should examine its internal working environment.

In the first risk management process, project risk planning, implementation has poor practice on the enterprise and the stockholders' involvement is uncertain according the respondents' which shows stockholders might have direct involvement or not. Similarly, the environmental factors and project communication are not intended to include in the planning. Assessing the respondents' which have direct involvement in project work concerning to, the awareness of effective risk planning on the success of the project has a positive replay.

Risk identification practice in the enterprise has not a standardize way of identifying the risk, in addition most of the time the enterprise uses expert judgment way to identify the risk which might not participate other stockholders. Meanwhile the employee's awareness has a positive convention concerning to the identification of risk and impact on project success.

Concerning to the risk analyzing that includes the practice of risk analyzing with respect to their likelihood of occurrence and impact magnitude on project success, ETRE took some actions but still unsatisfactory, similarly there is a lack of immediate response to react on the solution. As mentioned in the literature review priorities the risk will have a great influence on the project

success. According to the respondents' the company didn't clearly priorities the risk impacts. In addition, project documents and risk registration are not updated on time. But the awareness of employees has positive replay on the effective risk analyzation on success of the project.

Effective risk control and response has a great impact on the risk management process, so assessing ETREs practice specifically developed strategy within the project, the respondents' replay there is a poor practice. And the mostly strategy company using is risk transfer.

Finally, in this research the last experience of the enterprises' project completion is assessed based on the schedule, cost and quality. Based on the respondents' project completion on scheduled and cost has poor efficiency while quality completion has a positive replay.

#### **5.4 Recommendation**

This research study's main goal is to determine the actual risk management practice of Ethiopian toll roads construction projects. The following recommendations are forwarded based on the findings described above:

- The enterprise should clarify what the word "project risk" implies and convey it widely to project stakeholders so that everyone understands what it means in terms of project goals. The project should clearly define and convey the goal and objective of project risk management to all project stakeholders.
- The project must have a risk management technique that is implemented on a regular basis and is integrated into all project operations.
- Relevant stakeholders should be assigned appropriate risk management roles and responsibilities. Each of the project's most critical risks will have risk response owners assigned to them.
- Risk management procedures that regulate how project risk management should be regularly applied throughout the project should be clearly developed and unambiguous.
- The enterprise project practice should provide a timeline for risk management operations such as risk identification, assessment, and all mentioned project risk management processes.
- The enterprise must have well defined and regularly used risk rating guidelines for assessing both the likelihood and effect of risks. As a result, a risk priority and impact matrix must be designed and presented to all project stakeholders, as well as risk



reporting and documentation requirements.

- For all possible risks, including positive risks, the enterprise should develop an adequate risk response plan (opportunities). Furthermore, the existing response(s) to the project's most serious hazards must be properly documented. Using cost-benefit analysis, the project will examine the prospective cost in relation to the benefit delivered by the solution. Furthermore, risk response choices must be evaluated to see if they are in line with the project's stated objectives.
- To increase the project team's effectiveness in managing risks under their respective areas of responsibilities, project team members must participate in project risk management related training or other knowledge-enhancing activities that are compatible with their functions and levels of responsibility.
- There will be a separate department or allocated individual to deal with the uncertainties that arise during the project's lifecycle and who will be provided with necessary resources.

### **5.5 Limitations of the research work**

The study's outcome is solely determined by the individual responses of the respondents who took part in it. Furthermore, because the sample is tiny in comparison to the entire population, the findings may not be generalizable beyond the division from which the sample was obtained. Since the research is descriptive type, only the enterprises' general risk management practice assessed, critical factors specifically are not analyzed.

In addition to the foregoing, the researcher suggests that more research be done on the subject by using projects from various and unrelated industries to examine risk management practices in those projects and investigate their effects on perceived project success.

## References

- Andualem, Y. (2019). Critical Risks in Construction Projects in Ethiopia. *Journal of Advanced Research in Civil Engineering and Architecture*, Ethiopia
- Bahiru , Tai Sik Lee . (2017). The Impact of Risk in Ethiopian Construction Project Performance, *open Access Library Journal*, South Korea
- Benny Bahata,2019, A study on risk attitude and management in construction project evidences from Elmi Olindo construction Plc, *Addis Ababa University publication*, Ethiopia
- Chapman C. & Ward S. . (1997). Project risk management: process techniques and Insights England: *John Wiley and Sons Ltd*, England
- Creswell, J. (2009). Research Design: Qualitative, Quantitate and Mixed Methods Approaches. 3rd Edition. Thousand Oaks, California: *Saga Publications*, USA
- Dauglas, H. (2009). The failure of Risk Management: Why it is Broken and How to Fix It. New York: J.Wiley & Sons.
- Gudeta kuma,2018, ''The Role of Project Risk Management Practices for Project Success: The Case of Projects in the Commercial Bank of Ethiopia'', *Addis Ababa university publication*, Ethiopia
- Karim EL Dash, 2012, project risk management, Benha University, *research gate*, Madagascar
- Koushki P.A. , Al-Rashid K. & Kartam N. . (2005). Delays and Cost Increases in Construction of Private residential Projects In Kuwait. *Construction Management and Economics*, 23(3), 285-294,Kuwat
- Kululanga G. & Kuotcha W. . (2010). Measuring Project Risk Management Process for Construction Contractors with Stataement Indictors Linked to Numerical Scores. *Engineering, Construction and Architectural Management* 17, 336-351.

- Meron Biruu, 2020, Assessing the practice of project risk management a case study of zemen Bank head quarter, *Addis Ababa university publication*, Ethiopia
- Mohamad S.Rahma, 2020, Risk management and risk management performance measurement in the construction project of Finland, Finland
- Tesfamichael, G. (2018). Assesment of the Practice of Project Risk Management System in Ethio-Telecom. *Unpublished Project Work*. Addis Ababa University.
- Tigist, S. (2017). Assesment on Project Managment Practices : a case study on Japanese Social Development Trust Fund Grant Project , Msc Thesis. Ethiopia: Addis Ababa University.
- Toakley A.R. & Ling S.M.C. (1991). Risk management and the building procurement process. *Innovation and Economics in Building Conference*. Brisbane : Australia .
- Wang S.Q, Dulaimi M.F. & Auguria M.Y. . (2004). Risk Management Framework for construction projects in developing countries. *Construction Management and Economics* 22(3) , 237-252.

## Annex

### Questioner and Interview question

**St. Marry University**  
**Department of Project Management**  
**Post Graduate Program**

### Questioner

#### Introduction

Hello. This is Daniel Aragaw. I am a student at St.Marry University at the Department of Project Management. I am conducting a survey on the ASSESSING THE RISK MANAGEMENT PRACTICE OF TOLL ROADS IN ETHIOPIA that was implemented in the Ethiopian toll roads enterprise as part of my academic requirement. I request you to fill this questionnaire for my study purpose. The answers you give will strictly be used for purposes of this study and your identity shall be kept anonymous. However, the outcome of the research can be made available to you if you desire.

Thank you in advance for taking your precious time to fill this questionnaire. Please try to answer all the questions openly, as your answers will have an influence on the outcome of the research. Your 15 minutes or less will greatly contribute to the growth and advancement of knowledge in the company as well as the Ethiopian construction industry. If you have any questions or comments, please don't hesitate to contact me. You can reach me by;

❖☐ Mobile: +251920667151

❖☐ E-mail: daragaw56@gmail.com

With Regards,

**General instruction and information:** section I contains questions on general demographic characteristics of the respondents, section II contains questions that are directly related to the research objectives. Please attempt to answer all the questions and indicate your opinion by marking the appropriate number corresponding to your choice for the five point scale questions and by circling the letter of your choice for the multiple choice questions that best describes how you perceive risk management is applied in the project.

**1. Section one:** General questions on demographic characteristics of respondents

1.1. Gender: \_\_\_\_\_

A) Male B) Female

1.2. Age: \_\_\_\_\_

A) 20-25      C) 31-40      B) 26-30      D)41-50

1.3 Highest educational level: \_\_\_\_\_

A) Diploma      B) BSc/BA      C) MSc/MA/MBA      D) Others: \_\_\_\_\_

1.4 Project name: \_\_\_\_\_ Location: \_\_\_\_\_

1.5. Job title: \_\_\_\_\_

A) Senior Project Manager    B) Project Manager C) Assistant Project Manager D) others:

\_\_\_\_\_

1.6 Years of experience in the enterprise:

A) < 1 year    B) 1-4 years C) 4-7 years D)>7 years

**2. Question Related to General Overview of Risk Management Practices**

1.	The projects had a defined or standard risk management process.	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
2.	Risk management is treated as a continuous process in the project	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
3.	There is a policy or guideline that recommends how to manage unexpected uncertainties.	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
4.	There is a responsible person or department assigned to handle risk when it occurs.	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
5	In general, the responsibility of risk management is completely understood in	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>

	your Project.					
6	To what types of risks your projects were highly exposed to?	1.Financial Risk <input type="text"/>	2. Technical Risk <input type="text"/>	3.Market <input type="text"/>	4.Operation al Risk <input type="text"/>	5. Others <input type="text"/>

**Questions on Project risk planning in Your Project**

7.	Risk management planning was implemented in the enterprises project before the project is launched	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
8.	Relevant stakeholders are involved in risk management planning	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
9.	Environmental factors are taken into account during risk planning.	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
10.	Risk management planning in your project communicates the intended actions	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
11.	To what extent you agree that effective risk planning at the beginning of the projects contributes to the success of the projects?	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>

**Questions on Project Risk Identification**

12.	Structured and formal risk identification is practiced in ETRE projects	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
13.	Sources of risks, areas of impacts, and their corresponding causes and potential effects were identified in the project.	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>
14.	How do you identify risks in your project?	1.Brainstor ming <input type="text"/>	2.Expert Judgment <input type="text"/>	3. From previous projects <input type="text"/>	4. Delphi techniques <input type="text"/>	5. Others <input type="text"/>
15.	To what extent you agree with the statement "effective identification of risk contributes to the success of the project"?	1.Strongly Disagree <input type="text"/>	2.Disagree <input type="text"/>	3.Uncertain <input type="text"/>	4.Agree <input type="text"/>	5.Stronly Agree <input type="text"/>

<b>Questions on Project Risk Analysis</b>						
16.	Risks are formally analyzed with respect to their likelihood of occurrence and impact magnitude on project success	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
17.	ETRE asses impacts of identified risks fast enough to see its impacts on project success	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
18.	Project documents and risk register are updated after assessment of the risk that might occur was undertaken.	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>

19	To what extent you accept the statement "Effective risk analysis contributes to project success"?	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
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<b>Questions on Risk Response and Control</b>						
20	There were a well developed strategy within the project to respond and control to risks that affects project	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
21	What is the response to risk you selected for your project?	1.Mitigation <input type="checkbox"/>	2.Avoidance <input type="checkbox"/>	3.Transfer <input type="checkbox"/>	4.Acceptance <input type="checkbox"/>	5.Others <input type="checkbox"/>
22	To what extent you agree or disagree with the statement "The response taken to different risk have an impacts on project success"?	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>

<b>Question Related to Project Success</b>						
23	Does your project completed within the scheduled time?	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
24	To what extent your project is completed within the budgeted cost?	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>
25	Does your project completed within the specified quality?	1.Strongly Disagree <input type="checkbox"/>	2.Disagree <input type="checkbox"/>	3.Uncertain <input type="checkbox"/>	4.Agree <input type="checkbox"/>	5.Stronly Agree <input type="checkbox"/>

### **Interview questions**

- 1) Can you please tell me about risk management system in the ETRE projects? 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). 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?
- 4). Is there a special department or assigned person to handle uncertainties that occur within the lifecycle of the project? At which stage of the project are risks managed in the projects?
- 5). 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?
- 6). Are risks that might occur identified early while the project is at startup phase? or at all stages of project life cycle When the impacts observed? or risks were identified by examining local/international experiences? or other...? And what methods are used to identify them?
7. Have you experienced unidentified risks coming in the middle of the project or after the project started and threatened to damage your project? If you answer is yes, was the impact financial, schedule, quality or other? how did you manage it ?
- 8). within the project are risks analyzed to assess its probability of occurrence and level of impact?
- 9). what are the tools and techniques used to risk analysis of enterprises project? Brainstorming? Sensitivity analysis?, Delphi method? or other, please state
- 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). which of the following risk response strategy was used in the ETRE projects? Why?  
A. Avoidance B. Transfer C. Acceptance D. Mitigation
- 11). From lists of risks, for which types of risk(s) was/were your project highly exposed to?  
A). Financial B). Technological C). Political D). Market E). Others. Please specify



