

**Assessment of Project Risk Management Practice in The Case Of  
Jimma University Projects**

**A Thesis Report Submitted to the School of Graduate Studies of  
Jimma University in Partial Fulfillment of the Requirements for  
the Award of the Degree of Master of Art in Project Management  
and Finance**



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**July 2020**

**Jimma, Ethiopia**

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## Declaration

I, the undersigned, declare that this thesis work entitled “*Assessment of Project Risk management Practice in the Case of Jimma University Projects*” is my original work. This research has not been presented in any other university and that all sources of material used for the thesis have been duly acknowledged.

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## **Acknowledgments**

First and foremost, I would like to thank God for giving me the strength and patience to undertake this thesis while on my regular government duty.

I would like to extend my special thanks to my advisor Mr. Abel Worku for his assistance and unreserved holistic support starting from project title selection to finalizing the thesis. I am also deeply grateful to Mr. Monanol for his guidance and supportive comments. My family and friends also deserve due appreciation for encouraging me and financial supports for the research and the whole program. Particularly, I owe special thanks to my son and daughter Kennaasaa and Yaadanii for tolerating me when I failed to take care of them due to my focus on this work.

I, finally, would like to thank Jimma University, the contractors, consultants and all staff who has given support in obtaining information and data related to this work.

Thank you all.

## **Abstract**

*Risk management is understood as a significant practice in order to accomplish better construction projects successfully. Success in construction project is witnessed partly by its practical risk management performance in terms of project time, cost, quality, client satisfaction and safety among other things. In this south west Ethiopia Jimma University is known for its investment in construction projects. Therefore the study attempts to assess risk management practice of Jimma University Projects. The research type used in this study was sequential mixed method design. The researcher started by collecting a quantitative data and then collected a qualitative data for further explorations and confirmations. Four Jimma University ongoing construction projects were purposefully selected. All professional workers (80) in the four sites were selected and filled a questionnaire. Client, consultant, and contractors purposefully selected and interviewed. Microsoft Excel was used to organize and analyze the data collected. And, then integrated with the interview data, based on thematic category set in line with the specific research objectives. According to the results of the study, there is no clearly defined risk management method and procedure used in the construction projects of the university; but, responding to problems as they occur. Besides, there is a limitation in identifying risks early and including into the project plan. There is also less coordination among client, consultant and contractors to mitigate risk. The key actors of the construction projects were also not handling the human, material and financial risks that impact progress. As a result though there might be other factors, the four construction projects considered in this study were in a delay status and facing the problem of risk of cost overrun. Therefore, the construction projects of the university are better implemented based on basic risk management methods and make risk identification and mitigation its core activity. In other words, specific risk management methods such as, risk identification, assessment, analysis and mitigation should be performed before the start of the constructions. These should also be overtly included in to the overall plan documents of the specific projects together with clearly defined expected risk factors and the how of talking them.*

**Keywords:** Construction, Project, Risk, Risk Management

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# Chapter One

## Introduction

### 1.1 Background of the Study

Ethiopia is undoubtedly quickly expanding the construction industry for purpose of higher education expansion. As one of the most populous countries in Africa, the investment on construction for higher education expansion is important in the country. This is because as the number of student population is growing, to accommodate all, new universities have been established for the last two decades. The investment on universities is directly connected to constructions of different infrastructures, offices, classrooms, etc.

Among the universities in Ethiopia established two decades ago is Jimma University, in fact considered as one of the first generation universities. Jimma University was established by Council of Ministers in 1999, per the regulations no. 63/1999. Since then the construction projects in the university have been growing and becoming more complex. In fact, there had been construction projects prior to its establishment as university, because it had been serving as Jimma Institute of health and College of agriculture, which are considered as a base to evolve in to university. As one of the biggest universities, the investment on building constructions in Jimma University is run with public fund provided from government. And, how the associated and inevitable risks are managed in this regard are the concern of this study.

According to Project Management Institute (2013) risk is defined as any uncertain result that happens in due process of a project or set of conditions that occur and effect one or more objectives. Different literatures reviewed also show risk has considerable influence on a performance of any construction project. In other words, it is uncertainty that at different degrees affect the attainment of project objectives.

Despite different definitions given by scholars, the most important definition of Risk Management more relevant for this study purpose is the one given by Project Management Institute (2013). This definition puts risk management as holistically organized processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. Thus, the main objective of project risk management is to increase the prospect of positive events, and to decline the likelihood and influence of negative events that may happen at some time in the project life. A construction project is well known as the riskiest

project to perform because of the complexity of its activities, operating environment, and processes involved prior to and during project execution (Gao, Sung & Zhang, 2013). Therefore, risk management is crucial to reduce the risks.

Risk Management is a discipline at the core of every institution and encompasses all the activities that affect its risk profile. Risk management as commonly perceived does not mean minimizing risk; rather the goal of risk management is to optimize risk-reward trade-off. This can be achieved through putting in place an effective risk management framework which can adequately capture and manage all risks an institution is exposed to (Qamruzzaman & Jianguo (2017, p. 23).

In fact, due to a failure to give attention to risk management accordingly, completing projects on time and within budget planned at initial stage has become a chronic worldwide and is worsening (Ahmed et al., 2002). According to Ramabhadran (2018, p. 1) “One of the important criteria for project success is project completion within budget, time and the satisfaction of the client’s requirement. In the construction industry, completing a project within budget is even more critical, as companies work on narrow margins.” However, this is less likely to happen where there is inadequate preparation for risk management. As the quote states, though the end result is delay of completion, the contributing factors could be multiple and complex risk related issues; sometimes beyond the control of clients, contractors and consultants. Yet, careful risk management practices can reduce or protect any unforeseen affecting risks.

In most of the cases, in Ethiopian building construction projects, projects are less likely to be completed according to the original plan as they face different problems, modifications and changes that results in delay, cost overrun or compromised quality. Usually, there is accusing one another among different stakeholders due to delays as delay is more visible than the problems of risk management that otherwise disrupt the end result. Hence, any risk management of different magnitude that happens starting from the beginning throughout the life of a building construction project might be the reason for variations in project objectives unless they are managed well. Supporting this fact, Adams (2008) states giving attention to risk management in the beginning of contractual stage is important in reducing and controlling the effect of risk on project successes and objectives.

To realize this fact, there are diverse risk management practices and methods and procedures used in different stages of the construction projects. Risk management in the contractual stage in fact, before signing the contract is used very commonly. This is to identify and allocate the potential risks to the parties involved in the contract, so that it could be included in to the contract document, to help all contribute in dealing with the risks that encounter in the process. The question is that how much the scientific procedures of risk management practices is implemented needs a study to give one of the hints related to risk management concerning Jimma University construction projects that have been underway for years.

Therefore, this study is needed to understand the risk management practice of the university, particularly focusing on the currently on going building constructions that are already in problems of cost overrun and time overrun. In fact, projects could be delayed and suffer from cost overrun due to many reasons. But, for the purpose of this study only stresses on risk management practice issues as one of the major contributing factors. Hence, this study shed light on the benefit of focusing on risk management so that concerned bodies improve the practice of risk management to alleviate the problems.

By implementing a risk management plan and considering the various potential risks or events before they occur, organizations like Jimma University, and contractors and clients can save money, and protect their future. This is because a robust risk management method, plan and an overall good practice will help a stakeholders to establish clear scientific procedures to avoid potential threats, minimize their impact should they occur and cope with the results. This ability to understand and control risk enables organizations to be more confident in their business decisions. Furthermore, strong construction risk management principles that focus specifically on risk management can help everyone to reach their goals.

Furthermore, this study of risk management practice of construction projects of Jimma University has different rational as a focus on risk management practice. It could contribute to create a safe and secure work environment for all staff and customers and protect all involved people and assets from potential harm which otherwise lead to consequences of unnecessary costs in terms of time and/or money. Besides, the result also aware the university to focus on risk management practices for future construction projects it will have by involving its future

consultants and contractors, as having the over-all general university strategic plan may not save construction projects from risks.

## **1.2 Statement of the Problem**

A construction project is accepted as successful when work is done by proper planning and scheduling, in line with the budget and qualities specified, within specified time in a way that satisfy the stakeholders. For this to happen, careful risk management that identifies the probable opportunities and challenges is vital. From everyday experience, everyone observes that construction projects face different obstacles, and concerned bodies try to solve after the progress of projects are challenged. Due to this fact, delay has become one of the major problems in different projects, including construction projects of various types. Yet, such government funded construction projects are experiencing the challenges of delay because of different reasons. This needs to be studied.

For example, Jimma University has initiated building construction projects in different areas. Similarly, everyone has been witnessing the challenges Jimma University is facing in finishing the building construction projects started in different campuses.

Yet, nothing is known how the different parties involved in the construction of the universities projects are utilizing risk management. So far, survey of the existing literature shows that there is no study that illuminated about the risk management methods of the construction projects carried out under the ownership of Jimma University. Even, beyond the context of Jimma University, the previous studies focus on delay and cost overrun. For instance, Ebisa and Gudeta (2013) studied factors delaying constructions devoted on hotel in Ethiopia in relation to cost overrun.

Therefore, though the researcher does not claim this is the only study, there seems a gap in literature that risk management employed in relation to constructions of Jimma University needs to be studied. Needless to say, the university usually invests large capital to construction projects. The outputs could be an asset to the university, and to other stakeholders.

As shown under empirical literature section, there is no research that addresses this particular issue in Ethiopia and South West Ethiopia, according to my survey. There is no research that has been undertaken in particular to address the challenges that go with risk management of projects that concerns huge Jimma University construction projects. Of course, there are studies

conducted predominantly in western developed countries as summarized under chapter two. However, for obvious contextual difference, the realities in developed countries might not sufficiently reflect realities of our country. Hence, the fact that there is meager literature on similar such studies conducted in Ethiopia suggests that little attention has been paid to this area of investigation. Consequently, though the reason is not known, the ongoing construction projects considered in this study such as: Aggaro Campus, Administration Head Quarter, Hospitality and Hotel Tourism Institute and Kitto Furdisa Campus are under risk both in terms of time and money.

Despite the causes, projects of the university are usually delayed and cost overrun has become a common issue. For example, the following table shows this fact. This data was obtained from the project office of Jimma University in May 2020 to confirm that there is a practical problem of delay and cost overrun.

Project Site	Year started	No. of Days		Initial Budget plan (ETB)	Total cost to-date (ETB)	Current progress (May, 2020)
		Planned	Current			
Kitto Furdisa	July 05/2016	400 days	1460 days	170, 730, 434.49	135, 845,133.48	75%
Aggaro Campus (2 <sup>nd</sup> round contractor)	Dec. 10/2017	790 days	1405 days	368,343, 432.56	105, 846, 776.80	50.22%
Administrative Head Quarter	Oct.10/2015	730	1540 days	686,511,964.79	610,421,384.91	85.21%
Hospitality & Hotel Tourism Institute	Dec.29/2015	684	1805 days	791,244,083.85	245,360,116.25	33%

Table 1: The status of Jimma University construction projects

Within this context, it is important to investigate risk management practices affecting ongoing construction projects of Jimma University. But, it is not to claim that risk is the only factor for delay and cost overrun. With these basic contexts, this study attempts to answer the following questions:

- What risk management methods do the parties involved in the University's construction projects have?

- How do the client, the contractors, subcontractors and consultants include risk management methods in their plan?
- What are the major risk factors leading the construction projects of the University to delays and cost overruns?
- How are the project managers dealing with risk factors related to the human and material resources involved in the construction projects

## **1.3 Objectives of the Study**

### **1.3.1 General Objective**

The general objective of the study is to explore risk management practices affecting Jimma University owned construction projects.

### **1.3.2 Specific Objectives**

- To identify the risk management methods key stakeholders use to tackle the risk problems that delay the University's construction projects;
- To analyze how the client, the contractors, subcontractors and consultants include risk management methods in their plan;
- To explore the major risk factors that contribute to the delays of the construction projects of the University;
- To explain how the project managers of construction projects of the university deal with risk factors related to the human and material resources.

## **1.4. Scope of the Study**

This study is delimited to Jimma University owned construction projects that are not yet finalized. Specifically, risk management methods and how the major stakeholders include it in their plan, major risk factors and how risk factors related to material and human resources are managed were explored within the scope of this study. In terms of geographical location, the scope is limited to Jimma town (three of the projects) and Aggaro town (the new campus) where the University's ongoing projects are located.

## **1.5 Significance of the Study**

By explore risk management problems affecting Jimma University owned construction projects, this study attempts to contribute how to properly implement government funded capital projects by reducing risk factors. Hence, this study makes a contribution towards finding solutions for construction delays by indicating areas of weakness by client, contractors and consultant. The researcher also hops that the findings of this research would be used by construction project managers, project owners, government and organizations, consultants and contractors. Moreover, as student of project management and finance, the researcher also gets experience of this area of project completion challenges. It may also help other researchers as a starting point for further studies.

## **1.6 Organization of the Paper**

This study is arranged and presented in five chapters. The first chapter consists the introduction chapter that includes: background of the study, statement of the problem, objective of the study, significance of the study, and etc. The second chapter presents to present conceptual frameworks and review of related empirical studies. The third chapter is devoted present research methodology. The fourth chapter covers the data presentation, analysis, interpretation and discussion. Finally, chapter five consists brief presentation of summary, conclusion and recommendation.

## **1.7 Operational Definitions**

The following terms are key in this study and, relatively focused definition is presented here for each as used in this study.

**Risk Management:** Risk Management refers to the culture, processes, and structures that are planned to effectively manage risks including possible opportunities and threats to project objectives.

**Client:** A person or organization that commissions buildings or constructions for itself.

**Consultant:** A person or organization engaged by the client, to foresee a project starting from the design phase, involving project manager, engineer, surveyor.



Multinational Contractors: Multinational Contractors are usually foreign private companies or their affiliate, mostly managed by foreigners.

## **Chapter Two**

### **Review of Related Literature**

#### **2.1 Theoretical Review**

##### **2.1.1 Project and Project Management**

Various definitions can be given to a project. According to the Project Management Institute (2004) a project is a temporary endeavor undertaken to create a unique product or service. Different authors have been defining project differently, due to the fact that it is a multidisciplinary nature. Managers, Architects, Engineers and etc. have their definitions considering their own professional experiences. Turner and Muller (2003) defined project as an organization of human and financial resources in a novel way to commence a certain unique scope of work with a given specification, within defined cost and limited time that could be seen both quantitatively and qualitatively.

On the other hand, Lund (2011) defines a project as a task that is performed by a temporary organization in order to achieve a programmed result. From the definitions it is clear that there is a time frame given to complete a project. Hence, for any project, it is anticipated to be finished as planned both in terms of time, money and quality. Hence, a project is momentary in that it has a definite start and end in time, and consequently defined scope and resources.

But it is less likely that projects seen completed on time per the earlier plan, and takes much longer time to complete and demand much extra money, may be with compromised quality due limited professional skills in the area and other different related, of which failure to give attention to risk management issues could be one. Such problems are common in projects of developing countries like Ethiopia, and as a result frustrating government, clients and the society at large as it affects in one way or the other everyone (Abraham, 2004).

Similarly, according to Project Management Institute (2008, p. 5) project management is “a temporary endeavor undertaken to produce a unique product, service, or result.” Which means a project is done only one time. If it is repetitive, it’s not a project. To be considered as a project, it should have clear starting and ending points (time), a budget (cost), a clearly defined scope-or magnitude-of work to be done, and specific performance requirements. Within this context, a project management includes different activities starting from overall planning, coordination, and

control of a construction process to completion. Particularly, construction project management is aimed at meeting a client's requirement in order to produce a functionally and financially viable project. Project management, then, is the application of knowledge, skills, tools, techniques and procedures to project activities to meet the project desires.

### **2.1.2 Project Risk Management**

According to Project Management Book (PMI, 2004, p. 238) “Project risk is an uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective, such as time, cost, and quality”. Literature shows that risk and uncertainty are most often used concepts in the area of risk management. Many authors describe risk as a condition where absence of some part can cause a threat to the project. Among these lack of information, experience and knowledge are factors usually stated by authors as prominent causes for a failure. The description provided by Cleden (2009) goes with the purpose of this thesis as it concerns how risk is seen as a gap in knowledge unless handled correctly, will create a problem to the project.

In fact, risk management is a corner stone for project success as witnessed by many scholars of the area. Where there is less risk management system in project construction it would be less likely to finish the project on time per the planned cost. Even, where there are carefully planned risk management components, effectively completing a project is a challenging issue in most of the case. For example, Serpellaa, Ferradaa, Rodolfo, and Larissa, (2014, p. 654) states, risk management in construction projects is full of insufficiencies that disturb its success as a project management function and eventually, a projects’ performance. These scholars further explain that risk management in construction projects has been managed from the perspective of a reductionist approach that focuses most of the times handling risk depending on contingencies (money) or floats (time) without due consideration analysis of potential risks that can affect a project. In other words, most of the time, adequate attention is not given to comprehensive analysis of risk factors that hamper the progress of a project. Hence, in most often, projects end with delay and costs overrun.

Smith et al. (2006) presents a broad explanation of the concept of risk management and how it can be used in practice. According to the authors, risk management cannot be supposed just as a tool to foresee the future, as that too difficult. Rather they refer to it as an instrument to assist the

project in order to make enhanced results grounded on the evidence from the investment. In this way, decisions based on insufficient information can be avoided, and this will lead to better overall performance. Risk management has also a process with some predefined procedures. Though the scope of its definition differs among the authors, much of the information is the same. Supporting this fact Cooper et al. (2005) explanations:

The risk management process involves the systematic application of management policies, processes and procedures to the tasks of establishing the context, identifying, and analyzing, assessing, treating, monitoring and communicating risks.

Therefore, for an effective and efficient risk management, it is essential to have suitable and organized techniques and, may be above all, awareness about the risk issue, knowledge and experience of various types that can affect construction projects. For example, it requires knowledge of the unforeseen events that may occur during the execution of a project, on the actions that work well or not when one of these events happens, on ways to assess a risk or estimate the likelihood that it will occur, and so on.

The absence of an effective project risk management function has several negative consequences for participants in a project due to lack of preventive action against the risks and uncertainty that any project presents. For example, the lack of prevention against the risk of scope definition of a project, or environmental hazards or communication risks, between others, leads to delays, significant increases in costs and contractual disputes, among others (Serpellaa, et al., 2014, p. 654).

And risk management is among the most important factors in project management practices to confirm a project is fruitfully finished. A systematic approach to risk management, suggested by Turnbaugh (2005) has three basic stages: Risk identification – to determine the types of risks, identify, and assess the potential risks in the project; Risk Quantification – to identify the probabilistic characteristics and the degree of the impacts for their impacts; Risk Response and Development Control – to define opportunities for managing changes in risk during the project life cycle.

As a concept, risk management is used in all industries such as in information technology, automobile, the construction sector etc. Though each industry has developed its own risk

management standards, the general ideas of the concept generally remain the same irrespective of the specific sector. According to the Project Management Institute (2004), project risk management is among the nine most serious parts of project commissioning. This shows that there is a strong relationship between managing project risks and a project success. In fact, risk management is described as the most challenging area within construction management (Winch, 2002; Potts 2008) yet, as it is so crucial, its application is encouraged in all projects in order to reduce or avoid negative results (Potts, 2008).

Thus, in one way or the other, inappropriate, or absence of risk management skill, experience and preparation in construction projects results in delay of completion, that also leads to further financial crises. According to Assaf and Al-Hejji (2006) construction delay could be stated as the time overrun either beyond finishing time specified in a contract, or beyond the date that the parties agreed upon for project delivery. In other words, it is a project slipping over its pre-planned schedule. And, a delay that arises from inappropriate risk management is a crisis to any part involved in the project. To the client, delay means inability to accomplish once objective as planned, as the construction should provide service. On the other hand, to the contractor, delay could mean higher “costs because of longer work period, higher material costs through inflation, and due to labor cost increases and maybe lost opportunities for new projects because of diminished financial capabilities” (Assbeihat, 2016, p. 22).

Basically, there are four aspects (time, budget, scope, and quality) that make up what’s known as the balance quadrant. According to Williams (2008, p.3) “the balance quadrant demonstrates the interrelation-ship between the four aspects and how a change to one aspect will unbalance the quadrant. For instance, an increase in the project’s scope will have an impact on the time, the cost, and the quality of the project.” In reality, every project decision clients make have impacts on the four aspects as it may make the project more expensive, take longer time, be of poorer or greater quality, or interrupt its scope.



The balance quadrant (Williams, 2008, p.3).

In general, the objective of project risk management is to understand project and program level risks, to diminish the probability of negative occasions and to maximize the prospect of positive events on projects and program outcomes. From this it is possible to infer that project risk management is an ongoing process that begins during the planning phase and ends once the project is fruitfully concluded and twisted over to tasks.

### **2.1.3 Benefits of Risk Management Planning**

Risk Management needs a plan that passes through the process of identifying, analyzing and responding to risk factors all the way during the life of a project and in the best interests of its objectives. Proper risk management implies control of possible future events and is proactive rather than reactive. When accordingly performed, a risk management plan warrants that risks are managed appropriately. The goal is to decrease influences of negative risks and to improve the influence of opportunities. The risk management plan provides a tool for reporting risk to senior managements as well as the project sponsor and team. The risk management plan does not identify projects risks. As Newton (2015) confirms a risk management plan describe in detail how the concerned members of the team will manage risk. The plan shows the level of risk that is bearable for the organization. It also ensures that the level of risk management is appropriate with the recognized risks and the organization's preparation for risk.

As risk management plan is a sub plan of the whole project, it includes the methodology that will be used to control risk comprising the tools and data sources. It also classifies the owners of risks and what their accountabilities are to manage the classified risks. In the plan, budgeting for risk

management is also incorporated so that necessary resources and funds are made ready to manage the risks. The plan may also pronounce the reporting formats that will be used in the project as well as the how of introducing the risks to stakeholders of the project. Besides, a risk management plans also includes a probability and impact matrix to assess impact on project objectives (Newton, 2015).

As far as the time of risk management plan is concerned, it can be developed the initial stage of the project, but it should be open for revision and update until the end of the project. And the development of the risk management plan starts with looking at project expectations including data, staffing, etc. (Kendrick, 2015). The identified risks should be combined into all the processes of the project to support the uncovering of further risks and to reduce the unknowns. It is also important to review stakeholder patience for risk in the beginning of the project so that plans can be made to address the stakeholder need for precise estimates, clearly defined deliverables, and frequency of communication (Kendrick, 2015).

Risk management should start from the contractual stage. As briefly stated above, dealing with risk starts from planning for risk, and then assessing risk issues, to develop risk management strategies, so as to monitor risks and finally to determine how the risks are changed. However, as Partnership Victoria guidance material (2001) shows, risk management is an ongoing process that is closely observed throughout the project focusing on the following five steps. In the same way, Amjad and Kahlid (2012) lists understanding risk and risk management, risk identification, risk analysis and assessment risk monitoring. Hence, for the purpose of this study, how the construction projects work towards risk management will be based on these authors' suggestions.

- (i) Risk identification- The process of identifying all the risks relevant to the project; Risk identification is the process of identifying and determining risks that could possibly inhibit the project from achieving its objectives. It also includes recording and documenting and communicating the concern.
- (ii) Risk assessment- Assessing risks involves discovering the internal and external pressures and the consequences on the projects of the organization. All possible events should be identified early both from internal and external environment.
- (iii) Risk analysis- Risk analysis is the next step to be done after the assessment. Once the risks are identified, the probability of their occurrence and the consequences need to

determine. For this, qualitative and quantitative analysis should be performed to determine the extent of the threats impacts and how to alleviate them.

- (iv) Risk monitoring- Continuous monitoring by the project risk manager and the project team ensures that new and changing risks are detected and managed and that risk response actions are implemented and effective. Risk monitoring continues for the life of the project.

In general, by implementing a risk management plan and process, it is possible to consider the various probable risks or events before they happen. This enables any stakeholders of the project save money and benefit from the completed project. This is because a robust risk management process can help an organization to establish measures to escape likely threats, and decrease their impact.

#### **2.1.4 Sources of Risks in Construction Projects**

There are different varieties of risks that encounter construction projects. Risk sources are fundamental drivers that cause risks in a project or organization. There are many sources of risks, both internal and external to a project. Risk sources identify where risks can originate. Tah, Thorpe and McCaffer (1993) have categorized project risks into internal and external risks. The risks that are common in the external environment of projects are considered as external risks. They also list some examples of external risks such as inflation, fluctuations of currency exchange rate, technology changes, client induced changes, and politics, climate and weather conditions, natural disaster and major accidents are the major once. Among the external risks are more of non-controllable in their nature that demand frequently scanning and making a prediction about the risks for better preparation as agency's strategy.

However, internal risks are relatively more controllable wise managers due to their nature and may vary among projects. Among some of the examples of internal risks are: uncertainties due to labor, plant & material, subcontractor, resources and site conditions. Many researchers have identified several risk factors that are grouped in different types on the basis of their nature of risks. For Example, according to Razakhani (2012) risk factors are reliant on the nature of risks like physical, environmental, design and financial, contractual, legal, construction, political, management, natural hazards, safety and delay risks. Similarly, as shown below by Mishra and Mishra (2016, p. 1194), the following are the critical risk factors in various international



projects: inflation, or country economic condition, environmental and geological risk, or weather and climatic conditions, legal clearance before planning a project, design risk, new technology implementation, poor safety procedures, delays, inadequate managerial skills, improper coordination among teams, resource risk, or scarcity of availability of required resources.

Studies also show that there are unknown stakeholders i.e., people who have an influence over a project's goals, deliverables, resources or schedule. Yet the project team is unaware of them at the outset of the planning process. Such stakeholders represent a major risk factor because they often display unpredicted confrontation.

Classifying risks according to their categories enables to consider the risks within a more comprehensible framework and also offers the chance to discover whether a specific class or type of risk is amenable to a particular type of treatment (Negash, 2016).

### **2.1.5. Human resource risk management**

Huang, et al. (2017, p. 16) states, “with the development of society, the internal and external environment changes are more complex than the past while the human resources of enterprises are exposed to such turbulent environmental changes.” Therefore humans interacts with such uncertainties in the environment and such realities make difficult to analyze understand risk issues related to human resource if managers simply rely on the traditional human resources management. Thus, it is significant to get familiarized with the current, dynamic, dramatic changes and new challenges in human resources management. The authors further state that such considerations create a sense of risk management which will protect human resources risk as a significant part of enterprise in human resource management.

Human resources are the key resources of the company, and as compared to other material resources, it is the human resource that is more easily affected by both internal and external environmental factors of the organization, causing the practice of human resource management deviate against what is targeted. Including in daily life, such as crossing the road, traveling etc., human resource may be affected by a variety of unexpected factors and causes damage to the body and mind. Therefore, “human resource risk refers to the possibility of loss by an enterprise which is caused by the uncertainty factors of human resources” Huang, et al. (2017, p. 17). “The

"human factor" that was not fulfilled in time is the reason for the leadership to be blamed for the failure of the deadlines and the implementation of projects" (Mitrofanova, et. al., 2017, p. 700).

To reduce the impact of human resource related risk, human resource personnel should collect information to assess risks about people related governance, and compliance issues. The concerned official should also present reports of the human resource related concerns and potential risks to managers the compliance and operational risks, together with the recommended actions, and accept responsibility for reducing them (Deloitte, 2008).

In human resource management, there are two basic types of risks. First, it is clear that employees are the crucial source of risk in production decreases. This may arise due to when workers do not come to work as needed; come late and leave early before completing their job, or failed to accept responsibility for the quality of their work. Second, management can be influential in decreasing human resource risk when they are active in supporting employees in meeting or exceeding their performance goals. Therefore, successful human resource risk management that results in improved output involves excellent leadership, communication, training, motivation, conflict resolution and evaluation skills (Deloitte, 2008).

### **2.1.6 Risk and Construction Project Phases**

Risk is expected in each stage of the life series of a construction project irrespective of the size of the construction project. In fact, every project can be orderly separated into several phases, and there are sets of common practices in every project; this shows that there is a basic way of considering at risk. In other words, there is possibility to establish a common valid risk management approach for any construction projects which could be accustomed by the whole of the construction industry based on the existing contexts. Furthermore, at different construction phases, every project phase has their specific points and each continues one after another and demands a different approach to risk management. For all the construction project phases there should be specific plan under the overall plan of the project.

The planned risk management method and process is expected to be implemented for each phase as planned. And, at the end of each stage the construction project, risks are re-identified and analyzed for the next phases and the suggestion is made about how to succeed the risks in them. According to Smith (1999) the earliest phases of the project focus on value management to

increase the definition of design objectives. The design phase is concerned more with value engineering to attain essential function at lowest cost, and the construction stage focus on quality management to confirm that the design is constructed appropriately without the need for costly rework.

All phases contain numerous important requirements that must be fulfilled before making the decision to continue the next process. As the project progresses, the information is obtained in a way that approves or refutes the starting assumptions. If the information or data show the starting assumptions are denied, then entirely new risks which have to be managed may appear. To support this fact, Smith (1999) state that risks should reduce as the project progresses towards the end. This means, uncertainties and associated risks are the highest in early phases of the construction projects. As the project progresses from initial phase to the last phase, the number of risks and uncertainty decreases. Therefore, the levels of uncertainties are inversely related with the development of the construction project. In the same way, according to Godfrey (1996), as a project phase advances, cost expectations become facts and cost ambiguities, therefore reduces. As a result the risk related to finance can be easily managed. In the same way, contingency can be retired gradually giving better control of the project by preventing surpluses being used later to cover up mismanagement. Risk exposure can change within a project phase. Construction projects take long time to complete and similarly, completing one phase can take several months or even many years to complete. Hence there is a chance and time to work on risk identification and analysis throughout the phases, not only at its end. From the view of project phases in relation to construction project, risk management is an uninterrupted process and takes place during the course of phases of the sequence.

Nonetheless, usually the project does not run constantly. The progress may be disturbed within a phase for many reasons, such as deficiency of assets, market fluctuations, and political reasons and so on. These are one of the fundamental risks and do not depend on a single phase. Therefore, the ideas presented under this subtopic show that risk management must be subjected to the construction process, not to just the phases through which the project passes. All stakeholders involved in decision making should take in to account risk and its influence through the comprehensive life cycle of a project. Hence, construction risk management should be process-driven risk management.

### 2.1.7 Risks in Construction Project

Needles to mention, risk is attached to every human life and is inevitable in all human activities. Yet, the complication of the work practiced in construction activities makes it more predisposed to risk (Olamiwale, 2014). The part of the risk involved in construction is also more different and varies in degree owing to this complication (Dey & Ogunlana 2004). Several researchers have tried to define risk in different ways. Generally, the definitions were tailored to the purposes of the projects they were dealing with at a specific time. However, the definition of risk is greatly relay on the significance placed on applied management in a formation (Simu, 2006). Risk pronounces a condition where former documentation and practice exist upon which measures are taken by gaining a potential result (Oztas, & Okmen, 2004). Every time a decision is taken as a range of probable consequences in addition to certain likelihoods attached to the result, a risk exists (Smith, Merna, & Jobbling, 2006). Furthermore, (Abassi, Abdel-Jaber, & Abu-Khajedart, 2005) argue that risk is infrequently generously defined, beyond financial, as a possibility of damage, harm, loss, delay, drawback or devastation. Likewise, (Al-Salman, 2004) shows that risk relates to a deficiency of information or earlier practice in a given condition being managed by a decision maker. Further, the risk is considered as the probability of an investor's assertion in construction work failing to achieve the expected measures of feasibility (Warszawski, & Sacks, (2004).

In short, all the above authors suggest that risk is disagreeable happening; a consequence of supposable but unpredicted conditions. Conceivable circumstances are happenings that announce their manifestation, while unpredicted circumstances are happenings that occur without any notice.

Numerous definitions have revealed that risk has an influence or effect on any construction project at any phase. The effects thereof may be computed using many terms of financial loss, delay, property damages, injury to workers and sometimes a combination of these (Abassi, Abdel-Jaber, & Abu-Khajedart, 2005). Mills (2001) indicates that project performance, quality, potency, capacity and financial cost and completion time could be altered if an element of risk is involved. According to Creedy (2005) construction works such as planning, design and development are susceptible to some influences in an unreliable environment. Construction

projects are thus accomplished in an environment defined by a varying measure of risk and contingencies that could be from known or unknown situations (Smith, Merna, & Jobbling, 2006). Such contingencies are unintended incidences of events where the likelihood distribution is unfamiliar.

Risks of construction projects, based on individual views can be classified in different ways. Some are classified based on their possibility of occurring, while others are divided based on the consequence of the effect they may have on construction activities and their types and sources. Despite these different classifications, they are meant to attain a common objective, that is, they are an important aid in risk management and assist in forming risk lists that are used when detecting a risk (Wong, & Huie, 2006). These scholars further indicate that the construction risks can be classified based not only on the impact of the risk on the project but also the source of the risk.

According to Smith, Merna, & Jobbling (2006) the first category includes minimal deviations and frequently occurs and is unavoidable features of construction works. The second category is foreseeable risk events with a known probability of occurrence and impact. The last category is those which, the probability of occurrence cannot be predicted. According to (El-KarimiAzari, et.al., 2011) the risk could also be classified based on sources concerned with stakeholders. For instance, time related risks, environmentally related risks, cost related risks and safety related risks. The sub-categories of human risks linked with construction projects include technical, political, social, economic, legal, financial, health, managerial and cultural risks. Other scholars list the following ten categories that can apply in context of construction projects (Kishan, Bhavsar & Bhatt, 2014).

These are: defective design, inaccurate quantities, not coordinated design, rush design, awarding the design to unqualified designers, lack of consistency between bill of quantities, drawings and specifications. Physical occurrence of accidents, because of poor safety procedures, supplies of defective materials, security of material and equipment, public security, varied labor and equipment productivity. Logistically improper site investigation, inaccurate project program, unavailable labor, materials and equipment, high competition in bids, undefined scope of working, poor communications between the home and field offices

(contractor side). Legally ambiguous work legislations, difficulty to get permits, delayed disputes resolutions, legal disputes during the construction phase among the parties to the contract, no specialized arbitrators to help settle fast. From the perspective of environment, adverse weather conditions could be mentioned. From the side of the construction, there may exist gaps between the implementation and the specifications due to a misunderstanding of drawings and specifications, design changes, lower work quality in the presence of time constraints, rush bidding, undocumented change orders; managerial problems such as poor communication, unclear planning, poor resource management; from the perspective culture (religion and custom); financially, delayed payments on contract, unmanaged cash flow, inflation, financial failure of the contractor, exchange rate fluctuation and politically, unstable security circumstances (invasions) can all impact building construction projects as risk.

Yet, as it is impossible to look in to all aspects of risks of building construction projects, only four issues are considered in this study as stated under objective section of this thesis. Namely: risk management methods the major actors practice; the consideration of risks by including in the project plan, the identification of expected risk factors by the parts involved in the building construction projects and human and material related risk management.

## **2.2 Empirical Review**

Many researchers have conducted a lot of assessments to recognize the major types of risk to be faced by construction projects in general. However, from the limited survey for this initial proposal, the studies on construction projects owned by universities, in Ethiopia or elsewhere are none. Hence, this subsection attempts to present some empirical review that in general focuses on risk management issues that concerns projects of various types.

Despite the fact that project risk management is one of the greatest needs in project management, it is not much recognized as little has been done in this respect. According to Junior and de Carvalho, 2013, p. 64), one of the first articles that studied the significance of risk management was developed by Ibbs and Kwak (2000). However, this doesn't mean all construction project related problems are due to risk management practice problems.

Thus, the problems that harm construction projects emanate not only from malpractice of risk management. For instance, according to a study result in Chile, companies working as

contractors on construction services do not scientifically apply risk management practices in projects, and such limitation has resulted in undesirable consequences for the performance of projects (Wolbers, 2011; Howard & Serpell, 2012). Moreover, another study by Palma (2007) claims there exists a contract disputes in many of construction projects reflects the manifestation different risks that are not accordingly analyzed, or integrated by the parties: customers or contractors. Hence, such inadequate risk management practice becomes one of the main causes of some of the claims and disputes, contributing a lion's share in delaying projects and cost overruns.

In the same way, earlier researches show some of the main causes of delay and cost overrun, particularly in building construction are inappropriate project management and irrelevant risk management methods. Hence, due to unanticipated occurrences and contract management problems, building projects often face different kinds of problems. From this perspective, Liu Yi (2009), states during execution of a contract, ambiguities may start in the contract document such as inaccurate design information, mistaken design, and incomplete tender details, insufficient contract administration, capacity and willingness of stakeholders (client, contractor, consultant) to cooperate as per their roles and capacities, inadequate site investigations, external events that are beyond control and unclear risk allocation, etc. From the context of Ethiopia Abdissa (2003) identifies that blurred and less contextualized risk management are one of the root causes of disputes in construction.

Concerning Ethiopia's construction industry, the construction regulations (2007) states construction works as the investment on any building, civil engineering or engineering construction works. Related concept was also mentioned by Tecle and Mahelet (2009) in the teaching manual they developed for lowers for a course in construction law. According to them, from the perspective of Ethiopia, the construction industry is described as the sum of all economic activities related to civil and building works that include their conception, planning, execution, and maintenance. Such works are part of capital investment in the form of roads, railways, airports, ports and maritime structures, dams, power generating stations, irrigation schemes, health centers and hospitals, educational institutions, warehouses, factories, offices and residential premises.

One of the related local studies published on journals were Mihret and Teklemariam (2017), about software project risk management practice in Ethiopia. They state, in a country like Ethiopia, software projects may face several risk related challenges due to the under developed nature of the sector. Therefore, the objective of their study was to understand the software risk management practice in the country based on a survey of 45 banks, insurance companies and United Nations agency offices in Addis Ababa. The study also included the level of adoption of formal risk management models and the steps included in risk management implementation. Besides, the study attempted to see the relationship between risk management practice and project success. The conclusion of the study shows the risk management was practiced just only watching projects to see that risks occur during implementation without performing risk identification and mitigation or response plan. The researchers also reported that some project managers were not confident enough to tell they did risk management processes in the projects under their management.

Bahiru, Lee & Lee, (2017) were also studied the impact of risk in Ethiopian construction project performance. As the authors state, the main aim of their study was to increase the understanding of risk's impact on civil work construction project performance of Ethiopia. They identified risk factors literature review, and then collected data using questionnaire and focused group discussions. To analyses the data Statistical Package for the Social Sciences (SPSS) was used. However, no information was provided from which part of the Ethiopia, and what type of construction project was focused in the study. From the findings it was concluded that the main risk factors that affect the project performance were mainly equipment/material failure, labor under poor productivity, shortages of equipment and material. The miner risks identified were injuries, earthquake, winds, land slide and rock falls. In general, the analysis revealed that the risk management is not practiced very well.

At master's postgraduate level, Negash (2017) studied the practice of risk management on asphalt road construction project in Butajira. He tried to examine risk management is actually practiced while the road construction project was on progress. According to his finding, the practice of developing an operational risk management plan in the project was poorly practiced, even though the plan was claimed to be prepared with the participation of concerned stakeholders considering various factors. In fact, the researcher confirmed that risk was primarily identified by experts after assessment was done and the identified risks were analyzed and



evaluated considering characteristics. Yet, there was no adequate strategy designed to respond to probable risk. Similarly, risk monitoring and control practices of the management were also found poor, particularly in using a guide line that shows how to manage unforeseen issues.

Another local study was Alemu (2016) that investigated actual risk management practice of Batu and Dukem town water supply project for his master's thesis at Addis Ababa University. According to his finding, there was no clearly identified and defined risk management process practiced and implemented for the project. Before the commencement of the project, the risk planning activity was not conducted, and where there were efforts, it was not carefully conducted. Besides, for the uncertainties, there was no strategy developed for the project, and the clients and the contractors had almost none on their hands on how to act to responded to the problems the projects faced. Furthermore, risks were not monitored and controlled appropriately. Therefore, Batu and Dukem town water supply projects practice of risk management tried to implement some of the risk management standards, but more basic process and standards were needed.

There was also a similar study by Manyazewal (2017) that assessed the risk management practices of real estate projects in Addis Ababa with the major objectives of examining how the theoretical risk management process was practiced appropriately and efficiently and to investigate how project risk planning was integrated with corporate strategic plan of the real estate investors. He further considered the level of consciousness and insights of the risk management of the managers and owners of the real state. His finding confirmed that the theoretical issues in risk management of projects were rarely practiced, and there was little attention given to including risk management issues to corporate plans. These all was in fact because of limited perceptions and insights regarding the role of risk management in project success. Therefore, although the project was facing risky, poor risk management was being practiced and there was a big gap between what should be done and what was actually accomplished in the projects.

Another study was by Erstu (2017) that assessed the risk management practice of construction projects of Addis Ababa saving houses development enterprise. According to the study, the enterprise was practicing better quality risk management. There were quality assurance and quality checks on interval basis. Qualified managers and consultants were employed and as a

result the risks were controlled and cost and schedule impacts were to some degree minimized. But, there is no risk management department that works focusing on the risk issues and there were human resource related problems that did not give attention to their motivation. Hence, the high turnover is somehow impacted their success of completing on time.

A few of the local studies presented above show the research on risk management is getting attention in Ethiopia. And all the papers emphasis that risk management is crucial for effectiveness of projects in attaining their goals. The current study is different from the other studies in that, the previous studies focus at the central part of the country, and this is far from the center with its own different internal and external environments. In fact, though there is similarity on the title, the focus of the title and the objectives are also different.

### **2.3 Conclusion and Gap**

From the empirical review presented, it can be concluded that there is no study devoted to investigate the risk related issues that construction projects practices, particularly focusing on Jimma University construction projects. However, it is observable that the University has huge construction projects. Therefore, there is a gap that there is no clear evidence based study result that presents how much the University's construction projects currently on progress are implementing risk management issues in their practice. This is the main gap this stud intends to fill.

## 2.4 Conceptual Framework

The study mainly focus on the risk management the parties involved in building construction projects of Jimma University practice, where the practice considered is their method, together with how each included identified risk in to their plan. Of course, the study also attempts to disclose the major risk factors contributing for delay and how the risk related to human and material resources are managed. For the purpose of this study, conceptual framework that focuses on risk management process of construction projects are presented based on literature review and the objectives of this study. To achieve the goal of the research the bench mark for risk management practice assessment is the scientific risk management practice presented under this chapter. Therefore, the researcher sketched the following conceptual model based on the literature review and the research objective with the assumption that the construction projects success depends on the correct practice of the stated risk reducing practices. Yet, it is not to claim that these are the only practices for construction project success.



## **Chapter Three**

### **Research Methodology**

#### **3.1 Research Design of the Study**

In this study, an exploratory sequential mixed method research design was used in order to explore and understand risk management practice affecting Jimma University owned construction projects. The research type used in this study was sequential mixed method design. Mixed methods design, data collection and analysis is important in research because, it helps to approach a research question using the both quantitative or qualitative research perspectives, and therefore has the ability to advance the scholarly conversation by drawing on the strengths of both methodologies (Creswell, 2009). As sequential mixed methods exploratory design, the researcher starts by collecting a quantitative data and then collects a qualitative data for further explorations and confirmations regarding risk management problems affecting construction projects of Jimma University.

#### **3.2 The Study Population**

The study population of this study included all building constructions of Jimma University that are not yet completed. All the employees working in the construction projects of the university were the target population of the study. The target population consists of project client, coordinators, project managers, site managers, consultants and contractors, excluding nonprofessional daily laborers, 94 in total.

#### **3.3 Sampling Methods**

The main purpose of this study is to get the reliable information to explore risk management practice affecting on time and as planned completion of projects. As their numbers were manageable, census survey was used and all of them who were professionals working in the four projects were selected. Accordingly, 94 of them were selected from the four project sites including client, consultant and contractors. The key actors of the project, such as client, contractors and consultant were purposively selected and participated on interview because they can identify and state risk factors that delay the construction projects of the university. They were four in number.

### **3.4. Data Collection Tools**

The data required to explore risk management problems affecting construction projects were obtained from primary sources. The first tool used was closed-ended questionnaires filled by selected employees of the construction projects of the university. A five-point Likert scale was adapted from different literature in line with risk management. In total 5 background questions and 25 questions prepared to address the research objectives were distributed. And the instrument applied to collect data was questionnaire and semi structured interview. Finally, 22 of the questions that were correctly responded were analyzed. From the 90 distributed questionnaires, 80 of them were correctly returned and used in this study. The interviews of for participants were also used; two of them were willing to record their voices and two of them were not. Therefore, the recorded voice was transcribed and translated in to English; one from Amharic, and the other from Afan Oromo. The interview data of two of the participants were taken using a note.

### **3.5 Data Analysis and Presentation**

The collected data were edited for accuracy, consistency and completeness and were arranged to make it ready for final analysis. The data were analyzed to generate descriptive statistics, that is percentages. And, presented using graphs, tables and pie charts. Microsoft Excel was used as required to analyze the data collected. And, integrated with thematic based analysis of the interview data. The data from questionnaire and interview were presented in a way supporting one another. And for risk factors affecting the construction projects, the interview with key stakeholders were the main data source. This is because, the client, the contractor and the consultant can tell more what risk factors they have been facing.

### **3.6 Data Validity and Reliability**

According to Remenyi et al. (1998), data validity refers to how well the results of a research can give the right answer to the research question. In this regard, information from previous studies and different literatures that cover all the areas of the study was carefully seen for validity and reliability. The questionnaire was based on the theoretical framework in order to arrive at the right answer to the research problem. For data reliability, the researcher designed the questionnaire using an elaborated procedure of reviewing relevant literature.

## **Chapter Four**

### **Data Presentation Analysis and Discussion**

#### **4.1 Introduction**

This chapter presents the description results of questionnaires and the in-depth interview undertaken. It is aimed to explore the risk management methods of the stakeholders of Jimma University construction projects and how all concerned bodies include risk management methods in their plan. In connection to this, the study also attempts to identify the major risk factors leading Jimma University construction projects to delays and cost overruns, relating it with risk management of human and material related factors. In the questionnaire the workers with different status in five different construction projects in the university were asked to fill the risk related questions as they observe from their daily activities.

As mixed methods research, both data from questionnaire was integrated based on the major theme of the study, that is the four core objectives. The data collected from the questionnaire were analyzed using descriptive data analysis supported by Microsoft Excel. The interview data was quoted and presented where necessary to support the data from the questionnaire. After the statistical results are presented in a graph and pie chart, interpretation and discussion was followed.

#### **4.2 Questionnaire Response Rate**

All the questionnaires were close ended. In total, 90 questionnaires with 25 question each including the background information were designed and distributed for this research purpose. Out of the totally distributed 90 questionnaires, 80 of them were almost accurately filled and returned. But, from the 25 questions three were repeated and vague questions for which many respondents jumped. Therefore, 21 questions that were returned with complete answers were presented for analysis. Hence, from the totally distributed questionnaires, the overall questionnaire response rate was 88.88 percent.

## 4.3 Respondents' Profile

### 4.3.1 Sex of the Respondents

From the total respondents of the questionnaire, the great majorities were males with 82.5%, and the females represent only 17.5% share. Though the figure may not have direct relation with the risk management issue, all professionals in the work environment were participated and females are playing their role both in the construction projects. Therefore, their view is less reflected in this study due to their limited presence as the following graph 1 shows.

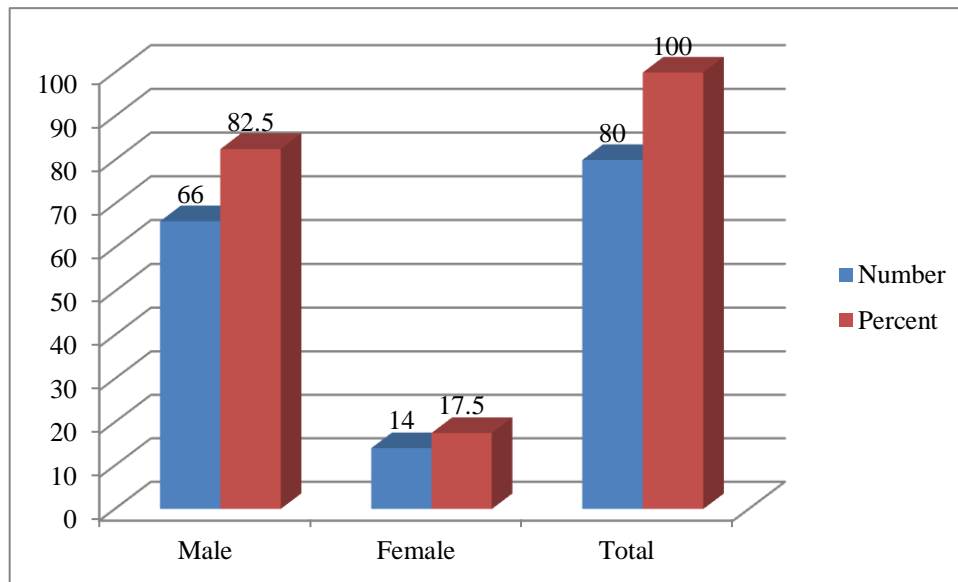


Figure1: Sex of the Respondents

### 4.3.2 Age of the Respondents

As background information the age of the respondents were asked to put the specific year on the blank space. Accordingly, all of them wrote their age and the whole responses were categorized in to five. These were: twenty-twenty five, twenty six-thirty, thirty one-thirty five, thirty six-forty, and forty one and above.

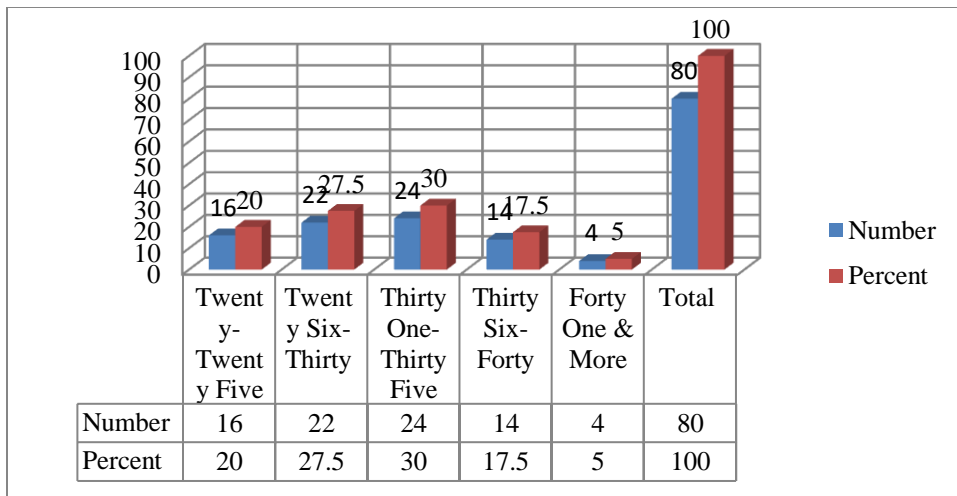


Figure 2: Age of the Respondents

As graph 2 shows, most of the respondents were in the age category of thirty one-thirty five (27.5%) and twenty six-thirty (30%) respectively. Hence, many of the respondents were matured enough to give responses to the questions.

#### 4.3.3 Role of the Respondents

Workers in the four construction projects who completed the questionnaire have different roles assigned to them in relation to their academic professions. From the total 80 questionnaire filled and returned, ten specific roles were observed. These were: office manager, vice manager, site manager, project coordinator, team leader, surveyor, resident engineer, design control and accountant. These were different professionals with direct everyday involvement in day-to-day activities of the construction. It seems they can witness the risk management issues of the project they are working for. Accordingly, office engineers are the first in number with 15%, followed by project coordinators (12.5%).



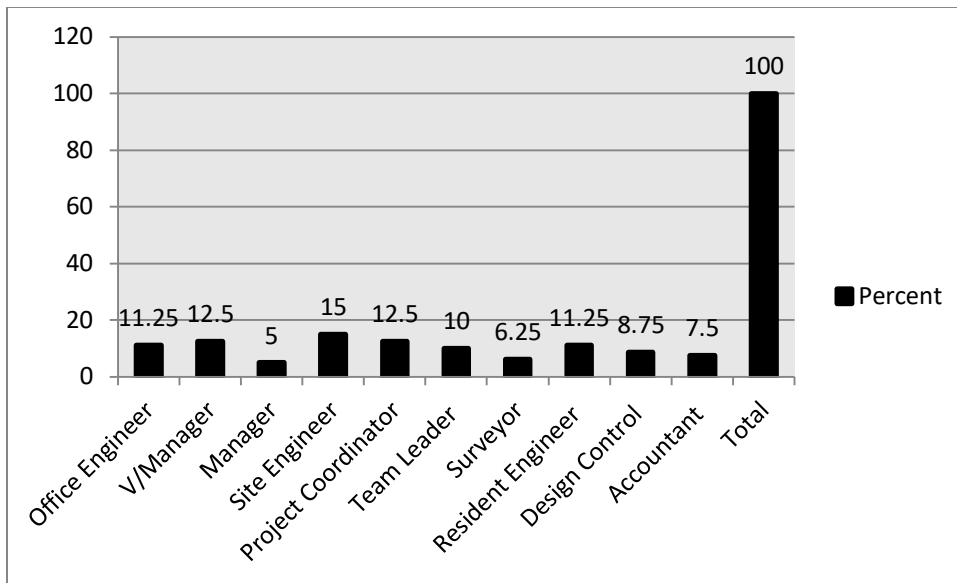


Figure 3: Role of the Respondents

The variety of the professional background of the respondents by itself has a positive role in mitigating the risk issues that construction projects face. Yet, the purpose here was that the respondents can respond to questionnaires as needed from the perspective of their own role. Hence, their responses have its own validity as they closely observe how the project is going and how the major stakeholders act in this regard. Of course, the major stakeholders of the project, i.e client, consultant and contractors responses through interview were integrated. Besides their role in the project, their academic level was also asked as graph 4 below show. In fact, academic level of the human resource involved in construction project has its own impact on managing risks. Stating from the point of view of risk management, Kishk and Ukaga (2008, p. 800) state “The various stakeholders involved in a project may each have a different view of what determines the successful project”. Hence, such various roles of the workers is an asset as far as reducing risk is concerned.

#### 4.3.4 Academic Level of the Respondents

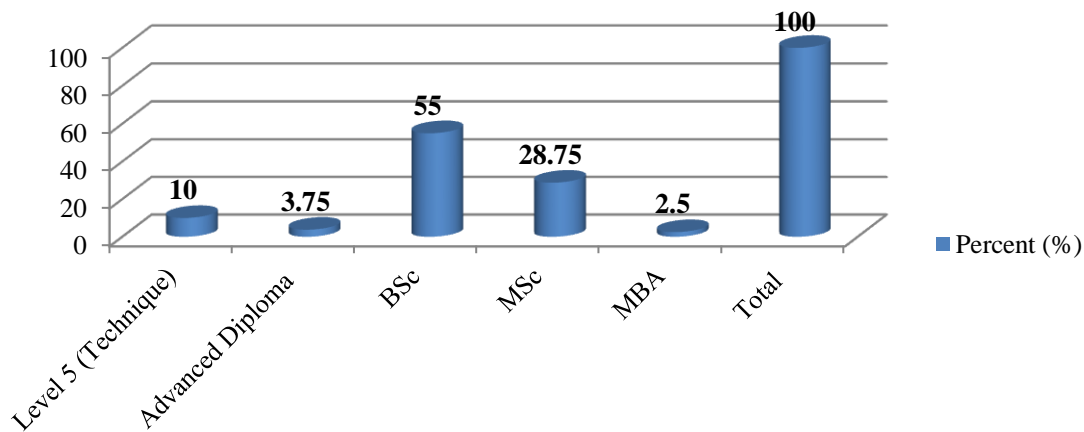


Figure 4: Academic Level of the Respondents

As graph 4 show, 55% of the respondents were holders of Degree and 30.25% of them had masters (28.75%, MSc and 2.5%, MBA).

#### 4.3.5 Work Experience of the Respondents in Construction Projects

Adequate experience is important for every activity. Construction projects underway in a university like Jimma University that demands billions of investment demands more experience for all successes. Particularly, where there is good experience in areas of one's duty, there is a possibility of responding to emerging risks on time.

In this study, respondents were asked to write their experiences in construction project. Accordingly, the whole response was summarized in to five categories based on interval scale. As graph 5 show, 35% of the respondents have experience of between six-ten years and 18.75% of them have eleven-fifteen years. As these two categories combined together represent more than half (53.75%), the experience could be a resource to reduce the risks that may encounter them. Yet, the workers with less than a year experience were also relatively significant. Besides, there are also workers with twenty year experience.

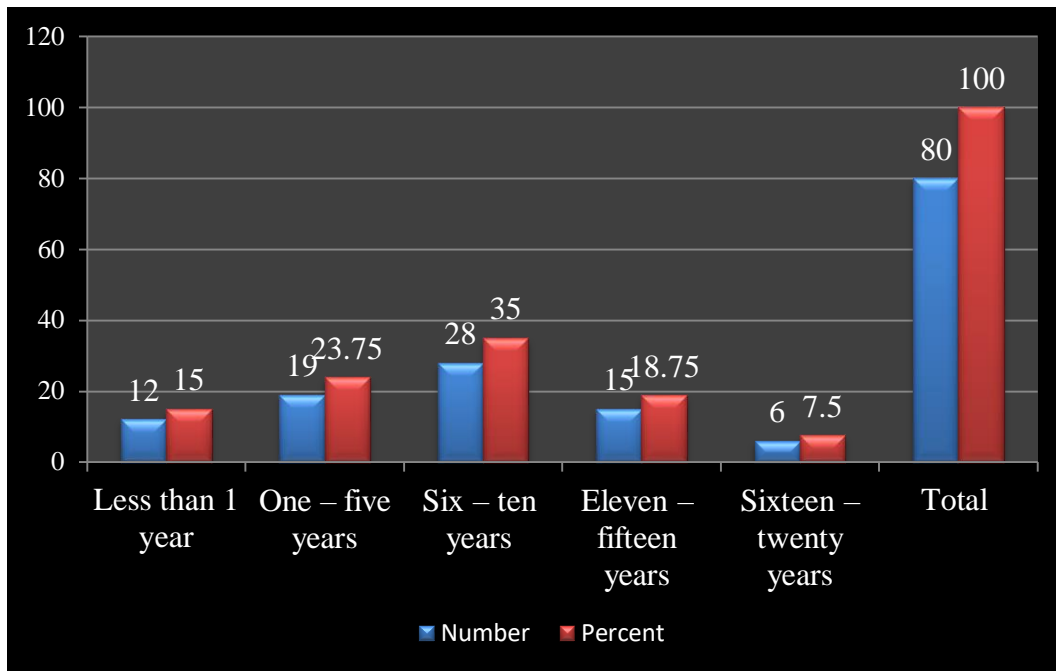


Figure 5: Respondents' experience in construction projects in years

#### 4.4 Risk Management Methods of University's Construction Projects

Seven questionnaires were devoted to explore the risk management methods employed in Jimma University's construction projects. This is because elucidating risk management methods is one of the key objectives of this study. Among the method focused questions, the one that seeks answer about consideration of risks early in the project was one.

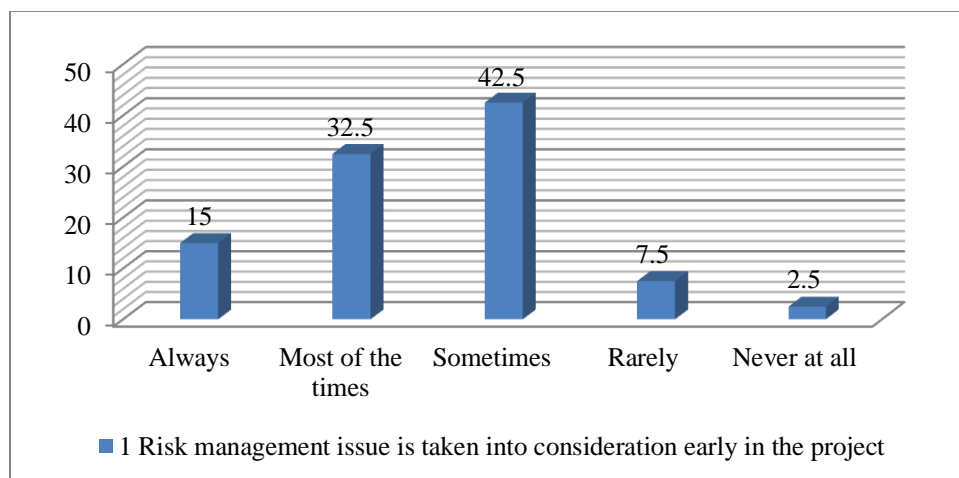


Figure 6: Considering risk management early

According to the data, 15% of the respondents replied that there is always risk management consideration early in the project. On the other hand, 7.5% and 2.5% of the respondents respectively assert that risk management issue is rarely and never taken into consideration early. Risk issue is not considered early means it would be difficult to fix risks when it encounters in due course, usually resulting in delaying the completion of the project. This was also confirmed through the interview with one of the consultants of the projects.

The designers cannot get adequate time to think risks of environmental, geological, functional issues, material types and other related important studies. There is no enough time given to consider crucial factors at design stage. Usually, many designs are included while the project is on progress. From this perspective, the projects' designs are not usually complete. Though I joined recently, the reason for the delay is partly this one- I think. (Consultant 1)

This fact is supported with the data of 42.5% of the respondents who responded that sometimes there is a practice of considering risk issues early. Among early consideration of risks are detail analysis and considerations of internal and external environments and project specific risk conditions. Furthermore, interview with one of the contractors revealed that though early assessment of potential risks is helpful, there is limited attention given from stakeholders, particularly from project owners.

Salah and Moselhi (2016) argue that risk in construction project is highest in the early stages since this is the point in where it is most probable to make a major fault that may not later be corrected easily. In the early stages, the assessments that call for risk management are strategic decisions, which have significant implications for the project's objectives. However, in the later stages, the risks are usually minor modifications and adjustments and more likely to be tactical decisions with limited drastic consequences. Hence, it early attempt to identify risks is a cornerstone to run the project as planned. It seems, this is not satisfactorily reflected in Jimma University construction projects.

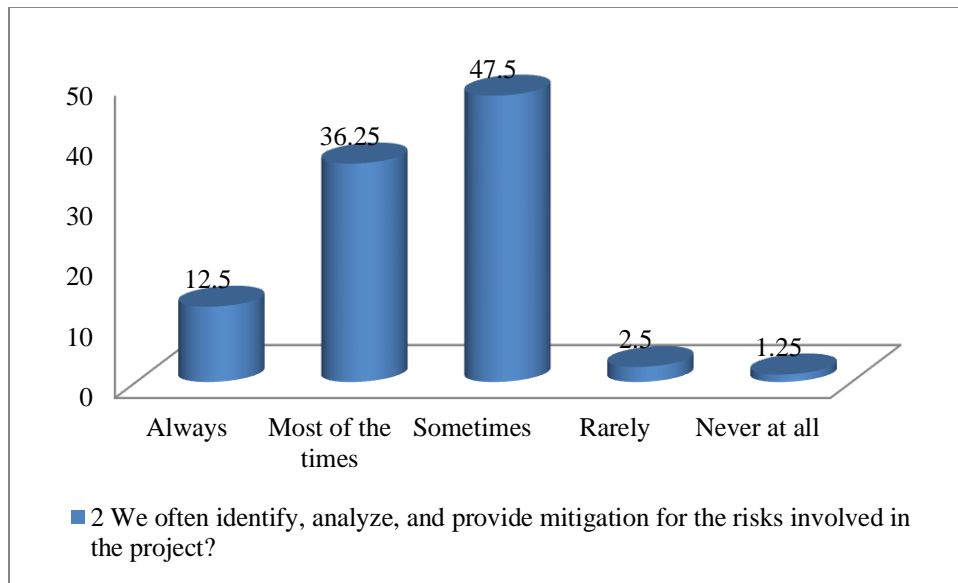


Figure 7: Identifying, analyzing and providing mitigation

As presented earlier, professional background of the workers involved in construction projects were multiple. It can be assumed that these help the workers and the stakeholders in identifying, analyzing and work towards alleviating the risk before the risk gets complicated. It was with this in mind that all respondents asked to respond that they often identify, analyze and provide mitigation in their area of involvement in the project as they are coordinators, managers, site engineers and etc.

However, the data show that almost half (47.5%) of the respondents confirm they do this crucial method of risk management that is identifying, analyzing and mitigation sometimes. It means, the practice is not a priority in the construction projects of the university. This makes the duty less attentive to emerging problems. Construction projects need proactively assessing risks so that things progress as planned rather than reactive responses that stop the progress of the construction until risks are fixed. On the other hand, there is a tendency of leaving these roles (identifying, analyzing and providing mitigation) to the consultant, contractor and client. The following interview quote makes this clear.

After the designer designs, the engineers of the client won't critically evaluate and comment for revisions before bidding. And after the start of the project, the design becomes incomplete as it won't adequately consider at design stage. On the process the client notices some other new idea and wants to be included. These modifications are

possible and general conditions in construction. *But, the problems need to be identified early and resolved quickly is the problem.* This is my view. (Consultant, 2)

Therefore, the attention given to early identification of risks in construction projects of the university is not satisfactory. As a risk minimization method the three interrelated methods were less known, and hence may contributed much in delaying the projects.

In their study, Al-Shibly, Louzi & Hiassat (2013, p. 22) showed that risk identification, analysis and mitigation impact project success. Likewise, Ewer & Mustafa (2008, p. 1-6) witnessed that, when stakeholders contribution increases in risk identification, the risk of vague and incomplete designs seems to lessen and advance project performance and, therefore, effect positively a project's outcome. A study by De Bakker *et al.* (2011, p. 78) also specifies that risk identification contributes to project success. They also confirmed that the communication and discussion with project members or workers in risk identification play a positive influence on the perceived success of the project. However, in case of Jimma University, there seems no much understanding about the contribution of this fact as one core method of handling project.

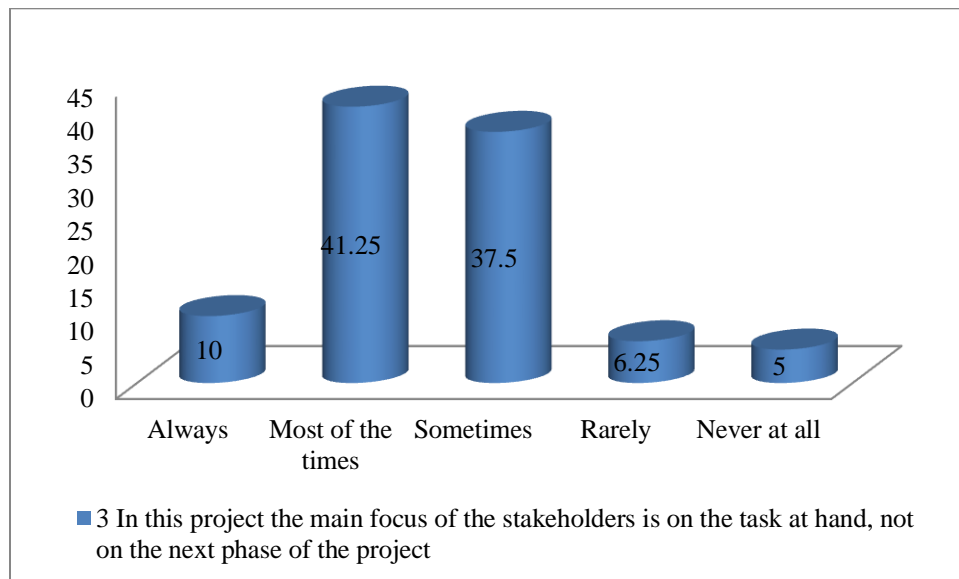


Figure 8: The main focus of Stakeholders

One of the risk management methods is that looking forward to the upcoming subsequent phases than just focusing on the task at hand. Failing to see the next stage of work could hide the problem that faces at next stage. In line with this the respondents were asked where their main focus of the stakeholders. The result show that 41.25%, of the stakeholders mainly focus on the task at hand and 37.5% sometimes focus of the task at hand rather than the next stage of the

construction phase. While it is important to focus on what is being done in construction project, the current practice is the base for the next one, and hence it is a priority to look forward and for see the activity and the risk a head. 10% of the respondents also confirm that there is always a tendency of just relaying only on the phase of construction phase.

As a case, one of the interviews narrated his experience of a problem he faced as a project consultant in Jimma university construction.

One of the colons missed when started from the ground. Then, when filling a slab on the first floor, the slab has already deflected on the other side and then cracked. The building was big. Then, immediately, temporary supportive colons were added to resolve the problem. Parts of the crack were demolished and mended. The new colon was made. It was then tested and the whole work continued. This problem has impacted different things. Even the work was stopped until the problem was proved resolved. The work was terminated for more than four months. Psychologically many of the workers and all concerned bodies were disturbed. It was included on the plan. But, missed on the sight while constructing. (Consultant 2)

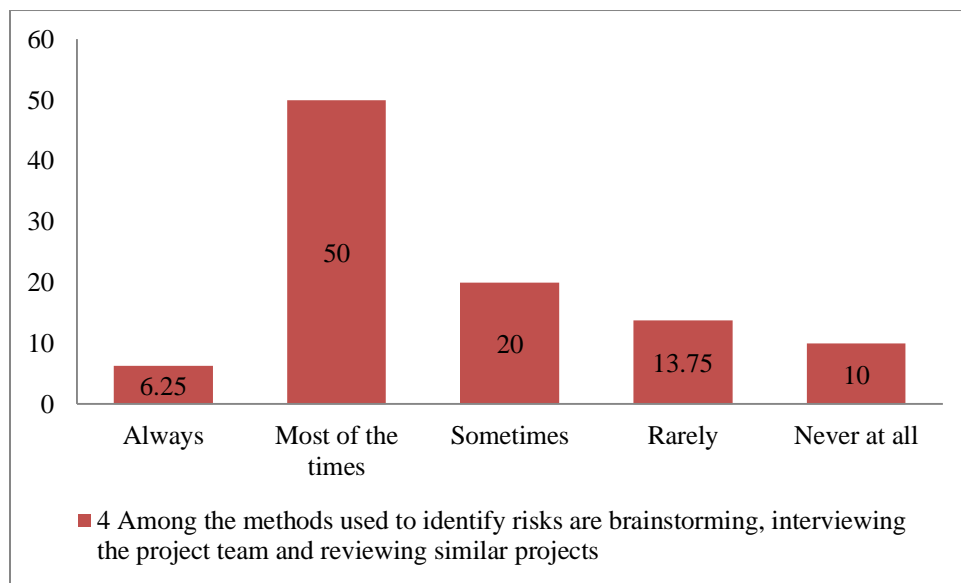


Figure 9: Method of identifying risks

Identification of risks can be carried out in different forms. Scholars of the area identify the bigger picture like feasibility study as an overall guidance towards risk mitigation. But, specifically, risk issues of both internal and external environment, human and material resource related risks can be examined and identified through brainstorming, interviewing the project team, and revising the similar projects. Accordingly, the extent of these practice in context of

Jimma University owned construction projects show 50% of the respondents confirm most of the times, the stated methods are employed as a method in risk identification. This is a good practice as the project team that also involve the respondents who have different key roles for the success of the projects participate in both brainstorming and interview to reflect from what they observe on daily bases.

In contrast, a very significant number of the respondents 43.75% have different view in that the method is practiced sometimes 20%, rarely (13.75%) or never at all (10%). If well practiced, this is helpful as it is participatory in its approach due to its inclusion of all workers in the project site. But, the reality on the ground doesn't show this as almost about half of the respondents haven't observed on their duty.

According to Nawaz, et al. (2019, p. 6), risk identification methods include many activities. From fourteen methods they list, interviews, scenario analysis, brainstorming expert judgment, risk review meetings, SWOT analysis are the main methods. However, as the data from both interview and questionnaire show, there is no much attention on using such varieties of techniques. In fact, the culture here is responding to risks as they arise and there is no construction project started with complete plan and design. Construction projects of the university starts quickly when some amount of fund is obtained from government or other sources without giving sufficient time to various risk analysis. According to an interview with one of the contractors the construction projects here are fund based. In his own words:

When a project is budget focused, the designing phase cannot get sufficient time to consider all necessary things. After the designer designs, the engineers of the client won't critically evaluate and comment for revisions before bidding. And after the start of the project, the design becomes incomplete as it won't adequately consider at design stage. On the process the client notices some other new idea and wants to be included. These modifications are possible and general conditions in construction. But, the problems need to be identified early and resolved quickly. This is my view. (Contractor 1).

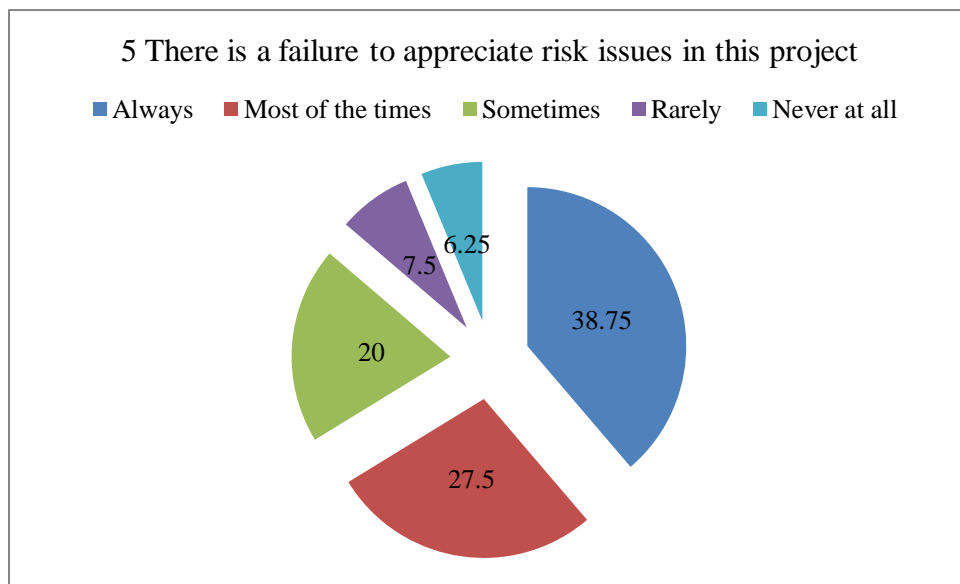
Therefore, from the results of the data and what the scholars of the area confirm, the project managers, consultants or clients can benefit as it allows all to take care of ongoing and upcoming daily activities of their projects by clearly identifying potential risks and by viewing the proper risk management techniques. Unfortunately, this is less practiced in the context of Jimma University construction projects by concerned stakeholders. Yet, projects of the university are



usually delayed and cost overrun has become a common issue as presented under introduction session.

As presented earlier, the study is limited to four ongoing construction projects. As can be witnessed from the table 1 under chapter one, all the projects are not progressing as planned. There is a delay in all of the cases. But, their financial expenditure is by far higher than their current performance level. This is as reported by overall manger of the university's projects. There is a huge gap between initial budget plan and total cost incurred so far. The university is also not using the constructions for intended purpose as planned. In the same way, the contractors are also complying about its impact on profit.

For example, Aggaro Campus construction project was interrupted due to the limited capacity of the contractor and the university was forced to pass it to new contractor. Still, no one can put when to finalize the projects and handover to the client. According to the interview, there are interruptions repeatedly because of continuous design modification and change by the client. On the other hand, there is also a complaint that the contractors are inefficient in their capacity both in machinery and human and financial resource to handle the huge projects of the university. This shows, there is less risk assessment in this regard before signing a contractual agreement. This fact is congruent with the quantitative data obtained from the workers on the site as presented in earlier graphs.



Pie chart 1: Appreciating of risk issues

Among methods of risk management is actively following risk issues. Just focusing only on the duty without due consideration of what is going in the environment, in the country, in the market etc. less likely leads to project success. Therefore, everyone involved in construction project needs to appreciate risks from every source and workout for the way outs.

In this case, as pie chart 1 shows, 38.75% and 27.5% of the respondents state there is a failure of the concerned bodies in proactively responding to risks always and most of the times. Such inattentiveness to risk is some of the key contributors to resource and time wastages of construction projects. For instance, the project of hospitality and hotel tourism planned to be completed in a year and eight months (684) days is on only 33% after using about 5 years (Table 1). This is loss to all, mainly to the client. If the activity continuous with similar pace, the university should wait extra ten solid years and this much human resource is to stay on site. According to Kishk and Ukaga (2008), failure to appreciate risk issues in construction project may give rise to serious consequences.

Regarding the delay on of the interviewee says:

Daily laborers quite the work during coffee harvesting time as they get better money from the coffee harvesting. On the other hand, the contractors have no capacity to pay more to maintain them. Therefore, on seasonal bases there are interruptions of some work types of the construction (Interview with contractor).

According to the interview, the weather condition and soil type of Jimma is also not conducive for construction projects. There is rain for long and this hampers the progress. The soil type is also muddy, making the digging and activities in the site difficult. However, such risks should have been identified and planned for before during environmental risk assessment.

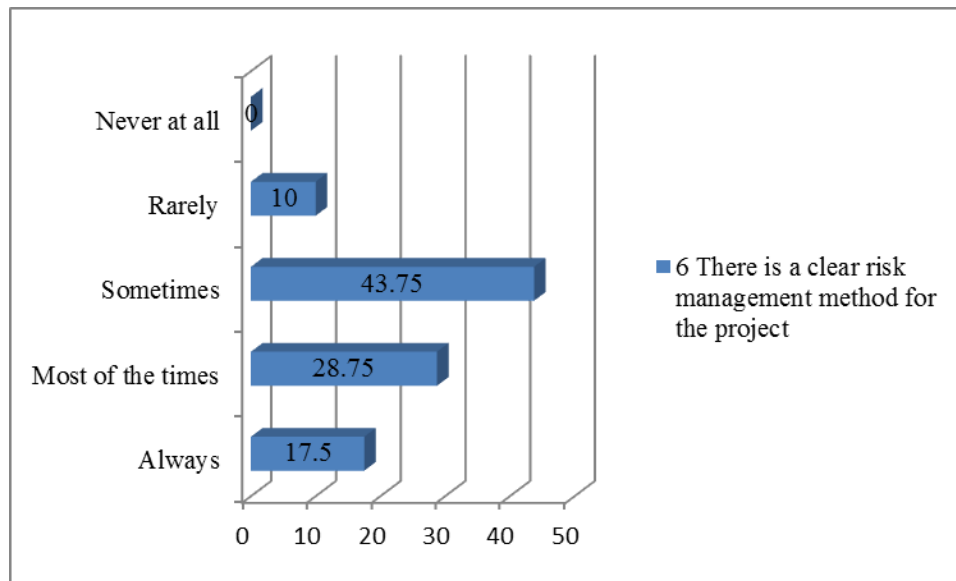
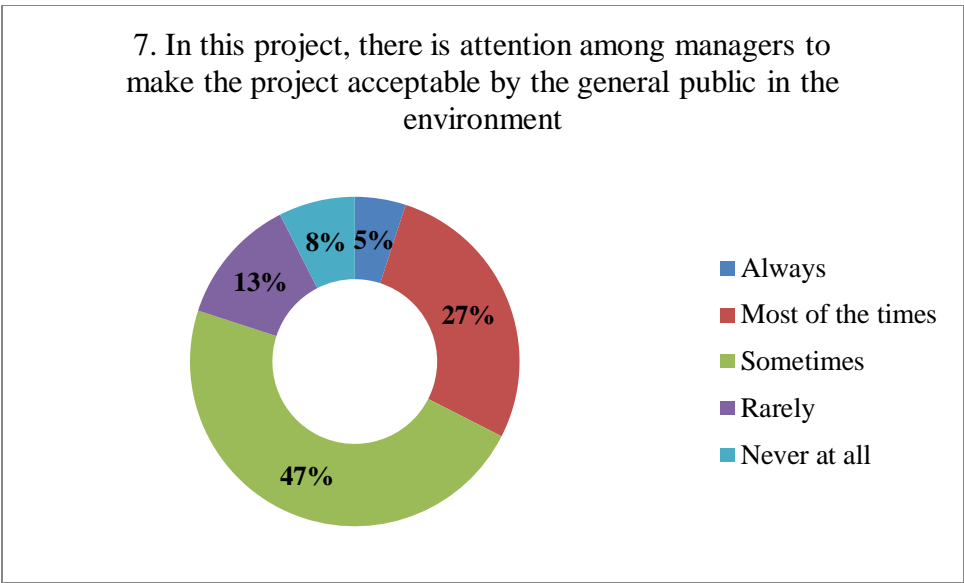


Figure 10: Clarity of risk management methods

The respondents were also asked through interview that there is a clear risk management methods that they know as workers in the project. Only 17.5% of them were sure that there are clear risk management methods. And further 28.75% state that most of the times there are clear risk management methods. Yet, 43.75% had different idea that they sometimes observe clear risk management methods. In fact, for a risk management methods of construction project to be successful, risk identification and assessment should be carried out before the commencement of the project and included in a project plan together with its mitigation techniques. These should also be communicated to all workers involved to grassroots daily laborers.

Unfortunately, all participants of the interview confirm that there is no section of the project plans that are devoted to risk identification when asked the four construction projects considered in this study. Their risk mitigation strategy is just confronting with whatever problem they face as it appears. Therefore, with this culture of construction project handling, the delay of construction projects of the university seems unsurprising.



Pie chart 2: Managers relation with the public

Risks may come from the environment for different reasons and interests. Though environmental context includes different groups, developing trust and smooth relations with the public in the environment developing a sense of ownership about the construction project adjacent to them is important to mitigate risks. For example, resolving a compensation issue with the coffee farmers in Aggaro Campus construction and the issue of site clearing has become a source risk as it has stopped the progress until it was resolved. The same problem has encountered regarding site clearing of Hospitality and Tourism Institute Hotel.

According to the questionnaire data in the pie chart 2, the managers' effort to make the surrounding community accept the project as their own resource is not satisfactory. Only 5% the respondents agree that there is attention always. As the surrounding community has different economic needs, it is wise to involve them in job opportunities starting from non-professional labor level works to future advantages they may get from the project. For developing this harmony, the client can also play a vital role. Almost half (47%) confirm that the attention among managers to reduce the potential risk that may come from the public in the environment is something that is done occasionally. However, the general public in the environment should be taken as an asset in risk identification and also mitigation.

And the result of the interview data with contractors show that as risk mitigation methods, they usually use close supervision of subordinates rather than focusing on other external factors. In an attempt to mitigate the negative consequences of construction projects of Jimma University, working and organizing closely how the subcontractors execute their role is also stated as another method of controlling risk. In fact this can be seen in line with human resource related risks and cannot avert other varieties

of risks. The result of this method is that construction project progress that is directly related to the maximum effort of workers and subcontractors can be resolved as collective input of available human and resources and project actors usually requires a lot of commitment in carrying out operations. So, with the existing human resources available increasing the efficiency of workers per hour results in a positive project progress.

According to interview data the major actors of Jimma University construction projects such as client, contractor and consultants are less cooperative in sharing risks. Usually, the consultants give work order and when risks that hamper the progress encounter, there is a practice of loading the mitigation issues on the contractors. This leads to conflict and pave the way for compromising time and quality standards as some risk factors has financial and profit implications. According to the interviewees, sometimes new risks may need cooperative efforts to accomplish them effectively. Therefore, joint risk management of not only the major stakeholders, but also all the subordinate workers and where it is feasible, it is also important to seek the participation of the local community and leaders. Because by its nature, risk is about working together to mitigate project risks both at initial and post contract stage (Rahman and Kumaraswamy, 2004).

#### **4.5 Risk Management Methods Inclusion in a Plan**

The second objective of the study is about the inclusion of risk management at the proposal stage by the major stakeholders. Literature about risk management stress that risk management should be part of the project plan by the stakeholders. Client as the project owner need to have its own plan on key areas that concerns it. Consultants also need to have their own plan in line with their consulting role. In fact, contractors are also expected to include in their work plan how to manage risks based on the nature of the projects. Besides, after all get prepared in identifying and mitigating risks from the perspective of their own roles, they should coordinate and complement each other to avoid conflict and share risks where possible. However, according to the data from interview, there is no risk management plan was included clearly by any of the stakeholders.

On the other hand, huge construction projects like this demand risk management consultant that is exclusively devoted to analyze, identify and forward mitigation techniques at all stages of the construction span. However, in case of Jimma University construction projects, there is only

general consultant whose main role is defined as giving work order and supervising that the orders are implemented as needed. This is confirmed from the interview with the tree major actors. The respondents of the questionnaire also reflected their observation about the presence of risk management consultant for the project they are working in. The response of many of them was different from what the consultant, client and contractors said. This indicates that they have no idea about the need to have risk consultant. 11.25% and 22.5 of them think that there are always and most of the times risk management consultant working for the project. Of course, 8.75% of them were aware that there is no such consultant at all. Hence, though it might be expensive, having such consultant may reduce or overcome risks that contributed for the cost and time over run presented earlier.

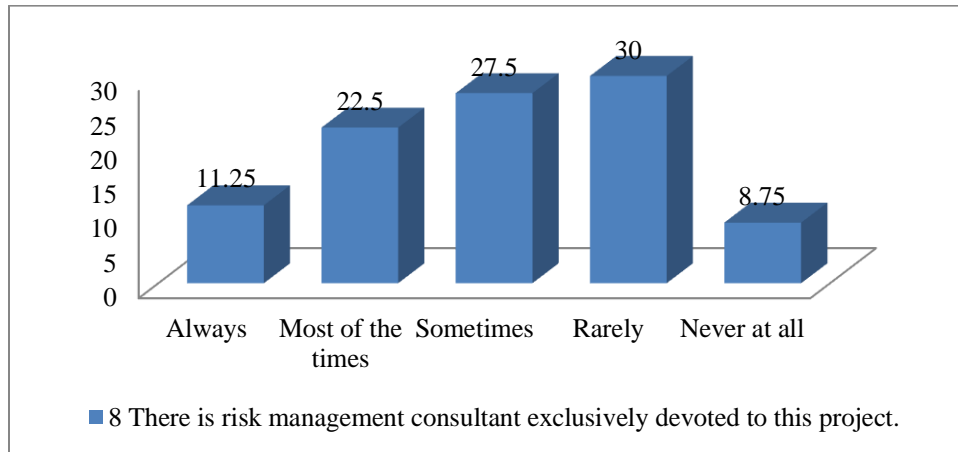


Figure 11: The presence of risk consultant

The data presented in graph 12 below is based on the data presented in graph 11 and the result is almost similar. As it is already concluded that from interviews and the questionnaire, there is no risk management consultant. Consequently, there cannot be risk management consultant who identifies risk issues and outline for the construction projects. This is also a gap contributing to overall project risks. Accordingly, 30% of the respondents answered that risk management consultant never at all or rarely outline risk issues involved in the construction projects. In other words, risk identification, assessment, analysis and monitoring is overlooked and the responsible party to execute these crucial risk management task is not clearly known as far Jimma University construction projects are concerned.

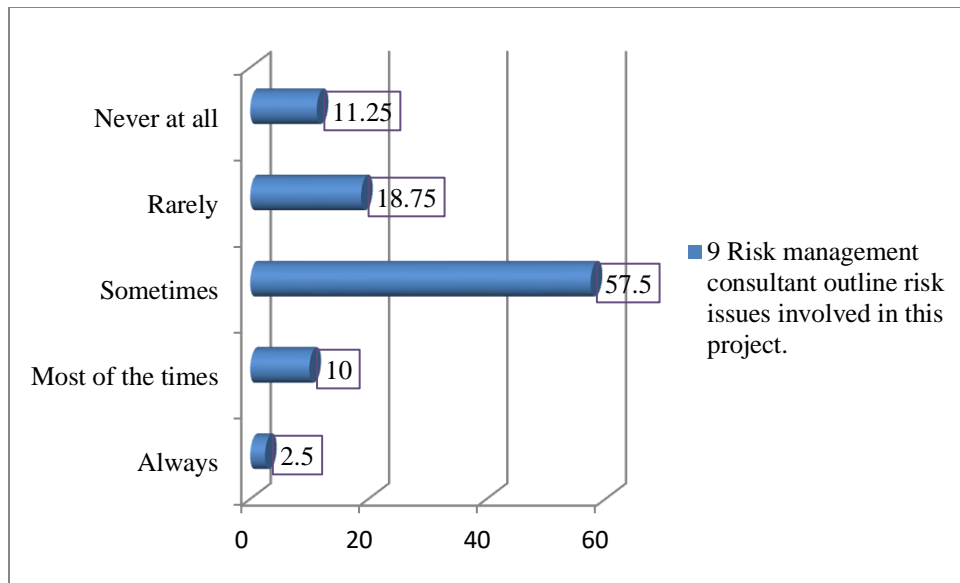


Figure 12: Risk management consultant outlining of risk issues

Regarding the need of risk management consultant or manager, Ward (2001) argues that there is a need for a corporate risk manager whose role is to mastermind the practice and the development of risk management throughout the projects and organization. In fact, he believes that the role of risk manager is not to manage the risk on behalf of the team members, instead is to guide, facilitate risk meeting provide education training and support for making the stakeholders to recognize risks early and how to play their roles in the decision making process for mitigation.

Though this is established procedure to handle risk in construction projects and other areas of management, this tradition is not known in the construction projects of Jimma University as can be concluded from the data.

Even though for the purpose of focus and giving committed responsibility, assigning a risk management consultant is mandatory, basically working on risk needs cooperation among all. The data in graph 13 presents that 36.25% and 55% of the respondents confirm there is insufficient coordination among project managers, client and consultants in identifying risks and providing mitigation. Such limited cooperation results in delay of fixing the risks.

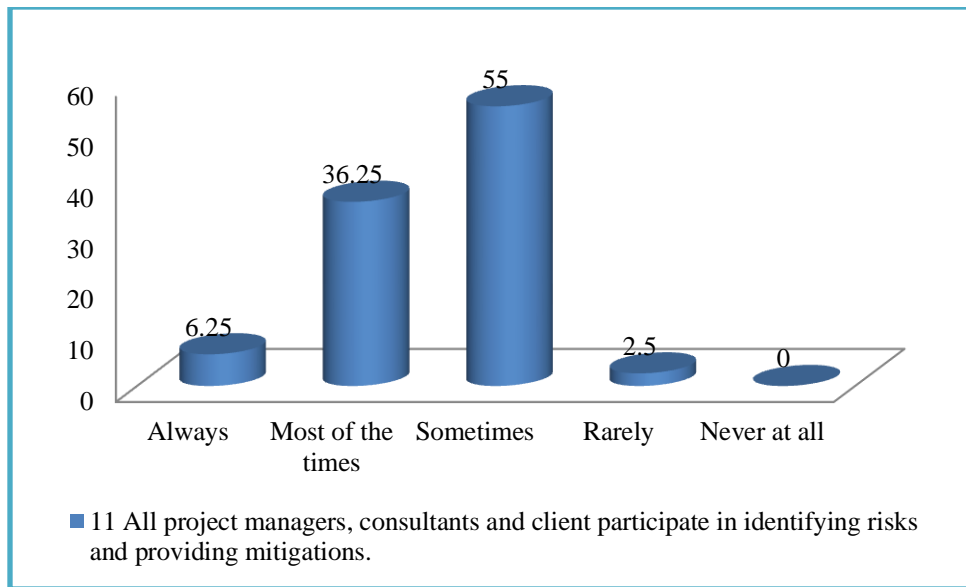


Figure 13: Cooperation among stakeholders for identifying and mitigating risk

The purpose of risk management plan is to define the activities and level at how and when risk management will be made for the project and how often there should be regularity of risk management meetings with concerned bodies for updates and solutions. The plan also identifies and lists the participants of the project risk management team that includes professionals with various disciplines working in the project and a budget should be set for the risk management activities. For the smooth progress of the project the risk management plan should be prepared early in project planning. To show cooperation problem, one of the interviewee complains:

The underground buried telecommunication cables, the water pipe and electric wires of the town passing through project site, are also a major obstacle to progress according to the plan. This because the telecommunication, water and electricity authorities are less interested to cooperate with client and contractors as clearing them demands them extra cost. The client usually tries to resolve these all after the contractual agreement is signed with contractor. (Interview with contractor).

Among key issues included in the project work plan schedule are: dates for project risk management meetings with identified members; time needed for team members to organize for evaluation of the risk register and risk responses; deciding milestones for communication and responsibility.



Therefore, despite the crucial positive role risk management plan plays for construction projects' successes, Jimma University construction projects inter in to contractual agreement with consultants and contractors ignoring these primary steps.

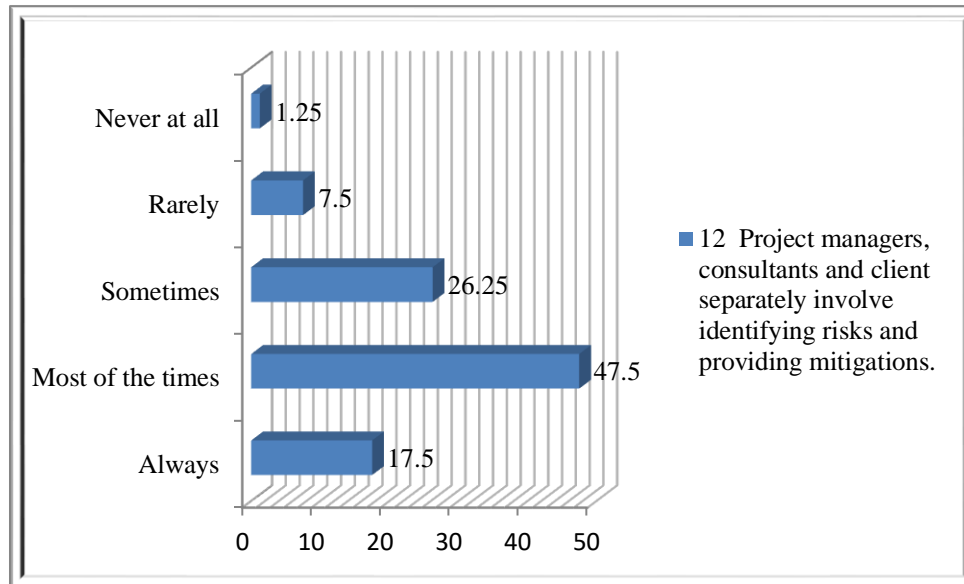


Figure 14: Uncoordinated risk identification and mitigation

Jimma University construction projects are progressing more of in uncoordinated way among the major actors as 47.5% of respondents state that most of the time the consultant, contractor and client separately engage in risk identification and mitigation. Besides, a significant figure (17.5%) asserts they always observe separate engagement of the actors. In fact, where there is no plan at initial stage that describes the joint and separated role of the stakeholders, haphazardly trying to resolve risk at happens is what is expected. This is what the workers at the site experienced. The interview of the client, contractor and consultant also approves the questionnaire data.

But, to maximize the likelihoods of a construction project succeeding, it is essential for the client, consultant and contractor to have an understanding of probable risks, to scientifically and quantitatively evaluate these risks, do in advance possible causes and effects, and then choose proper methods of dealing with them (Mobey & Parker, 2002). But, these all need to be coordinated rather than separately identifying risks and providing mitigations by these major

actors. To confirm that any likely risks are managed successfully, the risk process needs to be clearly coordinated for the decision making process.

An organizational culture supported by cross-functional teamwork, collaboration, and open communication must be developed within project organization. It will encourage the team members to work more efficiently and effectively. Organizational culture must support trust and cooperation among the team members. This will improve risk management in the project. Dondage, et al. (2018, p. 166)

Therefore, Jimma University construction project is not properly progressing based on applying basic principles of risk management, particularly risk planning and coordination of the key role players. Implementing risk management principle supports the quality improvement of the construction and improves cost estimation as there is a chance of identifying and mitigating possible risks before a project begins. Risk management puts appropriate practices in place by ensuring the management to access organized risk information timely to apply helpful actions. In turn, that can allow truthful schedule and cost estimates and assure successful completion of the project. That is partly why the four construction projects investigated in this study deviated much from the planned data and as a result demanding much extra cost as shown in table 1 in earlier section.

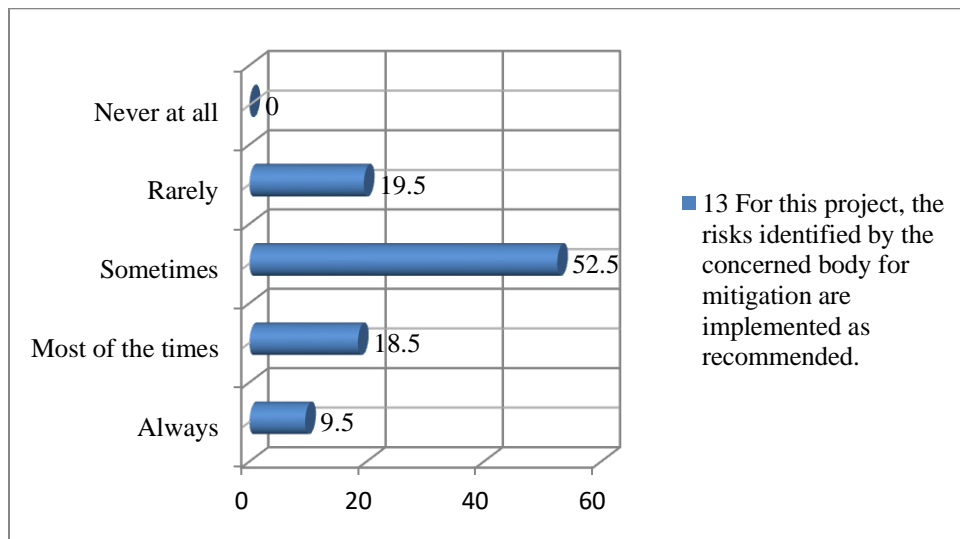


Figure 15: Mitigation of risks as recommended

As risks are not identified collaboratively through mutual support, there is a conflict among stakeholders to accept and correct the risks as recommended. Finally, though risks are resolved,

it is not with ease. As a result, there were different subcontractors whose contractual agreement were terminated and slowed the progress of the work. As can be seen from graph 15, there are occasions where contractors or subcontractors, client and consultants accept and work to resolve the risk identified (9.5%). And on the other hand, relatively significant number (19.5%) rarely welcomes the recommendation for mitigation. Basically, this is due to lack of coordination and agreement at planning stage to share risks and collaborate to identify and work together on mitigation.

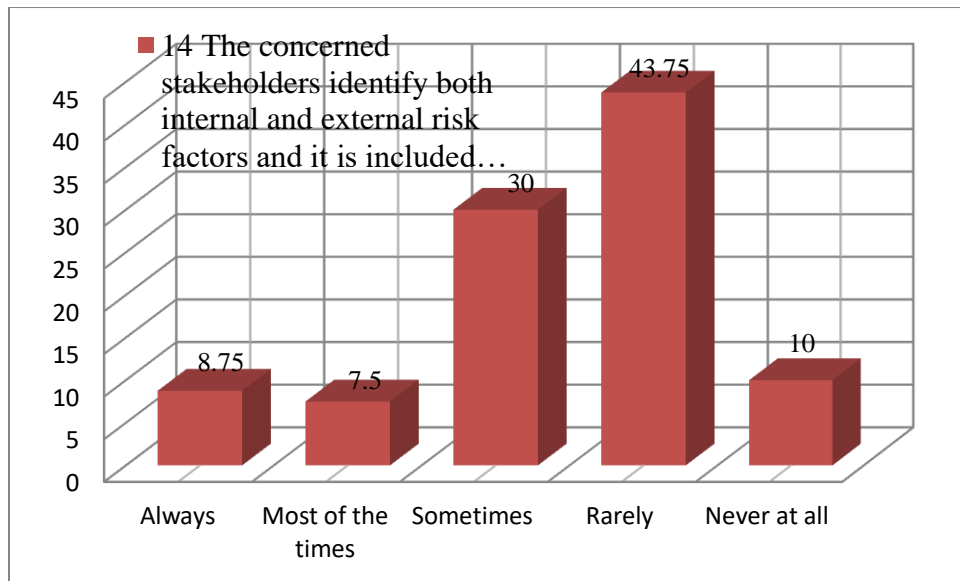


Figure 16: Identifying of internal and external risks by stakeholders

Both contractors and consultants of Jimma University construction projects complain during interview that delay of payments from internal risk and filiation of construction materials and the price of labor force from external risk are impacting their profit. 43.75% the data from the questionnaire also indicate that the external and internal risk factor assessment is rarely practiced. Paying attention to what is going on in and outside the construction projects on daily bases and close observation of regional, national and international trends impacting the construction project should be part of daily routines of all parties involved in the project.

Internal risks may occur due to financial problem, disagreement between stakeholders, distrust, technological changes and other related issues. For example, financial category of risk includes payments to contractors. If the client fails to pay timely to the consultant and to contractors, due to delay of funds from government, it is a risk. Probably, the only source of

revenues for the construction contractors is the payment from the client. When clients delay payment, there appears a financial hardship among them.

Similarly, clients sometimes intervene inappropriately in the construction phase of the project to endorse modifications that arise due to technological changes, or new interests, or due to poor scope of work definition at initial stage. Therefore, though internal risks cannot be eliminated, it should be managed systematically without significantly harming quality, time and money for all stakeholders. External risks such as economic inflation, political instability, weather condition and etc. should get considerations for different adjustments throughout the project progress. Without due consideration of this facts and the way to resolve together, signing an agreement between the parties may not beautifully concluded.

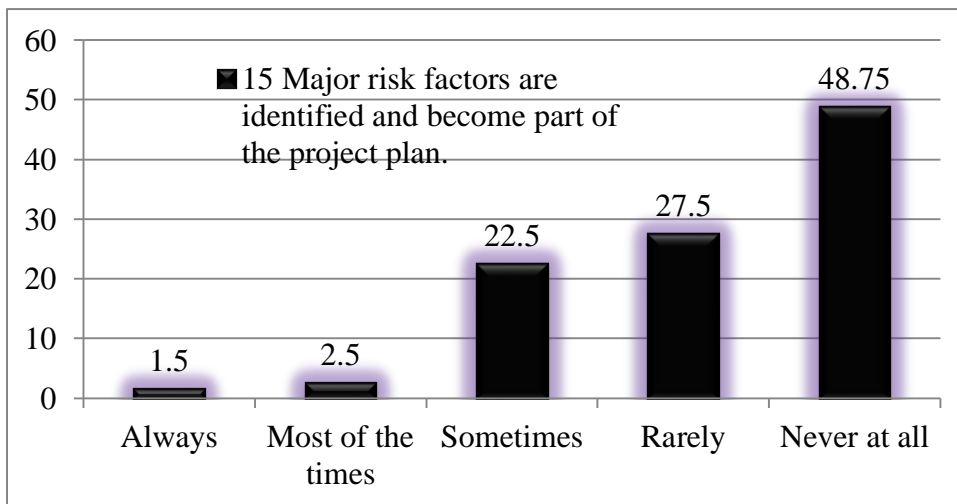


Figure 17: Major risk factors identification for plan

In Jimma University construction projects what is commonly practiced is not prior identification of major risks. The absence of including risks in to project plan was already presented. In the above graph 17, 48.75% of the respondents show there is no major risk factor identified and included for mitigation in the project plan. This significant number almost half, and the other 27.5% of them state such practice is rare in the construction project they work in. But, in the course of their work, the client, contractors and consultant lists five major risk factors the construction projects of the university face with varying degrees.

These are: rush design, conflict over site clearing and compensation, continuous design modification, contractors' limited capacity and economic inflation. Particularly, the Hotel and Tourism Hospitality Institute couldn't start on time as planned due to site clearing conflict and delay. And, the main problem of Aggaro Campus is due to site clearing and compensation problem and limited capacity of the contractor. On the other hand, economic inflation has impacted all the construction projects.

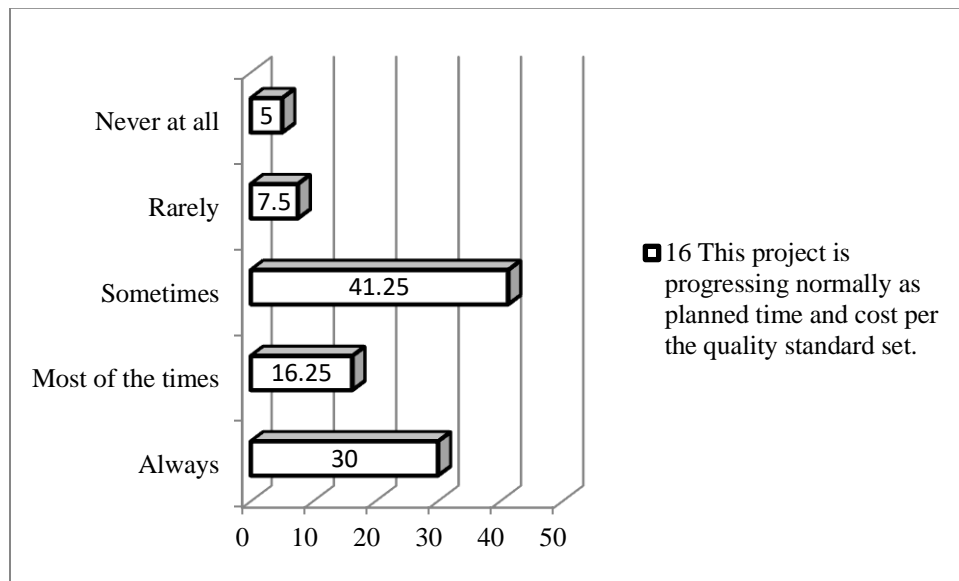


Figure 18: The progress of the project per the plan

According to the data presented in graph 18, the respondents were asked show their evaluation of how much the construction projects they are working is progressing per the planned time, quality and cost. Their evaluation result confirms that they have hesitations that the projects are progressing as planned all the three issues raised. 5% of them were sure that that the project is never progressing according to the plan, where as 7.5%, and 41.25% of them rated as rarely and sometimes there is normal progress on time, cost and quality plan.

To show this fact in line with interview data, Kitto Campus student lounge project was started to be completed within 400 days with the current contractor after the previous contract was cancelled due to various problems. Unfortunately, so far the contractor used more than 1460 days. Yet, the performance level is still on 75%. It is possible to see the gap between planned date and actually how much days actually wasted. The client blames the contractors for the problem. In the same way, Aggaro Campus, which is handed to the second contractor for the

material and professional inefficiency to the current contractor was signed to be completed within 790 days. However, they failed to meet the deadline and used more than 790 days, an only accomplished only 50% of the project. With these all problems, not only time but also inevitably, money is wasted.

The construction of Jimma University Head Quarter was also promised to be inaugurated within 730 days. And already more than 1760 days were used and it is on 85.21% at the time this interview. Under more serious risk is the Hospitality and Hotel Tourism Institute. Initially the time agreed to complete the project was 684 days. Yet, the current progress is only 33% after using more than 1725 days.

Therefore, Jimma University construction projects studied in this study are not progressing based on planned time, and money.

#### **4.6 The Focus Given to Criteria of Success**

As success criteria for a construction project, the stakeholders can have a number of a number of success indicators. In this study four of themes such as time, money quality and client satisfaction were considered from the perspective of risk management, basically in terms of achieving the client's purposes within the necessary time and expense and with the desired quality Taken all these together satisfying the interest of the client.

Managing risk appropriately requires identifying project success criteria before commencing the project. Hence, success criteria are part of a project plan that client, contractor and consultant commonly identify at the beginning. Accordingly, the research participants asked what they know the success criteria of the construction they are employed in and provided responses as can be seen from graph 19.

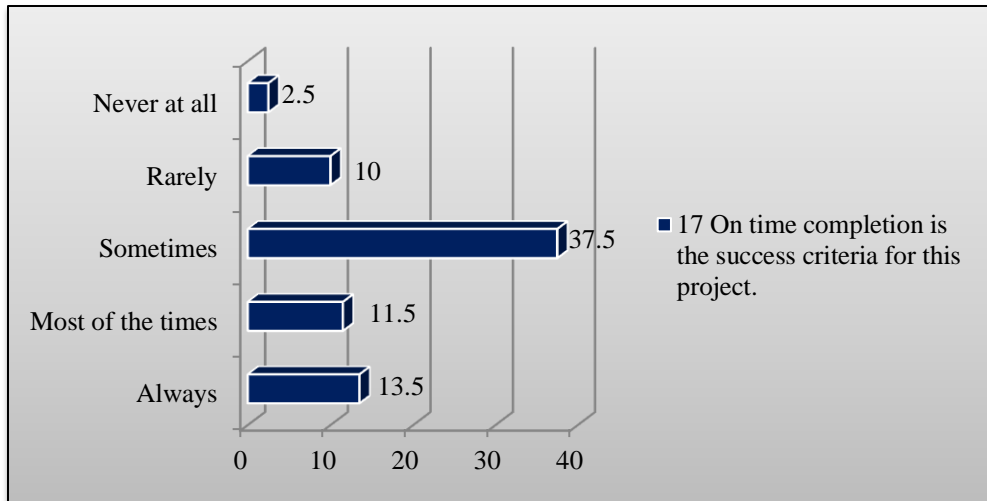


Figure 19: Time as success criteria

According to the responses of 37.5% of the respondents, on time completion is considered as the success criteria for the project some times. 11.5% and 13.5% of them observe that timely completing is most of the times and always seen as success criteria as far as the construction projects they are working in is concerned. However, this criterion has never become successful at all, as all the projects are sever time overrun, under earlier section. Rather 2.5% of the respondents who assert that on time completion is never at all a success criterion in their construction project reflected the reality on the ground. This is because performance is a matter of result and the current status of the projects shows that much more time is still needed. As completion time was fixed, it is clear that it was considered as success criterion by the client, consultant and contractors. But, failed to achieve it.

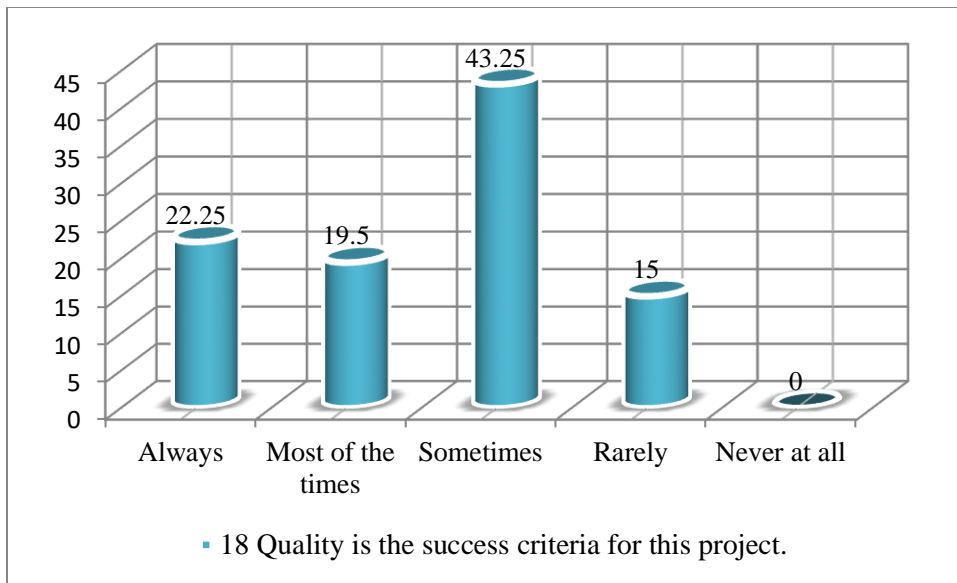


Figure 20: Quality as success criteria

Regarding quality, 22.25% and 19.5% respectively observe that it is always and most of the times considered as a success criteria. However, measuring that it is progressing according to the planned quality is not easily observable like time and budget.

However, construction projects there are unavoidable interactions between time, quality, and cost and client satisfaction. Unless, risks of different types interfere, construction project actors also try to complete their task as demanded. The problem lies on capacity, interest and commitment to foresee intervening internal and external risks and identifying the correct mitigation methods. For example, reducing the construction project cost will often also decrease the quality. On the other hand, increasing the quality standards will usually mean the project takes longer time to deliver. Therefore, before deciding the time and money, analyzing what is more feasible critically in line with the quality standard set is compulsory. Accordingly, the assessment made regarding this interrelated success factors for construction projects of Jimma University seems not considered as needed. This fact is visible not only from the data, but also can be physically observed from the construction sites taking into considerations the time started, and the money already used presented earlier in previous section.



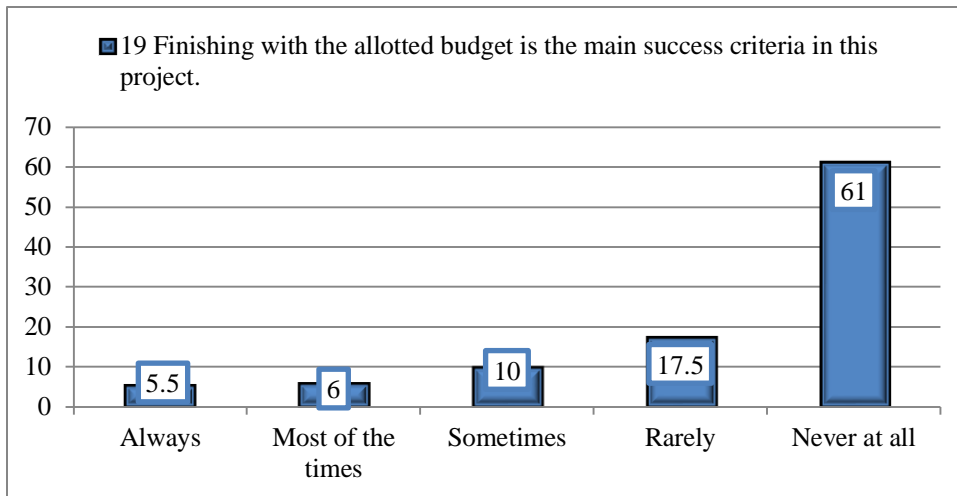


Figure 21: Finishing with allotted budget as success criteria

Participants of the study have learned from their experience on the construction sites that the project is not to be completed with the allotted budget. As a result, they didn't consider it as a success criterion. 61% and 17.5% of them state that finishing with allotted budget is never at all and rarely success criteria of the construction project. In reality, it is a core success criterion between the client and the contractors and also with the consultant, though failed to finish with planned budget. Therefore, as the interview data also confirms, budget is a success criteria for the construction projects, but it is challenging the key actors as it has already led them to cost overrun.

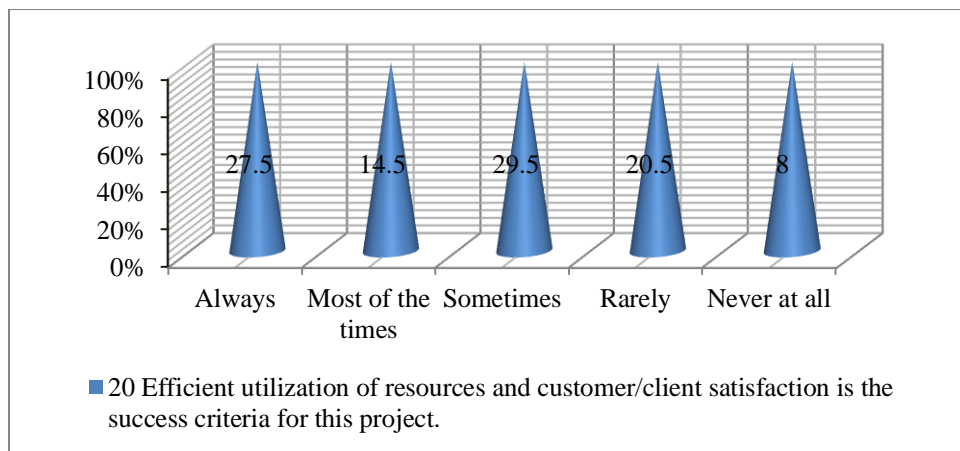


Figure 22: Efficient utilization of resources and client satisfaction as success criteria

Furthermore, the respondents were asked to give their opinions regarding efficient utilization of resources and client satisfaction based on their observations and experiences of the construction

projects particularly as success criteria. Accordingly, though the success in this regard is also not satisfactory, the data show that there is 27.5% of the case that there is consideration as success criteria. The other 14.5% and 29.5% also show there is an attempt to consider most of the times and sometimes respectively. In fact, it is difficult to accept that there is efficient resource (material, human and time) utilization as criteria of successes as almost all the construction projects current status less likely show this fact. In the same way, though customer satisfaction may be included as success criteria in the project, it has failed because client cannot get satisfied due to much time overrun and delay of the projects.

In relatively huge construction projects of like Jimma University, clearly outlining indicators of success factors during contractual agreement helps to focus on which part of work in identifying risks. Though there are many key success factors, in this study cost, time, quality and client satisfaction were considered under one objective.

These are interdependent that the risk the affects, for example cost can directly impact schedule overrun. In the same way, taking too much on the project also impacts cost overrun as it may encounter much economic irregularities as time goes. Similarly, when the client (Jimma University) gets additional fund, there comes design modification that changes the scope of previous contract and distorts the balance set earlier between time-cost-quality and scope. In this regard, Jimma University construction projects take for granted that the projects would be finished on planned time schedule, with initially allocated budget, with appropriate quality designed and client satisfaction. But, there is no documented and planned risk identification and mitigation to meet the desired goal. And these crucial issues for project completion successfully were not identified and reached on consensuses among client, contractors and consultants. But, there is superficial understanding on the issues.

#### **4.7 How Risk Factors Related to Human and Material Resources are Managed**

Obviously, human and material resources are important for project success. The risk that harms human resource of the construction projects has adverse effect on the project. Hence, risks associated to human resource starting from grass root such as daily laborer to professional such as surveyor or civil engineer should be identified and resolved early. Safety materials should be provided to all workers based on the nature of their work, so that to avoid physical injures and

risks to the life of the workers. The safety of the human resource is an input for the safety of the project.

In this regard, there is little attention mainly due to financial limitations to provide safety materials as needed according to the interview with contractors. As a result, workers sometimes suffer from different physical injuries. Besides, the turnover is also high due to limited contractor capacity to pay attractive salaries to professionals and experienced technical workers.

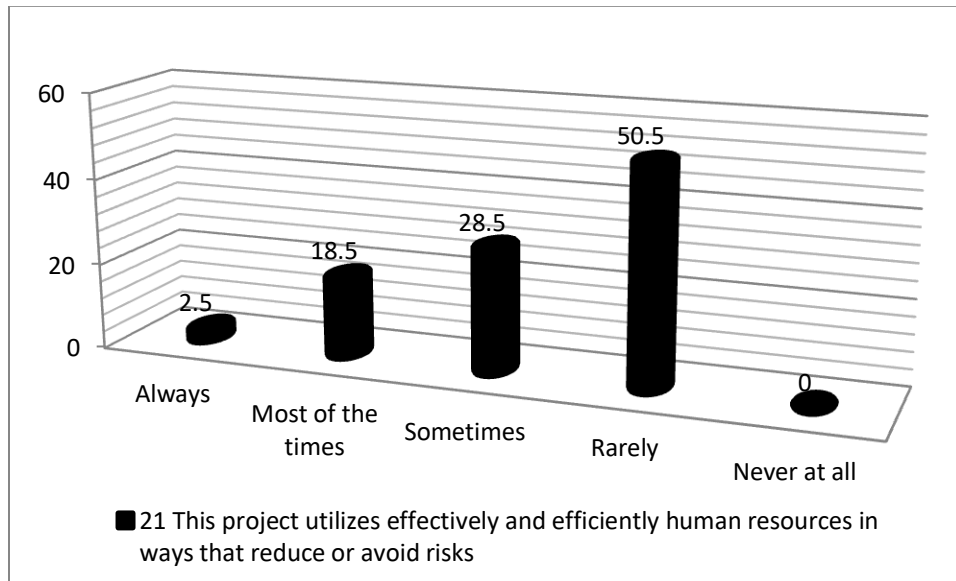


Figure 23: Effective human resource utilization

Particularly, the responses of the workers on the construction sites show that human resource is rarely managed in a way that reduce or avoid risks in 50.5% of the case. From this it is possible to imagine that workers may not well motivated to work diligently as they worry about their safety. On time completion with predetermined quality and budget cannot be separately seen from the way human resource is handled. The human resource working on the project also shows that only 2.5% of them were happy that there was always concern from the concerned body. Therefore, how human resource by itself handled in construction projects of Jimma University contributed to the delay and schedule overrun discussed earlier. An interviewee also says “In relation to material problem, the political instabilities that restrict transportation has affected our work progress. Sometimes we cannot transport construction materials from Addis Ababa. As a result we buy construction materials from Jimma with inflated price.”

Yet, this indicates the contractors are not working considering the political contexts. The transport could be stopped for three or five days or more. But, the contractors need to store all

what is necessary for their work for months. This shows, there is no risk identification and preparation even for minor and short term problems.

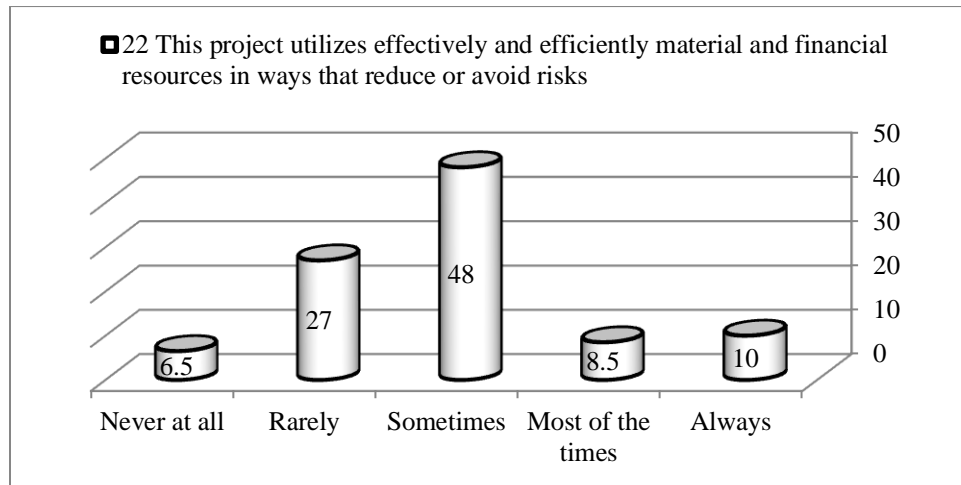


Figure 24: Effective material and financial resource utilization

As government project, Jimma University construction projects are funded from income collected from tax payers. Hence, the material and financial resource planned for the projects are expected to be carefully used for the intended purpose without compromising quality and impeding on time completion. In this regard, the respondents asked their observation of how material and financial resources of the project are effectively utilized, so that consequently risks related to these are reduced or avoided. According to the result, 27% and 6.5% of the respondents observe that there is efficient utilization of resources rarely and never all respectively. On the other hand, about half of the respondents (48%) state that there is sometimes such practice. This means, risks that come from the side of material and financial management inevitably affected the projects. These resources are the backbone for the project success and, inefficient utilization of them means, delay and cost overrun and related with this comes quality compromise. The Interview data on this matter confirms that there is frequent financial request by contractors without much progress. The contractor also blames the client for payment delays and lengthy financial payment process. Hence, risks that surround Jimma University construction projects considered in this study are multiple, varied and interdependent.

## **Chapter Five**

### **Summary, Conclusion and Recommendation**

#### **5.1 Summary**

The purpose of this research was to explore risk management problems affecting construction projects of Jimma University, specifically Aggaro Campus, Kitto Furdisa student lounge, Jimma University Administration Head Quarter and Hospitality and Hotel Tourism Institute.

Risk is inevitable in any construction project at varying degrees. But, with best risk management implementation and methods it is possible to minimize and achieve better performance. For this, it is essential to have success criteria in construction project so that it helps to focus on mitigating risks that challenge the identified criteria.

The study directed towards professional workers on the site such as engineers, architects, surveyors, site engineers and etc. to provide data through questionnaire and client, contractors and consultant through interview. Hence, mixed methods were used and the data were presented and analyzed. As a whole, risk management methods the stakeholders used, how risk is included in the project plan, the risk factors faced and human and material risks as independent variables have influenced the project success by increasing project cost, and completion schedule overrun which were taken as dependent variables.

According to the results of the study the four projects which were the focus were delayed more than double and sometimes more than triple. For example, Kitto Furdis student lounge was planned to be completed within 400 days, and it is on a progress of 75% only after using about 1,460 days. Therefore, the risk management methods used by the concerned bodies were not satisfactory. Because, 43.75% of the respondents confirm that there is no clear risk management methods for the projects. And, this figure is supported with the interview with major stakeholders through interview that the usually try to mitigate risks as they occur. Besides, 47.5% of the result confirm that there is no coordinated and pre planned risk identification, assessment, analysis and mitigation practices. Similarly, 62.5% of the result shows that on time completion not identified as a

criterion for the projects' success by the concerned body. 39% of the respondents also witness completing the project with amount early allotted budget is not taken as success criteria. Risks related to human and material resources were also received less attention as 48% of the respondents confirm. Based on these facts, the risk management practices of Jimma University ongoing construction can be concluded.

## **5.2 Conclusions**

Jimma University is known for its construction activities. But, poor progress of the construction and delayed completion schedule initiated the need for this study. As a focus, the objectives of the study were: identifying the risk management methods of the client, contractors and consultant and how they include in to their plan; identifying the major risk factors related to human and material were handled.

Based on the results and discussions presented under chapter four, the following conclusions are drawn about risk management practices affecting construction projects of Jimma University. First, there was no clear risk identification and mitigation plan and methods developed in written form and included in to the project plan by consultant, client or contractor. The result shows that 48.75% of the workers on the site confirm that major risk factors are never identified and become part of the project plan. With such practice, it would difficult to finish as planned both in terms of time and budget. Hence, inappropriate practice resulted to delay and cost overrun among other things. There was also no risk management consultant devoted to this task, or a department sections that focus of on risk issues. There common method of risk management is responding to risks as they occur and there is no risk sharing and coordination for mitigation. As a result the four construction projects are now in much delay in completion schedule and facing much cost overrun and their current progress is on 75% (Kitto Furdisa), 50.22% (Aggaro campus), 85.21% (Administrative head quarter) and 33% (Hospitality and tourism institute). Hence, risk management practice of the concerned body contributed to the problems. Consequently, the study concludes:

- ❖ The risk management methods of the construction projects were not adequately based on the clear scientific procedure of identification, assessment, analysis and monitoring/mitigation by including in a plan with mutual understanding and

cooperation. This is because the construction projects are started with rush design as soon as the finance is secured.

- ❖ Sufficient risk identification and analysis of both internal and external factors were not adequately identified and incorporated with the project plan, and their approach was managing risks when faced.
- ❖ Though time, quality, allotted budget and client satisfaction were part of the project plan during contractual agreement, they were not strictly identified as their success criteria.
- ❖ The attention given to material and human resources of the construction projects interims of avoiding of wastage of time, material damages, communication with workers and motivating, care for physical hazards is also not satisfactory.

Hence, Jimma University's construction project delays could be partly due to unscientific risk handling of client, contractor and consultant though there is a tendency of pushing the problem to contractors.

### **5.3 Recommendations**

Based on the data and findings of the research, the following recommendations are made:

1. Planning to mitigate risk in construction project needs early readiness. Therefore, properly analyzing and identifying the risks and methods of handling should get emphasis by all stakeholders including the workers. Therefore, the university should confirm that consultants and contractors are ready to practice risk management methods before signing a contract.
2. For huge construction projects like Jimma University, coordination to reduce risk and including in detail in the project plans of consultant, contractor and consultant should be mandatory before signing agreement.,
3. Similarly, identifying core success factors, and signing to attain it should be party of the project agreement, rather than just agreeing on project completion date.
4. The human and material resources situation of the construction project should not be regarded as minor to impact the progress of the projects as there is less attention.

5. The current study only focused on four variables. Many other factors can influence the success of construction projects from progressing as planned. Therefore, future study may show some other findings.



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**Appendixes**  
**Appendix A: Questionnaire**

**Jimma University**  
**College of Business and Economics**  
**Department of Accounting**  
**MA Program in Project Management and Finance**

***Questionnaire to be filed by different stakeholders involved in Jimma University Construction Projects***

Dear Participant,

This study is designed to investigate *Determinants of Project Risk Management of Construction Projects in Jimma University*. It forms part of master's thesis undertaken at Jimma University as partial fulfillment of MA in Project management and finance. Would you please spend a few minutes to complete this questionnaire to help me? The result of the study would be better, if you provide genuine response that primarily aims the academic practice as its goal. The project name, site and your name as participant will be kept strictly confidential throughout the research process as per the research ethics. Hence, all responses will be anonymous, that is it won't be possible to link questionnaire answers to individuals and to particular project site. Many thanks for your kind support.

**General Information about the Respondents**

1. What is your gender? Underline one. ( Male, Female)
2. What is your age? (In Years) \_\_\_\_\_
3. role in the project: \_\_\_\_\_
5. Your academic level? \_\_\_\_\_
6. Year of experience in construction projects (In Years) \_\_\_\_\_

The following are choices and for the following statements choose the numbers that best describes the risk management practices in this construction project based on the frequencies of the practice. As shown below, five options are presented with value assigned for all of them as 5=

Always, 4= most of the time, 3= sometimes, 4= rarely, 1= never at all. Put 'X' in front of the statements in a way the describes the reality in a construction project you are part of.

Always 5	Most of the time 4	Sometimes 3	Rarely 2	Never at all 1
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1. The following are choices and for the following statements choose the numbers that best describe

No.	Statements	5	4	3	2	1
1	This project is progressing normally on planned time and cost per the quality standard set.					
2	How often do you identify, analyze, and provide mitigation for the risks involved in the project?					
3	How often do you identify, analyze, and provide prepare contingencies for the risks involved in the project?					
4	How often this project utilizes effectively and efficiently human resources in ways that reduce or avoid risks?					
5	How often this project utilizes effectively and efficiently material and financial resources in ways that reduce or avoid risks?					
6	In this project, is there attention among managers to make the project acceptable by the general public in the environment?					
7	There is a failure to appreciate risk issues in this project.					
8	Risk management issue is taken into consideration early in this project.					
9	There is risk management consultant exclusively devoted to this project.					
10	Risk management consultant outline risk issues involved in this project.					
11	Risk management consultant identifies the tasks that would be mostly affected by risks.					
12	All project managers, consultants and client participate in identifying risks and providing mitigations.					



13	Project managers, consultants and client separately involve identifying risks and providing mitigations.					
14	For this project, the risks identified by the concerned body for mitigation are implemented as recommended.					
15	In this project the main focus of the stakeholders is on the task at hand, and not on the next phase of the project.					
16	On time completion is the success criteria for this project.					
17	Quality is the success criteria for this project.					
18	Finishing with the allotted time is the main success criteria in this project.					
19	Efficient utilization of resources and customer/client satisfaction is the success criteria for this project.					
20	There are no clearly defined success criteria in this project.					
21	Among the methods used to identify risks are brainstorming, interviewing the project team and review of similar projects.					
22	The concerned stakeholders identify both internal and external risk factors and it is included in the project plan.					
23	Major risk factors are identified become part of the project plan.					
24	There is clear risk mitigation strategy for the project.					
25	There is clear risk management methods for the project					

**Appendix B: Interview Guide**  
**Jimma University**  
**College of Business and Economics**  
**Department of Accounting**  
**MA Program in Project Management and Finance**

*Thesis Title: Determinants of Project Risk Management of Construction Projects in Jimma University.*

Dear participant,

My name is Meskerem Bekana. I am a graduate student in the Department of Accounting in Project Management and Finance here in Jimma University. At this time I am doing a research to complete my Thesis. You will be asked five questions that you are going to answer orally. The interview will not take you more than 20 minutes. The whole conversation during the interview will be recorded. And your participation in the interview is VOLUNTARY.

Interview guide for client (Jimma University), Contractors and Consultants of Jimma University Construction Projects.

1. Is a role that a client/contractor/consultant plays in a risk movement planning?
2. What are the roles of each in including risk management plan in to the overall plan of the projects?
3. How does each identify and include risk management planes into their project plans?
4. Are there risks associated with human and material resources?
5. How are human and material resources identified, planned and managed?

## **Appendix C: Interview Data (Consultant)-Translation**

Researcher (R): First of all thank you for your cooperation. Jimma University you are consulting started?

Informant (I): There are different projects under me. One is Jimma University min stadium. The second one is Jimma University sport coach or main stadium. Jimma University regiment project. Kito furdisa students canting project. This has two categories: One is the main contract student canting and the second subcontract is supplementary work on student lounge. The fifth project is main campus student canting. All these projects are under my consulting. Under these each project is clustered and resident engineers are assigned. There are also assistant engineers. We are doing in this way. There are almost finished projects. Jimma University mini stadium and student canting in main campus and the main stadium are being completed and we are compiling documents to hand over.

R: When did you start these all projects?

I: I think I should see the documents.

R: With how much amount did you win the bed?

I: We are consultants and not contractors. The contractor is the least bidder and we are also the least bidder. This was evaluated with together with client engineers and consultants evaluation. The technical qualifications were seen and those who scored more than 70% in technical evaluation won seen with the bid amount. We do have two duties. At preconstruction stage, we work on design, developing design document and other essential for the building. Second, on post design, after the bid is awarded and the contractor starts its work, we start supervising and facilitating according to the need of the client. There is a difference between design cost and supervision cost.

R: Is the project proceeding according to the plan?

I: Every project is not smooth. The problem with smooth progress is due to problem on feasibility study. Mainly our projects are budget focused. We think of new projects when we get money. When we get money, we think about work, and then it won't give time for the designers.

It is short term. The designers cannot get adequate time to think of environmental, geological, functional issues, material types and other related important studies. There is not enough time given to consider crucial factors at design stage. Usually, many designs are included while the project is on progress. From this perspective, the projects' designs are not usually complete. Though I joined recently, the reason for the delay is partly this one- I think.

R: Among standards for project are time and quality. Is this thing going according to your plan?

I: Usually, the contractor starts well at the beginning, and goes on slowing down and becomes weaker gradually. When a project is budget focused, the designing phase cannot get sufficient time to consider all necessary things. After the designer designs, the engineers of the client won't critically evaluate and comment for revisions before bidding. And after the start of the project, the design becomes incomplete as it won't adequately consider at design stage. On the process the client notices some other new idea and wants to be included. These modifications are possible and general conditions in construction. But, the problems need to be identified early and resolved quickly is the problem. This is my view.

R: Do you have risk management Plan?

I: All companies have a risk management plan in a written form. The problem is implementation of the risk management plans as planned when the risks arise. The issue is implementing and progressing forward. All bodies include beautifully in their plan and just win the bid. But, after winning the bid, there is a practical problem to implement the planned risk management. In our context, when a project is planned to be functional in the future, they start serving immediately. The focus is on the finance.

R: What is the role of consultant on risk management?

I: Our role is to see things in advance. Then we present it for the client. As new changes that occur affect finance, there is always discussion with client. Risks gradually emerge and may not be well recognized at the beginning. When it comes to planning, there are things to be focused on: usually, there is a contingency of 10% budget plan. But, what will come next as a problem is not clearly written. But, in an agreement, because between contractors and client there are responsibilities of both parties on how to handle when problems arise.

R: What is your role as consultant at planning stage in relation to risk mitigation?

I: Reporting risks as they arise. First, we manage time. We control quality. Our two major roles are these. Projects get staked and stopped due to unwillingness to share risks. For example, humans always err. Anybody that is on work makes mistake. After mistakes occur, when sharing risks, every stakeholder tries to scape rather than sharing it. And, tries to solve by writing a letter and just dropping all problems on certain body rather than sharing it. Then to claim that that I have already reported. There is a weakness of sharing risks. When weakness encounters on the part of contractors, usually there is no compromise. If the design fails, it is the responsibility of consultant. If consultant gives work orders and then it fails, the problem is associated with consultant. Then, on human resource or material resource, equipment, then the problem is of the contractor. Among the problems, we encountered are something not visualized on design comes late as additional unplanned work. Additional works are major risks here. Many are again there are contractors works without receiving work order. Then, when comments are given for correction, it results in economic loss. Other problems are usually many items are missed at planning stage. For example, in these building all doors may be missed. Then, it is after serious of meeting that it can be reincorporated in to the design. These resulted in stopping the project at least for temporary.

R: Is there any risk associated human power?

I: Consultants need to be matured enough. Specially, there are rules issued by ministry of construction. There is public procurement agency law. The consultant needs to have knowledge of the countries law and experience of consulting. These are some of the risks associated with human power. The consultants also need to be empowered so that they can solve everyday problems that encounter on sites. Usually, there is centralizing of power for every small problem. This delays daily activities. The knowledge and experience of consultant is more important than the knowledge and experience of contractors.

R: How can you include risks in your plan? What is the role of consultant and contractor in risk management plan?

I: Let me tell you simple example. You have 100 birr and went to market. You are shopping with a plan of using 100 birr. Then, if you immediately get additional 900 birr, you plan for 1000 birr

shopping. Therefore, in our case, construction project is finance based. Consultants change their interest on design and quality based on the amount of money they get. Look private construction; they plan for G+10 but, gradually add on one another based on the money at hand. They usually say, “We have this amount of money, and we need to build this” even without clear plan of what to do with the building. This is also a reality for public building. For example, finance minister releases certain amount of money. When public institutions get certain budget, they plan for building. When additional fun is obtained from other source, the client thinks for other modifications. There is no confidence to put risks clearly at planning stage. Besides, no one wants to identify the risks at the beginning. Risk identification at initial stage takes time to study. Therefore, there is a tendency of trying to solve risk as it emerges than planning.

The risk problems that may come in due course are not clearly presented to all stakeholders for discussions. Therefore, the one responsible for developing the project proposal must clearly include and propose how to solve and share risks. If it is not planned and agreed at the beginning, these upcoming problems may end in the hand of only one of the stakeholders. This may lead to conflict that eventually lead to delay. We do not identify risk at the beginning. Both environmental and social impacts are also rarely considered. Companies try to work for correction after problems happened and sometimes clients look for another contractor due to failure to solve the existing problem with the first contractor. This again results in delay. Another thing serious issue in Ethiopia is for example, if I say “I can finish this building in a year, what is my criterion? If I finish it in a year, who is going to take its risk? If the building planned to be finished in a year is not completed in a year, which is responsible? The client, the contractor, or the consultant? Whose weakness is it? We do not know. No one can put clear criteria for possibility of completion of a project within a year or three years.

R: What do you think is the major factor for risk management problem?

I: The major one is weak feasibility study. Without sufficient feasibility study, it is impossible to identify possible risks. It is good that experienced individuals study it at the beginning, not at certain team. The result of anything done based on study is beautiful. Otherwise, there would be wastage of time, energy and money.

R: Do you think, technology affects risk management?

I: It has impact. For example, ten years ago, there was no ICT network included in construction projects, only electric and sanitation lines were being considered. But, these days, how disposed wastes and used water are being treated for reuse and for avoiding environmental pollutions is considered. Therefore, of new technologies can result into demolishing parts of a building. The industry of construction is on continuous development. What can be done is planning, based on the existing technology. But, when new technology energy, we try to accommodate based on the need of clients. This has impact on time and budget. If the clients planned at the beginning, it would be good as there would be less risk.

R: What do you think is a major risk factor for construction projects from your experience and how did you manage to resolve?

I: It was not a public building. The colon missed when they start from the ground. Then, when they fill a slab on the first floor, the slab has already deflected on the other hand and then cracked and failed. The building was big. Then, immediately, temporary supportive colons were added to resolve the problem. Parts of the crack were demolished and mended. The new colon was made. It was then tested and the whole work continued. Now the building is functional. This problem had impacted different things. Even the work was stopped until the problem was proved resolved. The work was terminated for more than four months. Psychologically many of the workers and all concerned bodies were disturbed. It was included on the plan. But, missed on the sight while constructing. Usually contractors miss it. They miss the size; they miss the size of doors.

R: Thus far, have you faced any problem on Kito Campus project?

I: Already we have not faced any problem. On the first design, it was decided that one basement should be included. Then, the plan was revised to include the new interest. In fact, there is a weakness on the side of the capacity of the contractor that is delaying somehow the on time completion of the project. To conclude, I think much has to be worked on reducing risk issues. Starting from the beginning on the proposal stage, then any stage when risks encounter, it has to be announced to all that it may concern; the risk problem should be made public. Usually, when construction project stops, only few individuals know the reason.

## **Appendix D: Interview (Project Manager for Client)**

R: Is the project progressing according to the plan?

I: They are going according to the plan. Each has their own reasons for delay. For example, the Head Quarter was not started following the contractual agreement as there were many university stores on the site. The same project's design was modified, and therefore delayed the start of the construction. In recent years, because of shortage of foreign currency, there was a problem of importing construction materials and finishing materials.

For Hospitality and Hotel Tourism Institute, there was Oromia road transport and office on the site, and it took time until they build their own offices and leave the place. This was after long time of dispute that forced to revise the contract time because of too much delay before the start of the construction. Besides, there was design change that took again more time. There was also a problem of weather condition for the contractors. The recurring stability and conflicts in the town and the country has also impacted the transportation of construction materials.

Kitto Furdisa student Cafeteria was also delayed due to design modification and weather condition delayed progresses. And the contractor also has limited financial and construction machinery.

Aggaro Campus started after settling the site and boundary clearing dispute and compensation. More than two hundred families should get substitute land and resettle. This has taken much time. After this was resolved, the project started. But, it was stopped due to the contractor's limited financial, human resource and machinery limitations. The residents on the site were not left the site as needed on time. And, these all delayed.

R: Do you have plan for risk management for this project?

I: There is no risk management plan separately produced in the project plan. But, there is a mechanism to handle risks in the agreement document. Usually what we have is a contingency plan for budget to reduce financial risks. Other our responsibilities are facilitating payment after evaluation of consultants and working with stakeholders the influence the construction.



R: What is the risk problem in relation to human and material resource?

I: Our major limitation is we don't have sufficient professional of our own who control the progress of the projects. As a client we should have our own sufficient professionals. The main problem on the side of the client is insufficient scope definition.