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ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

Assessment of Project Risk Management Practices: The Case of Bole Lemi Industrial Park

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July 2020
Addis Ababa

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Department of Project Management

Assessment of Project Risk Management Practices: The Case of Bole Lemi Industrial Park

A Research Project Submitted in Partial Fulfillment of the Requirements for Obtaining Master's Degree in Project Management

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July 2020
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Post Graduate Program

Board of Examiners Approval

This is to certify that the thesis entitled "Assessment of Project Risk Management Practices: The Case of Bole Lemi Industrial Park" is prepared by Getu Tadesse in partial fulfillment of the requirements for the award of the degree of Master of Arts in Project Management, with the regulation and procedures of the university and the accepted standards with respect to originality and ethicality.

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Statement of Certification

This is to certify that Getu Tadesse has carried out his project work on the topic entitled "Assessment of Project Risk Management Practices: The Case of Bole Lemi Industrial Park" under my guidance and supervision. Accordingly, I hereby assure that his work is appropriate and standard enough to be submitted for the award of Master of Arts Degree in Project Management.

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July, 2020

Addis Ababa, Ethiopia

Statement of Declaration

I, Getu Tadesse, have carried out independently a project work on the topic “Assessment of Project Risk Management Practices: The Case of Bole Lemi Industrial Park” in partial fulfillment of the requirement for the Degree of Masters program. This project is my original work that has not been submitted for any diploma or other program in this or any other institution.

Getu Tadesse

Signature_____

Date_____

July, 2020

Addis Ababa, Ethiopia

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Acronyms

- PM-Project Management
- PMI-Project Management Institute
- PMBOK-Project Management Body o f Knowledge
- PRM-Project Risk Management
- RMP-Risk Management Plan
- IP-Industrial park
- IPs-Industrial Parks
- IPDC-Industrial Parks Development Corporation
- BLIP-Bole Lemi Industrial Park

Abstract

It has been a while since the development of industrial park is initiated in Ethiopia. The IPs in most cases have targeted to attract foreign investors. It is believed the high level of sophisticated infrastructure requirement of IPs need higher attention. Since international companies are expected to operate in the parks, it makes them central emphasis of effective project management. One of the key features of effective project management is a systematic and formal project risk management. Project risk is imminent and cannot be avoided. When it comes to grand project like IPs, the risk factor of project management is usually given a serious focus. This is because, even after an extended period after completion, the project could be found below standard. The project under study considers one case of the public industrial parks, BLIP. The project research area is chosen in consideration of the high-risk prevalence in IP projects. Environmental and social aspects make the project riskier like many other development projects. By employing nonrandom sampling technique and mixed approach research method, factors related to risk management practices are studied. It is founded that there are sufficient risk planning formalities, project risk management manual and quality project risk management tools and techniques while for capacity of the project risk management department/team, samples tend to be neutral. In addition, Value of project risk management is perceived to be high during project execution followed by project planning. It is also found that despite project risk management is perceived as being more useful than the other knowledge area in many occasions of the project, this does not make it the only important area. In fact, it is indicated the risk management could not have any value for the project unless it is integrated with the other areas. Some tools and techniques are identified. But, an un-organized and ad-hoc approach of risk management made the performance weak. Sources of project risk are identified to be both internal and external.

Key words: Project Management, Project Risk Management, Industrial Park

Chapter One: Introduction

1.1. Background of the study

Project Management Institute (PMI, 2017) defined project as a temporary endeavor undertaken to create a unique product, service, or result. Projects are undertaken to fulfill objectives by producing deliverables. An objective, is also defined by the institute as an outcome toward which work is to be directed, a strategic position to be attained, a purpose to be achieved, a result to be obtained, a product to be produced, or a service to be performed.

Klaus (2006) outlined project can be defined in many different ways in the literature and it might be characterized by different degrees of novelty perceived by those who are participating in it. It is also indicated in this study that, sometimes distinctions in purpose can play an important role for the definitions chosen. One important thing to note here is that there may not be a universally accepted singular definition of project or any aspect of the project. However, the general framework and some basic features remain the same.

The central focus of the project is assessment of project risk management practices. Turner (2007) defined "Risk" as 'possible departures from expectations which matter', in terms of all relevant aspects of performance, a cumulative or portfolio view of the impact of uncertainty from all sources which can operate at an event level, a project level, a corporate level, or anywhere in between. As organizations are the ones that undertake project, the more risk is involved in project the worrisome it is for the project owner.

The novelty and uniqueness of a project is evidenced more by Turner (2007). Absence of prior knowledge on that specific project makes project undertaking more risky than other intervention of an organization. This makes project management more uncertain endeavor than operations management. This calls for effective and efficient risk management that will be part of the general project management. Some projects are riskier than others for which project risk management became more indispensable.

Moreover, Salah (2003) clearly stated more that an important issue that looms high in the management of real-life projects is that of risk and uncertainty. It is more evidenced by this study

that, concerns about risk are everyday worries of project managers and the managers recognize the uncertain nature of their undertakings. It is proclaimed here that uncertainty in their estimates of resources, cost, and time is a fact of life for project managers. All these indicated the inevitability nature of risk

The main focus of this project report is on assessment of project risk management along with its application on the project lifecycles. Due to the value risk management could play in delivering a successful project, it is believed the importance it has for the project should necessarily be understood in practical manner. By taking a real case of one project, the Bole Lemi Industrial Park, the project aims at finding some unique conclusions.

The industrial parks development corporation is a public enterprise established by council of ministers regulation no 326/2014 to engage in development and operation of public industrial parks. Some of its responsibilities are develop and administer industrial parks, lease developed land and lease or transfer, through sale, constructions thereon; make necessary infrastructure accessible to industrial park developers'; promote benefits of industrial parks, and thereby attract investors to the parks and the like across the country.

Bole Lemi Industrial park is the first state owned and constructed industrial park in Ethiopia developed by the industrial park development corporation (IPDC). Industrial parks are inherently complex projects comprising numerous issues like buyers standards, national construction and industrial standards, company specifications. The parks interact with a host community and various regulatory compliance having serious of protocols, rules and standards. After all, starting early in the projects, some parts of the communicate is expected tone relocated, natural resource availability, like water has to be studied, infrastructure consumption like power needs to be considered and related other aspects has to clarified before developing the park if it has meet its objectives.

The most serious risk of industrial parks is however, the social and environmental effect that they have. Since they are meant to be for manufacturing enterprises, solid and liquid wastes management, corporate social responsibilities and societal benefits and costs needs serious attentions. Unless a proactive measure is in place to handle such risk, it is evident cost could

outweigh benefits and could bring project failure. It is therefore assumed proactive and systematic approach of risk management is must to have to avoid or minimize severe losses. With this in mind, the project under study tries to assess the risk management practices employed in Bole Lemi IP. (IPDC,2020; EIC,2020)

1.2. Statement of the problem

Carr and Tah (2001), Thompson (1992) and Flanagan (1993) have shown the construction industry is probably more risky than any other industries despite it has not been addressed adequately as performance delays, cost outruns and time lag has been repeatedly observed. The researchers also indicated construction project in general are becoming more complex and dynamic in their nature. As a result, the necessity of effective risk management has never been as needed as this time. Construction of factory sheds and infrastructure development is the major part of developing the industrial park. This makes them a center of attention for study when it comes to risk aspects more than anything.

Moreover, Nuno and Bruce (2010) highlighted large-scale infrastructure assets are delivered through one-off, multi-year, capital- and engineering-intensive projects. The researchers also indicated how the needed flexibility to allow some late change requests can create a tension on the project due to the fact that keeping the design fluid during physical execution is challenging, as gains in the effectiveness of the final asset may come at the cost of lost efficiency in project delivery, increasing the time and/or cost required for project completion. This tension between efficiency and effectiveness is assumed to be a key characteristic of large infrastructure projects. The risk management literature applied to major projects has recognized this tension as stipulated by Nuno and Bruce. The IPs are considered as grand project in our environment. The huge capital outlay is usually financed through international financing in most cases. The identified tension above is thought to affect the IP project on our environment. Owing to this, the project study gives emphasis to investigate the application of risk management during the project life cycle.

As PMI (2017) elaborated it, all projects, including the IP under study are thought to be risky due to unique undertakings with varying degrees of complexity that aim to deliver benefits. Since project risk management aims to identify and manage risks that are not addressed by the other

project management processes, it gives an important opportunity to control any irreversible perils. When risks are appropriately managed, the potential to cause the project to deviate from the plan and fail to achieve the defined project objectives will significantly diminishes. For this reason, it is concluded by the institute that the effectiveness of Project Risk Management is directly related to project success.

Risk management can make an important contribution to effective project management. However, there is some justification for the view that current PRM processes are threat orientated methods in practice and this can limit the contribution that PRM makes to improving project performance. Further a threat orientation is not the only concern. Comprehensive treatment of project uncertainty requires an approach which amounts to modifying and augmenting current PRM processes. However, Strategies for managing project uncertainty cannot be divorced from strategies for managing project objectives and associated trade-offs. A weakness in current PRM processes is that they are not readily focused on sources of operational variability in the performance of organizational activities. (Stephen et al. 2001).

The latest edition of Project Management Body of Knowledge published by PMI (2017) identifies 49 project management processes, an increase by two from the previous edition. Of all identified 49 processes applicable in all five project management life cycles and ten knowledge areas, 7 falls in the project risk management. This is the highest number of process than the other knowledge area, except project integration management which share the same number of processes. In addition to this, most of the project risk management processes fall in the planning cycle than the other cycles. Five of the seven processes are in the planning stage of the project. The remaining two processes are on the project execution and project monitoring and controlling process groups. This is one indicator of the fact that planning a risk play an important role to manage it later on. By comparing the project risk management along with the project life cycles, this study tries to assess its application areas.

Wallmüller (2012) outlined, in order to increase the likelihood of a project reaching a successful conclusion, the risks or potential problems for a project need to be identified at an early stage and appropriate counter measures developed. Risk Management, with this manner, is a practice with processes, methods, and tools for managing risks in a project. It is believed to provides a

disciplined environment for proactive decision making to assess continuously what could go wrong (risks). This helps to determine which risks are important to deal with an implement strategies to deal with those risks. These approaches create an opportunity to employ proactive decision making that avoids problems before they arise rather than "fire-fighting" and "crisis management" tradition of risk handing.

Some studies claim that risks are being managed every day in every industry, but not in such a structured way. As implied by other researchers, the knowledge of risk management is close to zero, even though the concept of risk management is becoming more popular in the construction sector. Moreover, some theories provided by risk management literatures are not at all applicable to specific industry. (Petr et al, 2018) The proposed project study is expected to reach at distinct findings that can help this gap in the risk management area by taking one case of industrial park.

Roque et al (2013) stated executives and professionals are involved with projects today. The results of ex-post assessments of project or even verification of loss business opportunities for companies are clear signals that this evidence has become more intense. Even though risk management is one of the greatest needs in project management, it is recognized that little has been done in this respect. The study also indicated that the risk manager is a new function established in the scope of project management and only little is studied by the specialized literature on the subject. Moreover, it is stated that the relationship of perceived success to the presence of a risk manager in projects is an important piece of information that serve as a touchstone to better understand this figure in the field of studies of project management.

Having these as a starting point, this project tries to assess the application of risk management practices in one of the country's top project driven organization and in one of priority projects, the industrial parks development corporation and Bole Lemi Industrial Park, respectively. By taking real case and approaching project participants, the project aimed at arriving a constructive conclusion with regard to the way of applying risk management during the five project management lifecycles. In addition to the assessment of application of project risk management during project phases, the project also tries to assess general application of the knowledge area

compared to the other nine knowledge areas identified by Project Management Body of Knowledge (PMBOK) latest edition.

1.3. Research Project Questions

The project study identified the following research question.

- What is the perceived level of risk management processes application for the project for Bole Lemi Industrial Park?
- What project risk management tools & techniques are utilized for the project?
- How does project team perceive the role/capacity of project risk management compared to other knowledge areas?
- How does project team perceive level of project risk management performance during the five project life cycles?

1.4. Research Project Objectives

By reviewing related literatures, collecting relevant necessary primary and secondary data, analyzing the data, finding conclusions, examining practical case, the project study tries to realize the following objectives:

1.4.1. General objective:

The general objective of the study is assessing the project risk management during its application in the project life cycles and investigating the comparative importance of project risk management taking a case of Bole Lemi Industrial Park of Industrial Parks Development Corporation.

1.4.2. Specific objectives:

The general objective is broken down and result in some specific objectives. Underneath the general objective identified, the following are specific objectives of the research paper:

- Assessing the importance of project risk management of Bole Lemi Industrial Park
- Identifying risk management tools & techniques for the project
- Evaluating risk management capacity of the project team

- Assessing risk management performance of the project

1.5. Significance of the study

This project research is assumed to have its own significance in different areas. After addressing each of the research questions, the findings are expected to have the following significances.

- **Improving the existing knowledge of project risk management**: Project risk management is one of the key activities of the project manager and the project team. However, it is indicated earlier that there are studies that justify the area is not much studied. Focus has been given to project risk management only recently. This project report is believed to improve this condition by taking practical case.
- **Reference:** The project report will serve as an important reference material for academicians and professionals interested in the knowledge area. This will help in suggesting other future studies as well.
- **Supporting project management professionals:** the project report is assumed to support project professional by investigating a real case.

1.6. Project Study Scope

The main emphasis of the project is assessment of project risk management in Bole Lemi industrial park. The report considers only one case located in the city of Addis Ababa. Even from the project aspect, not only everything is covered. Detail risk competition and analysis aspect are not focus of this study. The main area of study is only assessing the practical application of the project risk management knowledge area in the project. The study tries to investigate the risk management for the five project lifecycles.

The other scope area of the research is comparing the value and application of the project risk management knowledge area. This is related to perception of the project team with regard to project risk management in relation to the other knowledge areas.

1.7. Limitations of the study

The project study has some limitations. The first one is related to study samples. Samples are selected based convenience sampling due limitation of the population. The total project

participants are not thought to be diverse. This in turn has a limit on the sampling frame. Accordingly, it is believed impractical to use random sampling as number of the project team which represents the population are assumed to be very few. Moreover, the study area, project risk management, needs some expertise to answer the questionnaire and interview questions in reliable manner. To meet this, the project team which is familiar with the project's risk management is considered for data collection.

The second potential limitation is related to data analysis approach. Since the data needed is more of perceptions and ideas, it is converted to measurable figures. However, the ideas are not numerical naturally. Therefore, no regression model is employed. The last potential limitation is related with the project, that is a single case consideration. Since the project report employed single case, only sampled from one project are taken. This could affect generalizability of finding of the study to other projects.

1.8. Organization of the Project Report

The research project takes in to account many issues and concepts in the study. Beginning with the introduction in chapter one, the project report has five major chapters. The introduction includes the main points on the background of the study, statement of the problem, research questions, research objectives, significance of the study, limitations of the study, scope of the study, and organizations of the report.

Chapter two focuses on literature review. This chapter reviewed and discussed concepts, theoretical views, practical, empirical studies of the project area and related aspects and evidences. Chapter three details the research methodologies followed in conducting the project. The research design, the philosophical worldview, the strategies of inquiries, the population and sample size, the data of the study, methods and the data analysis methods applied are reviewed. The fourth chapter is presentation and analysis of the data collected and the discussions. This has the qualitative and quantitative results of the findings. In the final part, conclusions based on the findings are explained and recommendations are forwarded.

1.9. Definition of Key terms

This section deals with definition of the key terms in the proposed project study. One important thing to consider here is various definition of the term is available in the literature. The most

comprehensive definition of terms in most project management application areas are given by the project management institute (PMI). The institute is a nonprofit professional organization. Publication of the institute are cited by many researchers. (Zwikael & Globerson, 2016; Johanna et al, 2007; Crawford and Paul, 2002) For consistency purpose, definition of most of the key terms are taken from the latest edition of the PMBoK.

- Project life cycle: is the series of phases that a project passes through from its start to its completion.
- Project management processes: is a systematic series of activities directed toward causing an end result where one or more inputs will be acted upon to create one or more outputs.
- Project Management Process Group: is a logical grouping of project management inputs, tools and techniques, and outputs.
- The Project Management Process Groups include Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Project Management Process Groups are not project phases.
- Project Management Knowledge Area: is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques.
- Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, in order to optimize the chances of project success.

Chapter two: Literature Review

This chapter discusses review of the related literature on the project study. Kothari (2004) highlighted why literature review is necessary for a study as it helps in acquainting the researcher with the study problem. In doing so, it is mentioned two types of literature should be reviewed are forwarded by the author. These are the conceptual literature that concerns with concepts and theories, and the empirical literature that concerns with studies made earlier which are similar to the one proposed.

Relevant materials, published and unpublished are reviewed in this chapter. Both conceptual and empirical literature are examined in the following manner.

2.1. Project and Project Management

Different literature could define project from different angles. Some of the definition are more comprehensive than the other. Liviu et al (2010) in their study of best practices in project management defined project as "a new, unique and temporary set of activities, with a defined beginning and end, which uses resources in a planned and organized way with the purpose of reaching certain objective". In addition, Robert (2014) defined it as "A project is a sequence of finite dependent activities whose successful completion results in the delivery of the expected business value that validated doing the project". Moreover, project is defined by PMI as **"**project is a temporary endeavor undertaken to create a unique product, service, or result.". Despite the variation in wordings, some peculiarity of the meaning of the project are visible. The temporary level of engagement and unique nature of output are the common in all of the definitions though.

Project are needed to be managed in order to be successful. After all the strict quality requirements, high cost and firm schedule expectations call for a high level of skill in managing projects. That where project management becomes vital. Dragan and Sabin (2006) defined Project management a specialized form of management, similar to other functional strategies, that is used to accomplish a series of business goals, strategies, and work tasks within a well-defined schedule and budget. The study also indicated it is usually primarily associated with the planning and the controlling of project execution. Liviu et al (2010) provided project management has evolved over time to a sophisticated and complex process, becoming the principal mean of dealing with change in modern organizations.

Norman (2001) indicated Modern project management is a well-understood discipline that can produce predictable, repeatable results. With this, the methods of modern project management are assumed to be highly analytic, usually requiring automated tools to support on large projects. On their study of project management role for project success, Munns and Bjeirmi (1996) indicated project management is orientated towards planning and control and is concerned with on-time delivery, within-budget expenditures and appropriate performance standards. They also argued, being purely a subset of the project as a whole, the role of project management is to use resources available effectively to accomplish a set goal within certain criteria.

Amore comprehensive definition is given by PMI (2017, pp: 8), as "project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements and it is accomplished through the appropriate application and integration of the project management processes identified for the project." In line to this, the following are identified to be key benefits of effective and efficient project management by which strategic competency can be achieved.

- ✓ Tie project results to business goals,
- ✓ Compete more effectively in their markets,
- ✓ Sustain the organization, and
- ✓ Respond to the impact of business environment changes on projects by appropriately adjusting project management plans

What makes project management different from operations or process management is the nature of the project itself. The unique, temporary and non-routine features of project call for the nontraditional management approaches. On their study of lessons learned in risk management taking cases of software projects, Kwak and Stoddard (2003) have outlined the following differences among project management and process management.

Table 2.1.: Difference between Project and Process Management

PROJECT MANAGEMENT	PROCESS MANAGEMENT
Project has fixed duration	Processes are continuous and endless
Resources are allocated to the project	Resources are allocated to the functional group
Performance is measured for the project	Performance is measured by operation
Project is one of a kind, and unique	Work is replicated and repeated

Seung et al (2007) proclaimed that, even though risk management has traditionally been applied in the area of safety, cost, and time management in construction projects, its application area has also been expanded to include such fields as bid-decision making, feasibility studies, marketability studies, performance evaluations, and contingency management by reflecting the various factors spanning all phases of the project life cycle.

Furthermore, Stephen and Chapman (2001) have argued project risk management processes, as currently operated, have a limited focus which restricts the contribution to improving project management practice and hence project performance. They stated a broader perspective with focus on managing uncertainty is needed in order to make projects perform better. The project under study gives an additional insight with practical case analysis by approaching the project team.

Cooper (20005), like PMI, stated projects, by their nature, are unique and many of the more interesting ones are complex. They frequently take place over an extended period of time and demand the engagement of a wide range of resources, including people, finance, facilities, materials and intellectual property. In most circumstances, projects have defined objectives as an end-state that provides those involved in the project with a clear vision and specification of their goal. Cooper emphasized it also, Risk is exposure to the consequences of uncertainty. In a project context, it is the chance of something happening that will have an impact upon objectives. It includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of the uncertainty associated with following a particular course of action. Risk thus has two elements: the likelihood or probability of something happening, and the consequences or impacts if it does.

Most project risk management process (RMP) descriptions emphasize a need to identify 'risks' early in the process, typically restricting this to risk events and sometimes to just threats. However effective risk management needs to address uncertainty in a broad sense, with early consideration of all sources of uncertainty and associated responses. (Chris et al, 2003)

2.2. Project life cycles

Management applies specific functions of planning, executing, coordinating and monitoring while managing routine organizational day to day activities. When it comes to project, the special feature of projects makes the management functions to be more proactive, flexible, comprehensive and multi-disciplinary. Project management and project risk management are applied following the project life cycles accordingly. Different authors may suggest various life stages of project. The basic activities performed still reman similar, however.

Kwak and Stoddard (2003) claimed, despite project team members could have necessary skills to employ a risk management process; this does not guarantee that the team will use it during the project lifecycle. This indicated some processes are relevant in part of the life cycle while others are necessary in the others. Chapman and Ward (1997) and Stephen and Chapman (2001) also clarified it that, the scope for uncertainty in any project is considerable, and most project management activities are concerned with managing uncertainty from the earliest 'Conception' stage to the final 'Support' stage of the project life cycle (PLC)]. This includes illuminating what can be done, deciding what is to be done, and ensuring that it gets done. These studies imply how risk management activities performed in the earliest stage of the project can reduce potential risk of the project.

PMI (2017) states project life cycle as series of phases that a project passes through from its start to its completion. It provides the basic framework for managing the project. This basic framework is assumed to be applied regardless of the specific project work involved. The phases may be sequential, iterative, or overlapping. All projects can be mapped to the generic life cycle project life cycles [with this regard are believed to be independent of product life cycles] which may be produced by a project. A product life cycle is the series of phases that represent the evolution of a product, from concept through delivery, growth, maturity, and to retirement. Since project phase is thought to be collection of logically related project activities that culminates in the completion of one or more deliverables, phases in a life cycle can be described by a variety

of attributes. To this end, projects may be separated into distinct phases or subcomponents. These phases or subcomponents are generally given names that indicate the type of work done in that phase. The following table from the Project Management Body of Knowledge (PMI, 2017) shows the distinct phases a project passes and related processes.

It can be seen from the below table that the risk management process generally is highly well-thought-out during the planning stages and monitored in the execution phases of the project. This does not mean however it cannot be considered before the planning. On the other hand, projects need quality material at the needed schedule and at a reasonable cost. This needs a reliable supplier of materials. And this in turn call for systematic contract management. All these would be considered before execution of the project.

Table 2.2: PMI project life cycles and project management process groups

KNOWLEDGE AREAS	*PROJECT MANAGEMENT PROCESS GROUPS*				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
PROJECT RISK MANAGEMENT		8.1. Plan Risk Management 8.2. Identify Risks 8.3. Perform Qualitative Risk Analysis 8.4. Perform Quantitative Risk Analysis 8.5. Plan Risk Responses	8.6. Implement Risk Responses	8.7. Monitor Risks	

Source: PMI, 2017

Some contracts of the project could be applied retroactively after finishing all deliverables. This means, there is a potential risk area even after closing the project. Therefore, the fact risk management is aggressive in specific stages of the project does not indicate it is disregarded in other stages.

2.3. Project Risk Management

The concept of risk is among top concern areas for management. It is not uncommon to see risk management plan in many strategic plans of organizations. Since unmanaged risk brings additional cost to the organization, managing it realizes benefits. Risk is even major emphasis area for project driven organizations like the industrial parks' development corporation. Since managing risk has its own costs, benefits are expected to outweigh such costs. So far as projects are concerned however, return is not expected to be realized during the project life. For this reason, the risk management must envision both the ones that can be identified when the project became operation and while it is being implemented. This section discusses the detail of project risk management with this regard.

Sara et al (2013) have specified how embodying company's strategy in a strategic plan establishes a strategic line of work where projects can be defined. The need to link individual project risk management with the corporate strategic management to ensure achievement of corporate objectives is addressed accordingly. This is claimed to be the most important stage of risk management as success depends on it. According to this study, risk management at this stage is to ensure compliance with:

- Analysis of the context where the project will be developed.
- The project's defined objectives are in line with the company's strategy, and
- There is a correct choice of participants, activities and resources with respect to the objectives defined and the type of project

These together drive the activities of project risk management.

Eunchang et al (2007), in their study of large engineering project, stated project risk management is the planning, organization, monitoring and control of all aspects of a project and it consists of risk identification, risk qualification, risk response development, and risk response control. In

addition, Miller and Lessard (2001), as cited by Eunchang et al pointed out that understanding and managing project risks in large engineering projects are challenging tasks at the early phase. Form this end, the main purpose of project risk management is to identify, evaluate, and control the risks for project success. The measurement of project success is difficult because it may be changed by project phase, and many stakeholders have different criteria to evaluate project success

Elmar and Mark (2010) forwarded that the management of project risk is considered a key discipline by most organizations involved in project and best practice project risk management processes are claimed to be self-evidently correct. Albeit, project risk management involves a choice between which information is utilized and which is deemed to be irrelevant and hence excluded. And whenever there is a choice, there is a trade-off among the choices. In their study of "Deliberate ignorance in project risk management in IT projects, the authors conclude, project risk management is conditioned by deliberate ignorance of project managers in some projects. This indicates, having a good understanding of project risk management does not ensure its effective implementation.

On their study of Ontology-based risk management framework, Tserng et al (2009) have noted, the Ontology-based risk management approach is found helpful for contractor when conducting the project risk management. It is highlighted as well that, this approach could be of assistance in risk identification, analysis, and response for the project manager (PM). In addition to increasing RM effectiveness, the study verified that the project risk ontology could be developed through acquiring tacit knowledge and extracting explicit knowledge from the organization. It is concluded by the authors therefore that ontology-based risk management approach could support the project executor by increasing effectiveness of risk management workflow on the basis of implementing knowledge management. This study is an indicator of the fact that all risk management approaches may not have to be explicitly written in the project plan despite an effort should be to do so.

One of the important definitions of risk management plan is forwarded by Cooper (20005). According to him, Risk management refers to the culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects. The

risk management process in this regard involves the systematic application of management policies, processes and procedures to the tasks of establishing the context, identifying, analyzing, assessing, treating, monitoring and communicating risk. The purpose of project risk management, depending on Cooper, is to minimize the risks of not achieving the objectives of the project and the stakeholders with an interest in it, and to identify and take advantage of opportunities. In particular, risk management assists project managers in setting priorities, allocating resources and implementing actions and processes that reduce the risk of the project not achieving its objectives. Risk management facilitates better business and project outcomes.

Managing risk is claimed by Cooper (20005) to be an integral part of good management, and fundamental to achieving good business and project outcomes and the effective procurement of goods and service According to the author, the risk management is something many managers do already in one form or another, whether it be sensitivity analysis of a financial projection, scenario planning for a project appraisal, assessing the contingency allowance in a cost estimate, negotiating contract conditions or developing contingency plans.

2.3.1. The Risk Management Plan

All risk management activities are performed according to risk management plan. This plan is an integral part of the project plan having a plan of all the other knowledge areas, process, and stages. The pan is usually developed iteratively. It, however, is the major guide of actions and deliverables of the project.

Dietmar (2015) noted it, the risk management plan documents shows the tasks of the project risk management activity are planned, structured, scheduled, executed, measured, documented, and managed. The risk management plan is usually created by members of the project team together with business process experts from the functional areas that have interfaces to the project or even just have a tangential touch point with the project. In larger organizations, there might be experts in risk management who would be major contributors to the risk management plan. The risk management plan is, or should be, created parallel to the development of the other plans and must be available at the start of the project. (Dietmar, 2015)

Likewise, Rodney (2007) pointed it out that a formal risk management process (RMP) is suggested to be applied at all stages in the project**)** life-cycle, by clients (project owners), contractors, and other parties associated with a project, such as financial institutions providing funding. RMPs are most easily understood and explained in general terms when implemented in a comprehensive manner on behalf of a client during the development of a strategic plan.

2.4. Classifying project risks

There are several ways to look at the kinds of project risks. It is helpful to understand the different types of risk so that a team can explore the possibilities of each of them. However, one important thing to consider is some risks are relevant only for some projects. Construction related risk may not be viable for IT or software development project and pharmaceutical products development project risk may totally not be applicable for automotive projects. Various classifications are forwarded by different authors and researcher as a result. This section tries to discuss the one relevant for the project study.

2.4.1. Generic Vs Product Specific Risk

Generic risks are potential threats to every project. Some examples of generic risks are changing requirements, losing key personnel, or bankruptcy of the company or of the customer. It is advisable for a development organization to keep a checklist of these types of risks. Teams can then assess the extent to which these risks are a factor for their project based upon the known set of programmers, managers, and customers. (Laurie Williams 2004)

Product-specific risks can be distinguished from generic risks because they can only be identified by those with a clear understanding of the technology, the people, and the environment of the specific product. An example of a product-specific risk is the availability of a complex network necessary for testing. (Ronald,2013)

Generic and product-specific risks can be further divided into project, product, and business risks. **Project risks** are those that affect the project schedule or the resources (personnel or budgets) dedicated to the project. **Product risks** are those that affect the quality or performance of the product being developed. Finally, **business risks** are those that threaten the viability of the product, such as building an excellent product no one wants or building a product that no longer fits into the overall business strategy of the company. (Ronald,2013)

According to Laurie (2004), there are some specific factors to consider when examining project, product, and business risks. Some examples of these are listed below as identified by the author.

1) People risks are associated with the availability, skill level, and retention of the people on the development team.
2) Size risks are associated with the magnitude of the product and the product team. Larger products are generally more complex with more interactions. Larger teams are harder to coordinate.
3) Process risks are related to whether the team uses a defined, appropriate product development process and to whether the team members follow the process.
4) Technology risks are derived from the software or hardware technologies that are being used as part of the system being developed. Using new or emerging or complex technology increases the overall risk.
5) Tools risks, similar to technology risks, relate to the use, availability, and reliability of support products used by the development team, such as design software, and other Computer-Aided Software Engineering (CASE) tools.
6) Organizational and managerial risks are derived from the environment where the product is being developed. Some examples are the financial stability of the company and threats of company reorganization and the potential of the resultant loss of support by management due to a change in focus or a change in people.
7) Customer risks are derived from changes to the customer requirements, customers' lack of understanding of the impact of these changes, the process of managing these requirements changes, and the ability of the customer to communicate effectively with the team and to accurately convey the attributes of the desired product.
8) Estimation risks are derived from inaccuracies in estimating the resources and the time required to build the product properly.
9) Sales and support risks involve the chances that the team builds a product that the sales force does not understand how to sell or that is difficult to correct, adapt, or enhance.
10) Spontaneous and sporadic risk identification is usually not sufficient.

Additionally, Laurie (2004) highlighted there are various risk elicitation techniques the team can use to systematically and proactively surface them. After risks have been identified and enumerated, the next step is risk analysis. Through risk analysis, identified risks are transformed into decision-making information. In turn, each risk is considered, and a judgment made about the probability and the seriousness of the risk. For each risk, the project risk management team is suggested to do the following:

I. Assess the probability of a loss occurring. Some risks are very likely to occur. Others are very unlikely.
II. Establish and utilize a scale that reflects the perceived likelihood of a risk. Depending upon the degree of detail desired and/or possible, the scale can be numeric, based on a percentage scale.
III. The team should establish a set numerical probability for each qualitative value.
IV. Assess the impact of the loss if the loss were to occur. Delineate the consequences of the risk and estimate the impact of the risk on the project and the product. Like the probability discussion above, the team can choose to assign numerical monetary values to the magnitude of loss. Alternately, categories may be used and assigned values, such as 1=negligible, 2=marginal, 3=critical, or 4=catastrophic.

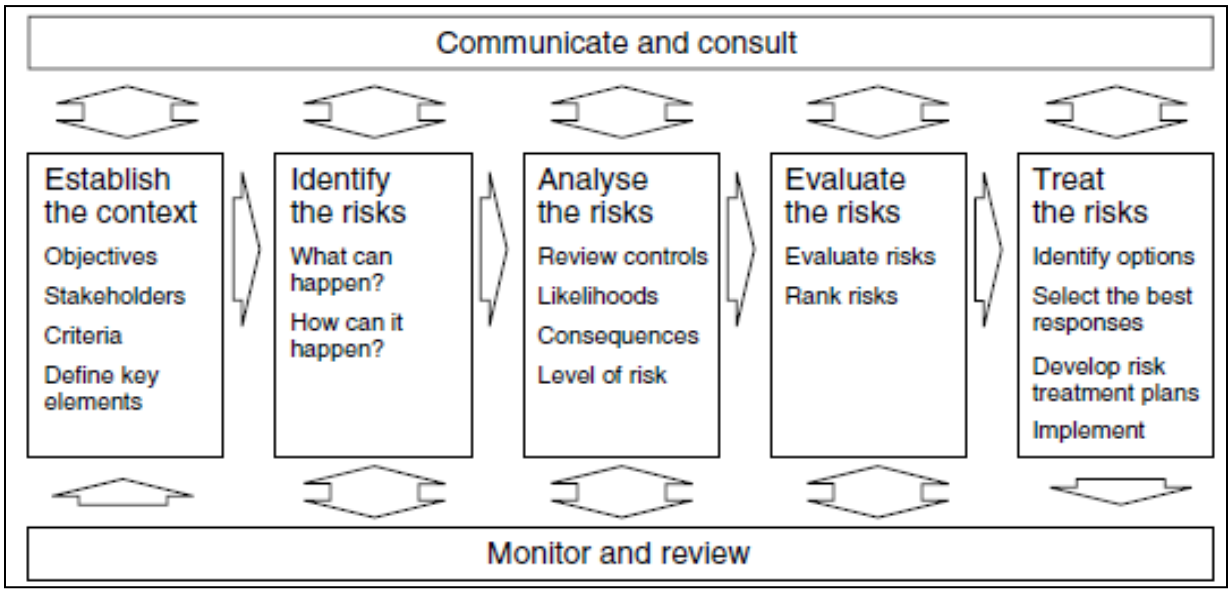
In addition to this, it is noted by Ronald (2013) that, careful attention is needed towards stakeholders while applying risk management. The three stakeholders involved in risk management are thought to include, the developer who must systematically and continually enumerate all the possible risks related to technical capability and making the schedule, the manager who must lead the team to follow the risk management process to proactively manage the project risks, the manager must also allocate resources for proactive risks management and the customer who must participate in the continual identification of risks. According to Ronald, none of the above stakeholders is empowered to manage business risks, i.e. organizational and managerial risks, and sales and support risks. This kind of risk must be managed by upper management and marketing department of the firm.

2.5. The comprehensive framework of RMP

Various approaches and modes of project management do exist in the literature. Different approached can defined depending on basic feature of project. Traditional project management, agile project management and extreme types of project have different approaches of risk management. It is evident here that, the more complex a project is, the less will be known about it and therefore the more flexible is assumes to be the risk management. Some comprehensive frameworks are developed by scholars however. This framework is assumed to have the following phases.

Cooper (2005) stated, the objective of risk management is to identify and manage significant risks. It involves several key phases, with feedback through a monitoring and review process. In most projects, risk management overlaps with other management processes and procedures, in that many of the steps are undertaken as part of normal project management. This is thought to provide the basis for integrating risk management and project management activities. The following model of project risk management is forwarded by the author accordingly.

Figure 2.1. Comprehensive Project Risk Management Approach



Source: Cooper, 2005

Another important detail of the comprehensive project risk management approach is illustrated by Rodney (2007). According to Rodney, the comprehensive project risk management has nine phases. These are:

2.5.1. The define phase

All Risk Management Plans (RMPs) embody aspects of a define phase, but much of it is usually implicit. Its purpose is to define project effort to date in a form appropriate for the RMP, to consolidate in a suitable form existing relevant information about the project which the RMP addresses and undertake project management activities to fill in gaps uncovered in the consolidation process **(Rodney, 2007)**

2.5.2. The focus phase

At his phase, Rodney forwarded, all RMPs should embody a focus phase, although much of it is often implicit, and some of it may be given other titles. Its purpose therefore is assumed to be to define RMP scope and strategy as distinct from the strategy of the project it addresses and to plan the RMP in operational terms as a project in its own right. If a RMP is being applied to test the viability of a new project, a purely qualitative approach may be appropriate

2.5.3. The identify phase

Rodney stated the third phase is related to most RMPs having an explicit identify phase for sources of uncertainty. Some use a separate later phase to identify responses to these sources. It is useful to couple the identification of sources of uncertainty and responses, and to use the term 'issues' to mean 'sources of uncertainty and associated responses. The key deliverable here is a clear common understanding of threats and opportunities facing the project.

2.5.4. The structure phase

The author indicated on the fourth phase how providing structure to clarify understanding of complex issues is central to RMPs. Some aspects of providing this structure are necessarily integrated with earlier phases, like the structure implied by the way issues are defined in the identify phase. For some RMPs, structure is implicit, assuming a simple standard structure by default. In general, the RMP is suggested to be as simple as possible, but not misleading.

2.5.5. The ownership phase

As per Rodney, all effective RMPs deemed to have an ownership phase have the following three purposes,

I. distinguish the sources and associated responses the client is prepared to own and manage from those the client wants other organizations (such as contractors) to own or manage;
II. allocate responsibility for managing sources and responses owned by the client to named individuals;
III. approve, if appropriate, ownership/management allocations controlled by contractor(s) and third parties.

The author commended the first of these purposes should be achieved on the first pass before moving on to the following phase of the RMP

2.5.6. The estimate phase

Based on Rodney comprehensive risk management approach, all RMPs have an estimate phase, concerned with cost, time and other performance measures. However, it may be given alternative designations, and sometimes it has separate 'qualitative' (non-numeric) and 'quantitative' (numeric) components. When a quantitative (subjective probability based) approach is used, it is applied only to those sources of uncertainty which are usefully quantified.

2.5.7. The evaluate phase

On the seventh phase, the issues of evaluating is captured. Here, all RMPs are assumed to have an evaluate phase, although it may be coupled with the estimate phase. Its purpose is the synthesis and evaluation of the results of the estimate. phase in the context of the structuring provided by all earlier phases with a view to managing the iterative nature of the RMP and client assessment of decisions and judgements. The deliverables will depend upon the depth of the preceding phases achieved to this point, looping back to earlier phases before proceeding being a key and frequent decision at this stage.

2.5.8. The harness phase

The eighth phase, according to the approach, is related with harnessing the strategic plan shaped by earlier phases. The harness phase begins by obtaining approval for the strategic plans shaped by the first seven phases. Detailed action plans are then prepared. Action plans involve base

plans incorporating proactive responses and contingency plans incorporating reactive responses with trigger points.

2.5.9. The manage phase

Managing implementation is mentioned as the last phase of Rodney's comprehensive RMPs approach. On this phase, all RMPs are expected to have a manage phase, ongoing as the project is implemented. One key deliverable is diagnosis of a need to revisit earlier base and contingency plans as basis of control. Another is rolling development of action plans ready for implementation as the detailed planning horizon rolls forward.

Various high level and comprehensive risk management approaches are applicable too. Elamr and Mark (2010) for example developed the following comprehensive and high-level risk management process summary table.

Table:2.3 Summary of project management processes

Major steps in project risk Management	**Major steps in project risk Management**	**OGC – Management of risk**	**PRAM - APM risk management process**
Planning	Risk Management Planning	Context	Focus and Define
Identification	Risk Identification	Risk Identification	Identify and Structure
Analysis	Risk Analysis	Assess - Estimate and Assess-Evaluate	Estimate and Evaluate
Response	Risk Response Planning Risk (Monitoring and) Control	Plan	Plan
		Implement	Ownership
		Communicate	Manage

Source: Elamr and Mark (2010)

2.6. Risk treatment strategies

The very basic aim of having an effective project risk management is to reduce risk and their resulting losses. Having a plan is not enough. Risk response come to play after having a good management plan. The project team could respond in different ways to risk. Some of the response are proactive while some others are reactive and passive. The risk response intentions are needed to be planned indeed. This section deals with possible risk responses in the literature taking both conceptual and empirical studies.

According to Yao (2016), Risk response, being part of the general project risk management, refers to developing, selecting, and implementing strategies in order to reduce risk exposure. In addition, Ebrahim et al (2009) et al stated, RRP (risk response planning) assists in converting the risk information into actions and judgments. According to this study, the RRP process recommends the risk treatment actions needed in the later stages and requires selecting the proper security control methods according to the impact and the likelihood of risks. This process also provides different execution possibilities and examines different "What-if" options. The goals of this process are: (1) Reduction of the probability of risk occurrence; (2) reduction of loss magnitude; or (3) changing on risk's consequences (Bruckner et al., 2001; Ebrahim et al, 2009).

Terry and Martin (2004) have conducted study in risk response and compared four selected risk response method usages. These are: risk elimination, risk reduction, risk retention and risk transfer. The research found out Risk reduction is the most frequently used risk response method closely followed by risk transfer, risk elimination and risk retention. In addition, the research compared three project response techniques namely, contingencies, contractual transfer, and insurance. Accordingly, it found out a preference for contingencies and contractual transfer over insurance.

According to Cooper (20005), the Risk Action Plans developed and implemented to treat an identified risk depends on the nature of the project and the nature of the risk. However, some general suggestions can be provided. During the response identification and assessment process, it is often helpful to think about responses in terms of broad risk management strategies. The

major risk responses according to Copper are: risk prevention (including risk avoidance); impact mitigation; risk sharing; insurance; and risk retention.

Cooper (20005) indicated, in practice, these categories overlap to some extent. Nevertheless, they provide a useful framework for thinking about how to deal with risks. These categories are in the nature of tactical responses. The organization is therefore expected to determine how they should be combined into its overall strategy, according to the extent to which it is prepared to accept or tolerate risk. Policy decisions such as this must be made at senior levels in the organization, not left to individual managers.

2.6.1. Risk Response Strategies

Fairley (2005) and Vanita et al (2014) have identified specific project risk response strategies. These includes:

Avoidance

Is eliminating activities with a high probability of loss by making it difficult for risk to occur, or by executing the project in a different way which will achieve the same objectives but which insulates the project from the effect of the risk can be termed was risk avoidance.

Transference

Is related to transferring a portion or entire risk to a third party, by identifying another stakeholder to manage the risk activities with low probability of recurrence, but with a large financial impact, is termed as risk transference.

Mitigation

Is understood by the authors as reducing the risk in order to make it more acceptable to the project or organization, by reducing its impact can be termed as mitigation of risk. From the perspective of risk mitigation, internal communication within project team and immediate stakeholders within the organization commands more relevance.

Acceptance

Is recognizing that residual risks (i.e., risk that remains after a risk response has been taken) will exist and responding either actively by allocating appropriate contingency, or passively doing nothing except monitoring the status of the risk can be termed as risk acceptance. According to

the authors, risk acceptance would also mean that taking no action on risk was a carefully thought-after decision.

2.7. Review of Empirical Studies

Empirical studies provide an important insight to the study project. In addition to the theoretical and empirical studies reviewed so far, this section highlights some important more empirical studies conducted.

Salah (2005) stated, an important issue that looms high in the management of real-life projects is that of risk and uncertainty. Concerns about risk are indicated to be everyday worries of project managers and they recognize the uncertain nature of their undertakings. To Project managers, uncertainty is deemed to be a fact of life in their estimates of resources, cost, and time. The issue is not that of recognition, but rather of measurement, and of how to cope with uncertainty in resource allocation and in managing the risk inherent in the estimates made relative to cost and time.

On their survey study of project risk management in engineering construction project, Terry and Martin (2004) found out an important points of the risk management aspects in projects these are mainly the use of risk management is moderate to high, with very little differences between the types, sizes and risk tolerance of the organizations. Their research also indicated risk management usage in the execution and planning stages of the project life cycle is higher than in the conceptual or termination phases. One important finding to this end is that, risk identification and risk assessment are found to be the most often used risk management elements ahead of risk response and risk documentation. When it comes to risk identification techniques, brainstorming is found to be the most common used techniques. Regarding risk response and treatment mechanisms, the risk identified risk reduction is the most frequently used risk response method followed by risk transfer; risk elimination and risk retention - with the use of contingencies and contractual transfer preferred over insurance.

On their study of effects of project uncertainty and risk management by employing a multiple regression analysis, Liu et al (2011) has identified project inherent uncertainty had a direct negative effect on process performance and product performance, that project planning and

control and internal integration had direct positive effects on process performance, and that user participation and internal integration had direct positive effects on product performance. In addition, they concluded user participation is necessary for project success and participation in the requirements analysis stage can decrease the risk of there being insufficient requirements. Too much user participation is identified to have negative effect on project success and delivery time by the authors as well. As a result, given novelty of the technology involved and the corresponding uncertainty about requirements, it is stated on the study clients/users will continually change their requirements, which can lead to conflict and the product being delivered late and over budget. Therefore, project managers suggested to be aware of the potential trade-offs between too much, and extremely limited user participation. As a conclusion, the study provided inherent uncertainty can moderate the effect of project planning and control on process performance and the effect of user participation on product performance.

Rediet (2017) found that despite there is presence of a defined or standard risk management process, it is not practiced in a well-defined manner and it is not applied properly in practice too. In addition, the author indicated even though there is a policy or guideline that recommends how to manage risks, it is not well known and understood by all project team members. This shows having a proper project risk management by itself does not guarantee managing project risks effectively. Moreover, Rediet found absence of responsible person assigned to handle issues related to project risk management.

On another risk management study conducted by Tesfamichael (2018), it is founded risk management is a continuous process and having a department to handle risks play an important role to employ guideline and defined standard risk management process that can help in minimizing uncertainties in the project. In addition, the author indicated, despite there are tools like expert judgment, meetings or others and relevant stakeholders are utilized for risk planning, the approach is not systematic overall. Though risk management plan is incorporated with the project plan, project team members didn't get required training to handle risks and environmental factors were not considered as an input to plan risk. This give an important insight since risk

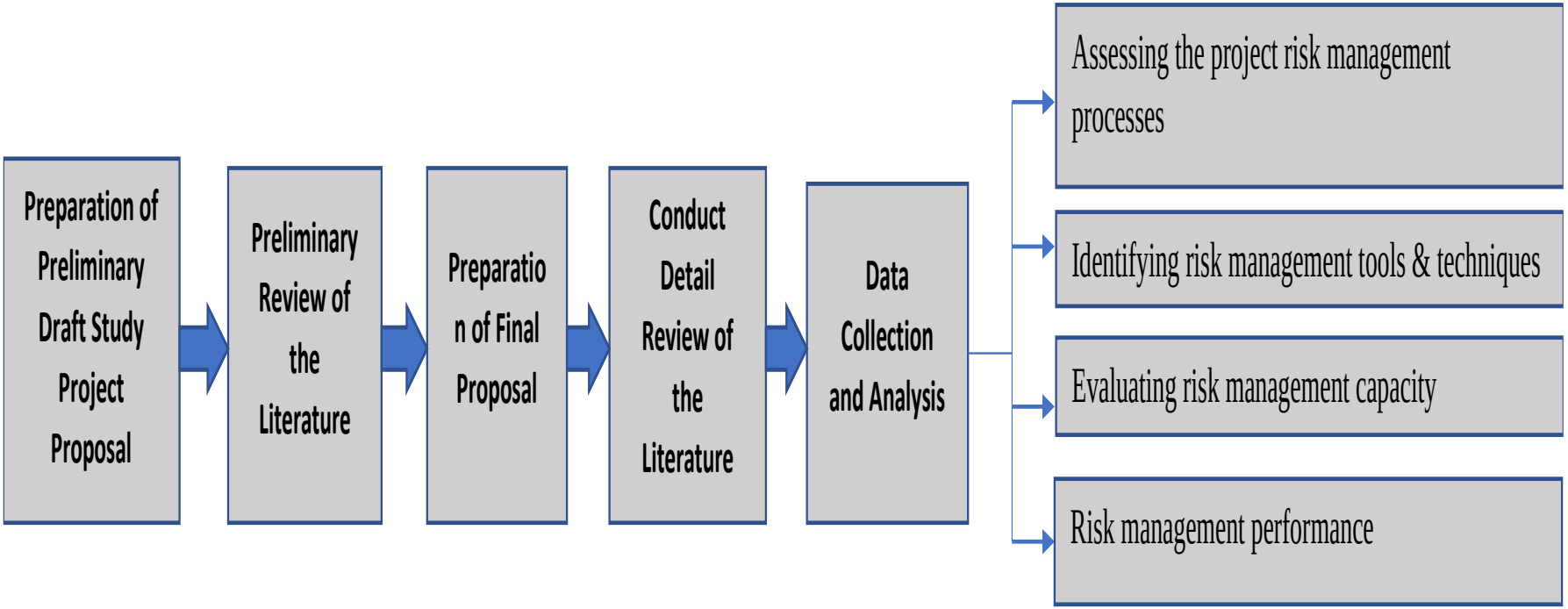
management is just about planning but follow actives are needed to properly manage risk and uncertainties.

On their study of risk managing success in engineering and construction project environment, Chihuri and Chihuri (2010) have indicated project risk management needs to an iterative process consisting of well-defined steps that, when taken in sequence, support better decision-making. The authors forwarded also; decision makers need to know about possible outcomes to take necessary steps to control risk impact. This is thought to be possible only if project risk management is an integral part of the project management process. Moreover, it is suggested on this study that, since there usually is a conflict of priorities for project managers when it comes to devoting time to managing risk versus managing the project to completion, an independent risk management team is needed. The dedicated resource can then work independently which allows for effective implementation of risk management without fear of overrunning the project budget or wasting project time.

2.8. Conceptual Framework/Model

With identification of the study variables, reviewing relevant literature and primary and secondary data collection, the project study aimed at reaching specific findings. The general conceptual model of the study is depicted below.

Figure 2.2: Study Conceptual framework/Model



Chapter Three: Research Methodologies and Methods

Research methodologies and methods are two different aspects of research despite being used interchangeably in various occasions. Kothari (2004) defined Research methodology as "a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. By which it deals the various steps that are generally adopted by a researcher in studying research problem along with the logic behind them". Research Methods, on another way includes all methods/techniques that are used for conduction of research. This chapter of the study focuses on the research methods and methodologies employed in the project study.

3.1. Research Design

Various forms of research types are forwarded by various authors and scholars. The basic types of research are Descriptive, Analytical, Applied, Fundamental, Quantitative, Qualitative, Conceptual and Empirical. (Kothari, 2004). A mixed approach is employed in the project and the research type is assumed a combination nature**.** Major features of the project study is on descriptive discussion and exploratory.

Kothari (2004) indicated exploratory research studies, or also referred as formulative research studies, have main purpose of formulating a problem for more precise investigation or of developing the working hypotheses from an operational point of view. The major emphasis in such studies is on the discovery of ideas and insights. The mixed research approach employed have an exploratory nature, as the main purpose of the project is assessing and learning on application of project risk management. Since data needed is collected in interviews and the questionnaire is planned to comprise perception of participants, the study features exploratory nature as well.

Research is conducted in two approaches, quantitative (the one that applies numbers) and the qualitative. Qualitative research is concerned with qualitative phenomenon i.e. phenomenon relating to or involving quality or kind. This approach results in non-quantitative outputs (Kothari, 2004, p. 4 and 5). The project report is designed both in qualitative and quantitative

approaches. A mixed research methodology is utilized for the project. Both qualitative and quantitative approach are employed having more emphasis on quantitative discussions. Since nature of the data collected is idea of experts, a Likert scale questionnaire are distributed. The study is conducted taking an actual case and based on data for empirical results. Since real case analysis is found to be relevant for the project, a project team from selected case, Bole Lemi Industrial Park of the Industrial Parks Development Corporation is selected. Only current data are considered and therefore cross-sectional timelines is considered on the project study. No historical data are utilized.

For the quantitative analysis, a questionnaire is distributed to selected samples of the project. Having collected response from samples, an analysis tool called IBM Statistical Package for Social Science (SPSS) is used. However, since the population study are found to be very limited, no regression analysis is employed.

3.2. Description of study area and target population

The population of the study is the area from which the samples are selected. As highlighted above, all the project participants are assumed to population study for this project. This comprises the team starting from the lower level project participants to middle level and higher-level project coordinators and/or manager. All this combined are population of the study. There are more than 70 experts who follow industrial parks, including the Bole Lemi Industrial Park in the corporation.

3.3. Sampling technique/methods and sample size

The project is an assessment on application of project risk management taking case of Bole Lemi Industrial Park. To collect primary data, samples are taken from the project owning organization. As highlighted above, the project took consideration one real case which is BLIP. Both data on questionnaire and interview are collected through convenient sampling. For the homogeneity and limited population size reasons, all core project are taken to be samples for the questionnaire. For interview, on the other hand, two samples are taken: One project team lead, and one project coordinator are targeted for interview.

Due to the fact that there are very few samples studies for the par, non-probability sampling techniques is employed while selecting samples. Questionnaire survey is distributed to 25 samples selected conveniently.

As employed by Tesfamichael (2018), a sample size determination rule of thumb model (Yount, 2006) is employed for the study. The following table shows the model.

Table 3.1: Sample Size determination

RULE OF THUMB	RANGE OF POPULATION SIZE	
1	0-100	100%
2	101-1000	10%
3	1001-5000	5%
4	5001-10,000	3%
5	Above 10,000	1%

(Adopted from: Yount, 2006)

The total population study is learnt to be 250. This includes the staff working in the IPDC head office and site representative in industrial park. In line to this, the rule of thumb adopted above suggests 25 sample size shall be taken considering 250 population size from which 10% sample needs to be taken.

25=10%-250

3.4. Data collection – source, types and instruments,

Two major types of data, both primary and secondary are used in this project. Primary data is collected using questionnaire and interviews. Standardized Questionnaire is distributed to samples. Questions are developed with reference to PMBoK guide 6th edition. Having the PMBOK and empirical studies performed earlier, questionnaire survey is developed in a way that can reflect research questions and research objectives. In addition to the primary data, secondary data is used for the project study. Accordingly, document review is performed on secondary data sources in addition to the primary sources. The secondary data sources are identified to be legal documents, unpublished electronic materials, brochures and other institutional materials collected from the project owner and other stakeholder/s. Different types of documents found in different formats are utilized with this regard.

3.5. Description of study variables

The research mainly focused on assessment of project risk management in Bole Lemi Industrial Park. Taking a practical case of the project, specific study variables are identified. The first study variable is level of risk management processes application of the project. This is related to how much formality does exist while applying the project risk management for the project. The second study variable is related to utilized project risk management tools & techniques utilized for the project. This is related to the systems and mechanism of risk management. The third study variable is identified to be the role/capacity of project risk management compared to other knowledge areas. This variable is basically related to perception of the project team on relative role of project risk management compared to the other knowledge areas. The last study variable is assumed to be the level of project risk management performance during the five project life cycles. This is mainly related to the level of risk management application during the five project life cycles as perceived by the project team.

3.6. Data Analysis

Data collected is analyzed in two major ways since the approach followed is mixed method. Documentation is performed for all the necessary relevant sources. Collected documents are used to give background info and help confirm some of the data indicated on the questionnaire. These secondary materials are read and understood, then explained in manner that can answer the research questions.

The second part of the data is quantitative discussion. Any data collected through questionnaire is analyzed using statistical package for social science (SPSS). Descriptive analysis are employed to this end. Since the project focuses on assessment of risk management from project team perspectives, a Likert scale type questionnaire is developed basically. Sample responses are encoded in a five-scale degree of agreement and analyzed using factor analysis application of SPSS software to drive conclusion.

Measure of centrode tendency are employed basically in the project. The data collected dis interval data through Likert scale collection method. To this end, regression analysis related detail correlation explanation is not employed.

3.7. Validity and Reliability Analysis

Validity refers to the extent to which a test measures what the researcher actually wishes to measure (Kothari, 2004) whereas reliability refers accuracy and precision of measurement. To obtain acceptable and accurate response for each question in the questionnaire, the questionnaire is reviewed, commented, and rechecked iteratively.

Keith (2017) highlighted how important "Cronbach's Alpha" test of reliability is in social science studies. As suggested by the author and utilized by some other studies, an Alpha value of less 0.6 is not considered to be reliable. The project study computed the Cronbach's Alpha value of the project as a whole. Each factor is analyzed using factor analysis of SPSS software.

Test of reliability is conducted for the whole data set and the major part of the survey.

Table 3.2 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.887	.890	23

As it is indicated in table 3.2, the test result shows a very good test of reliability. It can be assumed therefore that the data sets collected for the study are reliable assuming the common Cronbach's Alpha" test of reliability.

In addition, the valid level of response is indicated in the following table.

Table 3.3 Case Processing Summary

		N	%
Cases	Valid	22	100.0
	Excluded	0	.0
	Total	22	100.0

We can see from table 3.3. that the valid level of response is 22. This is realized through response of the whole samples. No missing data is identified on collected responses and this resulted in realizing the 100% level of valid response as depicted in the table.

25 samples are identified, and survey is distributed. Sample response of questionnaire is counted to be 22. This makes sample response rate to be 88%.

In addition, the questionnaire has four basic parts in addition to the demographic data. The following table indicated the reliability test of each of the major component factors. Table 3.4. below shows the summary of the four major reliability test components.

Tables 3.4: Summary of component reliability tests

Major Parts	Cronbach's Alpha	No of items
General Project Risk Management Question	.859	4
Comparative value of Project Risk Management During Project life cycles	.831	5
Comparative Value of Project Risk Management in relation to other knowledge areas	.937	9
Comparative application of Project Risk Management in relation to other knowledge areas during project lifecycles	.878	5

3.8. Ethical Consideration

The project is undertaken by adhering to the research ethics. In advance clarification and familiarization with purpose of the project is given to participants. A support letter from School of Commerce is submitted the corporation and the researcher followed all requirements of the office while collecting data. Then the response has been used only for the purpose of the study without making any alterations and kept confidential as assured by in the questionnaire. The researcher has followed ethically and morally acceptable processes in conducting the project and data is collected with the full consent of the participants. Due consideration is given no to miscommunicate intellectual properties and confidential matters of the data. When it comes to

references, all materials and sources are cited in the text and listed in reference. All third-party material and articles are acknowledged.

Chapter Four: Data Analysis and Presentation

This chapter detail the data collection results which comprises basically data presentation and explanation. It has three major parts. These are the demographic data presentation of cases, Model Discussion, and results discussion.

4.1. Demographic Data

This section of the response aimed at presenting general features of the samples. It has four major components including gender, academic level, study area and work experience. This section of the questionnaire aimed at giving general info of project participants. Any effect of the demographic data on the project study area, project risk management, is not covered in this study.

The following table shows demographic data of respondents.

Table 4.1. Respondent Demographic Data

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender					
Valid	Male	16	72.7	72.7	72.7
	Female	6	27.3	27.3	100.0
	Total	22	100.0	100.0	
Education Level					
Valid	Bachelor's degree	10	45.5	45.5	45.5
	Master's Degree	11	50.0	50.0	95.5
	PhD	1	4.5	4.5	100.0
	Total	22	100.0	100.0	
Experience					
Valid	4 to 6 years	8	36.4	36.4	36.4
	7 to 9 years	4	18.2	18.2	54.5
	10 to 12 years	2	9.1	9.1	63.6
	More than 12 years	8	36.4	36.4	100.0
	Total	22	100.0	100.0	

Gender

Most of the samples comprises male respondents. Male participants are identified to be by far the prominent in the sample. The Figure below depicts this fact as the data collected indicates.

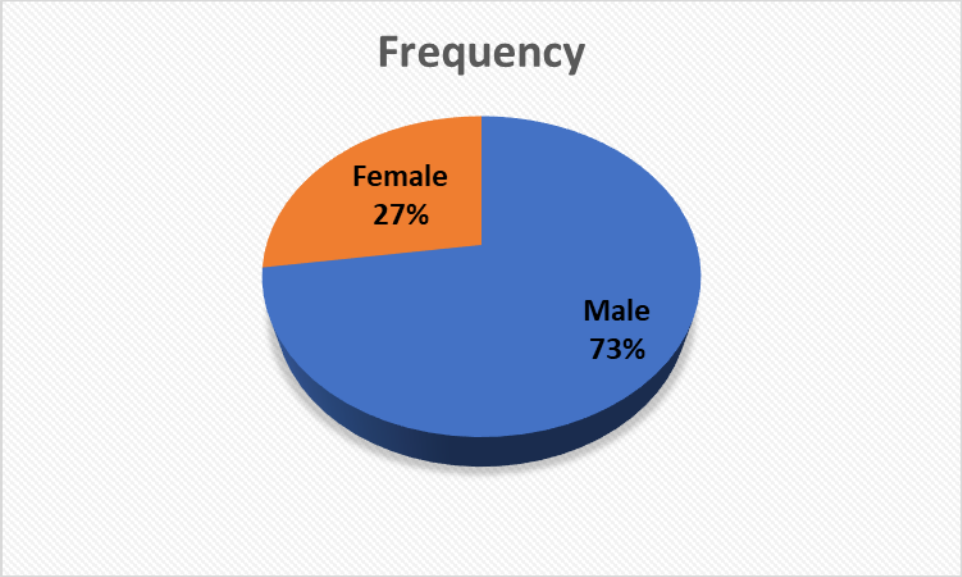


Figure 4.1: Respondents gender proportion

As it is indicated on table 4.1 and figure 4.1 Above the gender variation is inclined to the male respondents. Male participants represent 16 of the total samples collected and this comprises about 73% of the total. Female participants on the other hand represent only 6 of the total 22 samples which represents only 27% f of the sample study. This indicates most project team are male and female participants have limited presence.

Academic Level

Th second part among the demographic data is the academic level. On this section, respondents are asked to choose their achievement on academic level in four categories. The major given options are diploma, Bachelor's Degree, MSc/MA, PhD and other classifications. Accordingly, the following response result is identified from the response.

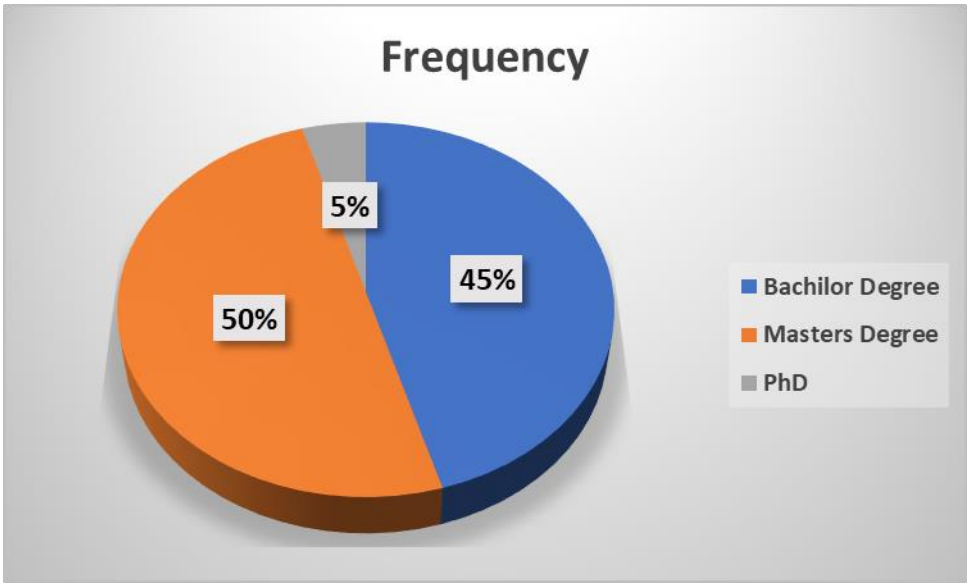


Figure 4.2 Respondents' Academic Level Proportion

As it is detailed in table 4.1 and figure 4.2, the academic qualification of respondent is a little more evenly distributed than the gender. Most of the samples are Master's degree holders. 11 (eleven) of all the 22 project participants are identified to be in this category. These samples represent about 50% of the total participants. Of all 22 participants, 10 (ten) are identified to be bachelor's degree holders. This represents 45% of the total number of samples. The remaining 5% came from one sample, holder of PhD. No participants are identified for the diploma and other qualification options. This indicated, most of the participants are Master degree holder and other two combined represents the remaining 50%. This is a mere indicator of the fact that most of the project participants have good academic qualification which could play an important role for the risk management activities of the project.

Respondent's Work Experience

The third section of the demographic data is in relation to respondents' level of work experience project organization. This is related to any position so long it is in project driven organization.

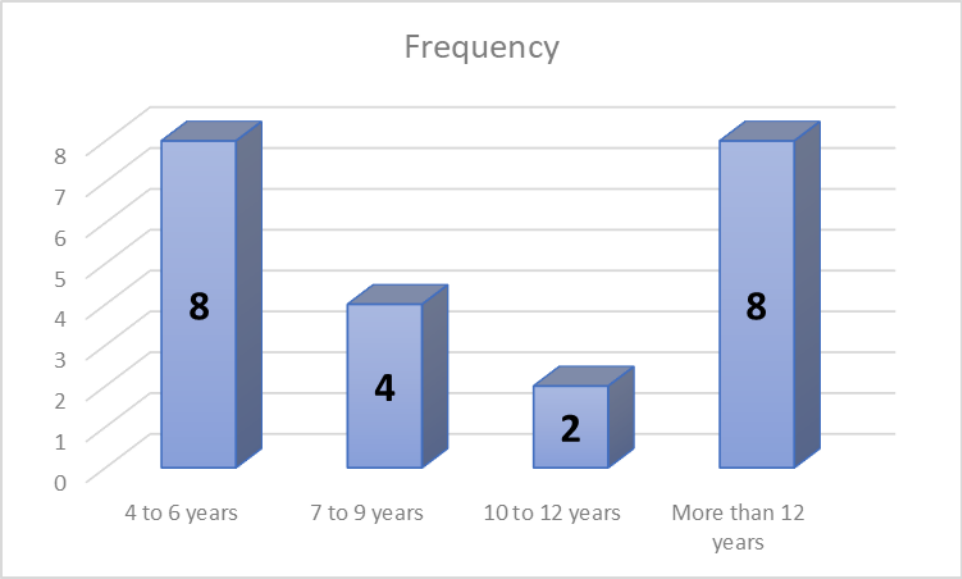


Figure 4.3. Respondents' Work Experience Proportion

A more diversified data is identified in "Work Experience Proportion" of Respondents' than the earlier two elements of the demographic data. As it is depicted above, the least of the participants are identified to be only 2, having an experience of "10 to 12 years". This represents only approximately 9% of the total participants. Next to this is identified to be respondents having an experience of "7 to 9 years". Samples in this category are 4 in number out of the total 22 representing about 18% of the total participants. Most of the samples have an experience of "4 to 6 years" and "More than 12 years". 8 participants in each, representing 36% are observed. Together these two represents about 16 of the total 22 samples, representing approximately about 73% of the total project participants. Despite an option is given for samples with an experience of "3 years and less", none is observed in this category. It can be concluded therefore that all the samples have an experience of more than three years or all are with an experience of at least 4 years.

Respondent's Study Area

The last element of the demographic data is related to Respondent's Study Area in terms of profession. The following table is identified for this element,

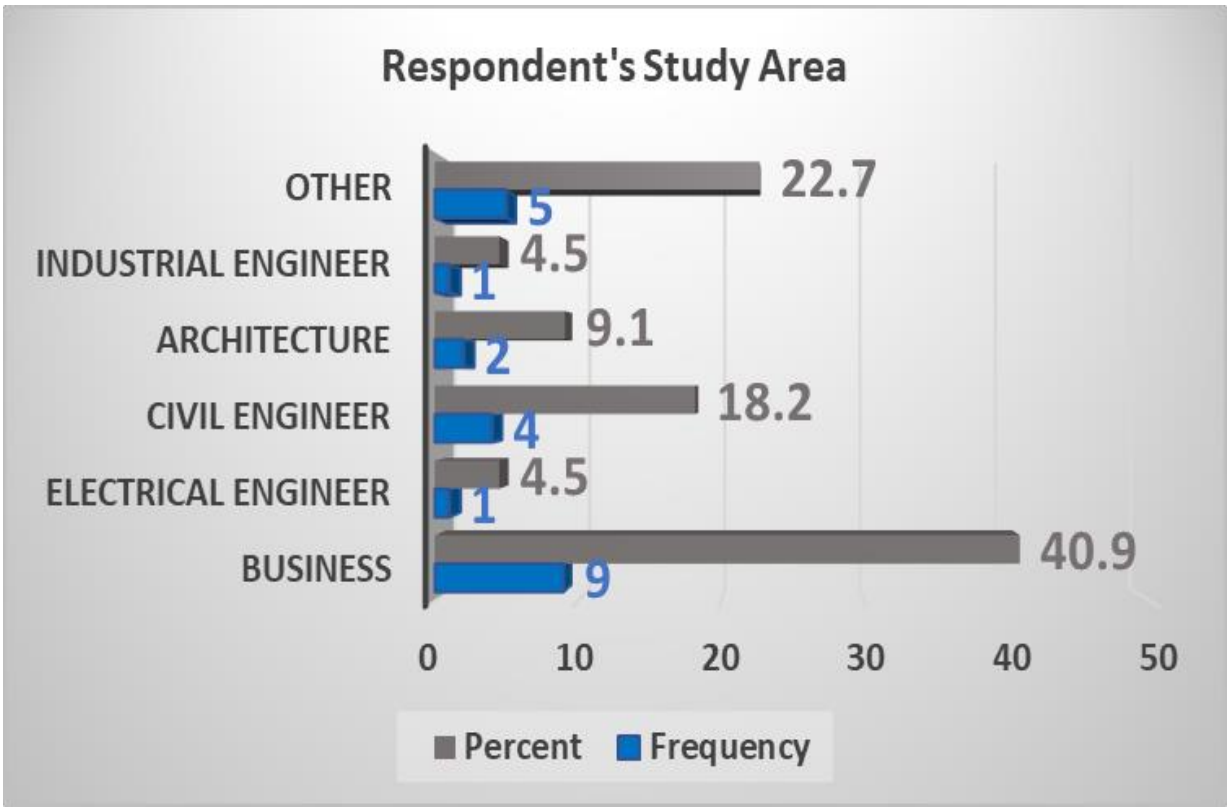


Figure 4.4: Respondent's Study Area

The most diversified element of the four demographic data is study area or profession of participants. Participants are identified for all the options given to select. As depicted in figure 4.4, least of the participants are represented by industrial engineer and electrical engineer. Each one has single participant each representing only 4.5% of total samples. Even together, these comprises only 9% of the whole project participant. The second least number are observed to be architectures in profession. These represent only 2 un number, indicating only approximately 9% of the total participants.

The third least participants are identified to be civil engineers by profession. These comprise 4 of the total 22 samples which makes it about 18% of the total ratio. The fourth least and at the same time the second most representative is the “other” section of the option. These in general represents profession which are not identified in the other four option of the questionnaire. Some of the position identified in this category are economics, project planning and management and education professionals. These together represents 5 of the total 22 samples and approximately 30% of the ratio. Most of the participants are identified to be “Business” professionals. These professionals represent 9 of the total samples which signifies about 41% of the total samples.

4.3. Data Discussion

In this section, detail discussion of the factors is conducted. It has five major parts. The first four focuses on the four components of the survey distributed. These are:

I. General Project Risk Management Question

II. Comparative value of Project Risk Management During Project life cycles

III. Comparative Value of Project Risk Management in relation to other knowledge areas

IV. Comparative application of Project Risk Management in relation to other knowledge areas during project lifecycles

And the fifth part focused on general summary statistics of the factors.

Part 1: General Project Risk Management Question

It is observed that the reliability test for the part is .859 that can be interpreted as good level of reliability test. It can be concluded therefore that the results are reliable enough to make conclusion on the samples.

In addition, we can see from table 4.2 below the item statistics of each factors or questions for which data is collected.

Table 4.2. Item Statistics

	Mean	Std. Deviation	N
How do you rate your level of documented risk planning formality?	3.73	.985	22
How do you rate quality of your risk management manual?	3.41	1.054	22
How do you rate capacity of your project risk management department/team?	3.14	1.125	22
How do you rate you rate quality of project risk management tools and techniques?	3.64	.848	22

It can be observed from the above data that the mean score of the question measuring formality of risk management document is 3.73 and this indicates samples have stated a good formality for

the project. Second better means score is for the question related to rating quality of the risk management tools and techniques used in the project risk management. A mean score of 3.64 is observed here which is a good level of understanding. A third level of score is identified for quality of risk management manuals. The 3.41 mean score is another good level of understanding despite it is nearer to the median or arithmetic mean score of the responses, which is 3. The least score is identified on the question that is concerned with capacity of the project risk management department/team. This indicated respondents are confident, but not to a higher level about capacity of the project risk managing team.

For all four items, the following summary can be extracted:

Table 4.3. Part 1: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.477	3.136	3.727	.591	1.188	.070	4
Inter-Item Correlations	.610	.508	.801	.293	1.577	.010	4

It is identifiable from table 4.3. that mean of the inter means is 3.477 which can be considered as a good level agreement by the respondents for part 1. The inter-mean correlation with this manner is observed to be positive and significant.

There are many sources of risks. Risk can come from anywhere. Various sources of project risks are identified to this end accordingly. Consideration classification as internal and external, the internal risk come in most cases from the project team, the owner and the contractor. There are some risks which are specifically attributable to the project team leaders and managers as well. The following are some of the internal risk identified so far as Boel Lemi IP is concerned.

- Internal Communication Distortion: In most cases, there is no formal, systematic and predictable communication mechanism. Usually, a letter and memo is needed for specific communication. Email communication is limited to very few task forces and this makes it fast communication hard.
- Change request: Some change requests are asked after many tasks for the previous deliverable are done.

- Resource Limitation: In some cases, there is resource limitation, like vehicles and vans unavailability.

There other facet of risk factors are external sources: Basically, these are thought to include the following.

- Absence of or Low engagement of stakeholders: the park is envisioned to have all needed facilities for manufacturing process. Many of such facilities are expected to be developed by external stakeholders. These are identified to be big factor of risk.
- Community engagement risk: some members of the community are not being relocated due to various reasons for the project.
- Regulatory requirements: Frequent change on the law and related procedures are other major source of external risk.
- Payment Cases: Some payment modalities are complex and are therefore another source of risk.

According to the responses collected, there are some tools and techniques utilized by the project team. Most of these are employed during the planning cycle of the project. Expert judgment is assumed to be the most common method among the tools and techniques. In most cases, few assigned experts involve in planning and forecasting potential risks. High level project managers and client organization are engaged in evaluating plans then. No detail quantitative analysis is found to be in use for the project in study. Qualitative analysis, focused group discussions, meetings and non-quantitative document reviews are identified be the most common on this regard.

SWOT analysis and risk identification and categorization are mainly employed as well. In most cases, risks are categorized based on source [internal and external]. Even the internal risks are further classified as client risk, project team risk and contractor risk. The external risks mainly emanate from stakeholders out of the client, project team and contractor. These may include institutions that follow movement of goods [customs], construction standards setting institutions, sectoral institutions, community members, city and woreda administrations.

Part 2: Comparative value of Project Risk Management During Project life cycles

The second part of the questionnaire focused on the comparative perception of applying project risk management during the five project life cycles. .831 level of reliability test is realized for this part. Like the first part, the reliability test for the second part is identified to be good depending on the "Cronbach Alpha" test standard.

In addition, the following mean scores are identified for each element of the data set.

Table 4.4: Part 2: Item Statistics

	Mean	Std. Deviation	N
Level of Risk Management During Project Initiation	3.27	.985	22
Level of Risk Management During Project Planning	3.73	1.032	22
Level of Risk Management During Project Execution	3.86	1.082	22
Level of Risk Management During Project Monitoring and Controlling	3.68	.839	22
Level of Risk Management During Project Closure	3.59	.796	22

For the question related to the level of project risk management during project initiation, the mean score is identified to be 3.27 which is the lowest score of the group. Even this is higher the median score of 3, it indicates respondents are not confident enough to see project risk management as highly implemented in the project initiation cycles. On the other hand, mean score of 3.59 is identified for application level of project risk management during closure cycle. This indicates, level of risk management application is higher for project closure than initiation.

When it comes to monitoring and controlling cycle, level of risk management application is considered higher than the above initiation and closure with a mean score of 3.68. This indicates respondents have a good confidence on average, in seeing level of applying project risk management during the cycle as good. A higher score level of the above three cycles is identified for project planning, with a mean of 3.73. This indicates how fundamental is risk management during the project planning compared to other cycles. Respondents consider project risk management is higher in terms of application during project planning than project initiation, project monitoring and controlling and project closure. The highest mean score of 3.86 is

observed level project risk management during project execution. This indicates respondents consider level of risk management is at the highest-level during project execution. Following in order of higher to lower based on mean score is: project execution, project planning, monitoring and controlling, closure and initiation.

The following table shows summary statistics of the factors in part 2.

Table 4.5. Part 2: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.627	3.273	3.864	.591	1.181	.049	5
Inter-Item Correlations	.490	.205	.733	.527	3.566	.029	5

We can see from table 4.5 that the inter mean score of the means is 3.627, representing a good level of understanding by respondents in seeing project risk management at good level of application for the project cycles. In contrary to part 1, the inter-mean correlation score, .49, is not identified to be significant despite being positive. The assumption here is, a correlation of more than 0.5 is seen significant.

During Project initiation and planning, it is identified that much activities are related to potential risk identification and listing. Especially in the project initiation phase, brainstorming and listing is done. Here, it is learnt that risks can come from any part of the team. In most cases, management team and team leaders take the lead in identification of risks. When approaching the planning phase, more organized and formal application of project risk management comes to play. The most common challenge in this area is identified to be stakeholder engagement. It is sighted that, in most cases, both internal and external stakeholders of the project do not act actively.

During project execution, the project plan gets implemented and so does the risk management plan. The most common challenge here is absence of much proactive risk management system. Risk management is employed, in most cases, when facing the risks. This is a passive way of handling risks. In some cases, risk can be destructive to the project and could reach to

unavoidability stage. In order to avoid such unwelcoming incidents, proactive and alert risk management procedure is needed. This is not the case in most cases for the project, however. There are no assigned project risk managers. The project coordinator and the project manager usually engage in the risk management activities.

Most of the project risk management activities in monitoring and controlling are identified to be follow up and track of risks. Some status report and case follow up are being used here. In most cases, post notes and coloring are used to identify priorities. Any risks identified are monitored here by the project manager/coordinator as there is no assigned personnel for this. In many cases, site engineers do engage monitor and controlling of risks as well.

During the project closure cycle, it is identified the most common risk is not meeting some specifications and/or requested changes. In such cases, a little delay is added to the project. Document review is performed in most cases in the project closure phase. Checklists are available that guide project handover and all related risks are assumed to be handled through this.

Part 3: Comparative Value of Project Risk Management in relation to other knowledge areas

On the third of factor discussion is perception of the comparative value of project risk management in relation to other knowledge areas for project success. Table 4.6. indicates the mean score of comparative value of project risk management relative to the other project management knowledge areas.

A very good level reliability test measured to be .937 is observed for part 3. This is the highest of part 1 and 2 and even higher than the overall reliability test of the study. Conclusion on this part are assumed to be very reliable based on “Cronbach Alpha” test of reliability standard, therefore.

The following table indicates mean score on comparative value of project risk management in relation to other knowledge areas.

Table 4.6. Part 3: Item Statistics

	Mean	Std. Deviation	N
Project Risk Management is more valuable than project scope management for project Success.	3.86	1.082	22
Project Risk Management is more valuable than project schedule management for project Success.	3.27	1.352	22
Project Risk Management is more valuable than project Cost management for project Success.	3.59	1.182	22
Project Risk Management is more valuable than project Quality management for project Success.	3.64	1.177	22
Project Risk Management is more valuable than project Resource management for project Success.	3.64	1.049	22
Project Risk Management is more valuable than project Communication management for project Success.	3.73	.935	22
Project Risk Management is more valuable than project Integration management for project Success.	3.82	.853	22
Project Risk Management is more valuable than project Procurement management for project Success.	3.82	.853	22
Project Risk Management is more valuable than project Stakeholder management for project Success.	3.82	.958	22

For a question relating project risk management as being more important than project schedule management, respondents agreed with a mean value of 3.27. Despite being near to the median score of 3, it still is higher and indicated the risk management is considered more important than the schedule management. For the question relating project risk management with cost management, samples responses show a mean score of 3.59. This represents a more level of agreement to the statement. Respondents to tend to see project risk management more important than cost management compared to its important relative to project schedule management. Participants even agreed more for the statement stating project risk management is more important than project quality management with a mean of 3.64. The same mean level of agreement is observed for project resource management. The risk management is considered more useful in the same manner for these two factors. This can be interpreted as “risk

management is perceived as being more important than quality management in the same manner as it is perceived more important than resource management".

A much higher level of agreement is observed with regard to participant perception of project risk management being more valuable than project communication management. A mean level of 3.73 agreement is observed. In a distinct manner, the same level mean score of 3.82 is identified on the perceiving project risk management to be more important than project integration management, procurement management and stakeholder management. This indicates the idea that these three factors tend to be perceived as being to have less important than project risk management for project success is in the same manner. The highest mean level of agreement is identified regarding seeing project risk management as having more contribution than project scope management.

The summary of item statistics in table 4.7. below illustrates the mean of item means is 3.687 which is higher than the median indicating a good level of agreement among the respondents tending to perceive project risk management more important the other knowledge areas. In addition, a positive inter item correlation mean of .646 is identified for part three of the survey.

Table 4.7: Part 3: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.687	3.273	3.864	.591	1.181	.034	9
Inter-Item Correlations	.646	.445	.914	.469	2.055	.013	9

Part 4: Comparative application of Project Risk Management in relation to other knowledge areas during project lifecycles

The last part of the items analysis on the survey emphasizes on the comparative application of project risk management in relation to other knowledge areas during project lifecycles. This compares, how project risk management perceived by respondents in terms of the importance it has during the five project life cycles.

The reliability test of part 4 is indicated to be good. Despite being lower than the test result for part three, the Cronbach's Alpha value of .878, is considered sufficiently a good result test of reliability.

As can be observed in table 4.8 below, the mean score of project risk management being applied more than other knowledge areas during the project initiation phase is 3.59. This can be considered a sufficient level of agreement having a positive perception on project risk management. A mean score of 3.41 is identified for the question whether risk management is considered more applied during project planning. Even though it is lower than the level of agreement observed during project initiation, this still represents a sufficient level of respondents' agreement.

Table 4.8: Item Statistics

	Mean	Std. Deviation	N
Project risk management is applied more than other knowledge areas during project initiation.	3.59	1.054	22
Project risk management is applied more than other knowledge areas during project planning.	3.41	1.098	22
Project risk management is applied more than other knowledge areas during project execution.	3.45	1.057	22
Project risk management is applied more than other knowledge areas during project monitoring and controlling.	3.68	1.086	22
Project risk management is applied more than other knowledge areas during project closure.	3.41	1.141	22

During project execution, a mean agreement level of 3.45 is observed for the question considering Project risk management being applied more than other Knowledge areas. We can see here that; this is in between initiation and planning. The highest level of agreement is observed to be during project monitoring and controlling. A mean score level of 3.68 is generated. This shows respondents are highly confident in seeing project risk management to be more applied during monitoring and controlling. Moreover, it can also be stated that the risk management is perceived more important compared to other knowledge areas during project monitoring and controlling than any other cycle. Project risk management is perceived to be

more applied than other knowledge areas during project closure in the same way it is perceived during project planning, with a score of 3.41.

Compared to other knowledge areas, application of project risk management is perceived higher during project monitoring and controlling first, project initiation second, project execution third and both project planning and planning in the fourth with the same mean score.

The summary statistics of part 4 of the survey below shows 3.509 mean score of agreement level for the five factors. This is thought to be sufficient level of agreement in considering the risk management as being more applied than the other knowledge areas during the project life cycles. Moreover, the table also shows a positive .592 mean of inter-mean correlation for the items.

Table 4.9: Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.509	3.409	3.682	.273	1.080	.015	5
Inter-Item Correlations	.592	.265	.851	.586	3.215	.031	5

During the project implementation, passive risk management is identified in place. Meaning, there is a tendency until some potential risks uncover themselves. Mainly, meetings and discussions are performed formally and regularly to manage risk on the execution cycle. Activity reports and status updates are also some of the techniques employed in the process. This include flagging an issue that could bring a risk and take corrective actions. The project coordinator and project teams take the responsibility as there are no responsible experts assigned to manage risks.

Like the actions in place during the project execution, a passive risk follow is employed during the project monitoring and controlling too. It is even more passive here since the risk management is conducted for the whole cycles together. No effort that segregates risk management of ach respective project cycles is identified. On the closure phase, only response from the client are expected to be sources of risks. To this end, project coordinator and manager take the responsibility of managing risks during this project cycle.

Major gaps are identified in the risk management processes of the project. The concept of practical risk management is not appropriately understood by the project term. This is evidenced

from the very passive approach employed. There are no detail probability and potential cost of risks analysis. Neither are identified systematic quantitative measures of evaluating risks. In most cases, the project manager and coordinator take the responsibility of managing project risk. This makes it unsystematic. Moreover, there are no identified risk logs and risk management templates. This makes the whole activity to be less organized and less formal. Owing to all these reasons, the organizational project risk management practice in general and capacity of the risk management department is understood to be low to medium.

It is noted by respondents that even though their response is to see project risk management as being more applicable than the other knowledge areas in many occasions of the project, this does not make it the only important area. In fact, it is indicated the risk management will not have any value for the project unless it is integrated with the other knowledge areas. However, there are instances in the project life cycles that shows the risk management is more applied than any other area. Likewise, it is also indicated that there are areas where other knowledge areas would be more significant that project risk management in order to deliver specific activity.

Chapter Five: Summary, Conclusion and Recommendations

The study emphasized on assessing project risk management practices taking cases of Bole Lemi IP project of the Industrial Parks Development Corporation. The study employed both quantitative and qualitative discussion of results by selecting sample studies conveniently. The SPSS software of IBM is employed in survey results generation collected through Likert scale responses. Reliability tests and related factor discussions are employed accordingly. In line to this, this chapter of the study includes the summary of key findings, concussion of results and recommendation forwarded to the project team and the project organizations.

5.1. Key Findings

22 samples are collected from targeted 25 sample frames which resulted in response rate of 88%. Sample frame is targeted using purposive non probabilistic method of sampling. Survey questionnaire has five major parts. The first part is about descriptive info of samples and it is not related to the findings. The latter four and the interview are assumed to be key indicators of findings. Accordingly, following are key findings of results.

- For the factor indicating general project risk management, respondents agreed that there is sufficient risk planning formality, project risk management manual and quality project risk management tools and techniques with mean inter means score of 3.477. For the question related to capacity of the project risk management department/team, they tend to be more neutral. Th score is only slightly higher than the median. On a rank level, samples indicated there are good quality of project risk management tools and techniques with a mean score of 3.64, rated level of documented risk planning formality to be good in general with a score of 3.73, thought there is quality of risk management manual with mean score of 3.41 and slightly agreed from being neutral on capacity of the project risk management team with mean score of 3.14. . Th inter-item correlation with this manner is observed to be positive and significant.
- For the factor that investigated comparative value of project risk management during project life cycles, inter means score of 3.627 mean is observed, representing a good level of understanding by respondents. A positive inter mean correlation is observed as well.

The highest mean score of 3.86 is observed level project risk management during project execution. This indicates, respondents consider level of risk management is at the highest-level during project execution. Based on samples' mean score perception on project risk management's application on project phases, following are from the highest to the lowest: project execution, project planning, monitoring and controlling, closure and initiation. Respondents are not confident enough to see project risk management as highly implemented in the project initiation cycles.

- For questions, comparing value of project risk management in relation to other knowledge areas, highest mean level of agreement is identified with regard to seeing project risk management as having more contribution than project scope management. The lowest mean value is identified for a question relating project risk management as being more important than project schedule management. Respondents agreed with a mean score of 3.27. In perceiving project risk management as being more important than the other knowledge areas, the order from being highly important to being as important as the other is identified to be: project scope management [3.86 mean score], three knowledge areas [project integration management, project procurement management, project stakeholder management-having all the same level of mean score 3.82], project Communication management [3.73 mean score], project quality management and project Resource management [having both the same level of mean score 3.64], project Cost management [3.59 mean score] and project schedule management [3.27 mean score]. Moreover, a good mean level of item-means and positive Inter-Item correlations is identified for this factor.
- For the factor comparing application of project risk management in relation to other knowledge areas during project lifecycles, project risk management is perceived higher during project monitoring and controlling first, project initiation second, project execution third and both project planning and planning in the fourth with the same mean score. In addition, a positive .592 mean of inter-mean correlation is observe for the items.
- During Project initiation and planning, it is identified that much activities are related to potential risk identification and listing. Especially in the project initiation phase,

brainstorming and listing is done. During execution, the project risk management is applied in a passive manner since it is employed when facing potential risks. The most common challenge here is there is no much proactive risk management system. Risk management is employed, in most cases, when facing the risks. This is a passive way of handling. Most of the project risk management activities in monitoring and controlling are identified to be follow up and track of risks. Some status reports and cases follow are used here. In most cases, post notes and coloring are used to identify priorities. During the project closure cycle, it is identified the most common risk is not meeting some specifications and or requested changes. In such cases, a little delay is added to the project. Document review is performed in most cases in the project closure phase. Checklists that can guide project handover are available and all related risks are assumed to be handled through this.

Internal risk sources [including Internal Communication Distortion, Change request and Resource Limitation] and external sources [including absence of or Low engagement of stakeholders, Community engagement risk, Regulatory requirements and Payment related risk] are identified to be major sources of risk in this project. Qualitative risk management tools and techniques are employed in most cases for the project. Focused group discussions, meetings and non-quantitative document reviews are identified to be the most common on this regard.

It is marked important to note that the findings from both data are not mutually exclusive. It is noted by respondents that even though project risk management can be seen being more applicable than the other knowledge areas in many occasions of the project, this does not make it the only important area. In fact, it is indicated the risk management will not any value for the project unless it is integrated with the other knowledge areas. However, there are instances in the project life cycles that shows the risk management is more applied than any other area. Likewise, it is also indicated that there are areas where other knowledge areas would be more significant than project risk management in order to deliver specific activity.

5.2. Conclusion

The project studied risk assessment practices by taking BLIP as a case. Following the key findings of the research data analysis, the following conclusions are reached.

- ✓ For the question related to capacity of the project risk management department/team, samples tend to be more neutral than aggreging to the statement which claims the team has a capacity of risk management practices. This indicates the risk management performances of the project are not to the high quality.
- ✓ Risk management is assumed to be at the highest-level during project execution followed by project planning. The team sees the knowledge area of risk management is most prevalent during the project execution than the other life cycles. This supports the findings from the interview which implied application of passive project risk management.
- ✓ It is indicated there are times when risk management is considered to have better value than other knowledge areas and in some other times it could have lower application. The project team especially indicated value of project risk management during project initiation and closure is lower than during project execution and planning.
- ✓ Unless it is coupled with the other knowledge area, risk management may not bring the needed impact for the project.
- ✓ There are various ways of risk identification and follow up procedures. In most cases, qualitative methods are employed during project risks identification. Senior project team leads take the responsibility of approving identified risks through focused group discussions and meetings.
- ✓ Not having a dedicated team that follow project risk make the whole risk management processes unorganized, unsystematic, non-consistent and unpredictable. Above all, it calls for engagement of the project manager or other project lead even for preliminary tracking tasks of risks.

5.3. Recommendations

Based on the specific findings and discussion results, some recommendations are identified for the project team and the organization. These are:

- ✓ The risk management processes employed are found to be ad-hoc and un-organized. Systematic project risk planning and follow up procedure application is needed for the project to be successful. Having an organized manner of risk management can help boost capacity of the project team that follows risks. This creates a more proactive way of managing risks and reducing the loss that can result in because of not doing it.
- ✓ An encouraging task of project risk management tools and techniques are being used by the project team. These are mainly prevalent during project execution. However, detailed level of risk planning has to be employed by the project team. Not identifying all possible risks would lead to not managing them. Before execution, planning and identification of risks must be performed to highest detail level. Quantitative risk analysis should be coupled with qualitative assessments. Quantitative models provide an important part of prediction and forecasting risks. They also help to do cost benefit analysis in planning risk response.
- ✓ Capacity of project team needs to be enhanced through training and/or employing risk experts. Project management manual has to be upgraded as well.
- ✓ When compared to other knowledge areas, project risk management is perceived higher during project monitoring and controlling first, project initiation second, project execution third and both project planning and planning in the fourth with the same mean score. Time, team, and other efforts has to be allocated in manner of these orders, therefore.
- ✓ A more proactive risk management procedure is needed to realize successful projects. To achieve this in turn, a dedicated team that works on risk identification and management must be set up. This enhances the learning capacity of the corporation.

- ✓ A standard risk management template and manuals are indispensable for successful effort of risk management. Such guiding documents must have room for upgrade and modification as well.

5.4. Potential for future Research Area

This project study focused on assessing risk management practices by taking a single case project of the industrial parks' development corporation. This can make it difficult to drive high level conclusion to all projects. Generalization is limited to similar project/ in the same organization. Future research can take this further and study abundant representatives and draw high scale generalizable conclusions.

The other potential future research area is with regard to the model employed. This study focused factor discussions without applying regression analysis due to limited number of project samples. Future researches can take this further to study covariances and see detail regression analysis. This would in turn help to draw a model that can help managing project risks more easily and systematically.

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Annexure: Data Collection Instruments

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Dear Sir/Madam

My name is Getu Tadesse, a graduate student in Addis Ababa University enrolled in project management MA program. Currently I am undertaking a project study focused on "Project Risk Management. This questioner is designed to collect data that focus on application of project risk management knowledge area. The information you provide will be utilized for making conclusions in the specified area and to answer the research questions for academic purpose. Your involvement is regarded priceless to the quality of the study results. Your honest response is highly appreciated.

General instructions

- Please mark your response in the appropriate box with a thick (✓) supply the relevant information as required.
- If you wish to contact the researcher, please use +251 9 11 615073 or email gttaccess@gmail.com

  Thank you very much for your time,

Demographic data

Please mark (✓) selected box:

- Your Gender Male ☐ Female ☐
- Your academic level.

  ☐ Diploma ☐ Bachelors degree ☐ MSC/MA Degree

  ☐ PhD Others, please state _____

- Your Study area.

  ☐ Business ☐ Electrical Engineering

  ☐ Civil Engineering ☐ Architectural engineering

  ☐ Industrial Manufacturing Others, please state_____

- Your Work experiences.

  ☐ 3 years and below ☐ 4 to 6 years

  ☐ 7 to 9 years ☐ 10 to 12 years

  ☐ 12 years and above

PART-1: General Project Risk Management Question

Please indicate your level of agreement with each of the following statement by marking (✓) on the space provided for the ranges: Very High **(VH)**, **High (H),** Average **(A)**, Low **(L)**, and Very Low **(VL).**

	VL	L	A	H	VH
11) How do you rate your level of documented risk planning formality?					
12) How do you rate quality of your risk management manual?					
13) How do you rate capacity of your project risk management department/team?					
14) How do you rate you rate quality of project risk management tools and techniques?					

PART-2: Comparative value of Project Risk Management During Project life cycles

Please indicate your level of agreement with each of the following statement by marking (✓) on the space provided for the ranges: Very High **(VH)**, **High (H),** Average **(A)**, Low **(L)**, and Very Low **(VL).**

	VL	L	A	H	VH
1. Level of risk management application during project initiation					
2. Level of risk management application during project planning					
3. Level of risk management application during project execution					
4. Level of risk management application during project monitoring and controlling					
5. Level of risk management application during project Closure					

PART-3: Comparative Value of Project Risk Management in relation to other knowledge areas

Please indicate your level of agreement with each of the following statement by marking (✓)) on the space provided for the ranges Strongly Disagree **(SD)**, **Disagree (D),** Neutral **(N)**, Agree **(A)**, and Strongly Agree **(SA).**

	SD	D	N	A	SA
• Project Risk Management is more valuable than project integration management for project Success.					
• Project Risk Management is more valuable than project scope management for project for project Success.					
• Project Risk Management is more valuable than project schedule management for project Success.					
• Project Risk Management is more valuable than project cost management for project Success.					
• Project Risk Management is more valuable than project quality management for project Success.					
• Project Risk Management is more valuable than project resource management for project Success.					
• Project Risk Management is more valuable than project communication management for project Success.					
• Project Risk Management is more valuable than project procurement management for project Success.					
• Project Risk Management is more valuable than project stakeholders management for project Success.					

PART - 4: Comparative application of Project Risk Management in relation to other knowledge areas during project lifecycles

Please indicate your level of agreement with each of the following statement by marking (✓)) on the space provided for the ranges Strongly Disagree **(SD)**, **Disagree (D),** Neutral **(N)**, Agree **(A)**, and Strongly Agree **(SA).**

	SD	D	A	A	SA	
1. Project risk management is applied more than other knowledge areas during project initiation.						
2. Project risk management is applied more than other knowledge areas during project planning.						
3. Project risk management is applied more than other knowledge areas during project execution.						
4. Project risk management is applied more than other knowledge areas during project monitoring and controlling.						
5. Project risk management is applied more than other knowledge areas during project closure.						

Would like to give any more insights, please describe?_____

_____

_____

_____

Thank you very much for you time,

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Dear Sir/Madam

My name is Getu Tadesse, a graduate student in Addis Ababa University enrolled in project management MA program. Currently I am undertaking a project study focused on "Project Risk Management. This Interview is designed to collect data that focus on application of project risk management knowledge area. The information you provide will be utilized for making conclusions in the specified area and to answer the research questions for academic purpose. Your involvement is regarded priceless to the quality of the study results. Your honest response is highly appreciated.

1. Would you mind telling your professional background and position?
2. How risk management is employed during project initiation?
3. How risk management is employed during project planning?
4. How risk management is employed during project Execution?
5. How risk management is employed during project monitoring and controlling?
6. How risk management is employed during project closure?
7. How is risk management is applied in your organization?
8. What are the major causes/factors of project risk in your organization? Please explain/classify them in to internal and external?
9. What tools & techniques are used to manage risk at each stage of the project life cycle?
10. How do you view (explain) your organizations resources & institutional capacity to manage project risks? What are the major gaps in this aspect?