

**RISK MANAGEMENT PRACTICES AND IMPLEMENTATION
OF INFRASTRUCTURE CONSTRUCTION PROJECTS IN
GALMUDUG STATE OF SOMALIA**

MOWLID ALI MIRE

**Research Project Submitted in Partial Fulfillment of the Requirements for the
Award of the Degree of Master of Arts in Project Planning and Management
Faculty of Business and Management Sciences University of Nairobi**

2022

DECLARATION

This current research study is my original work which has not been presented for examination in any other university.

Signed: 

Date: 29.09.2022

Mowlid Ali Mire

L50/39425/2021

I have given my approval as the university's supervisor for this research project.

Signed: 

Date: 28.09.2022

Dr. Moses Machuki Maturi Otieno

Lecturer,

Faculty of Business and Management Sciences

University of Nairobi

DEDICATION

This current research study is dedicated to my brother Yasin whose support and encouragement has propelled this far, both financial and moral.

DEDICATION

I dedicate this project to my brother Yasin for the support he accorded me, both financial and moral.

ACKNOWLEDGEMENT

I thank my supervisor for the support and encouragement I received as I was working on this project.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
DEDICATION	iv
ACKNOWLEDGEMENT	v
LIST OF TABLES	ix
LIST OF FIGURES	x
ABBREVIATIONS AND ACRONYMS	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Purpose of the Study	4
1.4 Research Objectives.....	4
1.5 Research Questions	5
1.6 Research Hypotheses	5
1.7 Significance of the Study	5
1.8 The Study's Assumptions.....	6
1.9 Delimitations of the Study	6
1.10 Limitations of the Study.....	6
1.11 Definition of Significant Terms	6
1.12 Organization of the Study	7
CHAPTER TWO: LITERATURE REVIEW	8
2.1 Introduction.....	8
2.2 Implementation of Infrastructure Construction Projects.....	8
2.3 Risk Identification Practice and implementation of Infrastructure Construction Projects ...	9
2.4 Risk Analysis Practice and implementation of Infrastructure Construction Projects.....	11
2.5 Risk Response Planning Practice and implementation of Infrastructure Construction Projects.....	12
2.6 Risk Control Practice and implementation of Infrastructure Construction Projects.....	13
2.7 Theoretical Review	14
2.7.1 Enterprise Risk Management Theory	14
2.7.2 Contingency Theory.....	14
2.7.3 Prospect Theory	15
2.8 Conceptual Framework.....	17
2.9 Knowledge Gap Matrix.....	18
2.10 Summary of Literature	19
CHAPTER THREE	20
RESEARCH METHODOLOGY	20

3.1 Introduction.....	20
3.2 Research Design.....	20
3.3 Target Population.....	20
3.4 Sampling Size and Sampling Procedures	21
3.5 Data Collection Instruments	21
3.5.1 Pilot Testing of the Instruments.....	21
3.5.2 Validity of the Instrument.....	21
3.5.3 Reliability of the Instrument	22
3.6 Data Collection Procedure	22
3.7 Data Analysis and Presentation	22
3.8 Ethical Considerations	23
3.9 Operationalization of the Variables	23
CHAPTER FOUR.....	25
DATA ANALYSIS AND PRESENTATION.....	25
4.1 Introduction.....	25
4.2 Questionnaire Return Rate.....	25
4.3 General Information.....	25
4.4 Reliability Results.....	26
4.5 Descriptive Statistics.....	26
4.5.1 Implementation of infrastructure construction projects.....	26
4.5.2 Risk Identification Practice.....	27
4.5.3 Risk Analysis Practice	28
4.5.4 Risk Response Planning Practice.....	29
4.5.5 Risk Control Practice	30
4.6 Regression Results and Hypotheses Testing.....	31
4.6.1 Regression Results.....	31
4.6.2 Hypotheses Testing.....	33
CHAPTER FIVE	34
SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS	34
5.1 Introduction.....	34
5.2 Summary of the Study	34
5.2.1 Risk Identification Practice and Implementation of infrastructure construction projects	34
5.2.2 Risk Analysis Practice and Implementation of infrastructure construction projects ...	34
5.2.3 Risk Response Planning Practice and Implementation of infrastructure construction projects.....	35
5.2.4 Risk Control Practice and Implementation of infrastructure construction projects.....	35
5.3 Discussion.....	36
5.3.1 Risk Identification Practice and Implementation of infrastructure construction projects	36

5.3.2 Risk Analysis Practice and Implementation of infrastructure construction projects ...	37
5.3.3 Risk Response Planning Practice and Implementation of infrastructure construction projects	37
5.3.4 Risk Control Practice and Implementation of infrastructure construction projects.....	37
5.4 Conclusion	38
5.4.1 Risk Identification Practice and Implementation of infrastructure construction projects	38
5.4.2 Risk Analysis Practice and Implementation of infrastructure construction projects ...	38
5.4.3 Risk Response Planning Practice and Implementation of infrastructure construction projects	39
5.4.4 Risk Control Practice and Implementation of infrastructure construction projects.....	39
5.5 Recommendations for Management, Policy and Practice	39
5.6 Areas for Further Research	40
REFERENCES.....	41
APPENDICES	47
Appendix I: Letter of Transmittal	47
Appendix II: Questionnaire.....	48
Appendix III: List of Projects	51

LIST OF TABLES

Table 2.1: Knowledge Gap Matrix	18
Table 3.1: Target Population.....	20
Table 3.2: Operationalization of the Variables	24
Table 4.1: General Information.....	25
Table 4.2: Reliability Results.....	26
Table 4.3: Implementation of infrastructure construction projects.....	26
Table 4.4: Risk Identification Practice.....	27
Table 4.5: Risk Analysis Practice	28
Table 4.6: Risk Response Planning Practice.....	29
Table 4.7: Risk Control Practice.....	30
Table 4.8: Model Summary	32
Table 4.9: ANOVA Results	32
Table 4.10: Coefficients and Significance	32

LIST OF FIGURES

Figure 2.1: Conceptual Framework	17
--	----

ABBREVIATIONS AND ACRONYMS

APA	America Psychology Association
COSO	Committee of Sponsoring Organizations
M&E	Monitoring and Evaluation
SPSS	Statistical Package for Social Sciences
SWOT	Strength-Weakness Opportunity Threat

ABSTRACT

This study's primary goal was to determine how risk management practices and the implementation of infrastructure construction projects in Galmudug State, Somalia, relate to one another. Specifically, the research sought to determine the influence of risk identification practice, risk analysis practice, risk response risk practice and risk control practice on implementation of infrastructure construction projects in Galmudug State in Somalia. The research was anchored on the enterprise risk management theory, the contingency theory and the prospect theory. Descriptive survey research design was adopted targeting 55 project contractors, sub-contractors, engineers and risk managers from four infrastructure construction projects in Galmudug State and census was used. The primary data was gathered using a standardized questionnaire, and its validity and reliability were then evaluated. The gathered information was analyzed using SPSS version 24. The study results were analyzed using means and percentages as well as regression analysis through SPSS version 24 and presented through tables. The findings were that risk identification practice ($\beta=0.978$) had the greatest effect on implementation of infrastructure construction projects followed by risk analysis practice ($\beta=0.404$), risk control practice ($\beta=0.319$) and lastly risk response planning practice ($\beta=0.209$). The study concludes that project risk management practices have significant influence of implementation of infrastructure construction projects. It was recommended that risk managers working in infrastructure construction projects in Galmudug State ought to leverage the existing risk identification, analysis, control and response planning practices in place so as to counter the negative impacts that are occasioned by occurrence of risky events. The contractors and risk managers working with infrastructure and construction projects in Galmudug State ought to identify clear risk acceptance levels in the projects. Regular tracking of risk status, risk audits and periodic risk reporting ought to be adopted by the risk managers of infrastructure and construction projects in Galmudug State.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Infrastructure construction projects are contemplated as among the most supportive and essential pillars for business environment in an economy (Pimchangthong & Boonjing, 2017). Nevertheless, the construction projects continue to brawl to attain the ideal implementation level. The rate of failure of these construction projects around the world is so alarming. Statistics from GlobalData indicate that in Latin America, most infrastructure construction projects are characterized by cancelations and delays (Data Journalism Team, 2022). Information from North Korea provide evidence that unsuccessful completion of infrastructure construction projects is a global challenge with Ryugyong Hotel, the seventh largest building in the world whose construction started in 1987 although it has remained uncompleted and it is no even likely to be successfully completed any sooner (Dolan, 2020). This has been attributed to high costs required towards its successful implementation (Dolan, 2020).

China has heavily invested in mega construction projects including the underwater railway tunnels but most of them have remained unsuccessful. For instance, since 2011, a total of 8 constructed bridges in China have collapsed in the country resulting into significant loss of human life. In 2012, the Yangmingtan bridge project in China that was valued at \$300 million collapsed (Langfitt, 2012). In India, the face a major problem of inability to implement construction projects at the required paced resulting into a backlog of these projects. Currently, a total of 218 construction projects have been delayed India and the government is facing the challenge of clearing their approval (Nallathiga, Shaikh, Shaikh & Sheik, 2017).

In Pakistan for instance, failure of infrastructure construction project is a common occurrence as illustrated by the collapse of Sher shah Bridge in Karachi (Wasima & Khalidi, 2018). In Jordan, most of the construction projects have remained unsuccessful contributed to by internal system hierarchy particularly from the perspective of the contractors (Khlaifat, Alyagoub, Sweis & Sweis, 2019). Evidence from Iran indicates that 597 thousand billion Rials was invested in construction projects in 2015, although 80% of these projects were unsuccessful while others reported time and cost overruns (Shahhossein, Afshar & Amiri, 2018). Additionally, the Research Center of the parliament of Iran reported that the unfinished construction projects has negatively impacted on

the annual economy of Iran by costing the state above 200 thousand billion Rials which is close to 30% of the development annual budget of the country (Shahhossein et al., 2018).

Ghana's government has been lobbying with the World Bank and the African Development Bank for a sizable sum of money to fund the development of roads, hospitals, and dams in Africa (Damoah & Akwei, 2017). The major emphasis of the past national budgets of Ghana has been on funding construction projects. However, in spite of all these efforts made by the Ghanaian government to support and invest in these construction projects, success of these project has remained a challenge (Damoah & Akwei, 2017, & Damoah & Kumi, 2018). Nigeria is one the countries in Africa that has a high number of abandoned, failed and ongoing construction projects presently (Obebe, Kolo, Enagi, & Adamu, 2020). Some of these unsuccessful construction projects in Nigeria include the Lagos-Calabar Railway Project (estimated at \$11billion USD), Mambilla hydroelectric power plant project (valued at \$5.8 billion), Ibeju Lekki Deep Seaports (valued at \$1.2 billion) with an expected completion by 2021, the Lagos–Ibadan standard gauge rail line (valued at \$2.1billion USD), Baro Inland Port Project (valued at N5.8 billion) (Obebe et al., 2020).

In South Africa, rarely are infrastructure construction projects successfully completed without undergoing some challenges and constraints that lead to cost and time overruns leading of incompleteness or poor quality of the final output (Mugumbate & Kruger, 2021). This challenge has been ongoing especially in public sector leading to failure of construction projects at local, provincial and national government levels (Mugumbate & Kruger, 2021). In Uganda, most infrastructure construction projects have remained uncompleted at varied stages while others have been marked as whiteprint or blueprint and never implemented (Otim, Alinaitwe, Tindiwensi & Kerali, 2012).

The available literature indicates that project risk management practices are enablers of success of infrastructure construction projects (Rodríguez-Rivero, Ortiz-Marcos, Romero & Ballesteros-Sánchez, 2020; Pimchangthong & Boonjing, 2017; Alsaadi & Norhayatizakuan, 2021). Risk identification helps in establishment and categorization of risk whose materialization would have significant adverse implication on the project (Mutunga & Ondara, 2021). Risk analysis is aimed at assessment of risks either on individual or collective basis utilizing qualitative and quantitative

methods so that they are prioritized based on the risk appetite of the project team (Maritim & Chelule, 2018). Risk response helps the project team to identify and select the optimal strategy to address the risks (Imbrizi & Mazieri, 2018). This is characterized by reactivity or reactivity towards risks by the project team. Risk control helps in monitoring the actions put in place for mitigation and undertake reassessment of the already known and the new risks that may emerge as the project progresses in the lifecycle (Aduma & Kimutai, 2018).

After complete failure and collapse of Somalia in 1991, infrastructure development in the country was adversely affected. However, since 2012, an internationally recognized government has been in place. Many areas including Galmudug State were adversely affected in terms of infrastructure development by the decades of civil war. In effort to realize economic recovery, the government of Somalia in collaboration with international partners has been working to implement infrastructure construction projects aimed at opening up the country and spurring trade. The implementation of these infrastructure construction projects in Somalia is critical towards the economic recovery efforts (BTI, 2022).

1.2 Statement of the Problem

Infrastructure development initiatives are crucial for each nation's economic development. A significant proportion of revenue of the government is spent on these Infrastructure construction projects and this holds in countries like Somalia. Notwithstanding, failure of these infrastructure construction projects is a waste of public resources that would otherwise have been spent on other alternatives for economic prosperity. It remains a fact that countries around the world including Somalia have initiated infrastructure construction projects that have not been successfully implemented or completed. In developing countries like Somalia, the risks posed by armed terror groups have been evident creating fear among construction workers of the infrastructure projects thus contributing towards delays, cost and time overruns. The implication of this assertion is that implementation of these infrastructure construction projects in highly risky country like Somalia requires an understanding and appreciation of effective project risk management practices.

The studies that are available include Rodriguez-Rivero et al. (2020), who looked to connect risk management to the implementation of foreign development projects in Cambodia. It was observed that the key risks in development projects are linked to political, cultural as well as economic

factors. Alsaadi and Norhayatizakuan (2021) focused on construction projects and analyzed risk management practices and performance using Oman as the point of reference. A significant nexus was registered between risk management and performance of the project. While focusing on Kenya using information technology projects, KinyuaOgollah and Mburu (2015) did an appraisal of strategies of managing risk and their implication on performance of the projects. The study registered existence of positive nexus between the strategies of managing risks and performance of the projects. In Nairobi, Njuguna (2019) evaluated risk management strategies and how they affected project performance. The research found that the project's performance is significantly influenced by the risk management strategies of transfer, prevention, and control.

The reviewed studies create gaps as some like Rodríguez-Rivero et al. (2020) were done in other countries like Cambodia while Alsaadi and Norhayatizakuan (2021) focused on Oman that are relatively advanced and stable as compared to Somalia. Other studies were conducted focusing on different projects like Alsaadi and Norhayatizakuan (2021) who focused on IT projects away from infrastructure construction projects. To address these gaps, the study sought to ascertain how project risk management techniques relate to the implementation of infrastructure development projects in Galmudug State, Somalia.

1.3 Purpose of the Study

The purpose of the research was to establish how risk management practices influence implementation of infrastructure construction projects in Galmudug State in Somalia.

1.4 Research Objectives

The research was guided by the following objectives:

- i. To determine the influence of risk identification practice on the implementation of infrastructure construction projects in Galmudug State in Somalia
- ii. To establish the influence of risk analysis practice on implementation of infrastructure construction projects in Galmudug State in Somalia
- iii. To analyze the influence of risk response risk practice on implementation of infrastructure construction projects in Galmudug State in Somalia

- iv. To assess the influence of risk control practice on implementation of infrastructure construction projects in Galmudug State in Somalia

1.5 Research Questions

The following research questions were addressed in the study:

- i. What effect does risk identification have on the implementation of infrastructure construction projects in Somalia's Galmudug State?
- ii. How does the use of risk analysis affect the implementation of infrastructure construction projects in Somalia's Galmudug State?
- iii. Does risk response planning practice influence implementation of infrastructure construction projects in Galmudug State in Somali
- iv. To what extent does risk control practice affect the implementation of infrastructure development projects in Galmudug State, Somalia?

1.6 Research Hypotheses

The research tested the following hypotheses:

- H01:** Risk identification practice has no significant effect on implementation of infrastructure construction projects in Galmudug State in Somalia
- H02:** Risk analysis has no significant effect on implementation of infrastructure construction projects in Galmudug State in Somalia
- H03:** Risk response planning practices in Somalia's Galmudug State has no significant effect on implementation of infrastructure construction projects.
- H04:** Risk control practice has no significant effect on the implementation of infrastructure construction projects in Galmudug State, Somalia

1.7 Significance of the Study

The project managers of the infrastructure construction projects in Galmudug State in Somalia would be in position to implement and strengthen the existing risk management practices of their projects. The study would shed light on salient project risk management practices that when

implemented can lead to Implementation of the infrastructure construction projects. The donors and other stakeholders of the infrastructure construction projects in Galmudug State in Somalia would be in position to demand adherence to salient risk management practices for success of the projects they fund. The risk management practitioners in project organizations would understand the relevant risk management practices that when adhered to can enhance project implementation. The research would advance our understanding of risk management strategies and how they improve project implementation. Thus, it would be used as a reference point by future scholars when conducting related studies.

1.8 The Study's Assumptions

The research assumed that the participants to be selected and included in data collection would be the true reflection of the population and able to share accurate information depending on their unique personal experiences. It was assumed that there would be no random and unpredictable occurrence that would have an effect on gathering of information from the participants.

1.9 Delimitations of the Study

The research focused on risk management practices and project implementation. More specifically, the focus of the study was on risk identification practice, risk analysis practice, risk response planning practice and risk control practice all with regard to project implementation. The study focused on infrastructure construction projects in Galmudug State in Somalia.

1.10 Limitations of the Study

Some participants were busy with their workplace activities during data gathering. As such, it was not possible to obtain information from the participants in a single day or session. In order to give the participants ample time to fill out the questionnaires, the researcher dropped the questionnaires and agreed on a later date to pick the filled questionnaire. This gave the participants ample time to share their responses without interfering with their schedules.

1.11 Definition of Significant Terms

Risk analysis practice: It includes qualitative and quantitative analysis of risks, risk assessment and allocation

Risk control practice: It include risk audit, risk tracking and status, corrective course of action and period reporting

Risk identification practice: it covers the tools and techniques for identifying risks, risk registration, determination of the types and sources of risks

Risk management practices: They include the identification, analysis, response planning and control of risks in the infrastructure construction projects

Risk response planning practice: It involve the avoidance, transfer, mitigation or acceptance of the risks **once** they have been identified and analyzed

Implementation of Infrastructure Construction Projects: It includes adherence to time, costs, quality and the satisfaction of the beneficiaries of the projects

1.12 Organization of the Study

There are five chapters in this proposal. The study's background, problem description, general objective, specific objectives, research questions, and hypotheses are all covered in the first chapter. This chapter also look at the significance, assumptions, delimiting and limiting factors and definition of terms are also detailed in chapter one. Chapter two is the review of conceptual, empirical and theoretical literature beside the presentation of conceptual framework and the gaps. In chapter three, the study outlines all the aspects of research methodology. Findings and presentation are detailed in chapter four and a summary, discussion, conclusion and recommendations are addressed in the fifth chapter.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter focus on reviewing literature on project implementation, risk identification, analysis, response planning and control all linked with the dependent variable. The theories anchoring the inquiry are also reviewed and the gaps are indicated in a matrix to provide the rationale for carrying out the proposed inquiry.

2.2 Implementation of Infrastructure Construction Projects

Implementation of infrastructure projects has long been viewed as ability of the project to under its objective identified at the initiation phase under the established schedule and budget. Implementation of infrastructure projects can be examined in terms of attainment of the budget and schedule goals including the need to deliver benefits and meet the expectation of the end users (Kimaru, 2019). It is easier to define the scope of the infrastructure projects more than cost and time. In this regard, scope can be used to refer to the degree which the core deliverable is attained against some establishes specifications. Quality is another important indicator when it comes to determine implementation of the infrastructure projects (Alvarenga, Branco, Guedes, Soares & Silva, 2019).

Developments in literature have resulted into inclusion of additional indicators like the need to attain functional requirements and provision of professional learning to the project team. Determining success of the infrastructure project varies depending on the assessor and therefore detailed comprehension of success should put consideration of varied viewed views and interests (Mutwiri, 2021). Literature provides other indicators that can also be used in gauging implementation of the projects which include efficiency and the resultant impact to end users. Therefore, an integrative approach need to be adopted when determining and gauging implementation of the project (McLeod, Doolin & MacDonell, 2012).

Organizational benefits and project efficiency are other indicators available in literature when determining project implementation. Implementation of the resultant product from the infrastructure project can be determined in terms of the satisfaction that end users derive as well as the resultant benefits. Project implementation therefore can be viewed in terms of the process, product and organization (Alvarenga et al., 2019). Specifications, budget as well as time are the

primary consideration for process implementation. Product implementation places emphasis on benefits to clients and the level of satisfaction. Organization success recognizes the strategic and business related benefits. In a nutshell therefore, implementation of infrastructure projects can be used in reference to the projects completed, adherence to time, compliance with costs and satisfaction of the beneficiaries (McLeod et al., 2012).

2.3 Risk Identification Practice and implementation of Infrastructure Construction Projects

The project cycle's crucial process of risk identification helps to come up with inherent risks likely to have an impact on implementation. Risk identification helps in establishing the key sources and types of risks with proper documentation of their attributes (PMI, 2017). With infrastructure construction projects, it is critical to identify and document the sources and attributes of any inherent risks within a risk register. Once these risks have been identified, prioritization should be conducted for further auctioning through an assessment of the probability of occurring and the resultant impact (Dandage, 2017). Risk identification practice lead to categorization of risks into four key categories: project management, organizational, external as well as technical risks. Further broad categorizations of risks at the identification level include external or internal risks (Pimchangthong & Boonjing, 2017).

Risk identification practice within infrastructure construction projects can be conducted through a number of methods which include the use of document review, checklists, brainstorming, through surveys, after a strength-weakness opportunity threat (SWOT) analysis as well as through use of Delphi method among others. Brainstorming is one of the widely embraced methods of identification of risks in construction projects by the contractors (Ghasemi et al. 2018). Therefore, risk identification is a critical practice within the entire risk management framework of the project organization and it covers such activities as information gathering, leveraging the risk identification techniques and tools and the documentation of all the identified risks in a register for reference. It is a critical practice that helps the project managers to identify the sources and types of risks that are likely to impact on success of the project outcomes (Armed 2019).

A study was undertaken on practices of managing risks and their implication performance with emphasis on construction projects by ALSaadi and Norhayatizakuan (2021) within the context of Oman. This nexus was explored quantitatively with the aid of the survey. It emerged that risk

identification is an instrumental part of the risk management framework that significantly enhance performance of the project activities. Another study whose focus was on risk identification and its essence in the entire risk management framework in project was done by George (2020). In this study, the meaning, significance and effective management of risks were discussed. In addition, the techniques critical for identification of risks were identified, the role of the project risk register and categorization. Given that risks are forms of uncertainties, the need for project managers to carefully plan for them emerged in this study. This calls for the risk management plan that helps in preventing wastage of the resources of the project (George, 2020).

The study by De-Araújo-Lima, Marcelino-Sadaba and Verbano (2021) placed emphasis on how to successfully put in place project risk management with a focus on small and medium firms. This was a cross case inquiry. The participants were project managers drawn from Italy and Spain. It emerged that the features of the project and the attributes of the project organization are instrumental when it comes to adoption of risk management in projects. Research conducted in Rwanda by Igihozo and Irechukwu (2022) placed emphasis on the process of managing risks in projects and the contribution towards performance with focus on construction projects. With the adoption stratified sampling and Sloven's formula in determination of sample size, it emerged from the results that risk identification is an instrumental practices in management of projects that contribute to the overall success of the projects. Another study conducted by Marinich (2020) combined the identification and response to risks and their implication on success of the projects. This was a quantitative correlational inquiry that that was done in United States through survey. The participants were the project managers and it emerged that risk identification and success of the project are significantly connected.

In a study conducted within the context of Kenya focusing on road construction projects, Otaalo, Muchelule, and Asinza (2019) conducted an investigation of risk analysis and identification and their impact on project performance. Leveraging questionnaire as a tool for gathering information, the participants covered 80 managers of the project, engineers, supervisors, inspectors, surveyors and contractors within the County of Kakamega. Both ongoing and the fully completed projects formed the unit of analysis of the inquiry. It emerged from the analysis that risk identification and the practices of managing risks in a project organization are significantly linked with each other (Muchelule & Asinza, 2019). In another study done by Mutunga and Ondara (2021), risk

identification was explored as a general practice in an organization and its contribution towards performance of the projects at Kenya Airports Authority was analyzed. It was observed that risk identification is a critical activity that significantly predicts performance of the project.

2.4 Risk Analysis Practice and implementation of Infrastructure Construction Projects

An analysis of the risks within the project can be conducted through quantitative as well as qualitative methods. Risks are prioritized for additional analysis or auctioning in qualitative risk analysis after their likelihood and impact have been determined. During qualitative analysis of risks, ranking is done ranging from risky events that are high, medium as well as low based on severity of the risk impact and the probability of occurrence (Nturanu & Mundia, 2019). For quantitative risk analysis, the combined impact of the established risks is numerically analyzed and determined for calculation of the frequency of risks and the degree of their impact. There are a number of techniques that play an instrumental role during risk analysis for instance, decision trees, Delphi techniques and sensitivity analysis among others. Thus, risk analysis plays a key role in determining the impact as well as the likelihood of occurrence of the identified risks.

In a study conducted by De-Marco and Thaheem (2014), the key focus was on risk analysis within projects dealing with construction activities. The inquiry aimed at proposing a practical framework methodology for assisting the managers of projects in selecting of ideal techniques of analyzing risk depending on some established drivers of the project. The proposed methodology was an expansion of the traditional indicators of project success to cover both project management organization and project related indicators of successful project undertaking. In a research carried out by Tepeli (2020), the main focus was on risk analysis in the initial phase of the complicated infrastructure projects. It was hypothesized that due to complexity of the infrastructure projects, interdependent risks are so evident. It is very hard when it comes to anticipation and controlling of these risks.

Amoah and Pretorius (2019) did an evaluation of risk management and its implication on performance of small construction entities in South Africa. The adopted design was case study and information was obtained through questionnaire that had undergone structuring. It emerged that the small construction entities had no clearly established processes of managing. Although risk management was not evident, most of the projects executed had attained the indicators of project

performance. The research carried out by Simon and Mutiso (2021) placed emphasis on risk management within projects and the contribution to performance. The focus of the inquiry was on agricultural projects with the county of Nakuru. The study appraised the role of risk analysis as one of the practices of managing risks in projects. Contingent theory provided anchorage to the inquiry and the results obtained confirmed that the analysis of project risks significantly impact performance of projects.

2.5 Risk Response Planning Practice and implementation of Infrastructure Construction Projects

Risk response planning is a process that helps in creation of strategies or options aimed at solving the positive as well as negative risks in projects. Both positive and negative events are viewed as opportunities and risks respectively. Negative risks identified can be treated in four key strategies: avoidance, transfer, mitigation and acceptance (Safaeian, Fathollahi-Fard, Kabirifar, Yazdani & Shapouri, 2022). Risks can be reduced or avoided for infrastructure development projects by removing the source, lessening the specific threat, or transferring the risk to another party. Also, risks can also be accepted in a project organization through the development of a contingency plan that can be implemented in the event that the risk has occurred. For positive risks (opportunities), there are also four alternatives that can be adopted in their responses including exploitation, enhancement, sharing and acceptance (Naji & Ali, 2017).

There is another body of literature that classifies five broad strategies of responding to risky events: prevention, reduction, sharing, transferring and acceptance. Risk prevention covers an array of ways that can be adopted to avoid any inherent risk occurrence as the project moves in the cycle (Yan, Liu, Zhao & Skitmore, 2021). Risk reduction is aimed at minimization of the impact of delays on performance of projects. Risk sharing occurs when a certain percentage of the costs of risks are transferred among parties to the contract. Risk transfer is a situation when all the costs of risks are passed to third parties like insurance firms. Risk acceptance is where all the uncertainties are accepted (Marinich, 2020).

In Malaysia, research with focus on construction projects by Karunakaran, Abdullah, Nagapan, Sambasivan and Sekar (2020) was to link project risk response as a moderator in the nexus between delay factors in projects and performance. This inquiry was a thematic review of the literature in place. A summary of the themes revolved around issues of delay, measures to respond to risks and

performance of projects. It emerged that the nexus between delay issues and performance of the projects was negative. On the other hand, risk response and performance of the project indicated direct link. The study conducted by Ahmadi-Javid, Fatemina and Gemünden (2020) was an appraisal of risk response planning and its implication on project portfolio management. The inquiry offered a method informed by mathematical optimization to come up relevant responses to project risks. The proposed framework was seen to play an instrumental role in management of projects.

2.6 Risk Control Practice and implementation of Infrastructure Construction Projects

Risk control practice helps in monitoring of the execution of the contingency plans with the tracking of the established risks and detection of the emerging ones as well as carrying out an analysis of the effectiveness of the process of managing risks. It is a constant procedure to monitor the project's risk status in order to spot any departure from the desired level of performance (Obondi, 2022). Risk control helps in correction of deviations between the planned and the desired response actions to risks and bringing about an overall improvement in the risk management activities and processes. Uncontrolled risks in construction projects can lead cost and quality overruns as well as the delays in scope and schedule. The various activities that can be done during risk control can range from the implementation of contingency plan, taking of corrective course as well as re-planning of the project. Efforts should be in place for the risk owner to ensure there is periodic reporting to risk team and the project manager (Amoah & Pretorius, 2019).

In a study that was conducted in Kenya by Kiage and Namusonge (2016) covered monitoring and evaluation (M&E) alongside the management of risks and how performance of projects in telecommunication firms. The results were that most respondents rated such factors as the need for regular risk analysis, involving the project managers in analysis of risk all significantly shape performance of the projects. In a different research by Obondi (2020), the main emphasis was on the procedures for managing risks in projects and their impact on the accomplishment of the project's operations. The specific emphasis of the inquiry was on construction projects. The variables covered risk assessment, risk audit, risk status meetings and the analysis of contingency reserves. The research was carried out within the context of US where it was noted that risk monitoring and control have positive and significant implication on success of the projects.

2.7 Theoretical Review

The research will be anchored on three theories, which are, the enterprise risk management theory, the contingency theory and the prospect theory.

2.7.1 Enterprise Risk Management Theory

The theory was developed by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission (2004). The theory advocates the need to measure and manage notable risks that face a given organization in totality as opposed to independent management of each set of risks. The theory recommends that efforts should be in place to combine the silos of managing risks in an organization into a comprehensive and holistic framework (COSO, 2004). The theory advocates that the company executives in senior positions and the staff need to be actively involved in process of analysis and responding to diverse forms of risks in an organization. The theory requires all staff in a project organization to participate in management of the risks as opposed to some identified few individuals with the risk department (Kommunuri, Narayan, Wheaton, Jandug, & Gonuguntla, 2016).

This theory further provides a highlight of the essence of having clearly established policies and process of risk management. The theory argue that when the project organization is able to adopt formal policies which help in defining the appetite to risks, strategic goals as well as the tolerance, the whole risk management framework in an organization is likely to be improved. The theory reinforces the need to create a risk management culture where all the stakeholders undergo empowerment to remain accountable in reference to management of risks in a project organization (Kommunuri et al., 2016).

The study that focuses on risk management techniques is determined to be pertinent to this theory. This theory suggests that all employees and stakeholders, including the senior management of the project organization, must be involved in the adoption and execution of these risk management strategies.

2.7.2 Contingency Theory

The proponents of this theory include Fielder (1960) with further development by Lawrence and Lorsch (1967) and its argument is that no single exists for organizing and leading a project

organization or for making management decision in regard to the project. The theory goes further and argues that the ultimate and optimum course of action to be undertaken is informed by external and internal situations to the project organization (Ghani & Mahmood, 2015). Thus, the forces with internal and external surrounding present some risks to the project organization which need to be addressed. Within the internal environment, risks emanating from the project organization like operational flaws are presented (Tadayon, Jaafar & Nasri, 2012). From the external environment, some challenges related to regulations and politics are presented.

The theory is premised on the fact that different project organizations are guided by varied structures. As such, there is no specific structure that is suitable to a given project organization. However, the efficiency of the project organization is contingent on a set of factors like the form of technology, variations in environment, size of the project and the structures of the project entity (Njeri, 2014). The theory shed light on the risk control variable and how it affects project implementation. The theory implies that the use of some specific risk control practices is contingent to a number of issues in a project organization including the structure.

2.7.3 Prospect Theory

The proponent of this theory was Tversky and Kahneman (1979) and supports decision making process under conditions of risks and uncertainties. The theory offers a description, explanation and prediction of the choices that are made by a typical individual when faced with uncertainties. The theory looks at how these choices undergo framing and evaluation when making decisions. The theory considers two phases when making decisions: the editing/framing phase as well as the evaluation phase. Framing involves the way that a choice or option is impacted due to the manner or order which the same are presented to the person charged with decision making. There are two parts in the evaluation phase of this theory; value and weight function. The losses and gains in relation to some reference point inform the value gain.

Therefore, in light of this prospectus theory, individuals make decisions on the basis of the potential value of gains and losses as compared to the ultimate outcome. There are some specific heuristics that guide people when evaluating these gains and losses. Risk is exposure to probability of financial or economic gain or loss, delay, physical damage, injury due to uncertainty that is linked with undertaking of a given cause of action. The relevant of this theory to the study is that

within construction projects, the occurrence of risks can have significant negative implication on quality and schedule as well as the budget provisions. Effective management of risks in construction projects required detailed planning, identification, analysis, development of adequate response strategies and the need to monitor and control risky events.

2.8 Conceptual Framework

Figure 2.1 is the conceptual framework to guide the study.

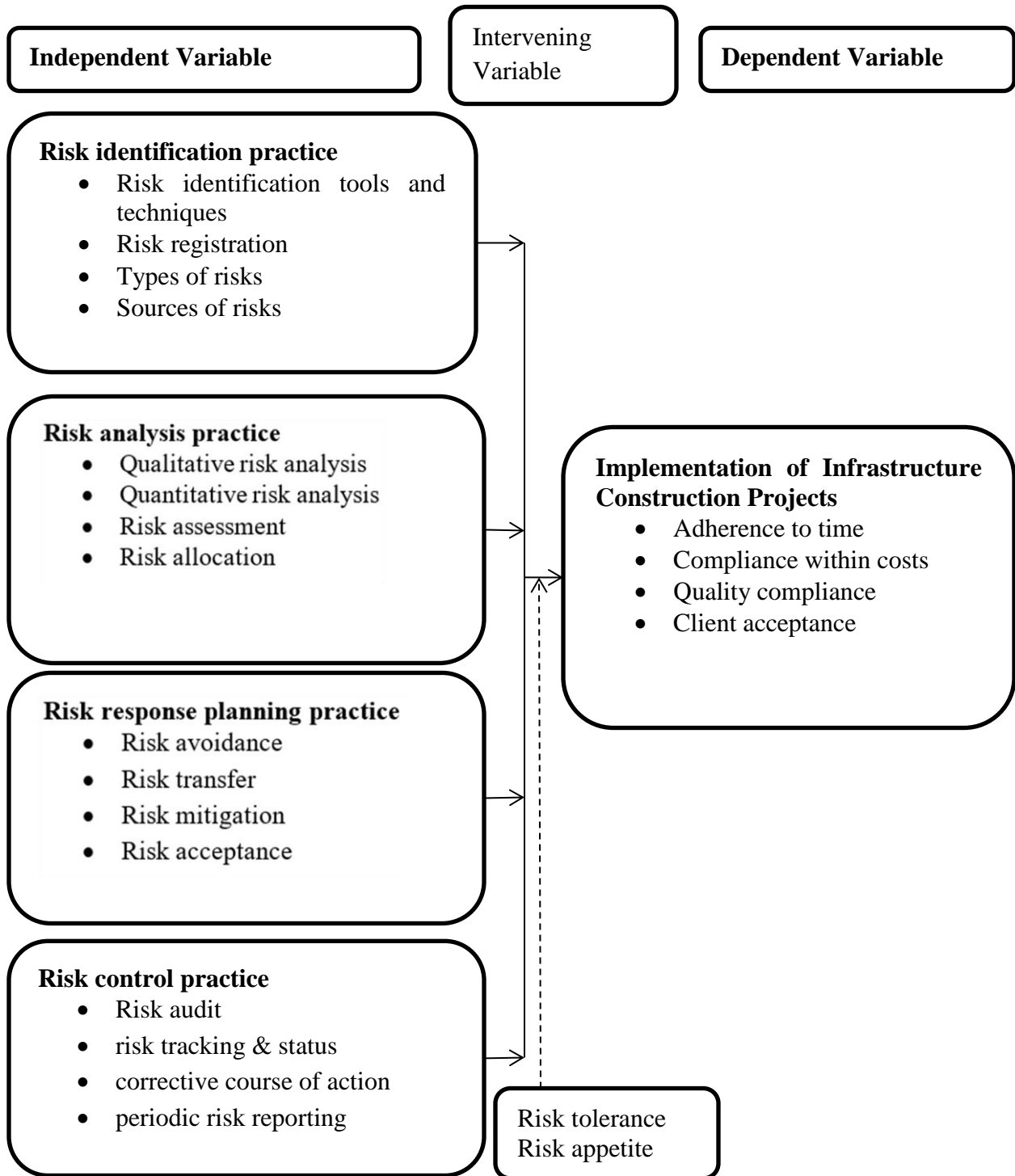


Figure 2.1: Conceptual Framework

2.9 Knowledge Gap Matrix

The chapter has reviewed literature that present gaps as presented in Table 2.1.

Table 2.1: Knowledge Gap Matrix

Variable	Author & year	Study	Key Finding	Knowledge Gap	Focus of present study
Risk Identification Practice	Marinich (2020)	Combined the identification and response to risks and their implication on success of the projects	risk identification and success of the project are significantly connected	It was done in United States through survey	The present study was done in Kenya
Risk Identification Practice	Otaalo, Muchelule and Asinza (2019)	risk identification and analysis and their role on performance of the projects	risk identification and the practices of managing risks in a project organization are significantly linked with each other	Project performance was assessed as the dependent variable	The current research focused on project implementation
Risk Analysis Practice	Marco and Thaheem (2014)	Risk analysis within projects dealing with construction activities.	The study was an expansion of the traditional indicators of project success to cover both project management organization and project related indicators of successful project undertaking	The study covered risk analysis in totality	Risk analysis was linked with project implementation in the present study
Risk Analysis Practice	Tepeli (2020),	risk analysis in the initial phase of the complicated infrastructure projects	due to complexity of the infrastructure projects, interdependent risks are so evident	The study covered risk analysis in totality	Risk analysis was linked with project implementation in the present study
Risk Response	by Karunakara	to link project risk response as a	the nexus between delay issues and	This inquiry was a	The present

Planning Practice	n, Abdullah, Nagapan, Sambasiva n and Sekar (2020)	moderator in the nexus between delay factors in projects and performance	performance of the projects was negative	thematic review of the literature in place	study was thematic review as well as empirical in nature
Risk Response Planning Practice	Ahmadi-Javid, Fateminia and Gemünden (2020)	an appraisal of risk response planning and its implication on project portfolio management	The inquiry offered a method informed by mathematical optimization to come up relevant responses to project risks.	project portfolio management was the dependent variable	Project implementation was the dependent variable
Risk Control Practice	Kiage and Namusonge (2016)	It covered monitoring and evaluation (M&E) alongside the management of risks with regard to performance of projects in telecommunication firms in Kenya	most respondents rated such factors as the need for regular risk analysis, involving the project managers in analysis of risk all significantly shape performance of the projects	Project performance was the dependent variable	Project implementation was the dependent variable
Risk Control Practice	Obondi (2020),	The procedures used in projects for risk management and their impact on the outcome of project activities	The success of the projects is positively and significantly impacted by risk management.	The research was conducted within the context of US	The study was done within Kenyan context

2.10 Summary of Literature

Research on theoretical and empirical investigations was outlined in this chapter, as well as theories that will guide the investigation. The conceptual framework is illustrated and the gaps in literature summarized in a matrix.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Under this chapter, key areas such as the research design, target population, means of sampling, data collection and the association procedures as well as the analysis methods are well outlined and explained. The chapter also looks into other areas that are deemed important while undertaking a research.

3.2 Research Design

Descriptive survey research design was adopted to meet the stated objectives. Research design is a plan that provides guideline to the study as far as gathering and analysis of data is concerned (Dźwigoł, 2019). It is a blue print for the methods to be embraced in gathering, analysis and interpretation of the results. According to Harris, Holyfield, Jones, Ellis and Neal (2019), descriptive survey research design seeks to provide responses to questions regarding the status of an inquiry by gathering of data. Relevant behaviors and attributes are some of the key issues that need to be studied through this type of design. This design helps in gathering information from a sample of participants at a given point of time to draw inferences to the larger population. The justification of adopting this design was that it allowed the study to provide a description of the current state on project risk management practices and project implementation as far as construction projects in Galmudug are concerned.

3.3 Target Population

The study targeted 55 project contractors, sub-contractors, engineers and risk managers from these projects. Target population is a representation of items as well as individuals that are in line with established criteria for selection and inclusion in the study (Thanem & Knights, 2019). There are four infrastructure construction projects in Galmudug (appendix III).

Table 3. 1: Target Population

Category of employment	Target population
Contractors	9
Sub-Contractors	21
Engineers	17
Risk Managers	8
Total	55

Source: Ministry of Public Works (2022)

3.4 Sampling Size and Sampling Procedures

Sampling is the method that is used to select participants for inclusion in an inquiry (Hennink, Hutter & Bailey, 2020). Sample size on the other hand is a smaller proportion that is selected from the larger population to provide the basis of generalization of the results (Ghauri, Grønhaug & Strange, 2020). Given the relatively smaller population of the study, this study adopted census and thus all the 55 respondents were included. Gravetter and Forzano (2018) posit that, when there are fewer than 200 people in each unit, a census is ideal.

3.5 Data Collection Instruments

The research employed questionnaires to collect to gather primary data. According to Quinlan, Babin, Carr and Griffin (2019), data collection is the methodical and careful gathering of information that is pertinent to answering research questions. According to Privitera (2018), the study's field information is what counts as primary data. Structured questionnaire helped in gathering the primary data that was used to support the analysis. The questionnaire was structured to ensure it was accompanied by a list of relevant alternatives that gave an option for participants to select from. A 5-point Likert scale with a 1-strongly disagree and 5-strongly agree range was used to develop the questionnaire. The questionnaire was divided into sections that addressed both the general information and the inquiry's variables.

3.5.1 Pilot Testing of the Instruments

Prior to the main investigation, a pilot test is carried out on a smaller scale. Its aim is to provide guideline for examining specific issues of the survey (Bell, Bryman & Harley, 2018). It seeks to provide testing of understandability and clarity of the questions on the questionnaire. Adams and McGuire (2022) suggest that 1–10% of the respondents from the target demographic be used for the pilot study. Therefore, in the current study, 10% of the target group, or 5 respondents, were chosen to participate in the pilot study. To prevent any bias, the research participants who took part in the pilot study were not included in the final research.

3.5.2 Validity of the Instrument

Research validity is the extent which the test provides measurement of what it is designed to indicate. It is critical for the questionnaire to be aligned with the definition that has been used to

operationalize the study variables (Hair, Page & Brunsveld, 2019). A reliable measure can easily be understood and the results can be understood and clearly utilized. The supervisor and two designated risk management specialists each received a copy of the questionnaire, and they provided their opinions. All their suggestions and concerns were factored in and addressed before the final data gathering process in the field.

3.5.3 Reliability of the Instrument

Reliability is the dependability, stability and consistence of the information and views that have been shared by the participants. It is the degree which a measure provides results that are consistent and stable (Greener & Martelli, 2018). The dully filled questionnaire from pilot testing was used to compute values of Cronbach Alpha in order to test for reliability. Creswell and Creswell (2017) suggest the following rule of thumb when it comes to the interpretation of Cronbach Alpha values: > 0.9 implies excellent, > 0.8 implies good, > 0.7 implies acceptable, >0.6 means questionable

3.6 Data Collection Procedure

An introduction letter from the university and research permit from Somalia was sourced before proceeding to the field to gather information from the participants. The questionnaire was self-administered to the participants who were expected to give a better response rate from the study participants. At the point of administering the questionnaire to participants, they were given time to fill in before they are collected. This was a strategy for increasing the response rate.

3.7 Data Analysis and Presentation

Assarroudi *et al.*, (2018) posits that data analysis is the use of reasoning aimed at comprehending data that has been collected so as to predict patterns that are consistent while summarizing details that are relevant. The gathered information was coded into SPSS version 24 where means and standard deviations as well as percentages were summarized to describe the variables. The study further adopted a multiple regression analysis model to test the hypothesis as specified below:

$$PI = \beta_0 + \beta_1RIP + \beta_2RAP + \beta_3RRPP + \beta_3RCP + \epsilon$$

Where;

PI- Implementation of infrastructure construction projects

RIP- Risk Identification Practice

RAP- Risk Analysis Practice

RRPP- Risk Response Planning Practice

RCP- Risk Control Practice

ε is the error term

β_0 is the regression beta coefficient

The results were presented through tables.

3.8 Ethical Considerations

Ethics describe the norms that provide guideline on how the research should be conducted (Privitera, 2018). The consent of the participants was sought before they were engaged in gathering of the information. No one was forced to participate, and all information provided was kept in the strictest confidence. Names of the participant were optional entries on the data gathering tool. All the information gathered in literature was acknowledged and cited using APA system of referencing.

3.9 Operationalization of the Variables

The variables of the investigation are broken down in Table 3.2, along with how each was operationalized.

Table 3.2: Operationalization of the Variables

Objective	Variable type	Indicators	Scale of measurement	Data collection	Tool for data analysis
To determine the influence of risk identification practice on the implementation of infrastructure construction projects in Galmudug State in Somalia	Independent Risk identification practice	Risk identification tools & techniques Risk registration Types of risks Sources of risks	Ordinal scale	Questionnaire section B	Means, standard deviations and percentages Regression analysis
To establish the influence of risk analysis practice on implementation of infrastructure construction projects in Galmudug State in Somalia	Independent Risk analysis practice	Qualitative risk analysis Quantitative risk analysis Risk assessment Risk allocation	Ordinal scale	Questionnaire section C	Means, standard deviations and percentages Regression analysis
To analyze the influence of risk response risk practice on implementation of infrastructure construction projects in Galmudug State in Somalia	Independent Risk response planning practice	Risk avoidance Risk transfer Risk mitigation Risk acceptance	Ordinal scale	Questionnaire section D	Means, standard deviations and percentages Regression analysis
To assess the influence of risk control practice on implementation of infrastructure construction projects in Galmudug State in Somalia	Independent Risk control practice	Risk audit risk tracking & status corrective course of action periodic risk reporting	Ordinal scale	Questionnaire section E	Means, standard deviations and percentages Regression analysis
	Dependent implementation of infrastructure	Adherence to time Compliance within costs Quality compliance Client acceptance	Ordinal scale	Questionnaire section F	Means, standard deviations and percentages Regression analysis

Source: Researcher (2022)

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

The section covers the results guided by descriptive and inferential statistics. It also presents the results after analysis by way of tabulation.

4.2 Questionnaire Return Rate

From the 55 questionnaire administered to respondents, 39 were fully filled and returned leading to a 70.9% response rate. This rate was deemed as adequate (Yin, 2017).

4.3 General Information

Consider Table 4.1.

Table 4.1: General Information

Category	Classification	Frequency	Percentage
Gender	Male	29	74.4%
	Female	10	25.6%
	Total	39	100
Highest level of education	Diploma level	11	28.2%
	Degree level	15	38.5%
	Masters level	13	33.3%
	Total	39	100
Years of experience	Less than 5 years	7	17.9%
	6-10 years	8	20.5%
	11-15 years	11	28.2%
	16-20 years	5	12.8%
	Over 20 years	8	20.5%
	Total	39	100

It was shown from Table 4.1 that while 74.4% of the respondents were male, 25.6% were female. In terms of education, while 38.5% had degrees, 28.2% had diplomas. In view of experience, while 28.2% had worked for 11-15 years, 17.9% had worked for less than 5 years.

4.4 Reliability Results

Reliability was done and the findings summarized as shown in Table 4.2.

Table 4.2: Reliability Results

Variable	No of items	Cronbach Alpha Coefficient
Implementation of Infrastructure Construction	4	.876
Risk Identification Practice	7	.765
Risk Analysis Practice	7	.983
Risk Response Planning Practice	6	.885
Risk Control Practice	7	.783
Overall		.859

Table 4.2 indicates the average Cronbach Alpha coefficient value as above 0.7, which means that a reliable scale was adopted in the study.

4.5 Descriptive Statistics

4.5.1 Implementation of infrastructure construction projects

Table 4.3 is a breakdown of descriptive statistics on implementation of infrastructure construction projects.

Table 4.3: Implementation of infrastructure construction projects

	SD	D	N	A	SA	Mean	Std. Dev
There has been adherence to time when implementing infrastructure construction projects in Galmudug State	0.0%	20.5%	38.5%	30.8%	10.3%	3.31	0.922
Infrastructure construction projects in Galmudug State have been completed in the established costs	0.0%	38.5%	10.3%	51.3%	0.0%	3.13	0.951

The execution of infrastructure construction projects in Galmudug State has been done based on established quality standards	0.0%	20.5%	17.9%	51.3%	10.3%	3.51	0.942
The completed infrastructure construction projects have been accepted by clients	10.3%	10.3%	20.5%	48.7%	10.3%	3.38	1.138
Average	2.6%	22.5%	21.8%	45.5%	7.7%	3.33	0.988

The findings in Table 4.3 show that on average, 53.3% (M=3.33, 0.988) of respondents agreed that there implementation of infrastructure construction projects, 25% disagreed and 21.8% were neutral. More specifically, 41.1%(M=3.31, SD=0.922) were in agreement that there had been adherence to time when implementing infrastructure construction projects in Galmudug State and 51.3% (M=3.13, SD=0.951) said that infrastructure construction projects in Galmudug State had been completed in the established costs. It was shown from 61.6% (M=3.51, SD=0.942) that the execution of infrastructure construction projects in Galmudug State had been done based on established quality standards while 59.0% (M=3.38, SD=1.138) opined that the completed infrastructure construction projects had been accepted by clients.

4.5.2 Risk Identification Practice

Table 4.4 summarizes results on risk identification practice

Table 4.4: Risk Identification Practice

	SD	D	N	A	SA	Mean	Std. Dev
Document review is used to identify risks in the infrastructure construction projects	0.0%	2.6%	33.3%	51.3%	12.8%	3.74	0.715
Risks in infrastructure construction projects are identified through Delphi technique	0.0%	2.6%	35.9%	48.7%	12.8%	3.72	0.724
Brainstorming is a technique used to identify risks in the infrastructure construction projects	0.0%	12.8%	15.4%	61.5%	10.3%	3.69	0.832
A technique known as SWOT analysis is used to find risks that could have an impact on infrastructure construction projects	0.0%	0.0%	23.1%	48.7%	28.2%	4.05	0.724
All the identified risks in the infrastructure construction projects are documented in a register for reference	0.0%	0.0%	15.4%	66.7%	17.9%	3.87	0.894
All the identified risks in the infrastructure construction projects are categorized into their respective types	0.0%	0.0%	10.3%	79.5%	10.3%	3.90	0.718

The sources of risk inform risk identification in the infrastructure construction projects	0.0%	2.6%	15.4%	74.4%	7.7%	3.87	0.570
Average	0.0%	2.9%	21.3%	61.5%	14.3%	3.84	0.740

Table 4.4 point out that on overall, 75.8% (M=3.84, SD=0.740) agreed that risk identification was practiced among the infrastructure construction projects in Galmudug State. It was shown that 89.8% (M=3.90, SD= 0.718) of respondents that all the identified risks in the infrastructure construction projects were categorized into their respective types. It was shown by 84.6% (M=3.87, SD=0.894) of the respondents that all the identified risks in the infrastructure construction projects were documented in a register for reference. Responses from 82.1% (M=3.87, SD=0.570) of respondents were that the sources of risk informed risk identification in the infrastructure construction projects. According to 76.9% (M=4.05, SD=0.724) of the respondents, SWOT analysis technique was used to find risks that could have an impact on infrastructure construction projects. In line with 71.8% (M=3.69, SD=0.832), brainstorming was a technique used to identify risks in the infrastructure construction projects. The findings from 64.1% (M=3.74, SD= 0.715) of respondents were that document review was used to identify risks in the infrastructure construction projects. It was observed from 61.5% (M=3.72, SD=0.724) that risks in infrastructure construction projects were identified through Delphi technique.

4.5.3 Risk Analysis Practice

The findings on risk analysis practice were determined and shown in Table 4.5.

Table 4.5: Risk Analysis Practice

	SD	D	N	A	SA	Mean	Std. Dev
The analysis of risks in the infrastructure construction projects is conducted using qualitative methods	2.6%	15.4%	15.4%	41%	25.6%	3.72	1.099
During qualitative analysis of risks, ranking is done based on severity of the risk impact to the infrastructure construction projects	0.0%	12.8%	15.4%	59%	12.8%	3.72	0.857
Qualitative analysis of risks in the infrastructure construction projects is done to establish probability of occurrence	0.0%	0.0%	30.8%	56.4%	12.8%	3.82	0.644
Quantitative methods are utilized to analyze risks in the infrastructure construction projects	0.0%	15.4%	10.3%	66.7%	7.7%	3.67	0.838
Quantitative risk analysis helps calculation of the degree of the impact of	0.0%	12.8%	10.3%	61.5%	15.4%	3.79	0.864

risks on the infrastructure construction projects								
The analyzed risks in the infrastructure construction projects are assessed to predict their frequency of occurrence	0.0%	5.1%	10.3%	61.5%	23.1%	4.03	0.743	
Risk allocation in the infrastructure construction projects is conducted to complement analysis process	0.0%	15.4%	7.7%	61.5%	15.4%	3.77	0.902	
Average	0.4%	11.0%	14.3%	58.2%	16.1%	3.79	0.849	

On overall, 74.3% (M=3.79, SD=0.849) of respondents agreed that risk analysis was practiced in the infrastructure construction projects in Galmudug State. More specifically, it was shown by 84.6% (M=4.03, SD= 0.743) that analyzed risks in the infrastructure construction projects were assessed to predict their frequency of occurrence. Additionally, while 76.9% (M=3.77, SD=0.902) shared that risk allocation in the infrastructure construction projects was conducted to complement analysis process, 76.9% (M=3.79, SD=0.743) said that quantitative risk analysis helped calculation of the degree of the impact of risks on the infrastructure construction projects. While it emerged from 74.4% (M=3.67, SD=0.838) that quantitative methods were utilized to analyze risks in the infrastructure construction projects, 71.8% (M=3.72, SD=0.857) said that during qualitative analysis of risks, ranking was done based on severity of the risk impact to the infrastructure construction projects. While 69.2% (M=3.82, SD=0.644) shared that qualitative analysis of risks in the infrastructure construction projects was done to establish probability of occurrence, 66.6% (M=3.72, SD=1.099) said that the analysis of risks in the infrastructure construction projects was conducted using qualitative methods.

4.5.4 Risk Response Planning Practice

Table 4.6 is a breakdown of the results.

Table 4.6: Risk Response Planning Practice

	SD	D	N	A	SA	Mean	Std. Dev
The identified negative risky events in the infrastructure construction projects are avoided through elimination of the cause	2.6%	10.3%	5.1%	66.7%	15.4%	3.82	0.914
Risks in the infrastructure construction projects are avoided through reduction of the specific threat	2.6%	12.8%	10.3%	59%	15.4%	3.72	0.972
The identified risks in the infrastructure construction projects are mitigated through transfer to insurance firms	0.0%	5.1%	2.6%	79.5%	12.8%	4.00	0.607

Positive risky events in the infrastructure construction projects are responded to through exploitation	0.0%	17.9%	7.7%	71.8%	2.6%	3.59	0.818
Infrastructure construction projects respond to the identified positive risks through enhancement	0.0%	0.0%	28.2%	46.2%	25.6%	3.97	0.743
Sharing is a response strategy to the identified risks in the infrastructure construction projects	0.0%	2.6%	33.3%	61.5%	2.6%	3.64	0.584
Average	0.9%	8.1%	14.5%	64.1%	12.4%	3.79	0.773

On average, 76.5% (M=3.79, SD=0.773) noted that risk response planning was practiced in the infrastructure construction projects in Galmudug State. Through this, 92.3% (M=4.00, SD=-0.607) of participants said that the identified risks in the infrastructure construction projects were mitigated through transfer to insurance firms and 82.1% (M=3.82, SD=0.914) shared that the identified negative risky events in the infrastructure construction projects were avoided through elimination of the cause. While 74.4% (M=3.72, SD=0.972) said that risks in the infrastructure construction projects were avoided through reduction of the specific threat, 74.4% (M=3.59, SD=0.818) shared positive risky events in the infrastructure construction projects are responded to through exploitation. The results from 71.8% (M=3.97, SD=0.743) were that infrastructure construction projects responded to the identified positive risks through enhancement and 64.1% (M=3.64, SD= 0.584) shared that sharing was a response strategy to the identified risks in the infrastructure construction projects.

4.5.5 Risk Control Practice

The findings on risk control practice were determined and summed up in Table 4.7.

Table 4.7: Risk Control Practice

	SD	D	N	A	SA	Mean	Std. Dev
There is continuous tracking of all the identified risky events in the infrastructure construction projects	0.0%	5.1%	15.4%	71.8%	7.7%	3.82	0.644
Risk tracking observes the risk status of the infrastructure construction projects so that any deviation from the desired level of performance of the project can be identified	0.0%	15.4%	10.3%	61.5%	12.8%	3.72	0.887
Risk status meetings are convened in the infrastructure construction projects	0.0%	0.0%	12.8%	69.2%	17.9%	4.05	0.560

Risk audit is done to identify new sources of risks in the infrastructure construction projects	0.0%	10.3%	5.1%	74.4%	10.3%	3.85	0.745
Risk audit is conducted to establish the extent of adherence to the contingency plan in the infrastructure construction projects	5.1%	12.8%	10.3%	59%	12.8%	3.62	1.042
There is periodic reporting of risks in the infrastructure construction projects	0.0%	10.3%	12.8%	71.8%	5.1%	3.72	0.724
There is monitoring of the execution of the contingency plans to undertake a relevant corrective course	0.0%	15.4%	7.7%	69.2%	7.7%	3.69	0.832
Average	0.7%	9.9%	10.6%	68.1%	10.6%	3.78	0.776

The overall implication in Table 4.7 are that 78.7% (M3.78,SD=0.776) of the participants in the study were of the opinion that risk control was practiced in the infrastructure construction projects in Galmudug State. It was shown that while 87.1% (M=4.05, SD=0.560) said that risk status meetings were convened in the infrastructure construction projects, 84.7% (M=3.85, SD=0.745) said that risk audit was done to identify new sources of risks in the projects. While responses from 79.5% (M=3.82, SD=0.644) were that there was continuous tracking of all the identified risky events in the infrastructure construction projects, 76.9 (M=3.69, SD=0.832) said that there was monitoring of the execution of the contingency plans to undertake a relevant corrective course. While 76.9% (M=3.72, SD=0.724) said that there was periodic reporting of risks in the infrastructure construction projects, 74.3% (M=3.72, SD=0.887) shared that risk tracking observed the risk status of the infrastructure construction projects so that any deviation from the desired level of performance of the project could be identified. The results from 71.8% (M=3.62, SD=1.042) of respondents were that risk audit was conducted to establish the extent of adherence to the contingency plan in the infrastructure construction projects.

Thus, based on descriptive statistics, it can be deduced that when ranked, the highly adopted aspect of risk management in the studied project was risk identification practice (M=3.84) followed by risk analysis practice (M=3.79), risk response planning practice (M=3.79) and lastly risk control practice (M=3.78).

4.6 Regression Results and Hypotheses Testing

4.6.1 Regression Results

The model summary results shown in Table 4.8

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826 ^a	.682	.644	1.15532

Table 4.8 shows that 64.4% variation in the implementation of infrastructure construction projects in Galmudug State in Somalia is as a result of change in project risk management practices (Adj. R²=0.644). This means that other additional factors are evident when it comes to implementation of these projects and future studies should seek to bring them out.

Table 4.9: ANOVA Results

	Sum of Squares	df	Mean Square	F	Sig.
Regression	97.285	4	24.321	18.221	.000 ^b
Residual	45.382	34	1.335		
Total	142.667	38			

Table 4.9 shows that on overall, the regression model adopted in this study was significant (F=18.221, P<0.05). Table 4.8 presents coefficients and significance levels.

Table 4.10: Coefficients and Significance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	Beta		
(Constant)	21.062	4.264		4.939	.000
Risk Identification Practice	.978	.185	.629	5.275	.000
Risk Analysis Practice	.404	.180	.403	2.250	.031
Risk Response Planning Practice	.209	.080	.012	2.613	.010
Risk Control Practice	.319	.104	.096	3.067	.001

The fitted equation becomes:

$$PI = 21.062 + .978RIP + .404RAP + .209RRPP + .319RCP$$

Where;

PS- Implementation of infrastructure construction projects

RIP- Risk Identification Practice

RAP- Risk Analysis Practice

RRPP- Risk Response Planning Practice

RCP- Risk Control Practice

Thus, based on beta coefficients, it can be summed up that risk identification practice ($\beta=0.978$) had the greatest effect on implementation of infrastructure construction projects tracked by risk analysis practice ($\beta=0.404$), risk control practice ($\beta=0.319$) and lastly risk response planning practice ($\beta=0.209$).

4.6.2 Hypotheses Testing

H₀₁: Risk identification practice has no significant effect on implementation of infrastructure construction projects in Galmudug State in Somalia. Table 4.10 gives the p_{value} as 0.000 that is $p<0.05$. This implies that risk identification practice had a significant effect on implementation of infrastructure construction projects in Galmudug State in Somalia. Thus, the study reject hypothesis H₀₁.

H₀₂: Risk analysis has no significant effect on implementation of infrastructure construction projects in Galmudug State in Somalia. Based on Table 4.10, the p_{value} of risk analysis was 0.031 that is $p<0.05$. Thus, the study reject hypothesis H₀₂.

H₀₃: Risk response planning practices in Somalia's Galmudug State has no significant effect on implementation of infrastructure construction projects. Table 4.10 shows that risk response planning practices had p_{value} as 0.010 which is <0.05 . Hence, the study reject hypothesis H₀₃.

H₀₄: Risk control practice has no significant effect on the implementation of infrastructure construction projects in Galmudug State, Somalia. It was noted in Table 4.10 that the p_{value} of risk control practice was 0.001, which is $p<0.05$. Thus, the study rejects hypotheses H₀₄.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

A summary of the analyzed results and discussion are provided in this chapter. The conclusion and recommendations and areas that need further research are also indicated.

5.2 Summary of the Study

5.2.1 Risk Identification Practice and Implementation of infrastructure construction projects

On overall, 75.8% (M=3.84, SD=0.740) agreed that risk identification was practiced among the infrastructure construction projects in Galmudug State. It was shown that 89.8% (M=3.90, SD=0.718) noted that all the identified risks in the infrastructure construction projects were categorized into their respective types. It was shown by 84.6% (M=3.87, SD=0.894) of the respondents that all the identified risks in the infrastructure construction projects were documented in a register for reference. Responses from 82.1% (M=3.87, SD=0.570) of respondents were that the sources of risk informed risk identification in the infrastructure construction projects. According to 76.9% (M=4.05, SD=0.724) of the respondents, SWOT analysis technique was used to find risks that could have an impact on infrastructure construction projects. In line with 71.8% (M=3.69, SD=0.832), brainstorming was a technique used to identify risks in the infrastructure construction projects. Regression results led to rejection of hypothesis H_{01} ($p < 0.05$) where it was inferred that risk identification practice has significant effect on implementation of infrastructure construction projects

5.2.2 Risk Analysis Practice and Implementation of infrastructure construction projects

On overall, 74.3% (M=3.79, SD=0.849) of respondents agreed that risk analysis was practiced in the infrastructure construction projects in Galmudug State. More specifically, it was shown by 84.6% (M=4.03, SD= 0.743) that analyzed risks in the infrastructure construction projects were assessed to predict their frequency of occurrence. Additionally, while 76.9% (M=3.77, SD=0.902)

shared that risk allocation in the infrastructure construction projects was conducted to complement analysis process, 76.9% (M=3.79, SD=0.743) said that quantitative risk analysis helped calculation of the degree of the impact of risks on the infrastructure construction projects. While it emerged from 74.4% (M=3.67, SD=0.838) that quantitative methods were utilized to analyze risks in the infrastructure construction projects, 71.8% (M=3.72, SD=0.857) said that during qualitative analysis of risks, ranking was done based on severity of the risk impact to the infrastructure construction projects. In line with regression results, the study rejected hypothesis H₀₂ and deduced that risk analysis practice has significant effect on implementation of infrastructure construction projects.

5.2.3 Risk Response Planning Practice and Implementation of infrastructure construction projects

On average, 76.5% (M=3.79, SD=0.773) noted that risk response planning was practiced in the infrastructure construction projects in Galmudug State. Through this, 92.3% (M=4.00, SD=-0.607) of participants said that the identified risks in the infrastructure construction projects were mitigated through transfer to insurance firms and 82.1% (M=3.82, SD=0.914) shared that the identified negative risky events in the infrastructure construction projects were avoided through elimination of the cause. While 74.4% (M=3.72, SD=0.972) said that risks in the infrastructure construction projects were avoided through reduction of the specific threat, 74.4% (M=3.59, SD=0.818) shared positive risky events in the infrastructure construction projects are responded to through exploitation. The results from 71.8% (M=3.97, SD=0.743) were that infrastructure construction projects responded to the identified positive risks through enhancement. From regression analysis, hypothesis H₀₃ was rejected where it was deduced that risk response planning practice is a significant predictor of implementation of infrastructure construction projects.

5.2.4 Risk Control Practice and Implementation of infrastructure construction projects

The overall finding was that 78.7% (M=3.78, SD=0.776) of the participants in the study were of the opinion that risk control was practiced in the infrastructure construction projects in Galmudug State. It was shown that while 87.1% (M=4.05, SD=0.560) said that risk status meetings were convened in the infrastructure construction projects, 84.7% (M=3.85, SD=0.745) said that risk audit was done to identify new sources of risks in the projects. While responses from 79.5%

(M=3.82, SD=0.644) were that there was continuous tracking of all the identified risky events in the infrastructure construction projects, 76.9 (M=3.69, SD=0.832) said that there was monitoring of the execution of the contingency plans to undertake a relevant corrective course. While 76.9% (M=3.72, SD=0.724) said that there was periodic reporting of risks in the infrastructure construction projects, 74.3% (M=3.72, SD=0.887) shared that risk tracking observed the risk status of the infrastructure construction projects so that any deviation from the desired level of performance of the project could be identified. The results from 71.8% (M=3.62, SD=1.042) of respondents were that risk audit was conducted to establish the extent of adherence to the contingency plan in the infrastructure construction projects. Regression results provided strong evidence of rejecting hypothesis H₀₃ and an inference was drawn that risk control practice significant predicts implementation of infrastructure construction projects.

5.3 Discussion

5.3.1 Risk Identification Practice and Implementation of infrastructure construction projects

On overall, 75.8% (M=3.84, SD=0.740) agreed that risk identification was practiced among the infrastructure construction projects in Galmudug State. Regression results led to rejection of hypothesis H₀₁ ($p < 0.05$) where it was inferred that risk identification practice has significant effect on implementation of infrastructure construction projects. These findings agree with ALSaadi and Norhayatizakuan (2021) who noted that risk identification is an instrumental part of the risk management framework that significantly enhance performance of the project activities. Igihozo and Irechukwu (2022) established that risk identification is an instrumental practices in management of projects that contribute to the overall success of the projects. Marinich (2020) established that risk identification and success of the project are significantly connected. Otaalo, Muchelule, and Asinza (2019) established that risk identification and the practices of managing risks in a project organization are significantly linked with each other. Mutunga and Ondara (2021) observed that risk identification is a critical activity that significantly predicts performance of the project.

All the identified risks in the infrastructure construction projects were categorized into their respective types besides being documented in a register for reference. This finding concur with

Dandage (2017) who noted that with infrastructure construction projects, it is critical to identify and document the sources and attributes of any inherent risks within a risk register. Similarly, Pimchangthong and Boonjing (2017) noted that risk identification practice lead to categorization of risks into four key categories: project management, organizational, external as well as technical risks. Further broad categorizations of risks at the identification level include external or internal risks.

5.3.2 Risk Analysis Practice and Implementation of infrastructure construction projects

On overall, 74.3% (M=3.79, SD=0.849) of respondents agreed that risk analysis was practiced in the infrastructure construction projects in Galmudug State. In line with regression results, the study rejected hypothesis H₀₂ and deduced that risk analysis practice has significant effect on implementation of infrastructure construction projects. These findings are consistent with Tepeli (2020) who hypothesized that due to complexity of the infrastructure projects, interdependent risks are so evident. It is very hard when it comes to anticipation and controlling of these risks. In a study conducted by Simon and Mutiso (2021) it confirmed that the analysis of project risks significantly impact performance of projects.

5.3.3 Risk Response Planning Practice and Implementation of infrastructure construction projects

On average, 76.5% (M=3.79, SD=0.773) noted that risk response planning was practiced in the infrastructure construction projects in Galmudug State. From regression analysis, hypothesis H₀₃ was rejected where it was deduced that risk response planning practice is a significant predictor of implementation of infrastructure construction projects. These findings are in line with Karunakaran, Abdullah, Nagapan, Sambasivan and Sekar (2020) was to link project risk response as a moderator in the nexus between delay factors in projects and performance where risk response and performance of the project indicated direct link. The identified risks were mitigated through transfer to insurance firms; the identified negative risky events were avoided through elimination of the cause and through reduction of the specific threat.

5.3.4 Risk Control Practice and Implementation of infrastructure construction projects

The overall finding was that 78.7% (M3.78, SD=0.776) of the participants in the study were of the opinion that risk control was practiced in the infrastructure construction projects in Galmudug

State. Regression results provided strong evidence of rejecting hypothesis H₀₃ and an inference was drawn that risk control practice significantly predicts implementation of infrastructure construction projects. Kiage and Namusonge (2016) covered monitoring and evaluation (M&E) alongside the management of risks and how performance of projects in telecommunication firms where it was shown that most respondents rated such factors as the need for regular risk analysis, involving the project managers in analysis of risk all significantly shape performance of the projects. Obondi (2020) focused on the procedures for managing risks in projects and their impact on the accomplishment of the project's operations. It was noted that risk monitoring and control have positive and significant implication on success of the projects. Risk status meetings were convened, risk audits were done to identify new sources of risks and there was continuous tracking of all the identified risky events in the projects.

5.4 Conclusion

5.4.1 Risk Identification Practice and Implementation of infrastructure construction projects

Risk identification was practiced among the infrastructure construction projects and it had significant effect on implementation of infrastructure construction projects. All the identified risks in the infrastructure construction projects were categorized into their respective types besides being documented in a register for reference. Sources of risk informed risk identification, SWOT analysis technique and brainstorming were techniques that were used to identify risks in the infrastructure construction projects.

5.4.2 Risk Analysis Practice and Implementation of infrastructure construction projects

There was risk analysis practice in the infrastructure construction projects in Galmudug State and this had significant effect on implementation of infrastructure construction projects. The analyzed were assessed to predict their frequency of occurrence and risk allocation was conducted to complement analysis process. Quantitative risk analysis helped calculation of the degree of the impact of risks on the infrastructure construction projects besides being used to analyze risks. During qualitative analysis of risks, ranking was done based on severity of the risk impact to the infrastructure construction projects.

5.4.3 Risk Response Planning Practice and Implementation of infrastructure construction projects

Risk response planning was practiced in the infrastructure construction projects in Galmudug State and it significantly affected the implementation of infrastructure construction projects in Galmudug State. The identified risks were mitigated through transfer to insurance firms; the identified negative risky events were avoided through elimination of the cause and through reduction of the specific threat. Positive risky were exploited and enhanced.

5.4.4 Risk Control Practice and Implementation of infrastructure construction projects

Risk control was practiced in the infrastructure construction projects in Galmudug State and this significantly predicted the implementation of infrastructure construction projects. Risk status meetings were convened, t risk audits were done to identify new sources of risks and there was continuous tracking of all the identified risky events in the projects. Monitoring of the execution of the contingency plans was done to undertake a relevant corrective course besides periodic reporting of risks. Risk tracking helped to observe the risk status of the projects so that any deviation from the desired level of performance of the project could be identified.

5.5 Recommendations for Management, Policy and Practice

- i. The risk managers working in infrastructure construction projects in Galmudug State ought to leverage the existing risk identification, analysis, control and response planning practices in place so as to counter the negative impacts that are occasioned by occurrence of risky events.
- ii. The risk managers working in infrastructure construction projects in Galmudug State ought to leverage different quantitative and qualitative technique for robust and accurate identification and analysis of risks in the project
- iii. The contractors and risk managers working with infrastructure and construction projects in Galmudug State ought to identify clear risk acceptance levels in the projects
- iv. Regular tracking of risk status, risk audits and periodic risk reporting ought to be adopted by the risk managers of infrastructure and construction projects in Galmudug State

5.6 Areas for Further Research

- i. Future studies should be conducted focusing on other dependent variables like project sustainability or performance aside from implementation
- ii. Away from infrastructure projects, future studies should be done focusing on other projects like water and sanitation or education projects

REFERENCES

- Adams, K. A., & McGuire, E. K. (2022). *Research methods, statistics, and applications*. Sage Publications.
- Aduma, L. K. & Kimutai, G. (2018). Project risk management strategies and project performance at the National Hospital Insurance Fund in Kenya. *International Academic Journal of Information Sciences and Project Management*, 3(2), 111-136
- Ahmadi-Javid, A., Fatemina, S. H., & Gemünden, H. G. (2020). A method for risk response planning in project portfolio management. *Project Management Journal*, 51(1), 77-95.
- ALSaadi, N., & Norhayatizakuan, N. (2021). The Impact of Risk Management Practices on the Performance of Construction Projects. *Studies of Applied Economics*, 39(4).
- Alvarenga, J. C., Branco, R. R., Guedes, A. L. A., Soares, C. A. P., & e Silva, W. D. S. (2019). The project manager core competencies to project success. *International Journal of Managing Projects in Business*.
- Amoah, C., & Pretorius, L. (2019). Evaluation of the impact of risk management on project performance in small construction firms in South Africa: the case study of construction systems. *Journal of Engineering, Design and Technology*.
- Armed, M. Y. (2019). Risk management and project performance of UNDP projects in Somalia: a case study of Mogadishu to Cadale Road Construction Project.
- Assarroudi, A., Heshmati Nabavi, F., Armat, M.R., Ebadi, A., & Vaismoradi, M. (2018). Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing*, 23(1), 42-55.
- Bell, E., Bryman, A., & Harley, B. (2018). *Business research methods*. Oxford university press.
- BTI (2022). Somalia Country Report 2022. Retrieved at <https://bti-project.org/en/reports/country-report/SOM>

- Damoah, I. S., & Kumi, D. K. (2018). Causes of government construction projects failure in an emerging economy: Evidence from Ghana. *International Journal of Managing Projects in Business*.
- Damoah, I. S., Akwei, C. (2017). Government project failure in Ghana: a multidimensional approach. *International Journal of Managing Projects in Business*, 10(1), 32–59.
- Data Journalism Team (2022). The state of infrastructure construction projects around the world – April 2022. Retrieved at <https://www.airport-technology.com/features/>
- de Araújo Lima, P. F., Marcelino-Sadaba, S., & Verbano, C. (2021). Successful implementation of project risk management in small and medium enterprises: a cross-case analysis. *International Journal of Managing Projects in Business*.
- De Marco, A., & Thaheem, M. J. (2014). Risk analysis in construction projects: a practical selection methodology. *American Journal of Applied Sciences*, 11(1), 74-84.
- Dolan, R. (2020). Incomplete Buildings And Monuments Around The World. Retrieved at https://www.huffpost.com/entry/abandoned-10-incomplete-buildings-and-monuments_n_981957
- Dźwigoł, H. (2019). Research methods and techniques in new management trends: research results. *Virtual Economics*, 2(1), 31-48.
- George, C. (2020). The Essence of Risk Identification in Project Risk Management: An Overview. *International Journal of Science and Research (IJSR)*, 9(2), 1553-1557.
- Ghauri, P., Grønhaug, K., & Strange, R. (2020). *Research methods in business studies*. Cambridge University Press.
- Gravetter, F. J., & Forzano, L. A. B. (2018). *Research methods for the behavioral sciences*. Cengage learning.
- Greener, S., & Martelli, J. (2018). An introduction to business research methods
- Hair, J. F., Page, M., & Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.

- Harris, D. E., Holyfield, L., Jones, L., Ellis, R., & Neal, J. (2019). Research methods. In *Spiritually and Developmentally Mature Leadership* (pp. 57-65). Springer, Cham.
- Hennink, M., Hutter, I., & Bailey, A. (2020). *Qualitative research methods*. Sage.
- Igihozo, L., & Irechukwu, E. N. (2022). Project Risk Management Process and Performance of Mpazi Channel Construction Project in Nyabugogo, Kigali-Rwanda. *Journal of Strategic Management, 6*(2).
- Imbrizi, F. G., & Mazieri, M. R. (2018). Understanding the influence of project risk management on information technology project success: a multidimensional analysis. In *VII Internacional Symposium on Project Management, Innovation and Sustainability*.
- Karunakaran, P., Abdullah, A. H., Nagapan, S., Sambasivan, M., & Sekar, G. (2020). The Moderating Effect Of Project Risk Response-Related Measures On The Relationship Between Project-Related Delay Factors And Construction Project Performance. *Humanities & Social Sciences Reviews 8*(2):405-412
- Khlaifat, D. M., Alyagoub, R. E., Sweis, R. J., & Sweis, G. J. (2019). Factors leading to construction projects' failure in Jordon. *International Journal of Construction Management, 19*(1), 65-78.
- Kiage, A. K., & Namusonge, G. (2016). The effect of monitoring, evaluation and risk management of projects on performance of firms in the telecommunication sector in Kenya. *Journal of Management, 3*(4), 567-589.
- Kimaru, J. M. (2019). *Effects of project complexity on project success: the case of telecom firms in Nairobi* (Doctoral dissertation, Strathmore University).
- Kinyua, E., Ogollah, K., & Mburu, D. K. (2015). Effect of risk management strategies on project performance of small and medium information communication technology enterprises in Nairobi, Kenya. *International Journal of Economics, Commerce and Management, 3*(2), 1-30.

- Langfitt, F. (2012). Chinese Blame Failing Bridges on Corruption. Retrieved at <https://www.npr.org/2012/08/29/160231137/>
- Marinich, M. (2020). *Relationship between Risk Identification, Risk Response, and Project Success* (Doctoral dissertation, Walden University).
- Marinich, M. (2020). *Relationship between Risk Identification, Risk Response, and Project Success* (Doctoral dissertation, Walden University).]
- Maritim, S.K., & Chelule, K. (2018). Influence of Project Risk Management Practices On Performance Of Telecommunication Network Modernization Projects In Kenya. *European Journal of Business and Strategic Management*, 3(7), 101-124.
- McLeod, L., Doolin, B., & MacDonell, S.G. (2012). A perspective-based understanding of project success. *Project Management Journal*, 43(5), 68-86.
- Mugumbate, T., & Kruger, D. (2021). Investigation into South African municipal construction project failures. *Civil Engineering= Siviele Ingenieurswese*, 29(9), 22-25.
- Mutunga, M.S., & Ondara, A. (2021). Risk Management Practices and Project Performance at Kenya Airports Authority. *Journal of Entrepreneurship & Project Management*, 5(1).
- Mutunga, M.S., & Ondara, A. (2021). Risk Management Practices and Project Performance at Kenya Airports Authority. *Journal of Entrepreneurship & Project Management*, 5(1), 45-63.
- Mutwiri, F.R. (2021). *Antecedents of Project Success in Constituency Development Fund Construction Projects in Kenya* (Doctoral dissertation, JKUAT-COHRED).
- Naji, H. I., & Ali, R. H. (2017). Risk response selection in construction projects. *Civil engineering journal*, 3(12), 1208-1221.
- Nallathiga, R., Shaikh, H. D., Shaikh, T. F., & Sheik, F. A. (2017). Factors affecting the success/failure of road infrastructure projects under PPP in India. *Journal of Construction Engineering and Project Management*, 7(4), 1-12.

- Njuguna, P.G. (2019). Risk Management Practices And Performance Of Projects In Nairobi City County, Kenya.
- Nturanu, J.N., & Mundia, M. (2019). Effect of risk avoidance strategy on the success of construction projects in the judiciary at Narok County Courts. *The Strategic Journal of Business & Change Management*, 6 (2), 2138 – 2147
- Obebe, S.B., Kolo, A., Enagi, I.S., & Adamu, A.A. (2020). Failure In Contracts In Nigerian Construction Projects: Causes And Proffered Possible Solutions. *International Journal of Engineering Applied Sciences and Technology*, 5(2), 679-692
- Obondi, K. (2022). The utilization of project risk monitoring and control practices and their relationship with project success in construction projects. *Journal of Project Management*, 7(1), 35-52
- Obondi, K.C. (2020). The Relationship Between Project Risk Monitoring. *Control Practices, and Project Success in Construction Projects (Unpublished Doctoral dissertation, Northcentral University)*.
- Otaalo, G., Muchelule, Y., & Asinza, K. (2019). Effect of Risk Identification and Risk Analysis on Performance of Road Construction Projects in Kenya: A Case Study of Kakamega County. *International Journal of Social Science and Humanities Research*, 7(2), 407-411.
- Otim, G., Alinaitwe, H.M., Tindiwensi, D., & Kerali, A.G. (2012, March). The causes and impact of uncompleted buildings: Studies in Kampala city. In *2nd International Conference on Advances in Engineering and Technology* (pp. 30-31). TamiNadu.
- Pimchangthong, D., & Boonjing, V. (2017). Effects of risk management practices on IT project success. *Management and production engineering review*.
- Pimchangthong, D., & Boonjing, V. (2017). Effects of risk management practices on IT project success. *Management and production engineering review*.
- Privitera, G.J. (2018). *Research methods for the behavioral sciences*. Sage Publications.

- Quinlan, C., Babin, B., Carr, J., & Griffin, M. (2019). *Business research methods*. South Western Cengage.
- Rodríguez-Rivero, R., Ortiz-Marcos, I., Romero, J., & Ballesteros-Sánchez, L. (2020). Finding the links between risk management and project success: Evidence from international development projects in Colombia. *Sustainability*, *12*(21), 9294.
- Safaeian, M., Fathollahi-Fard, A.M., Kabirifar, K., Yazdani, M., & Shapouri, M. (2022). Selecting Appropriate Risk Response Strategies Considering Utility Function and Budget Constraints: A Case Study of a Construction Company in Iran. *Buildings*, *12*(2), 98.
- Shahhossein, V., Afshar, M.R., & Amiri, O. (2018). The root causes of construction project failure. *Scientia Iranica*, *25*(1), 93-108.
- Simon, O. F., & Mutiso, J. (2021). Influence Of Project Risk Management On Performance Of Agricultural Projects In Nakuru County; Kenya. *International Research Journal of Business and Strategic Management*, *2*(2).
- Tepeli, E. (2020). Risk Analysis in Early Phase of Complex Infrastructure Projects. In *Issues on Risk Analysis for Critical Infrastructure Protection*. IntechOpen.
- Thanem, T., & Knights, D. (2019). *Embodied research methods*. Sage.
- Wasima, S.S., & Khalidi, M.A. (2018). Causes of Construction Project Failures in Pakistan *Civil and Environmental Research* *10*(7)
- Yan, P., Liu, J., Zhao, X., & Skitmore, M. (2021). Risk response incorporating risk preferences in international construction projects. *Engineering, Construction and Architectural Management*.

APPENDICES

Appendix I: Letter of Transmittal

Dear Respondent,

My name is Mowlid Ali Mire, and I'm a Master of Arts graduate in project management at the University of Nairobi. I am now working on a research project named **RISK MANAGEMENT PRACTICES AND IMPLEMENTATION OF INFRASTRUCTURE CONSTRUCTION PROJECTS IN GALMUDUG STATE OF SOMALIA**. You will participate in this research study as a respondent, and all information you provide will be kept in strict confidence. Feel free to contact me in case of further concerns with my details below. Thank you.

Regards,

Mowlid Ali Mire,

Appendix II: Questionnaire

SECTION A: GENERAL INFORMATION

1. Kindly indicate your gender

Male () Female ()

2. Kindly indicate your highest level of education

Primary certificate ()

Secondary certificate ()

Certificate level ()

Diploma level ()

Degree level ()

Masters level ()

Other.....

3. Kindly indicate the number of years you have worked with this institution

Less than 5 years () 6-10 years () 11-15 years () 16-20 years () Over 20 years ()

SECTION B: Implementation of Infrastructure Construction

4. Given below are statements on Implementation of infrastructure construction projects.

Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

	SD	D	N	A	SA
There has been adherence to time when implementing infrastructure construction projects in Galmudug State					
Infrastructure construction projects in Galmudug State have been completed in the established costs					
The execution of infrastructure construction projects in Galmudug State has been done based on established quality standards					
The completed infrastructure construction projects have been accepted by clients					

SECTION C: RISK IDENTIFICATION PRACTICE

5. Given below are statements on Risk Identification Practice and Success of Infrastructure Construction Projects. Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

	SD	D	N	A	SA
Document review is used to identify risks in the infrastructure construction projects					
Risks in infrastructure construction projects are identified through Delphi technique					
Brainstorming is a technique used to identify risks in the infrastructure construction projects					
A technique known as SWOT analysis is used to find risks that could have an impact on infrastructure construction projects					
All the identified risks in the infrastructure construction projects are documented in a register for reference					
All the identified risks in the infrastructure construction projects are categorized into their respective types					
The sources of risk inform risk identification in the infrastructure construction projects					

SECTION D: RISK ANALYSIS PRACTICE

6. Given below are statements on Risk Analysis Practice and implementation of Infrastructure Construction Projects. Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

	SD	D	N	A	SA
The analysis of risks in the infrastructure construction projects is conducted using qualitative methods					
During qualitative analysis of risks, ranking is done based on severity of the risk impact to the infrastructure construction projects					
Qualitative analysis of risks in the infrastructure construction projects is done to establish probability of occurrence					
Quantitative methods are utilized to analyze risks in the infrastructure construction projects					
Quantitative risk analysis helps calculation of the degree of the impact of risks on the infrastructure construction projects					
The analyzed risks in the infrastructure construction projects are assessed to predict their frequency of occurrence					
Risk allocation in the infrastructure construction projects is conducted to complement analysis process					

SECTION E: RISK RESPONSE PLANNING PRACTICE

7. Given below are statements on Risk Response Planning Practice and implementation of Infrastructure Construction Projects. Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer. SA- Strongly Agree to SD- Strongly Disagree

	SD	D	N	A	SA
The identified negative risky events in the infrastructure construction projects are avoided through elimination of the cause					
Risks in the infrastructure construction projects are avoided through reduction of the specific threat					
The identified risks in the infrastructure construction projects are mitigated through transfer to insurance firms					
Positive risky events in the infrastructure construction projects are responded to through exploitation					
Infrastructure construction projects respond to the identified positive risks through enhancement					
Sharing is a response strategy to the identified risks in the infrastructure construction projects					

SECTION F: RISK CONTROL PRACTICE

8. Given below are statements on Risk Control Practice and implementation of Infrastructure Construction Projects. Which of the following assertions are you most in agreement with? Please tick (√) in the space corresponding to the correct answer SA- Strongly Agree to SD- Strongly Disagree

	SD	D	N	A	SA
There is continuous tracking of all the identified risky events in the infrastructure construction projects					
Risk tracking observes the risk status of the infrastructure construction projects so that any deviation from the desired level of performance of the project can be identified					
Risk status meetings are convened in the infrastructure construction projects					
Risk audit is done to identify new sources of risks in the infrastructure construction projects					
Risk audit is conducted to establish the extent of adherence to the contingency plan in the infrastructure construction projects					
There is periodic reporting of risks in the infrastructure construction projects					
There is monitoring of the execution of the contingency plans to undertake a relevant corrective course					

Appendix III: List of Projects

1. Somalia Regional Corridors Infrastructure Programme (SRCIP)
2. The Somalia Strengthening Institutions for Public Works Project (SSIPWP)
3. Peace Road Project
4. Somalia Urban Resilience Project (SURP) II