



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

**ASSESSMENT OF CAUSES & CONSEQUENCES OF ROAD PROJECT  
DELAY:  
(CASE STUDY OF ADDIS ABABA CITY ROAD AUTHORITY)**

**BY  
ZERIHUN AYTENFISU**

**JUNE 2023**

**ADDIS ABABA**

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**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY SCHOOL OF  
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PROJECT MANAGEMENT**

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## DECLARATION

I hereby declare that this thesis entitled “**ASSESSMENT OF CAUSES & CONSEQUENCES OF ROAD PROJECT DELAY CASE STUDY OF ADDIS ABABA CITY ROAD AUTHORITY**” has been carried out by student researcher under the guidance and supervision of Dr. ABEBAW KASSIE. Therefore, the thesis is original and has not been submitted for the award of any degree or diploma to any university or institution.

Zerihun Aytenfisu

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Date Signature

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## LETTER OF CERTIFICATION

The undersigned certified that he has read and recommends hereby for acceptance by St. Mary`s University school of graduate studies entitled: Assessment of delay on road construction projects: The case of Addis Ababa City Road Authority in fulfillment of the requirement for the Degree of Masters of Arts in Project Management.

Abebaw Kassie (Ph.D)

Date and Signature



Jun 2023

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## ABBREVIATIONS

AACRA	Addis Ababa city Road Authority
AAICA	Addis Ababa Infrastructure and Construction Authority
AAWSA	Addis Ababa Water and Sewerage Authority
AACTA	Addis Ababa City Transport Authority
AAU	Addis Ababa University
ADR	Absence of alternative dispute resolution
CII	Construction Industry Institute
DCI	Ductile cast iron
EOT	Extension of time
ERA	Ethiopian Roads Authority
EEPCO	Ethiopian Electric Power Corporation
EEU	Ethiopia Electric Utility
ETC	Ethiopian Telecommunications Corporation
GDP	Gross Domestic product
IHA	Infrastructure and Housing Affairs Offices
LADA	Land Administration and Development Authority
LHS	Left hand side MOFED Ministry of Finance and Economic Development
NDA	Neighborhood Development Agency
NCHRP	National cooperative highway research program
RHS	Right hand side RII Relative Importance Index
ROW	Right of Way
RSDP	Roads Sector Development Program

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## ABSTRACT

*Road construction is a difficult operation that involves a large amount of people, machinery and technical as well as financial resources, despite the fact that many stakeholders are involved. High traffic volumes, utility conflicts and relocations, and in urban area building have all presented challenges to road construction projects in overcrowded urban areas. The primary goal of this study was to assess the causes and consequences of road projects delays on selected ongoing road construction projects in Addis Ababa City Road Authority. This study was carried out to identify the major causes and consequences of road projects delay for road construction projects. Thirty two (32) project delay attributes were identified through detailed literature review and experts support & five (5)-delay effect. The study adopts quantitative & qualitative methods with the help of primary and secondary data. Primary data was collected using self-administered questionnaires on selected respondents from clients, consultants and contractor. Secondary data was collects through reviewing of related materials such as road construction project contract documents and project completion reports. Based on the findings, from 32 causes of delay to reduce to ten causes of delay includes right of way, lack of coordination with the utility supplier; difficulties in financing the contractor's, land acquisition, resettlement and compensation-related causes; inaccurate site investigation by the consultant; shortage of contractor materials on site, local authority-related causes; inadequate planning and scheduling of work by the contractor; poor site management and supervision by the contractor. On the other hand, time and budget overruns, quality difficulties, this is done based on wide literature review. Findings of this journal will help clients, contractors, consultants and any other concerned bodies to consider and give priorities for better road construction performance in the future. The researcher recommended for client before offer the project to contractor first clear the site free from right of way problem, land acquisition, resettlement, and compensation-related causes and with local authority make smooth work sprit, the contractor mange properly the financial problem & deliver materials properly at right time and consultant proper site investigation and ready the design document at right time.*

*Keywords Causes of delay road project, Right of way problem, Lack of Coordination with Utility suppliers, Relative Importance Index*



# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the Study

Construction projects are complicated activities that require careful planning and supervision to be successful. Problems like time overruns, cost overruns, quality control issues, and socioeconomic issues have always presented challenging obstacles to the project teams and stakeholders in every sector and nation on earth. Additionally, poorly managed construction, by its very nature, is a risky business. Forecasting its duration is part of what makes it risky. Contractors estimate projects without a complete understanding of the time components, unnecessarily increasing their risk and exposure to delays. The goal of a building project is established according to the contract specifics, and clients, consultants, and contractors all contribute to meeting the goals of the stakeholders (Dlamini & Cumberlege, 2021).

The construction sector is undoubtedly a national asset whose development ought to reflect the growth and transformation of a wider people. In addition, a country's economic development is influenced by the physical infrastructure that is delivered by the construction sector and its main participants. Due to this, it is imperative that the construction industry needs to improve its capacity and delivery way to meet social and economic development. Africa's building sector is now experiencing a boom. The gross domestic product (GDP) of both countries has been significantly boosted by the construction industry. It provided over 7% of Kenya GDP, 11.9% of Nigeria, 21.5% on average for sub-Saharan Africa, and 32.8% of Ethiopia, the largest contributor on the continent, over the past ten years, according to (Ford et al., 2020).

Road is of movement and accessibility is the main purpose. Currently, improving and connecting their road networks is a top priority for developing nations all over the world. The construction of roads is a complicated endeavor influenced by geological elements, hydrological issues, and macro environmental factors. Roads are the cornerstone of regional economic development and are significant to social and economic development. Due to the

stringent safety and durability requirements for roads, the construction subject should carefully consider the impact of overall environmental factors like geology, hydrology, and climate, strictly control the quality, and practically carry out the construction work in accordance with the actual environment and actual requirements of the road project. Road Construction industry plays a strong role in developing country like Ethiopia, because developing countries are considerably dependent on the growth and development of their physical infrastructures, for that reason the linkage of the construction industry is both economic and social sectors is very significant (Yonas, 2020).

Delay defined as the extension of time in the completion of project. It is the means of failure to complete the project within target time, budgeted cost and quality specified in contract documenting other terms, delay when a project is not finished on schedule and within the allocated money, and quality as specified in the contract Period. Delay is a risk in a construction project for this reason, it is necessary to carry out risk management to improve project time performance. It is necessary to identify corrective and preventive actions on many factors affecting project delays (Ray, 2021).

They have always presented challenging issues to the project teams and stakeholders in every industry and nation of the world, issues include project delivery delays, cost overruns, quality control, and profitability. In addition, construction is a dangerous industry by definition. Estimating its duration is an integral part of what makes it risky. Without a thorough understanding of the time components, contractors that estimate projects unnecessarily enhance their danger and susceptibility to delays (Zhong, 2019).

Under the common project success criteria of being delivered on time, on budget, to the required standard, and in the requisite quality, the majority of the projects completed in Africa in recent years have failed. These had a significant negative influence on the already scarce resources of the continent since they require additional funding to execute works initially and maintenance of infrastructure before it was needed, among other things. There are numerous justifications for these. However, the industry's inability to embrace professionalism has to be the most important factor. The current state of things means that

projects start, planned, and carried out beyond the limits of formal project management concepts and procedures. This will unavoidably lead to inefficiency. The construction company in Africa is changing. The size and complexity of construction projects on the continent are growing. Recent places claim that this is because of increased development, strong economic growth, the rise of a middle class, and regional integration among all of Africa's countries.

One of the main economic drivers in Ethiopia is the construction industry. It significantly affects the productivity and efficiency of numerous industries. The demand for public infrastructure is driving a boom in the nation's building industry. However, time and expense overruns cause many issues for the construction industry's daily operations. Due to various known and unknowable events, the construction projects do not proceed according to the original contract period and contract price (Adamu, 2020).

Road Construction delay occurs when the progress of a contract falls behind its scheduled program. Any party to the contract, perhaps a direct result of one or more circumstances, may cause it. Projects that take longer than expected to finish due to variables linked to clients, consultants and contractors are say to have had time overrun and cost overrun. Time overrun is a sneaky problem that frequently leads to cost overrun, conflicts, and total abandoning of project (Abebe, 2020).

Similarly, to this, it is frequently observed that many construction projects in Addis Ababa City currently face a problem of time overrun due to known and unknown reasons. Construction delays have adverse effects on both the contractor and the owner (in the way of revenue losses or extra expenses), and they frequently raise the contentious concerns of delay responsibility, which may lead to dispute (Perris,2020).Different project-related issues, such as the project consultants, contractors, Clint, budgets, designs, construction materials, and construction equipment, can have a substantial impact on the projects' schedules and, as a result, prevent them from have been completed within the allotted time limit More than 82.3% of the road and building construction projects in Addis Ababa are not completed agreed-upon deadline (Kumar, 2020).



The study Time is one of the three pillars of construction project management, along with cost and quality; therefore, understanding the reasons why road construction projects in Addis Ababa were delay is crucial. It was anticipate that a study on project delays would help determine the root causes of inefficiency in road construction projects. The parties to the projects will be able to direct their energy and resources towards the particular variables after the primary causes of substantial delay-causing factors has be identified, thereby minimizing delays to the projects. In the context of Addis Ababa, the study of road development is crucial since it helps the city economy grow and reduce poverty.

## **1.2. Statement of the problem**

Urban road-building site small dimensions, high car, and pedestrian traffic, traffic bottlenecks are easily create. Controlling the traffic is quite difficult. Within the limits of the construction scope. In addition, that communication line, water supply line, electric power line, and sewerage lines are underground installed increases to the difficulty of building and makes it difficult to manage (Hagere, 2014).

Construction delays are one of the primary obstacles to achieving project goals in developing nations; claim (Islam &Trigunarsyah, 2017). Project delays typically have a negative impact on the development of national economies, cause significant financial losses, and impede the growth of the economy and the construction industry. Various studies have determined various reasons why delays occur across/within continent/countries and have ranked various reasons and groupings according to their importance. According to (Aziz et al. 2016); there are no root causes that can be taken for granted to be the most or least effective delay causes.

According to data from the Addis Ababa City Road Authority, Communication director yearly magazine.15-year edit, no.1 (2021/2022).One of the big problems on progress of road construction is right of way problem (ROW). It includes obstruction of all things lied on the road corridor, house, fence, utilities like telecom lines, EEPCO Lines and water and sewerage line. Removal of those obstruction on the road corridor takes long period, due to

different reason like have different stakeholders, coordination and communication gap between each stake holders. In addition, demand huge amount of money in relation to compensation payment in relation to this problem. Accordingly, those problem stated on the above highly affect contractors' performance physically and financially. Witness to this, the documents found on Addis Ababa City Roads Authority in relation to their plan to clear those right of way on road corridor for last year report shows. The main causes of the Right of way work activity issue in Addis Ababa are improper management, various parcel and property characteristics, a lack of funding for compensation payments, a lack of land for relocation, a lack of available replacement housing, political pressure, improper planning and scheduling, a shortage of qualified professionals, and communication issues between various parties. Involved parties in Right of work activity and residents' desire to leave the area are to blame for the under whelming performance of road construction.

Tsegay & Luo.(2017) state that corruption, a lack of utilities on the job site, inflation/price rises in materials, a lack of high-quality materials, late design and design papers, and slow project execution are the major causes of delays. Delivery of materials, delayed project work approval and receipt, poor site management and performance, delayed budget/fund release, and inefficient project planning and scheduling are all examples of delays.

It is important to consider the unique factors of each project when analyzing causes of delays. It would be helpful to review the previous studies and determine what factors were considered in their analyses, and whether additional factors specific to the Addis Ababa City Road Authority's projects need to be investigated. Identifying the root causes of delays can help stakeholders take appropriate action to prevent or minimize delays in the future, the study goal is to identify the external stakeholders and causes that contribute to road project delays, as well as evaluate their effect on the client, contractor, and consultant. This information is used to inform future work and help reduce project delays by addressing key questions.

### **1.3. Research Questions**

The study attempts to answer the following questions:

1. What does the major causes & consequences of road construction project delay in Addis Ababa City Road Authority?
2. What does the effects of the road construction delay in Addis Ababa city Administration?

### **1.4. Research objective**

#### **1.4.1 General Objective**

The general objective of this study is to assessment causes &consequences of road project delay in Addis Ababa City Road Authority.

#### **1.4.2. Specific objectives**

The study specifically aims:-

1. To identify and rank the causes delay of road project by their significance of road construction projects performance by using RII from the perspective of clients, consultants and contractors.
2. To identify the effect of road construction project performance in time, cost and quality dimension. In road construction projects of Addis Ababa City Road authority.

### **1.5. Significance of the study**

This study significance lay in its ability to pinpoint the main causes that contributed to the chosen Addis Ababa city Road Authority projects and assess how they affected the causes that contributed to the delays in those projects. It can serve as a resource for information for owners, contractors, consultants, and other stakeholders with direct contributions in the sector, even though future studies on the issue of urban road construction will focus more on the delay caused by client, contractors, and consultants with direct contributions in the sector. This analysis utilized to draw attention to the need for Addis Ababa City Road Authority road development projects to reduce causes and improve sustainability.

## 1.6. Scope of the Study

The Addis Ababa City Road Authority's own force buildings are not included in this research, and the clients provide the road through commercial contractors, not by itself. This project's research is limited to road construction projects in Addis Abeba City. Time overruns, cost overruns, and quality-related issues occur during building projects for a variety of reasons from many stakeholders. Although there are many factors that can cause delays in construction projects, including labor, equipment, external factors, clients, consultants, and contractors, this study is only able to evaluate the factors that can cause delays when it comes to the major project players, such as clients, contractors, and consultants.

Table 1.1 location and size of different road project of the study area AACRA the researcher

No	Name of Constructer	Size of the project
1	Kalite Round About Tulu Demit	11 km length
2	Kalite Round about Bole bulebula kilento road project	10.5km length
3	Ararat hotel kotobe	3.1 length
4	Haile garment to jemmo3	4.5 km length
5	Weyra Betele	1.9 km length
6	Koyficha Lot-2 Condominium phase -2 road project ; project 11	13.9km length
7	Arabsa condominium to Hayat condominium	3.3 km long
8	Keraberate–mebrahthile condominium	2.3 km long
9	Koyficha Lot-2 Condominium phase-2 road project; proje16	14km length

*Source; Survey Results and Own Computation, 2023*

## 1.7. Limitation of the study

The study focuses on assessing the causes and consequences of delays in road projects in Addis Ababa City Road Authority that are now being built or are being constructed by the city road authority. In terms of strategy scope, and territory, the project study scope is limited.

## **1.8. Organization of the study**

There are five chapters in this research report: the background of the study, the statement of the problem, the research questions, the objective of the research, its significance, its scope and limitations, and its organization is first chapter. Chapter two of the review of related literature includes an introduction, theoretical literature, empirical literature, research gaps, and a conceptual framework for the assessment of road project delays. Chapter three covers the study methodology, description of the study area, research design, universe or population, sampling, sampling methods, data collection tools, data analysis, validity and reliability, and ethical considerations. The chapter four results and discussion, introduction, and demographic data follow, and these sections provide a solution to the question asked in chapter one. The final chapter covers a summary of the results, a conclusion, and recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

One of the major economic drivers in Ethiopia is the construction industry it significantly affects the productivity and efficiency of numerous industries the demand for public infrastructure is driving a growth in the nation building sector the practice of the building industry, however, has many issues with time and expense overruns. Due to several known and unknowable events, construction projects do not follow the original contract term and contract value. The construction industry is a vital component of national economies that plays a crucial role in supporting social and economic development. It is a significant service industry with numerous connections to other sectors of the economy (Demissie, 2020).

Many different people are involved in building projects, including contractors, clients, consultants, suppliers, regulatory agencies, financiers, and the general public. Construction projects' inherent risks and uncertainties had been shown to be poorly addressed and managed. Therefore, to accomplish the success of a project in terms of time, cost, and quality, there is a diverse need to deal with these risks and uncertainties in an integrated manner (Tessema,2022).

This chapter presents a theoretical, empirical, and conceptual framework review of the literature related to the identification and analysis of the major causes of delay in construction projects, mainly focused on road construction projects in urban areas.

#### **2.2. Theoretical Literature Review**

##### **2.2.1. Concepts of Project**

A project defined as a collection of tasks that must completed in order to reach a particular objective. Each project is distinct in its own way, whether it is in terms of the length of time required to finish it, the area where it is performed, the caliber of the work produced, the project's budget, or other aspects like the stakeholders. It is in terms of the length of time required to finish it, the area where it was performed, the caliber of the work produced, the project's budget, or other aspects like the stakeholders. In an industry where business failure rates run remarkably high, this is a problem that urgently needs solving. A construction project begins with the

objective of the project in accordance with the contract details in which clients, consultants, and contractors contribute to fulfill the requirements (Tedja & Rarasati, 2021). Projects have limited time, quality, and resources and scheduled for a certain plan in terms of time, cost, and resources, according to the (PMI, 2021).

### **2.2.2. Delay in Construction**

One of the main issues facing construction experts is delays in road construction projects due to numerous causes. The inability to complete projects on time and within a specified budget is a chronic problem everywhere. Delay is the amount of time that elapses past the deadline for completion set in a contract or the date set by the parties for project delivery. For the owner, a delay means losing money because there are not enough manufacturing facilities and rental space, or they have to rely on their current facilities. In some circumstances, a contractor's overhead expenses will increase due to longer work duration, greater material costs due to inflation, and increased labor costs (Parchamijalal, 2018). Although: Delay or time overrun is defined as a condition where a construction project does not complete within the designed time period. It happens when the work of contract does not complete in its prescribed time. Time overrun is a most common incident, which occurs nearly in all the projects related to the construction industry. Time delay is critical in developing countries where it exceeds its 100 % of estimated time while constructing a project (Muhammad, 2017).

Therefore, finishing projects on time is an indicate of efficiency. However, the construction process is subject to a number of variables and unpredictable causes that arise from a variety of sources, so it is important to conduct a thorough assessment and calculate the loss resulting from delays on both parties in the projects with time required for the extension of projects time if the project is delayed. The late completion of work compared to the planned schedule or contract schedule is what is referred to as a construction project delay. Construction project delays are the most prevalent and pervasive issue in the sector (PLoS One, 2022).

### **2.2.3. Causes of Delay in Road Construction Projects**

The delay occurred when the contractor failed to complete the project within the specified period by the date of the contract as agreed by both parties in the contract. Various causes contribute to delays in completion of road construction project. Clients, contractors and consultants are the most important causes among many other causes. Many factors are commonly responsible for time overrun of construction projects, which include underestimation of project costs, the addition of scope during later stages, and changed conditions (Negalign,2020). Delays in a construction project can be such a problem and a very serious issue for the parties involved such as client, consultants and contractors. Many adverse effects can occur as the results of the delays. To reduce this problem from occurring, site management made carefully.

When a construction project was delayed, it costs contractors money and causes them frustration. However, there are many different reasons why delays can occur, including bad weather, equipment malfunctions, labor shortages, missing or incorrect data, project errors, and conflicts. Although some factors, like the weather, are out of your control, the majority of construction project delays could be prevented. Working using cloud-based, integrated construction software can keep everyone on the same page by allowing for real-time visibility into the status of resources, workers, and equipment as well as the productivity and timetable of the project. This aids builders in completing their deliverables on schedule and under budget them ( Alajmi & Memon,2022).

#### **2.2.4. Stakeholders Related Causes**

Any company or individual with an interest in and engagement in a particular project or business is referred to as a stakeholder. In construction projects, there are many patrons as contractors, clients, consultants, and regulatory bodies. In the construction industry related to many stakeholders, the performance of projects is poor some causes are design change, the delay of material delivery, poor communication and coordination, and poor project management skills.

Many local construction projects report poor performance due to many evidential project-specific causes such as unavailability of materials excessive amendments of design and drawings; poor coordination among participants, ineffective monitoring and feedback, and lack of project leadership skills. Project performance can measured and evaluated using a large



number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, client changes, business performance, health and safety. Many causes that have an influence on project cost performance, these include project manager's competence, top management support, project manager's coordinating and leadership skills, monitoring and feedback by the participants, decision-making, coordination among project participants, owners' competence, social condition, economic condition, and climatic condition.

#### **2.2.4.1. Client Related Causes**

The client related causes are concerned with client's type, individuality, experience, financial status, awareness, organization, construction complexity, confidence, extent and risk dealing. Delays are caused by the client's actions emanating from his need or inactions contrary to provisions stipulated in the contract. Where the cause of the delay is the project owner's responsibility, the contractor would be entitled to compensation against these losses. Delay client will nevertheless begin to incur Service Fees, which the Client shall pay in accordance with this Service Attachment, beginning on the Managed Services Start Date, even if the Provider is unable to begin delivery of the Services on the Managed Services Start Date (defined below) due to any failure on the part of the Client including but not limited to the Client's failure to provide the Client resources in a timely manner. The length of the building phases is within the control of the client, a significant project participant. Clients are now a frequent reason for schedule delays (Abeykoon,2019).The following are causes of delay road client responsibility lack of coordination with the contractor and utility, delays in contractors progress payment by owner, Poor contract management, unclear contract conditions, and inadequate progress review tasks Client financial problems/client finance/economic ability, Change orders by owner during construction, owner delay to deliver the site, delay in approval of completed work by owner/client, Poor scope definition/ Changes in client's requirements, type of project bidding and award, mistakes and discrepancies in contract documents, complicated administration process of client & providers Poor communication and coordination of the owner.

#### **2.2.4.2. Contractor Related Causes**

Contractors are those who are tied directly to a contract of construction projects that are responsible for controlling and implementing the project during the construction site until the project is fully

completed. Contractor is someone who undertakes to carry out and complete any construction work. In project undertaking, contractors are assigned to a construction project during the design or a licensed architect has completed once the design. The assignment of contractors is done through a bidding process with different contractors. Low labor productivity, low labor productivity of the manager of the construction acquisition equipment, poor material quality, lack of experience, and a low tender price (Baguec&Chunho,2020).Contractor responsibility delay are the following Financing by contractor during construction, Poor qualification of the contractor's technical staff, Coordination &communication problems with others Stake Holder ,Slowness of the owner decision making process, Shortage of materials/Equipment on site Poor site management and supervision by contractor, improper construction methods implemented by contractor and Contractors inefficiency in handling resources, inadequate contractor experience causing error, Ineffective planning and scheduling of project by contractor, delay in site mobilization by contractor, Construction mistakes and defective work and reworks due to defects/ in construction material.

#### **2.2.4.3. Consultant Related Causes**

Delays may also result from consultant problems which include design errors, late approval of tests and drawings, inadequate experience of consultant, lack of consultant's site staff, poor project administration etc (Tariq ,2023). Listed some of the possible causes of consultant delays which include lack of consultant site engineer, lack of adequate knowledge on the part of the consultant, inexperience on the part of the consultant site staff, delayed in making decisions, insufficient documents, and slowness in passing information. In this case, the contractor will be entitled to claim for time extension or/and financial compensation whereas the client will not be entitled to claim for liquidated damage as the consultant is the representative and within control of the client. Consultant responsibility is inspection delays, wrong or improper design, lack of experience of consultant in construction projects, with other parties Lack of consultant's site staff, mistakes and discrepancies in design documents, Poor communication and coordination of the consultant delay of design submittal from consultant, delay in approving major changes in the scope of work and rework due to change of design or deviation order.

#### **2.2.4.4. External Stake Holder Related Causes**

External stakeholders include investors, consumers, suppliers, sub-contractors, third party, governmental authorities, pressure group and communities. Those have indirect connection to the project (Riahi, 2017). Obtaining permits from municipality (government), L/C Exchange rate (Price) fluctuation/economies, Material and labor wage escalations (inflation), Shortage (availability) in construction materials; Unreliable suppliers, Social, religions and cultural causes; Political situation, Poor weather conditions, Conflict, war, revolution, riot, and public enemy external, poor government judicial system for construction dispute, settlement Changes in laws and regulations, transportation delays, external work due to public agencies (utilities and public services) and Delay in providing services from utilities (such as water, electricity)

### **2.2. 5.Effects of Delay in Road Projects**

Construction delays can affect a project in a number of ways, including project completion delays, lost productivity, consequential damages, increased costs, and contract cancellation. To be able to recover time and money, the party suffering damages due to delays must be able to identify the delays and the parties at fault (Regi & Varghese,2021).

The construction companies in many countries around the world experience significant delays. Construction delay can be defined as time overrun or extension of time to complete the project. It is a situation when the actual progress of a construction project is slower than the planned schedule or late completion of the project. However, delay situations are complex in nature because multiple delays can occur concurrently and because they can be caused by more than one party, or by none of them principal parties. One delay may contribute to the formation of other delays. In complex and big projects having many activities, delays are analyzed only based on the two major parameters i.e. time and cost because recording each activity schedule is difficult. Since the delay in infrastructure projects affects the economy of the country, it is important for the projects to be completed within the budgeted cost and time. The general consequences are cost overrun, time overrun etc, For the owner/client delay is the loss of money, loss of time, loss of other facilities etc, For the contractor, delay means the loss of wealth for more expenditure on equipment, other materials and for hiring the skilled labor (Pandey,2016).

#### **2.2.5.1. Time overrun**

Time overrun is a severe problem in the construction industry where only rare projects are completed on the estimated time. Projects are considered as overrun in time, which are completed beyond the date of completion specified in a contract, or beyond the date that the parties agreed upon for delivery of a project. According to Abu-Bakr(2021) project, time have been defined as the duration that was needed to complete the work starting from site handover until finished. Project time performance is the most important indicator of project success.

Time control aims at to complete the project with contract duration time control hinges on time performances and the sequences of execution of activities. The basis of measuring activity time progress is the project master schedule of work. Time control monitoring starts with measuring of time status of completed in-progress and nonstarter balance activities. It uses time plan updating techniques to depict progress pictorially ( Benila, 2019).

#### **2.2.5.2. Cost overrun**

Cost overruns have obvious effects for the key stakeholders in particular, and on the construction industry in general. To the client, cost overrun implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs were passed on as higher rental/lease costs or prices. To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of profit for non-completion, and defamation that could jeopardize his/her chances of winning further jobs, if at fault. To the industry as a whole, cost overruns could bring about project abandonment and a drop in construction activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks.

All these consequences undermine the viability and sustainability of the construction industry. The effects of cost overrun are not confined to the construction industry but are reflected in the state of the overall economy of a country. They state that delays and cost overruns in construction projects prevent the planned increase in property and service production from taking place, and this phenomenon in turn affects, in a negative way, the rate of national growth unanticipated expenses that wind up costing more than the project budget are referred to as cost overruns. Any project can experience cost overruns, but software development, manufacturing, and construction projects are particularly prone to them. A cost overrun, sometimes referred to as

a cost increase or budget overrun, can occur for a number of different reasons. Before delving into the causes of project budget overruns, let us look at project management tools that can save costs. Software called Project Manager Gathers data in real-time to make it easier for you to keep track of your spending. Six project parameters, including cost, are automatically gathered and calculated by our live dashboard and are then presented in vivid, easy-to-read graphs. There is no setup needed, unlike with lightweight tools. Start using Project Manager right away for free (Landau, 2022).

#### **2.2.5.3. Concept of quality Related**

As it is stated in the PMI, (2021) quality is one of those crucial attributes in construction that relates to all aspects of any construction project. Most component deliverables are visible at some point in time and accepted. Quality in construction takes on an additional layer of expectations for the participants when one considers the visible construction work and its construction practices along with how well the project was managed with respect to its cost and schedule. Quality in construction relies on the project management systems to ensure that the project meets all aspects of the constructed project. Quality control is the process of verifying that the project is built to plan, that the tolerances allowable by industry standard and engineering practices have been met and that the finished project meets with quality standards of the project as inspected by the involved Stakeholders. The goal of quality control is to improve quality and involves monitoring the project outputs to determine if they meet the quality standards or definitions based on the project stakeholder's expectations. Quality control also includes how the project performs in its efforts to manage scope, budget and schedule (Shofoluwe, 2013).

#### **2.2.5.4. Dispute between parties Stake holders**

Disputes are the effects of major causes of poor performance in construction projects such as causes of client related, contractor related, and consultant related and external related that might be arisen during the construction projects among the project parties. Lack of communication may also leads to misunderstandings, conflicts, and disputes. Hence, it necessitates the project managers to have effective communication skills that are one of the significant soft skills (People skills) with the project parties involving in construction projects (Alfakhri,2018).

#### **2.2.5.5. Termination of a project by Causes of Delay**

Terminations a permanent stoppage of work of all or a portion of the contract and the contract is terminated. For a party to possess the right for termination, a termination clause must be specifically included in the contract. Most contracts allow the owner the right to terminate the contract, while some contracts grant the contractor this right. A project nearing its closure can face challenges not foreseen during the planning phase. These could be technical issues concerning new products or designs, needing adequate handholding for the client, disagreement amongst stakeholders on deliverables, or a disinterested, irresponsible approach towards closing the project. And then, there are the challenges posed by the project team. The team members might need to work on formalities for fear of being retrenched, or they might lose interest once they have been reassigned to a new project. Lastly, there is the customer's aspect that could delay closure (Haiti, 2023).

### **2.3. Empirical Literature**

In the construction sector, they have different problems, from implementation to the excision of work, because of the sector in which different parties are involved they have so many problem involved the executed .The Ethiopian construction industry is one of the engines of the country economy. It has significant impacts on the efficiency and productivity of various sectors. The country's construction industry is booming with the rising need for public facilities. However, the practice of the construction industry faces a lot of problems, from time runs to cost overruns to rising costs, quality problems, and difficulties in the implementation of scope, as construction projects fail to go in line with the original contract duration and contract amount due to different known and unknown causes. At these time road project delay commune in Addis Ababa because, of many resin the main resin was the client cause, consultant cause, constructor and other related causes these causes crate cost overrun, time over run, quality problem and socio economic factor in the society the major causes of delay factors in Addis Ababa city Road Authority.

Many research investigations have been conducted to determine the reason for the delay in the construction of road projects on different continents. An analysis was conducted on Bahrain's road project delays with the aim of identifying the causes, ranking the effects, and offering suggestions and solutions. The study combined the cause-and-effect method with three categories of results. The problem side it is detecting is a lack of planning and storage of skilled

labor; the owner/client side delay causes leads to suspension of work, budget availability, and delay in decision-making; and the consultant-related causes is a lack of experience and low monitoring and evaluation.

The study on causes of delay in road construction projects across 25 developing countries was conducted to determine the ten principal causes of delay in road construction projects in 25 developing countries across the globe. The research method of meta-analysis for processing data is the information collected from variable and fixed effects. On-experimental, non-cross-sectional, and explanatory analysis, the reasons for the delays were identified as falling into the following 10 categories: absence of an experienced construction manager, poor planning and scheduling, impact on private property while building the road, etc.

Many design modifications and poor communication between parties involved in the building Equipment shortage, major event, contract amendment, delays in the billing process, and more Lack of building supplies and late payments to contractor they identified (Baguec& Yeom,2020).

Similar studies in many African countries examine the reasons for project delays the causes and impacts of delays on African construction projects, the research technique used was a review of prior studies on the causes that cause construction delays, their impacts, and related mitigation measures in the African construction industry (Abebe, 2020).

A management frame work to reduce delay in road Construction Projects in Sudan the objective of the study is Critically reviewed relevant published studies, reports, policy documents magnet export professional from road Construction and individual responses toward delay causes in road project there fading is cost overrun and time over run ( Khair,2017). In the case of Tanzania and Morocco, planning and scheduling, design change, communication, consultant, and material-related are the basic problems for construction delays (Sambasvan, 2017).

Ethiopia Scenario The aim of the study is to assess the existing system of time and cost overruns and identify the causes that affect time and cost overruns in Addis Ababa road projects. The research type of investigating the frequency of delay questionnaire survey from the research ten completed road projects in Addis Ababa according to the result is the following: time overrun

and cost overrun major share tasks, minimum of the range 25% and maximum 264.38%, and minimum of the range 4.11% and maximum 135.06% (Tariq, 2020).

MeridTaye (2016) studied how Ethiopian defense construction projects were impacted by time and cost overruns. He identified fifteen (15) factors that cause time and cost overruns, including: insufficient early project planning, poor contract management, poor planning processes, lack of prompt decisions, changes in design, drawn-out approval procedures for drawings and material samples, incomplete drawings, frequent equipment and construction plant failures, excessive change orders, and arbitrary, unrealistic deadlines.

## **2.4. Research Gap**

To fill the gap by investigating the major causes of delay in road projects in Addis Ababa City Road Authority in order before signing counteract the client must be working site free from utility line like telecom lines, water lines, EEPKO Lines and water and sewerage line, house, fence. Remove or reallocated before start construction client ready for contractor the site for construction. The missing item is the lack of coordination between utility suppliers organization. Not addressed properly right of way related causes, land acquisition, resettlement & compensation related causes and local authority woreda, sub city and municipal. The privies researcher not addressed or not properly identified the causes of delay road project they answered for delay client, contractor & consultant in general but in these research, the external stakeholder with respect consultant, constructor and client briefly sawed. The issue critical urgently solved because of delay of road project the socio economic of the society highly affected and the lost the scares budget resource.

## **2.5. The Conceptual Framework**

Delays occur in every construction project and the magnitude of these delays varies considerably from country to country even project to project based on prevailing factors contributing to construction projects, number of studies have been conducted in regard delays in construction projects for decades with scholars advancing various factors and groups of factors that contribute to causing delays. From the literatures reviewed during this study, 32 delay causes identified and 5 causes of delay factors. Each delay causes are described on the questionnaire designed for the



survey. Literatures reviewed indicate categorization of various factors in groups of up to the three categories of Client related, consultant related and contractor related other with respect to external stake holder factor related.

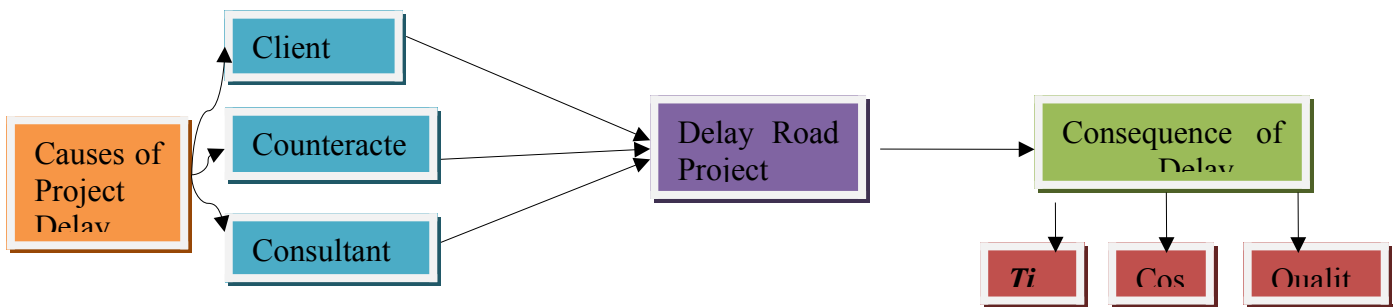


Figure 1- Conceptual Frame work

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Research Study Area**

The study for this research was conducted in Ethiopia's capital city, Addis Ababa. Geographically, Addis Abeba is situated in the middle of the nation on a plateau that receives plenty of rainfall and is encircled by hills and mountains. The Ethiopian state has only had Addis Ababa as its capital since the late 19th century. At 2,200–2400 meters above sea level, Addis Ababa is the third-highest mountain capital city in the world. Since the Ethiopian Emperor Minillike II and Empress Taitu created the city, it has been known for wearing its heart on its sleeve. In Addis Ababa, trade and commerce are the two main economic activities. Manufacturing and industry, homemaking, civil administration, transportation, and communication are additional economic sectors that provide the majority of job opportunities in the city Addis Ababa with 11 Sub-cities and 116 Woreda as for administrative purpose.

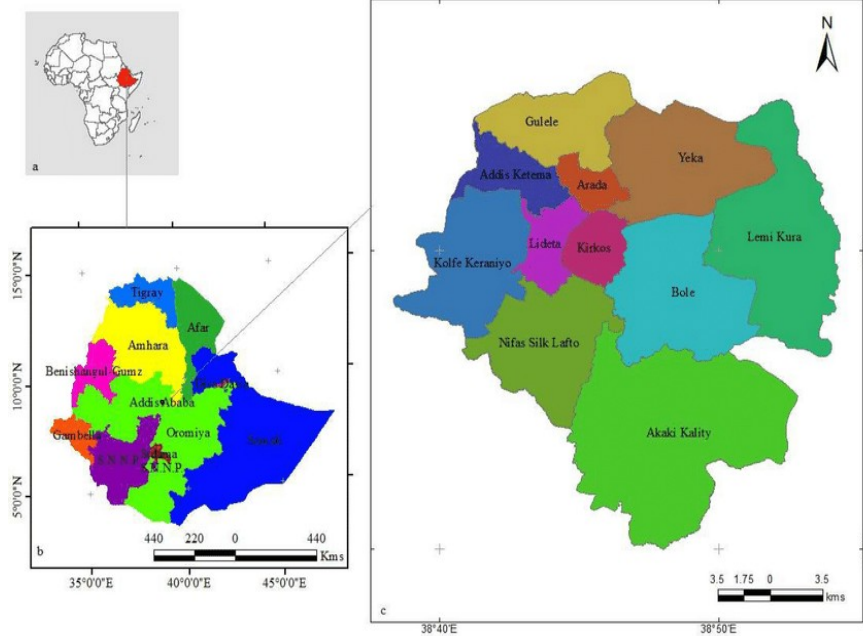


Figure 2. Research Study Area

### 3.2. Research Design

The study adopts both descriptive and explanatory research method. Descriptive research involves gathering data that describe events and then organizes, tables, pipe chart, bar chart, histogram, and describes the data collection. The study is descriptive the researcher selected it helps to describe the current practices and procedures of road construction in Addis Ababa city road authority. Using graphs makes it simpler to show relationships between large data sets. This is why, while analyzing your results, you typically look at histograms, box plots, and distribution plots in addition to the numbers and statistical values of your tests to rapidly understand what is happening in your data. A visual depiction of data known as an "input for chart" can help readers focus on certain standout characteristics like trends and outliers. Using the appropriate type of data analysis and matching your methodologies to your research objectives are made possible by a well-planned research design (McCombes, 2021).

Explanatory research is a research method that explores why something occurs when limited information is available. It can help you increase your understanding of a given topic, ascertain

how or why a particular phenomenon is occurring, and predict future occurrences. Exploratory research can help you define a clear hypothesis and issue statement, as well as give you the "lay of the land" on topic it can also help you narrow down your topic (Tegan, 2023).

### 3.3. Population

The research focused only on the client (Addis Ababa City Road Authority) give for contractor build nine road projects now under construction total staff 373of works it is directly connected the work of the researcher finding for his research.

### 3.4. Sampling

The target population of the study was clients, contractors, and consultants who are directly involved in the construction of the road projects, irrespective of their experience in road construction projects, as the number of under-construction road projects was focused. The researcher to get accurate and reliable information he selected the respondent directly connected to work that are(project Manager, Resident Engineer, supervisor, site engineer, Contract Administration, project coordinator and Right of way officers).It selected only 62 respondent and the research didn't considered a closed projects and own force construction project,

### 3.5. Sampling Methods

Purposive sampling used to deliberately choose the appropriate sample units for the issue and interview a few of the respondents' top managers. Additionally, a sample of the available design and contract documents for a few chosen projects that were thought to be facing significant challenges were collected for the study based on the same methodology. 62 professionals in all participated in the survey as respondents, including 20 contractors, 18 consultants and 24 from the client (AACRA).

Table 3.1 Major Stakeholder in Road Construction

Types	Number	Percentage (%)
Clients	24	38.70
Contractors	20	32.25

Consultants	18	29.05
<b>Total</b>	<b>62</b>	<b>100</b>

*Source; Survey Results and Own Computation, 2023*

### **3.6. Data Collection Tools**

The data collection approach was the main method used in this study to gather data. Data gathered using a study survey that includes a questionnaire, interviews, source documents such as client, consultant, and contractor agreements or contracts, as well as other relevant progress reports. Consultants, customers, and contractors all received the questionnaire. Meantime, directly involved in the investigation are right-of-way officers and directors from the counteract administration of the Addis Ababa City Road Authority. The questionnaire asks both open-ended and closed-ended questions in an effort to pinpoint and ascertain the primary reasons behind Addis Ababa city road project delays. To gauge agreement or disagreement and to pinpoint the difficulties associated with the intensity of road construction projects, survey questions are constructed using a five-point Likert scale. Each point is equally weighted.

### **3.7. Data Analysis**

After gathering, the data must be processed and analyzed to produce results. Quantitative analysis was applied in the study depending on the nature of the issue. Tables were utilized to summaries the responses for the quantitative (numerical) response of descriptive statistics related to the practice of right-of-way acquisition using percentage, frequency, measures of, and central tendency. The data obtained from the survey used a Likert scale ranging from 1 (very low), 2 (low), 3 (average), 4 (high), and 5 (very high), and the data analysis was determined to establish the relative importance of various causes that contribute to construction delays.

The ranking of the attributes in terms of their criticality as perceived by the respondents done by using the Relative Importance Index (RII). The relative index technique has broadly used in construction research for measuring attitudes with respect to surveyed variables. In order to ensure the logical completeness and consistency of responses, the researcher has carried out data editing and coding. Once editing has done, the data had analyzed qualitatively and quantitatively

for the data that had obtained through different data collection instruments. RII used to rank the different causes of delays from the perspectives of clients, consultants and contractor. The approach was also used to evaluate the different causes of delays among different categories; the same methodology was used for this analysis.

$$RII = \frac{\sum W}{A * N} \qquad RII = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{5 * (N)}$$

Where:

RII= Relative Important Index

W= Weight is given to each factor by the respondent and ranges from 1 to 5

A= the highest weight 5

N= the total number of respondent

### 3.8. Ethical Considerations

Different personalities make human behavior and attitudes unpredictable. Any work that requires human involvement raises ethical concerns regarding how to respect, treat, and interact with people. In order to manage ethical difficulties, it is crucial to follow the proper ethical standards and principles in all projects and research investigations (Roshaidai, 2018).

The key ethical concerns in this research study include data confidentiality, incorrect interpretation of results, and how carefully respondents complete the questionnaires.

The project makes an effort to minimize these hazards by adhering to the rules of research. Honesty, trust, and dependability are also the project's guiding principles. Additionally, this study receives approval from the AACRA organization, which also provides a document that outlines the data's intended use and guarantees its exclusive use in the study. Additionally, those who answered the questionnaire did so deliberately and voluntarily.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

This chapter presents and analyzes data collected through two instruments of data collection namely questionnaire and interview. The general objective of the study is to assess causes & consequence of delays in road construction projects by Addis Ababa City Road Authority. It is guided by three research questions on major causes of road construction project delays, responsible bodies for the delays and consequences. Quantitative and qualitative data is generated and analyzed towards answering the research questions.

#### **4.1. Response Rate**

The data on respondent general characteristics such as background information, that is, respondent's character, gender, age, and educational level, work experience and assigned position is presented here below:

Table 4.1 Selected Respondent Characters

<b>N</b>	<b>Respondent Category</b>	<b>Distributed</b>	<b>Frequency</b>	<b>Percentage (%)</b>
----------	----------------------------	--------------------	------------------	-----------------------

<b>o</b>		<b>Questioner</b>		
1	Client	24	19	79.17
2	Contractor	20	17	85.00
3	Consultant	18	16	88.89
	Total	62	52	84.35

*Source; Survey Results and Own Computation, 2023*

This result discusses a research study that sent out questionnaires to 62 respondents. Of those, only 54 correctly filled out the questions, and two more were rejected, leaving only 52 participants. Of those participants, 19 were clients or owners, 16 were consultants, and 17 were contractors. The return rate of the questionnaires that could be used for analysis was 84.35%, and 10 respondents did not participate in the research (which equates to 15.65% of the total respondents) .Questioners were sent primarily through personal networking with construction

experts and by appointing a data collector. Furthermore, respondents were contacted both in person by participating on the distribution site and regularly by phone & e-mail.

Table 4.2. The Demographic Characteristics of Respondents

<b>N</b> <b>o</b>	<b>Factor</b>	<b>Categories</b>	<b>quantity</b>	<b>Percentage (%)</b>
1	Sex	Male	38	73.1
		Female	14	26.9
2	Age	18-30	14	26.9
		31-40	26	50.0
		41-50	9	17.3
		51-60	2	3.8
		Above 61Years	1	2.0
3	Educational Back Ground	Diploma /Vocational	6	11.5
		First Degree	28	53.8
		Master	14	26.9
		PhD & Above	4	7.7
4	Work Experience	1-5 Years	11	21.2
		6-10 Years	17	32.7
		11-15 Years	13	25.0
		16-20Years	8	15.4



		Above 21 Years	6	5.8
5	Work posion	Project Manger	8	15.4
		Resident Engineers	3	5.8
		Supervisor	10	19.2
		Site Engineer	16	30.8
		Counteract Admin.	3	5.8
		Project Coordinator	4	7.7
		Right off Officer	8	15.3

*Source; Survey Results and Own Computation, 2023*

Based on the data from Table 4.2, we can conclude that out of the total 52 respondents, the majority (73.1%) are male, while the remaining 26.9% are female. This shows that there were more male respondents than females who took part in in AACRA in engineer's.

According to the respondents' ages, it appears that the age distribution of respondents for the Addis Ababa City Road Authority (Table 4.2) is as follows: 14 respondents (26.90%) are between the ages of 18 and 30, 26 respondents (50%) are between the ages of 31 and 40, 9 respondents (17.30%) are between the ages of 41 and 50, 2 respondents (3.80%) are between the ages of 51 and 60, and 1 respondent (2%) is over the age of 61. Overall, the majority of respondents (50%) fall in the age range of 31–40, followed by the 18–30 age groups (26.90%). Only a small percentage of respondents are over the age of 50.

Table 4.2 is showing the distribution of respondents based on their educational qualifications. Out of 52 respondents, 6 of them held a Diploma (11.5%), 28 of them held a first degree (53.8%), 14 of them held a Master's or Second degree (26.9%), and the remaining 4 respondents held a PhD degree or higher (7.7%). This indicates that the majority of the respondents had at least a first degree, with a significant number having advanced degrees. It also shows that there was a good mix of educational backgrounds among the respondents.

Based on the information provided in Table 4.2, we can indicate that the work history of the respondent is as follows 11 respondents (21.20%) have a work history between 1 and 5 years. 17 respondents (32.70%) have a work history between 6 and 10 years. 13 respondents (25%) have a work history between 11 and 15 years, 8 respondents (15.40%) have a work history between 16

and 20 years. Six respondents (5.80%) have a work history over the age of 21. Therefore, we can use this data to analyse the work experience of the Addis Ababa City Road Authority in the study, which is highly skilled.

To summarize, Table 4.2 shows the percentage share of different job roles in a project. There were a total of 10 respondents, including 3 project resident engineers (5.8% share), 8 project managers (15.40% share), and super viziers (19.20% share). The majority of the respondents (16) were site engineers, with a 30.80% share. The Contract Administration category had 4 respondents, with a 5.8% share, and there were 8 right off officers with a 15.30% share.

These percentages were calculated using the triangulation method, which involves cross-referencing data from multiple sources to ensure accuracy, senior officials involved in the interview process, as it suggests that the organization places a high value on the opinions and perspectives of its top leaders. Additionally, having representatives from the client side, contractor side and Consultant side can help ensure that the interview process is fair and balanced.

Lastly, having an interviewed from the Contrate Administration Director of AACRA suggests that the organization is seeking input and advice from experts in the construction industry who can provide valuable insights into best practices and trends in the delay of road construction and consequences.

## **4.2. Respondents Perceptions**

The data was analyzed using descriptive analysis and presented in different sub-sections are in relationship with the objectives of the study and the items asked in the questionnaire. The first objective of the study was relate to analyzing the causes of delays in road construction projects in various stakeholders' perspectives that have been identified and grouped into three major groups. These causes were ranked in each group based on their Relative Importance Index (RII) to delay from the contractors, owners and consultant we see the external stakeholder as we see indirectly directly the three one is major contribution for delay of road project.

## **4.3. General perspectives on Causes of delay**

The perspective of all parties that were participated in the road construction projects owned by the Addis Ababa Road Construction Authority was first analyzed from each stakeholder's perspectives and then the overall result was computed. The causes of delay were discussed based on the RII ranking depicted in the following table.

Table 4.3 General perspectives on Causes of delay

<b>Major delay Causes</b>	<b>RII</b>	<b>Mean</b>	<b>Rank</b>
Right of Way Casus	0.947	4.83	1
Lack of coordination with the client and utility providers (ethio telecom, AWSSA & EEPC)	0.936	4.31	2
Difficulties in financing the construction project by the contractor	0.926	4.60	3
Land Acquisition, Resettlement and Compensation Related Causes	0.915	4.79	4
Inaccurate site investigation	0.894	4.42	5
Shortage of contractors materials on site	0.884	3.77	6
Low cooperation local Authority (woreda&sub city)	0.870	4.63	7
Inadequate planning and scheduling of work by contractor	0.864	4.12	8
Poor site management and supervision by contractors	0.856	4.02	9
Delay in design documents preparation by consultant	0.851	4.31	10
Slow decision making process with stake holder owner	0.850	4.19	11
Delay in progress payment for Contractor	0.847	4.21	12
Inadequate contractor experience	0.847	3.92	13
Weak in follow up the planned work schedule by the contractor	0.835	4.27	14
Poor communication & coordination of the owner with other parties	0.835	4.25	15
Poor project manager skills	0.835	4.10	16
Delay in inspection and testing by the consultant	0.825	4.13	17
Poor qualification of the contractor's technical staff	0.823	4.15	18
Poor contract management by consultant	0.812	4.12	19
Delay in delivering construction site to the contractors	0.811	4.12	20
Inadequate experience of consultant	0.800	3.92	21
Poor communication & coordination of owner with other parties	0.789	4.46	22
Unrealistic contract duration and requirements imposed	0.789	4.13	23
Type of project bidding and award (selection based on least bidder)	0.789	3.94	24
Mistakes during construction stage	0.788	3.96	25
Change orders by owner during construction	0.778	4.02	26
Coordination of with other parties contractor	0.776	4.13	27
Poor communication and coordination of the consultant with other parties	0.775	4.31	28
Lack of consultant's site staff	0.772	3.98	29
Rework due to error during construction	0.768	3.69	30
Mistakes and discrepancies in design documents	0.750	4.06	31
Environmental Authority problem	0.736	3.35	32

*Source; Survey Results and Own Computation, 2023*

**Table.4.3.**Based on the results of the study, it can be concluded that delays in road construction projects are caused by various factors, with the client's initial request for a delay being the biggest cause of delay. Other factors include right of way problems, lack of coordination among utility suppliers, challenges with contractor financing, land management office delays, and inaccurate site investigation. Insufficient planning and timing of the work, poor site management and monitoring by contractors and the creation of design papers by consultants were also identified as causes of delays. Overall, clients caused four out of ten delays, contractors caused four, and consultants caused two. The study also highlights the importance of addressing issues related to coordination with utility suppliers and government regulatory bodies before entering into construction contracts.

#### **4.4. Top Ten Delay Causes of Road Project in Addis Ababa City Road Authority**

Table 4.4 Overall delay causes of road project

<b>Causes of delay</b>	<b>RII</b>	<b>Mean</b>	<b>Rank</b>
Right off Causes	0.947	4.83	<b>1</b>
Lack of coordination with the client and utility providers (ethio telecom, AWSSA & EEPCC)	0.936	4.31	<b>2</b>
Difficulties in financing the construction project by the contractor	0.926	4.60	<b>3</b>
Land Acquisition, Resettlement and Compensation Related Causes	0.915	4.79	<b>4</b>
Inaccurate site investigation Consultant	0.894	4.42	<b>5</b>
Shortage of contractors materials on site	0.884	3.77	<b>6</b>
Local Authority (woreda & sub city)	0.870	4.63	<b>7</b>
Inadequate planning and scheduling of work by contractor	0.864	4.12	<b>8</b>
Poor site management and supervision by contractors	0.856	4.02	<b>9</b>
Delay in design documents preparation by consultant	0.851	4.31	<b>10</b>

*Source; Survey Results and Own Computation, 2023*

Table 4.4 From the above table the researcher understand that the highest RII causes of road project delay causes in Addis Ababa City Road Authority was Client/owner Related causes was first in rank, the second one was contractor related causes and Consultant Related was the list causes of delay for road project in Addis Ababa city Road Authority. From the result I consider

that the external stake holder has more influence over the client because the client first gives the site to the contractor free from right-of-way problems and gives compensation to the client for land taken from the landowner and for the project's delay in construction in the construction stage because the client first did not clear the site before the contractor started work. The second delay Casus for delay of road project is contractor because of poor management of financial resource, shortage of construction materials in site, indicate planning and scheduling work and poor site management. The third delay of road causes project is delay by consultant this comes due to inaccurate site investigation Consultant and delay in design documents preparation by consultant. Identify the cause of delays in completion of the road project during construction failed due to client, counteracter and consultant (Yosef, 2007).

#### 4.5. Each Stake Holders contribution of the Delay of the Road Project

##### 4.5.1. Client related delay causes

Table 4.5 Client related delay causes

Client Related Delay Causes	RII	Mean	Rank
Right off Way Casus	0.947	4.83	1
Lack of coordination with the contractor and utility providers (ethio telecom, AWSSA & EEPC)	0.936	4.31	2
Land acquisition, Resettlement and Compensation Related Causes	0.915	4.79	3
Local Authority (woreda, sub city &Mire office)	0.870	4.63	4
Slow decision making process with stake holder	0.850	4.19	5
Delay in progress payment for Contractor	0.847	4.21	6
Delay in delivering construction site to the contractors	0.811	4.12	7
Poor communication & coordination of the owner with other parties	0.789	4.25	8
Unrealistic contract duration and requirements imposed by owner	0.789	4.13	9
Type of project bidding and award (selection based on least bidder)	0.789	3.94	10
Change orders by owner during construction	0.778	4.02	11
Environmental Authority problem	0.736	3.35	12

*Source; Survey Results and Own Computation, 2023*

From table 4.5. The main causes of delays in Addis Ababa city Road Authority projects, according to the respondent client side, were delays in Right Off Cases, a lack of coordination between utility providers, and delays in road construction. Delays in land management offices, local authorities (woreda, sub-cities and Mire offices), delays in contractor progress payments slow decision-making with all parties involved, unrealistic contract terms and conditions imposed by the owner, the type of project selected for award (based on the lowest bidder). Owner-placed modification requests during construction Poor coordination and communication between the owner and other parties, a delay in handing over the construction site to the contractors, and issues with the Environmental Authority are the outcomes, respectively. According to; Mahlet (2014) Construction of roads, a major source of dispute, which causes a delay in the construction of such roads, is the delay with respect to the procurement of Right of Way (ROW).

#### 4.5.2. Contractor Related Causes for Delay

Table 4.6. Contractor Related delay causes

<b>Contractor Related Delay Causes</b>	<b>RII</b>	<b>Mean</b>	<b>Rank</b>
Difficulties in financing the construction project by the contractor	0.926	4.60	1
Shortage of contractors' materials on site	0.884	3.77	2
Inadequate planning and scheduling of work by contractor	0.864	4.12	3
Poor site management and supervision by contractors	0.856	4.02	4
Weak in follow up the planned work schedule by the contractor	0.835	4.27	5
Poor project manager skills	0.835	4.10	6
Poor qualification of the contractor's technical staff	0.823	4.50	7
Inadequate contractor experience	0.800	3.92	8
Mistakes during construction stage	0.788	3.96	9
Coordination of with other parties	0.776	4.13	10
Poor communication & coordination of owner with other parties	0.775	4.31	11
Rework due to error during construction	0.768	3.69	12

*Source; Survey Results and Own Computation, 2023*

The above table 4.6 illustrates that there are twelve major cases of delay from the contractor's point of view on Addis Ababa Road Construction Authority road construction projects. According to the results of the causes that contributed to the road construction delay, there was difficulty with the contractor's financing, a lack of materials provided by the contractor on the job site, inadequate planning and scheduling of the work, poor site management, weak follow-up on the planned work schedule by the contractor, poor project manager abilities, poor qualification of the contractor's technical staff, inadequate contractor experience, mistakes during the construction stage, and a low effect on the delay of the road project in Addis Ababa. Coordination with other parties, Poor communication and coordination by the owner with other parties and rework due to errors during construction RII (0.918–0.864) or rank 1–3 higher causes of the delay of the project in counteracting the higher impact of the delay of the road project. Were RII (0.778–0.0.768) or ranked (9–12), it shows low causes for delay in road projects (AACRA). Hilario & Chunho (2020): Their finding shows that the lack of an experienced construction manager, inadequate planning and scheduling, and influence on people's land along with the road construction project Poor communication between construction parties and frequent changes in design Contract modification delays in the execution of progress billing Shortages of construction materials, delayed payments to contractors and Poor labor productivity are the major causes of delays in developing countries.



### 4.5.3. Consultant Related Delay Cause

Table 4.7. Consultant Related delay causes

<b>Consultant Related Delay Causes</b>	<b>RII</b>	<b>Mean</b>	<b>Rank</b>
Inaccurate site investigation	0.894	4.42	1
Delay in design documents preparation by consultant	0.851	4.31	2
Delay in inspection and testing by the consultant	0.825	4.13	3
Poor contract management	0.812	4.12	4
Inadequate experience of consultant	0.800	3.92	5
Poor communication and coordination of the consultant with other parties	0.775	4.31	6
Lack of consultant's site staff	0.772	4.10	7
Mistakes and discrepancies in design documents	0.750	4.06	8

*Source; Survey Results and Own Computation, 2023*

From table 4.7 Results show the respondent provided a flowing response, an inaccurate site investigation, and delay in design documents preparation by consultant, delay in inspection and testing by the consultant, poor contract management, and inadequate experience of consultant, Poor communication and coordination of the consultant with other parties, lack of consultant's site staff, Mistakes and discrepancies in design documents. It was scored from 1 to 8 based on respondents' responses to questions 1 through 8. The first three have a strong impact on project delays, namely inaccurate site investigation, delay in design documents preparation by consultant and delay in inspection and testing by the consultant. According to Adamu,(2022);In accurate stating site investigation report is the Maine delay factors for delay of road project.

### 4.6. Effects of Delay of Road Project

Finally, survey questionnaires were given to respondents (contractors, other related parties, consultants, and clients), and the data were analyzed. From the perspectives or viewpoints of all three stakeholders, the top 10 major causes of delays in road projects were determined. In general, the key causes of road construction project delays have been recognized in this study. In

Addis Ababa City Road Authority road construction projects. From the perspectives of clients, consultants and contractors related causes the obstacles were assessed by their importance in road construction projects using the relative importance index. In addition, in the case of the Addis Ababa City Road Authority, the project study examined the causes of delay in road construction project performance and ranked them according to their significance using RII.

Table 4.8. Effect of Delay of Road Project

<b>Effect of Delay of Road Project</b>	<b>RII</b>	<b>Mean</b>	<b>Rank</b>
Time overrun	0.91 4	4.571	1
Cost Overrun	0.88 5	4.428	2
Quality Problem	0.85 7	4.285	3
Dispute between parties involved in sector & Court	0.82 8	4.285	4
Total & Underutilization of the project	0.74 2	3.714	5

*Source; Survey Results and Own Computation, 2023*

In the table 4.8. the survey, data gathered from all stakeholders was evaluate using the viewpoints of clients, consultants and contractors. The effects of road project delays on performance are lists in order of importance from all angles, as can be saw in the table above. The three most common causes of road delays, as determined by the findings of the questionnaire survey, are listed in the table as follows: time overrun (RII = 0.914), cost overrun (RII = 0.885) and quality problem (0.857). First, second and third respectively, according to the survey findings, while client/owner, contractors and consultants scored (1-3) respectably. The main goal of this study was to identify and assess the major causes of road project delays that affect the performance of road construction projects in the Addis Ababa Construction Road Authority. As a result, 32 causes of issues were discovered and 5 effects for delay of road project in Addis Ababa City Road authority according to researcher finding shows.

## **4.7. Discussion of the Results**

### **4.7.1. Major causes of road construction project delay**

Overall, the study found that there were multiple factors contributing to delays in road projects in Addis Ababa City, with client-related causes being the most prominent. These included delays in acquiring the right of way, lack of coordination with utility suppliers, difficulties in financing, land acquisition and resettlement issues, and inadequate planning and scheduling by clients. Contractor-related causes included shortages of materials and poor site management, while consultant-related causes included inaccurate site investigations and delays in design documents preparation. The study highlights the need for better coordination and communication between all stakeholders involved in road projects, as well as improved financial arrangements and more efficient procurement processes. It also emphasizes the importance of thorough site investigations and planning to minimize unforeseen delays and costs during construction. Overall, addressing these factors could help to streamline road project delivery and improve infrastructure development and service provision in Addis Ababa City. Based on the research results, it appears that there are different causes of delay in road projects and these causes are not the same for all stakeholders. According to the findings, client-related delays are the most significant, followed by contractor-related delays and consultant-related delays. These findings are corroborated by Mitku's research findings (2021); according to his findings, the key causes of road project delays are time, cost, quality, and material shortages, which are most common in the construction business.

### **4.7.2. Effects of the road construction delay**

Based on the analysis, interviews and literacher conducted, it can concluded that delay in road construction projects in the Addis Ababa city Road Authority is primarily caused by time overruns, cost overruns, and quality problems. These factors can significantly affect the performance of road construction projects and can result in negative consequences for all stakeholders involved. The effects of these delays can include increased project costs, reduced profitability, decreased reliability and trust between contractors, consultants and clients/owners,

as well as damage to the reputation of the agency responsible for the project. Furthermore, this study has identified thirty-two causes of issues that contribute to the delay in road construction projects in the Addis Ababa Construction Road Authority, which need to be addressed to reduce the occurrence of delays and improve project efficiency. Overall, it is important for all stake holders to work together effectively to identify and address the root causes of delays in road construction projects to ensure the successful completion of projects within budget and on time while meeting quality standards. Although, these finding result supports successful project development impels delivering projects within time, cost and budget, challenging management percties in construction industry (Amoatery & okanta, 2017).

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1. Summary of Findings**

The finding of this study is to assess causes & consequences of road project delay in Addis Ababa City Road Authority.

1. Thirty two road project delay causes and 5 consequences of delay effects were found in the AACRA based on analysis, interviews, and literature. The client, the counterpart, and the consultant for the road project are the main reasons for delays in terms of stake holders. Time, cost, and quality-related issues are consequences or effects of delays. 24 clients, 20 contractors, and 18 consultants from 32 delay causes that can be reduce to the top 10 delay causes completed the questionnaire forms on behalf of the three main stakeholders. The respondents in Chapter 4 state the following:-

Right-off Causes RII (0.947), Lack of Coordination with Client and Utility Providers RII (0.936), Difficulties in Contractor Financing the Construction Project RII (0.926), Land Acquisition, Resettlement, and Compensation Related Causes RII (0.915), Inaccurate Site Investigation Consultant RII (0.894), Shortage of Contractor Materials on Site RII (0.884), Local Authority Issues RII (0.870), Inadequate Planning and The outcome indicates that the client's RII for the road project is (0.947, 0.936, 0.915, and 0.870), the counteracter RII for the road project is (0.926, 0.884, 0.864, and 0.856), and the consultant's RII for the road project is (0.894 and 0.856), with an average RII of (0.875). The outcome of the delayed road project reveals the first client, the second counteracter, and the third, a consultant. The results of a similar study conducted in Kenya were as follows: By enhancing communication through timely design

review meetings for the owner and consultants and regular project meetings for the owner, consultants, and contractor, the construction delay can be further reduced (Choong, 2018).

2. To identify the effect of road construction project performance in time, cost and quality dimension. In road construction projects of Addis Ababa City Road authority. The effects of delays in road building projects include time overruns RII value (0.914), cost overruns RII value (0.885) and quality problem overruns RII value (0.857). The average result of the three is the RII value of (0.885) the time-overrun effect has been found to have an impact on delays in road construction projects. Additional expenditures incurred because of the delay are the primary reason for the time-overrun effect's major impact on project delay time. Due to the prolonged delay in the project's completion, these additional expenditures also include greater labor and management costs. Additionally, the impact of the delay, such as time overruns cost overrun and quality-related problem. Although, the study conducted the subject Clients, contractors, consultants, and other stakeholders commonly view timely and within budget completion of a construction project as a key measure of project success (Luka & Muhammad, 2014).

## **5.2. CONCLUSION**

The construction sector is regarded as an important component of every economy in the world, and its importance and share of the gross domestic product are greater in developing countries than in developed countries. Road construction industries or infrastructure contributes more than other sectors to facilitating socio-economic growth and advancement in developing countries like Ethiopia. The country's economic progress may significantly be affected by investments in road transport. A well-established network of roads connects supply and demand, enhancing people's quality of life and promoting socioeconomic activity. Through building the infrastructure necessary for the development of other industries. The road construction sector significantly boosts the Gross Domestic Product (GDP) of those nations by generating jobs, providing a road network, social services, infrastructure, and markets. In general, the road construction business has an important impact on overall economic growth, agricultural growth, urban growth, and poverty alleviation in both urban and rural areas. As mentioned in the objective section, the primary objective of this study was to identify and evaluate the causes and effects of road construction project delays in the Addis Ababa City Road Authority. This led to the discovery of 32 sources of problems and the creation of a questionnaire survey to gather respondents' viewpoints on performance problems. The findings also demonstrated that the inclusion of AACRA and the following four stakeholders: the Water Supply and Sewerage Services Authority, Ethio Telecom, the Land Management Office, and the Ethiopian Electric Power Corporation, had a substantial influence on project delays. Finally, the result showed the main causes of delay and cost overrun, in that order, are client delay resulting from poor planning, site acquisition and construction delay, right-of-way, inadequate contractor supply of goods and equipment, and incomplete

design. In order to finish projects on schedule, for the estimated cost, and with the desired level of quality, remedies provided once the primary causes have been recognized (Tadewos, 2018).

### **5.3. RECOMMENDATION**

In summary, the following recommendations can be made to reduce delays in construction projects:

- To be able to avoid time overruns, budget overruns, and quality problems, the client must complete all site delivery requirements prior to the start of construction. The client must also properly evaluate the design submitted by consultants and bring the issue to a public debate before awarding construction work to a contractor. In order to minimize right of way and utility conflict issues, regulatory institutions and stakeholder groups should maintain regular communication with relevant parties to ensure project completion with specified time, cost, and quality. An independent organization with authority to coordinate all institutions involved in road construction can be established.
- Lack of materials on the job site is said to be a major cause of delays in the building of roads. To avoid delays brought on by a lack of materials, contractors should always keep an inventory of the materials on site to determine when they need to be replaced. Therefore, contractors should always make sure that materials are on site before they are used, notwithstanding challenges with project financing. Project viability must receive careful consideration when choosing contractors who have the resources necessary to complete the work on schedule.
- Monitor and closely oversee the contractor's work, and carry out routine inspections to identify problems quickly and expedite the review and approval of design documents and modification channels to avoid delays brought on by consultant approval. To prevent problems from arising, a thorough site assessment can be conducted during the design phase with an eye towards the actual field data. They ought to keep themselves



accountable for gathering precise data and choosing the most effective solution while working on the design. Consultants held highly accountable for project oversight and should deliver a finished project design with minimal room for variation.

- Communication and coordination with other parties are crucial components to completing the project on time because there are many parties participating in the project and the degree of dependency may be high.

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## APPENDIX-1

Date -----2023

No-----2023

### Research Questionnaire

**Dear participant,**

Dear participant, my name is ZerihunAytenfisu I am a student undertaking a Master of Arts Degree in Project Management at St.Mary's University. To fulfill the completion of this course, I am carrying out a study on the "Assessment causes &consequences of road project delay in the case: of Addis Ababa City Road Authority". I am inviting you to participate in this research study by completing the attached questionnaire. If you choose to participate in this research, please answer all questions as honestly as possible. In order to ensure that all the information will remain confidential, you do not have to include your name. The data will be for academic purposes only.

The questionnaire has three sections. The first section (Section I) consists of questions aimed at collecting General information (profile and experience in construction) of the respondents. The second section (Section II) is Assessment causes &consequences of road project delay in the case: of Addis Ababa City Road Authority. The third section (Section III) is focuses on the effect of the causes of delay of in Addis Ababa Road Authority.

Yours Sincerely,

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Advisor: AbebawKassie (PhD)

Addis Ababa

**General Instruction:** Please, tick “✓” in the appropriate columns for your response for closed - ended questions among the provided alternatives but write your response in the space provided for open-ended questions.

**Section I- Respondent Background**

1. Gender: Male ( ) Female ( )
2. Age: 18-30yrs ( ) 31-40yrs ( ) 41-50yrs ( ) 51-60yrs ( ) Over 60yrs ( )
3. Level of education: Vocational Training/Diploma ( ) Degree ( ) Masters ( ) PhD ( )
4. Respondent position in the company  
Project Manager ( ) Resident Engineers ( ) Supervisor ( ) Site Engineer ( )  
Contract Administration ( ) Project Coordinator ( ) Right of officers ( )  
Other, specify \_\_\_\_\_
5. Which of the stakeholder are you? (Please choose one).  
Client ( ) Consultant ( ) Contractor ( ) Others ( )
6. For how long have you worked in construction industry? (In Years)  
1-5 ( ) 6-10 ( ) 11-15 ( ) 16-20 ( ) 21 above ( )

**Section II:** General Instruction: Please, tick “✓” in the appropriate columns for your response for closed - ended questions among the provided alternatives but write your response in the space provided for open-ended questions. **Assess met Causes**

**of delay in road Construction projects in Addis Ababa Road**

**Construction**

1. Please tick the extent to which you believe that the following **Client** related factors that can contribute to assessment causes & consequences of road project delay in Addis Ababa Road Authority. Using the following scale:

1 very low; 2 Low; 3 Average; 4 High and ; 5 very high.

<b>Client related factors</b>	1	2	3	4	5
a) Right of way Casus					
b)Lack of coordination with the contractor and utility providers( Ethio Telecom, AWSSA & EEPC)					
c) Land Acquisition, Resettlement and Compensation Related Causes					
d) Local Authority (werda, sub city &Mire office)					
e) Delay in progress payment for Contractor					
f) Slow decision making process with stake holder					
g) Unrealistic contract duration and requirements imposed by owner					
h) Type of project bidding and award (selection based on least bidder)					
i) Change orders by owner during construction					
j) Poor communication & coordination of the owner with other parties					
k)Delay in delivering construction site to the contractors					
l) Envormentale Authority problem					

2. Please tick the extent to which you believe that the following **Consultant** related factors that can contribute to assessment causes &consequences of road project delay in Addis Ababa Road Authority. Using the following scale:

1 very low; 2 Low; 3 Average; 4 High and 5 very high.

<b>Consultant related factors</b>	1	2	3	4	5
a. Poor communication and coordination of the consultant with other parties					
b. Delay in inspection and testing by the consultant					
c. Lack of consultant's site staff					
d. Inadequate experience of consultant;					
e. Mistakes and discrepancies in design documents					
f. Poor contract management					
g. Delay in design documents preparation by consultant					
h. Inaccurate site investigation					

3. Please tick the extent to which you believe that the following **Contractors** related factors that can contribute to assessment causes & consequences of road project delay in Addis Ababa Road Authority. Using the following scale:

1 very low; 2 Low; 3 Average; 4 High and 5 very high.

<b>Contractors related factors</b>	1	2	3	4	5
a. Poor qualification of the contractor's technical staff					
b. Shortage of contractors' materials on site					
c. Mistakes during construction stage					
d. Inadequate contractor experience					
e. Difficulties in financing the construction project by the contractor					
f. Inadequate planning and scheduling of work by contractor					
g. Poor site management and supervision by contractors					
h. Contractors inefficiency in handling resources					
i. Weak in follow up the planned work schedule by the contractor					
j. Rework due to error during construction					
k. Poor communication & coordination of owner with other parties					
l. Poor project manager skills					

4. Please tick the extent to which you believe that the following **other** related factors that can contribute to assessment causes & consequences of road project delay in Addis Ababa Road Authority. Using the following scale:

1 very low; 2 Low; 3 Average; 4 High and 5 very high.



If you have comments regarding the causes of delay, please specify here: \_\_\_\_\_

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### Section III: Effects of Delay in Road Construction projects

1. Please rank effects of delay below in what you consider the most important effect of delay.

1 very low; 2 Low; 3 Average; 4 High and 5 very high.

Effects Of Delay	1	2	3	4	5
1. Time overrun					
2. Cost overrun					
3. Quality Problem					
4. Dispute between parties involved in sector & court					
5. Total & Underutilization of the project					

If you have comments regarding delay effects, please specify here: \_\_\_\_\_

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What is your general comment regarding causes of delays and their effect on the road construction project?

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Thank you very much for your contribution to this study!

## **APPENDIX -2**

### **List of Name of Organizations**

#### **Clients**

AACRA— Addis Ababa City Road Authority

#### **List of Contractors**

1. Aser Construction plc
2. Melcon Construction plc
3. Diriba Defersha General contractor
4. IFH Engineering Plc
5. Rama Construction Plc
6. Marcan Construction Plc
7. Fale Construction Plc
8. CCCC
9. EECC

#### **List of Consultants**

1. BEST Consulting Engineer“sP.l.c
2. Classic consulting engineersplc
3. Eng. Zewdie Eskinder & Co. plc
4. Core Consulting Engineering Plc
5. Unicon consulting engineersplc
7. Prominent consulting engineersplc
8. Gondwana consulting engineersplc
9. Frans National consulting engineers plc
10. CWC

**APPENDIX -3**  
**Ongoing Road Projects**



Figure 3. Kality Tulu Dimtu Road Project



Figure 4. Ararat Hotel Kotebe Road Project