ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE COLLEGE OF BUSINESS AND ECONOMICS

Factors Affecting Performance With Respect to Time and Cost of Road Construction Projects: The Case of Some Selected Ongoing Road Construction Projects in Addis Ababa

BY: Gerum Niguse Haile

ID NO: GSD/8444/12

ADVISOR: Abraraw Chane (PHD)

A Thesis Submitted to Addis Ababa University, College of Business and Economics, School of Commerce, for the Partial Fulfillment of Master of Arts in Project Management

JUNE, 2022

ADDIS ABABA

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June, 2022

Addis Ababa, Ethiopia

DECLARATION

I hereby declare that the thesis project work titled "Factors Affecting the Performance With Respect to Time and Cost of Road Construction Projects: The Case of Some Selected Ongoing Road Construction Projects in Addis Ababa" is the result of my own efforts and research, and that all sources of materials used in the study have been properly acknowledged. With the exception of my Research Advisor's help and suggestions, I created it entirely on my own. This study has not been submitted for a degree at this or any other university. It is available for partial fulfillment of the requirements for the Master of Art in Project Management degree.

Declared by: Gerum Niguse Haile

Date: ----------

Signature: ----------

STATEMENT OF CERTIFICATION

This letter certifies that Gerum Niguse Haile completed this thesis project under my supervision on the topic "Factors Affecting the Performance With Respect to Time and Cost of Road Construction Projects: The Case of Some Selected Ongoing Road Construction Projects in Addis Ababa." This work is unique, and it is sufficient for partial fulfillment of the requirements for the Master of Art in Project and Management degree.

Abraraw Chane (PHD)

Signature _____

Date _____

Addis Ababa, Ethiopia

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This is to Certify that the project work prepared by Gerum Niguse Haile, entitled: Factors Affecting Performance With Respect to Time and Cost of Road Construction Projects: The Case of Some Selected Ongoing Road Construction Projects in Addis Ababa submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Project Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by the Examining Committee:

External Examiner: _____ Signature: _____ Date: _____

Internal Examiner: _____ Signature: _____ Date: _____

Advisor: _____ Signature: _____ Date: _____

ACKNOWLEDGMENT

I dedicate this work to God Almighty, who made everything possible by providing me with the strength, health, courage, and inspiration I needed throughout my schooling, as well as to my sister, Lemlem, Niguse, and all of my family and friends for their guidance, support, and encouragement. My sincere gratitude also goes to Abraraw Chane (PhD), my thesis advisor, for his academic guidance during the project's completion. In addition, I would like to thank everyone who contributed to my thesis by contributing useful material and sparing their time by filling out the questionnaires.

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Acronyms/Abbreviations

AACRA: Addis Ababa City Road Authority

EOT: Extension of time

PMBOK: Project Management Guide

RII: Relative Importance Index

SPSS: Statistical Package for Social Science

WRT: With respect to

Abstract

Effective evaluation of performance with respect to time and cost of road construction projects should be present and given proper attention in order to attain the projects' goals. Otherwise, risk can manifest itself in a variety of ways, including time and expense overruns, financial losses, loss of life, environmental damage, material spending, and a variety of other failures.

This research aims to identify the key causes of the Addis Ababa road project's performance with respect to time and cost, and to provide a roadmap for future work in addressing this issue.

The study used a descriptive research design. The primary data was gathered using a well-structured questionnaire that was sent to the client's (AACRA), contractors', and consultants' professional staffs who are working on the selected ongoing road construction projects.

The major findings include;-The top seven factors causing poor performance wrt time of the selected road contraction projects are; - Delay to deliver the site (right of way problem); Poor awareness creation of the client to the local community and utility providers; Delay in the decision-making of the client; Delay to payment and finance problems of the client; the Shortage of material on the market; Contractors' Financial problems; and Inadequate planning & scheduling of Contractors.

While The top seven factors causing poor performance wrt cost of the selected road contraction projects are; - Delay to deliver the site (right of way problem); Change in scope of the project; Material price variations (inflation/escalation); Poor awareness creation of the client to the local community and utility providers; Delay to payment and finance problems of the client; Inadequate planning & scheduling of Contractors; and the Shortage of material on the market.

All the three stakeholder companies are recommended to improve their performance in order to complete the projects with short time and less cost overrun.

Key words: factors, performance, time overrun, cost overrun, ongoing road construction projects

CHAPTER ONE

1. INTRODUCTION

The study's background, problem statement, research questions, and objectives are all outlined in this chapter. In addition, the chapter covers the scope/delimitation, significance of the study, definition of operational terms and organization to the study. The detail is presented as follows.

1.1. Background of the Study

The construction industry involves the construction or refurbishing of buildings, infrastructures and civil engineering structures (Nyangwara & Datche, 2015). This sector is strategically important for all countries, providing the infrastructure and buildings on which all sectors of the economy depend. It is a huge and most complex industry consisting of different parties such as owners/clients which includes government, industry, private parties, and investors, consultants which include designers (architects) and construction monitors(engineers), contractors including field managers, supervisors, regulators and craftsmen (Habenom, 2017).

Many problems and complex issues in performance plague the construction industry. Project Performance is connected with numerous subjects and factors like time, cost, quality, client fulfillment, efficiency and safety. Performance has been defined in one sense as a participant's (client, consultant, or contractor) contribution to the execution of the task required to complete the project in construction, due to the large number of participants who contribute to the achievement of project objectives (Mullins, 1995).

An efficient Project performance fulfills the overall objectives by attaining the three critical success factors that are meeting the cost, time and quality requirements. Project completion on budget, time, within the specified quality and client satisfaction are often used as measures to determine the success of a project (Nyangwara & Datche, 2015).

Any construction project's failure is primarily due to issues and performance failure. Project performance is thus a serious issue in the construction industry (Pheng and Chuan, 2006).

Project performance issues can be caused by a variety of reasons and factors. Performance issues arise in large construction projects for a variety of reasons, according to Long et al (2004), includes incompetent designers/contractors, poor estimation and change management, social and technological issues, site-related issues, and improper techniques and tools. According to Shaban S.A, (2008) the construction industry performance problems in developing economies can be classified into three

layers: problems of shortages or inadequacies in industry infrastructure (mainly supply of resources), problems caused by clients and consultants and problems caused by contractor incompetence.

In Ethiopia, the current state of the construction industry falls short of meeting domestic and international quality standards and the performance demand expected from the sector (MoWUD, 2006). Most construction projects in the country experience time and cost overruns during their execution phase. The causes of delay, cost overrun and various other problems in the industry continue to cost the country economically.

Hence, it is precisely in this context that this study aims to determine the critical factors that affect the performance of the road construction works in Addis Ababa city. In particular, it aims to determine the critical factors affecting the performance with respect to time and cost of the construction work of some selected low performance with respect to time of ongoing road projects in Addis Ababa.

1.2. Statement of the Problem

For a country's growth and development, effective road infrastructure construction performance is critical. Successful construction industry is critical to a country's economic development. The construction industry is unquestionably a national asset, and its expansion and transformation should match the growth and change of a larger population. The physical infrastructure provided by the construction sector and its major actors also has an impact on a country's economic development. As a result, the construction sector must increase its capacity and delivery methods in order to satisfy social and economic development objectives.

According to the Addis Ababa City Road Authority (AACRA) Road Sector Development, delays in work projects result in budget increases and a delay in the project's benefit to the country. Projects managed by local and international contractors are prone to cost and schedule overruns for a variety of reasons.

This study tried to assess the causes of poor performance with respect to time and cost of the currently ongoing road construction projects in Addis Ababa city by selecting some low performing projects in terms of time.

These selected projects almost failed to attain the time of completion seated in the contract. The Extension time needed to complete these projects in turn has cost implication due to additional overhead and other costs. Delays in construction projects can lengthen schedule, increase in project costs and jeopardize quality and safety (González et al, 2013).

Chan and Kumaraswamy (2002) stated that construction time is increasingly important, since it often serves as a crucial benchmarking for assessing the performance of a project.

Therefore, this study assessed the factors affecting performance with respect to time and cost of the selected ongoing road project in Addis Ababa in order to assist owner, consultants and contractors to overcome performance problems and to improve performance of their construction projects.

The primary output of this investigation is to develop a suitable resolution way to mitigate the occurrence of the low performance with respect to time and cost of the selected ongoing road construction projects and minimize the risks of projects failure. It identified the critical causes of low performance with respect to time and cost, assess the severity of the causes and suggest the best practice mitigation of the low performance with respect to time and cost.

1.3. Research questions

This section encompasses questions that the researcher wants to ask for the base of this study. These are:

1. What are the client's related factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city?
2. What are the consultants' related factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city?
3. What are the contractors' related factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city?
4. What are the other external factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city?

1.4. Objective of the Study

1.4.1 General objective

The major purpose of this study is to identify the critical factors affecting performance with respect to time and cost of the ongoing road construction projects in Addis Ababa city and to recommend ways to mitigate the underperformance of projects to the major stakeholders.

1.4.2 Specific Objectives

The specific objectives of the study are:-

- To identify the client's related critical factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city.

- To identify the consultants' related critical factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city.
- To identify the contractors' related critical factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city.
- To identify the other external critical factors affecting the performance with respect to time and cost of the selected ongoing road construction projects in Addis Ababa city.

1.5. Significance of the Study

The outcome of this study will be useful to the major stakeholders in providing an in-depth perceptive of the factors that inhibit their projects' performance with respect to time and cost. The result of this study is also vital to other researchers by making contributions to literature with more data on the major factors that cause delay and cost overrun of road construction projects in Addis Ababa city.

1.6. Scope/ Delimitation of the Study

This study is geographical delimited to Addis Ababa city, five sub cities such as: Kolfe Keraneyo, Bole, Akaki Kality, Nifas Silk Lafto and Yeka sub cities on the road construction projects that are being undertaken until the recent time and that showed low performance in terms of time.

Table1. 1: List of selected under construction road projects in Addis Ababa city

No	Name of the project	Place of the project	Commencement date	Contract date of completion	Contract amount(birr)	Work progress as of March, 2022
1	Package 20 Kera Kebt Beret - Gofa Mebrat Hail Condominium Junction Road Project	Nifas Silk Lafto Sub City	4th September 2018	29th april 2022	214,851,545.37	61.15%
2	Package 37 Lot 1: Ring Road Junction Improvement Project Contract I: Imperial and Kadisco Intersection	Bole Sub-City	24th July 2020	15th April 2022	791,098,988.89	11.92%
3	Kality Ring Road - Kilinto Roundabout and Bole Bulbula Lot-2 Road Project	Bole and Akaki Kality Sub-City	13th March 2017	14th February 2022	2,334,287,098.27	73.87%
4	Package 36: Tuludimtu Condominium Access Road Project	Akaki Kality Sub-City	27 th May 2020	26th May 2022	185,517,842.15	24.11%
5	Fafa Food Factory - Dama Hotel-Beheretsigae-Sene Zetegn -Dbrezeyit Road	Akaki Kality and N/S/Lafto Sub-City (around Beheretsigae)	28th February 2019	3rd March 2022	294,694,946.04	20.89%
6	Package 37 Lot 1: Ring Road Junction Improvement Project Contract I:Saris Abo and Lebu Intersection	Nifas Silk Lafto Sub City	24th July 2020	14th February 2022	1,068,708,881.52	13.20%
7	Kality interchange Tulu Dimtu	Akaki Kality Sub City	10th April 2017	22nd September 2022	2,459,376,742.68	55.30%
8	Bole Michael Lot -3	Bole Sub-City	18th November 2019	10th October 2022	986,441,331.85	53.03%
9	Bole Bulbula Lot-2	Bole Sub-City	7th November 2017	26th March 2022	250,560,478.70	74.26%
10	Agusta Woyera Asphalt road project	Kolfe keraniyo(Agusta)	31th March 2020	1st October 2022	308,386,693.50	33.25%
11	Ararat Kotebe Lot 1Asphalt road project	Yeka Sub city	2nd May 2017	6th May 2022	272,937,090.30	70.00%

Source: AACRA May, 2022 projects' progress internal unpublished report.

Conceptually this study attempted to identify all the major critical factors that are hindering the performance (time and cost) of these selected ongoing road construction projects (projects that showed low performance in terms of time). It assessed the three major stakeholders' perspectives on the relative importance of factors affecting time and cost of these road construction projects.

1.8. Definition of Operational Terms

Project is a temporary endeavor undertaken to create a unique product, service or result" (PMBOK, 2017).

Performance: The accomplishment of a given construction project against the contractual cost, time and quality standards (Atkinson. R, 1999).

Client: Organization for whom the construction project is being undertaken (Fidic, 2006).

Contractor: A natural or juridical person under contract with an owner to construct the construction projects (Fidic, 2006).

Consultant: Legal Representative of the client that designed the project, supervising the construction works and carrying out contract administration (Fidic, 2006).

Stakeholder: Organization or individual who are actively involved in projects and whose interests may be negatively or positively affected in the courses of completion or execution of particular projects (Singleton, 2007)**.**

1.9. Organization to the Study

This study has five chapters. Chapter one contains; the introduction part, background of the study, statement of the problem, study objectives, research questions, significance of the study, scope of the study and delimitations of the study. In chapter two related literature reviews presented on the various aspects concerning factors affecting performance with respect to time and cost of road construction projects. In chapter three the following topics are illustrated; research design, research approach, study population, sample and sampling procedure, data collection and data collection procedures, validity and reliability of research instruments and data analysis techniques.

In chapter four the following topics are captured; data collection, analysis, presentation and interpretations. In chapter five the following topics are outlined; the summary of findings, conclusion and recommendations of the study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Introduction

This section covers review of related literature of different scholars and authors that have been reviewed in the area of construction projects with special focus on factors affecting performance of construction projects. It deals with both theoretical and practical findings of various researcher's concepts related to performance, performance in construction projects and factors affecting performance of construction projects. It deals with the review of related literatures gathered from different secondary sources such as published books, articles and related websites.

2.2. Theoretical Literature Reviews

2.2.1. Concept of a Project

Many project management scholars defined a project in different ways. Project is defined as a temporary activity performed to generate a unique product, service, or outcome, according to PMBOK (2017). A project is a short-term undertaking with a defined start and end date. To put it another way, the period is restricted but not necessarily small; the duration of a project is determined by the project type. Because projects are not ongoing, their duration is limited. Furthermore, 'temporary' does not usually apply to the project's product or services, as most projects are undertaken to produce a long-term result. The term "unique" refers to the fact that each endeavor is distinct in some way. Even though there are certain features that are repeated, the project is unique since it has a separate owner, design location, and amenities. Because each project's product is always unique in its own way, the repetitive nature of the elements has no bearing on the overall effort's fundamental uniqueness (Hackett et al, 2005).

Another Scholar Lewis (2005), described a project as a one-time assignment with precise beginning and finishing points, well-defined scope of work, a budget, and the ability to multitask. A project, according to Wysocki (2003), is a collection of distinct, complicated, and interconnected operations with a single objective or purpose that must be accomplished on time, on budget, and according to specifications.

2.2.2. Characteristics of a project

Project is different from programs and routine works. A Project has its own different characteristics that distinguish it from programs. According to Nicholas and Herman (2008), there are seven project characteristics:

1. A project has a single defined goal, end-item, or result, which is usually outlined in terms of cost, schedule, and performance.
2. Each project is distinct in that it necessitates doing something different than what has previously been done. Variables such as geography, access, zoning rules, labor market, public services, and local utilities make even ordinary undertakings like home construction unique. A project is a one-time action that will never be duplicated exactly.
3. Projects are short-term endeavors. The purpose of an ad hoc organization of individuals, material, and facilities is to achieve a goal, usually within a set time frame; after the goal is achieved, the organization is disbanded or reconfigured to work on a new goal.
4. Projects cross organizational boundaries because they require the skills and abilities of people from various professions and organizations. Project complexity is frequently caused by the complexity of advanced technology, which produces task interdependencies that might lead to new and unusual issues.
5. Because a project is different from past work, it entails some unfamiliarity. It may include new technology and have major aspects of uncertainty and risk for the entity doing the project
6. The organization usually has something at stake when doing a project. The activity may call for special scrutiny or effort because failure would jeopardize the organization or its goals.
7. Finally, a project is the process of working to achieve a goal; during the process, projects pass through several distinct phases, called the project life cycle. The tasks, people, organizations, and other resources change as the project moves from one phase to the next.

2.2.3. Project management

According to PMBOK (2017), Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management has 5 stages which are; initiating, planning, executing, controlling and closing. Project Management is the skills, tools and management processes required to undertake a project successfully (Jason Westland, 2006). James P. Lewis (2011) also shares this thought and states that, project management deals with people, tools and systems.

Effective project management is used to: Meet business objectives; Satisfy stakeholder expectations; Be more predictable; Increase chances of success; Deliver the right products at the right time; Resolve problems and issues; Respond to risks in a timely manner; Optimize the use of organizational resources; Identity, recover, or terminate failing projects; Manage constraints (e.g., scope, quality, schedule, costs, resources).

Poorly managed projects may result in: Missed deadlines, Cost overruns, Poor quality, Rework, Uncontrolled expansion of the project, Loss of reputation for the organization, unsatisfied stakeholders, and Failure in achieving the objectives for which the project was undertaken(PMBOK® Guide, 2017).

2.2.4. Construction Project

Construction is an action or a process of constructing. It contains a series of actions to produce either a new set of buildings, roads and other infrastructures or may involve alterations in the existing buildings, roads and infrastructures (Radosavljevic and Bennett 2012).

Construction projects is described by Chitkara (2005), as high-value, time-bound, and special construction missions with predetermined performance objectives.

The industry of Construction is complex in nature because it contains large number of project parties as clients, consultants, contractors, stakeholders, shareholders and regulators. The complexity and fragmented nature of this industry and its highly casual employment of labor makes it sensitive to poor contract performance (Helen. L and Steve. R, 2005).

2.2.5. Construction Project Performance

Different works of literature forward different conceptual definitions for the term performance. Armstrong (2006), noted Performance is often defined simply in output terms the achievement of quantified objectives. Eldanfour and Abushaiba, (2014) also stated the concept of performance as related to the success of an organization or project.

Project performance can be used to indicate the success of a construction project. But, the concept of project performance has not been clearly defined in the construction industry (Ingle and Mahesh, 2016). In construction projects, Performance is understood as the quality of the operation of a construction site, and also the successfulness of the site's operation (Salminen, 2005). However, the concept of project performance is being developed in many ways as criteria for appraising the success of a project (Arazi et al., 2011). But, there is no single uniform measure for project success, and the success criteria vary from project to project (Kylindri et al, 2012).

Construction projects are always measured at least by comparing achievements to project objectives, determined by budget/cost, schedule/time and quality requirements. Many research studies have been conducted to evaluate and improve performance in the construction sector. Traditionally, the industry evaluates its performance using three key indicators; time, cost, and quality (Atkinson. R 1999).

2.2.6. Problem of Performance in Construction Projects

Any construction project's failure is mostly due to issues and performance failure. Furthermore, there are other explanations and elements that contribute to this issue. According to Shaban S.A. (2008), problems in the construction industry in developing economies can be classified into three layers: shortages or inadequacies in industry infrastructure (primarily resource supply), problems caused by clients and consultants, and problems caused by contractor incompetence/inadequacy.

Performance measurement or evaluation has been a source of concern for a number of nations at various stages of socioeconomic development, all of which have recognized the need to enhance the performance of their construction industries (Kingsley A. N. 2010). Low productivity, delays, cost overruns, poor quality, and other issues were noted by Navon (2005). Poor project performance has been identified as the scourge of various countries' construction industry, particularly those in emerging countries.

The performance of international construction projects is influenced by more complex and dynamic factors than domestic projects, and they are frequently exposed to serious external uncertainties such as political, economic, social, and cultural risks, as well as internal risks from within the project (Ling et al, 2007).

2.2.7. Project Time

According to Chan (2001), project time is defined as the duration that is needed to complete the work starting from site handover until finished.

Time overrun is a delay beyond the baseline construction schedule. Time delay frequently occurs in all phases of a construction project and consequently increases the project’s total duration (Aftab, 2011). Moreover, Stumpf (2000) also defined delay as an act or event that extends the time required to perform the tasks under a contract.

Time overrun may be caused by various reasons such as poor site management, factors related to environmental conditions and supervision, which can affect productivity. Various researchers have highlighted several factors affecting project time (Aftab, 2014).

2.2.8. Project cost

The project cost, according to Chan (2001), is the amount of money necessary to accomplish all project operations. Project performance with respect to cost evaluates the degree to which the general conditions promote the completion of a project within the estimated budget (Bubahit and Almhawis, 1994). Cost is an amount that is provided for all works of a construction project. However, Cost is not only confined to the tender sum or the contract sum only, it is the overall cost that a project incurs from inception to completion. Therefore it includes any costs arising from fluctuations, variations, any modification during construction and the cost created by legal claims, such as litigation and arbitration. When this project cost exceeds the initial contract or tender sum due to these additional costs, the term 'cost overrun' is often used (Chan, 2001).

Cost overrun is defined as the excess of actual project costs over budgeted costs. It is the difference between the construction project's final cost at the completion of the project and the agreed amount in the contract between two parties (client and contractor). According to Chan (2001), cost overrun is the amount by which actual costs exceed the baseline or approved costs.

2.3. Empirical research review

2.3.1. Factors affecting project performance

A number of research on factors impacting project performance have been conducted in various nations throughout the world. The following are some of them summarized.

Incorrect planning, poor financial control on-site, fraudulent practices and kickbacks, lack of coordination between designers and contractors, wastage on-site, previous experience of the contractor, and frequent design changes are among the factors affecting the cost and quality of construction (Jamaludin, et al., 2014).

Amusan (2011) investigated the elements that influence performance with respect to cost of Nigerian construction sites. The investigation revealed that project complexity, contractor inexperience, insufficient planning, inflation, frequent variation orders, project shortening, change in project design, and fraudulent practices were all key causes in cost overruns.

The construction industry is the means through which a society realizes its urban and rural development goals. It's a sector that contributes to a country's economic growth. The building business follows the wider economy and responds quickly to changes (Abdullah, 2013). Schedule and resource-driven industries are among the most complicated and fragmented enterprises. The fundamental criterion for project success in the construction sector is project completion on schedule (Aftab, 2011).

The failure of a construction project is primarily due to issues and poor performance. There are a variety of causes and variables that contribute to such issues. According to Ogunlana et al. (1996), the construction industry performance challenges in emerging nations can be divided into three layers: shortages or inadequacies in industry infrastructure (primarily resource supply), client and consultant problems, and contractor incompetence/inadequacies. Okuwoga (1998) discovered a link between poor budgetary and time management and low performance. According to Long (2008), performance issues develop in large construction projects for a variety of reasons.

The inability to finish projects on schedule, on budget, and to a high standard of quality continues to be a global issue (Ahmed et al., 2000). According to Azhar and Farouqui (2008), time and expense overruns are a typical occurrence around the world. When it comes to construction projects in Ethiopia, the majority of them have experienced time and expense overruns, which has raised a lot of concern (Becker and Behailu, 2006).

Construction projects frequently fail to meet their objectives in terms of quality, cost, and timeliness. Due to factors such as construction complexity, the presence of various interest groups such as project owners, end-users, consultants, contractors, and financiers; materials, equipment, project funding; the climatic environment; the economic and political environment; and statutory regulations, only a small percentage of projects are completed on time, on budget, and with high quality. Most construction projects experience time and expense overruns, and the severity of these overruns varies greatly from project to project. To prevent and avoid delays, poor quality, and rising costs in any construction project, it is critical to identify the actual causes of low quality, schedule, and cost overruns (Ahmed et al., 2000).

2.3.2. Client Related Factors Affecting construction Performance

Client-related issues have been found as a cause of lower construction project performance in multiple studies conducted by various academics. Chabota *etal.* (2008), detected financial issues and contract change relates to poor performance. Late interim payments by the client to the contractors is the major factor that hinders the performance of the projects.

Murali *et al.* (2007), also found that owner intervention, unrealistic contract term, sluggish decision-making, and enforced restrictions all led to worse performance. Client type, lack of timely decision-making, unrealistic enforced contract, and client-initiated modifications are all factors that lead to lower performance, according to Fong et al (2006). Change or variation orders, delays induced by the owner,

and oral change orders by the owner are all factors that lead to worse construction project performance, according to Essam (2006).

Sadi et al. (2006) also identified factors such as the owner's delays in furnishing and delivering the site to the contractor, change orders by the owner during construction, the owner's lateness in revising and approving design documents, poor communication and coordination by the owner and other parties, the owner's slow decision-making process, conflicts between joint-ownership of the project, and the contractor's lack of incentives for finishing ahead of schedule.

According to Abdalla et al. (2002), the owner's meddling, sluggish decision-making, and unrealistic contract term all lead to inferior performance. Delays in site preparation and contractor claims settlements were identified by Sweis et al. (2007), as well as work suspension by the owner, too many change orders from the owner, slow decision-making by the owner, inference by the owner in the construction operations, and delay in progress payments by the owner. Therefore, there are a lot of factors from the previous study that causes the lower performance in a construction project.

2.3.3. Consultant Related Factors Affecting construction Performance.

In the construction industry, the consultants' team is responsible for safeguarding the client's interests, and if their responsibilities are not met, it will have a negative impact on the client's interests. Consultant -related issues have been found as a cause of lower construction project performance in multiple studies conducted by various academics. Aibinu and Odeyinka (2006) emphasize that inadequate supervision, late issuance instructions, incomplete drawings and inadequate site inspections are among consultants' related delay and cost overrun factors. Testing delays, delays in authorizing scope-related adjustments, poor coordination and communication between other project stakeholders, late evaluation and approval of the design document, and involvement of unskilled consultants are just a few factors.

The main factors influencing the cost of highway projects in Australia, according to Creedy (2005), are changes in design in various components, changes in contract tender price, quantity increased measure, latent condition, removal and replacement of unsuitable material due to faulty design, and change in design.

Low construction performance with respect to time and cost is caused by factors such as late design document revisions, delays in approving shop drawings and sample materials, poor communication and coordination by consultants and other parties, slow decision-making, and conflicts between joint-ownership of the project, according to Sadi et al. (2006).

According to a study done in china by Long (2008), low-competence designers are the cause of design errors or poor design. Especially with government-funded projects, the approved design or drawing process becomes low-quality and unproductive. The unrealistic design discovered after the commencement of construction projects must be changed, which may result in cost overruns.

Construction consultants in Addis Ababa are performing averagely and unsatisfactorily during the feasibility, construction, and contract administration stages, according to a study conducted in Addis Ababa by Nuhamin (2018), demonstrating a lack of professional diligence and commitment. The lowest outcomes of all the phases were in construction and contract administration, indicating that this area of service requires special attention. This is in line with other studies on the current situation of the local construction industry, which has a slew of issues stemming from inadequate supervision and contract management, including quality issues, cost and time overruns, and so on.

Furthermore, Nuhamin (2018) found that, while most consultants have good cultures in terms of staffing, progress reports, and client relationships, they demonstrate vulnerability when it comes to essential people being placed on a defined project. General management abilities, quality management skills, and relationships with contractors and other consultants are all areas where consultants can improve. Furthermore, the researcher discovered a significant gap between consultants' obligations and actual performance in terms of safety requirements, proactive problem solving and avoidance throughout the project's life cycle, financial and schedule management, and environmental difficulties.

2.3.4. Contractor Related Factors Affecting construction Performance

Several studies by various experts have highlighted contractor-related variables as contributing to poor project performance. Murali et al. (2007) found factors that contribute to worse project performance, such as the inappropriate planning contractor, poor site management, and inadequate contractor experience with subcontractors. Subcontracting issues, contractor inefficiency, contractor financial troubles, and poor quality of contractor's work are all factors that contribute to low project performance, according to Essam (2006).

According to Yaw et al. (2003), poor planning and scheduling, errors in cost projections, and construction errors all lead to poor project performance. Factors such as the subcontractor, site management, construction method, inappropriate planning, and insufficient contractor expertise, according to Abdalla et al. (2002), contribute to low project performance.

Sadi, et al. (2006) identified factors related to the contractor's ineffective project planning and scheduling, conflicts in subcontractors' schedules during project execution, conflicts between the

contractor and other parties (consultant and owner), rework due to errors during construction, poor site management and supervision by the contractor, poor communication and coordination by the contractor with other parties, and improper construction methods used by the contractor. Sweis et al. (2007) also identified factors such as a lack of contractor administrative personnel, poor project planning and scheduling by the contractor, a shortage of technical professionals in the contractor organization, insufficient coordination among the parties by the contractor, a delay in mobilization, a failure to follow safety rules and regulations within the contractor's organization, incompetent technical staff assigned to the project, and improper technical staffing.

2.3.5. Other External Factors Affecting construction Performance

Several studies by various experts have highlighted external environment-related factors as contributing to poor project performance with respect to time and cost.

The environment around the project might create delays and cost overrun in the construction process. These external elements are outside the project team's control and affect the project's success. Weather-related construction delays, subsurface conditions, governmental laws and regulations, and delays in getting licenses and approvals are all factors that affect the construction timeline (Jackson, 2010).

Sadi et al. (2005) found that a lack of construction materials in the market, changes in material types and specifications during construction, delays in material delivery, damage to sorted materials when they are urgently needed, delays in manufacturing special building materials, late procurement of materials, and late selection of finishing materials due to the availability of many types in the market all contribute to lower construction performance.

According to Omoregie and Radfort (2006), pricing variance is the primary source of construction project cost increases. This might be due to currency restriction, which has an impact on construction material pricing as well as the total price level. Another aspect is the imbalanced inflationary tendency, which occurs when demand exceeds supply, resulting in a lack of products, which leads to an increase in the price of commodities.

Another research work by Murali et al. (2006) found that a lack of high-quality materials on markets contributes significantly to the poor performance of construction projects.

Natural factors such as landslides, floods, and earthquakes, as well as the availability of construction materials supplies, local infrastructure, conflicts with neighbors, importation restrictions, can all impact the project's performance.

Important factors such as the effects of relevant political, legal, and economic systems, market conditions, the importance of completing the project on time, the form of and division of responsibilities and liabilities, specific location, weather and environmental concerns, level of technological advancement, project life span, project value, and project quality are all left out, according to Cho (2009).

Moreover, in their study in Kenya, Oguya.S.A and Muturi.W (2016), discovered that inter-community and inter-clan conflicts, compensation and resettlement legal challenges, insecurity (armed robbery and terrorism), and a lack of goodwill by local people have all contributed to poor project performance.

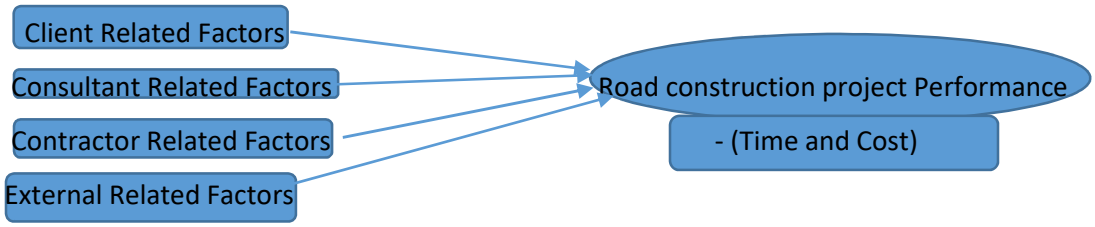
External factors such as construction materials, labor force market, and natural factors such as acts of God, weather conditions, government institutions such as educational institutions that do not produce skilled educated personnel for the labor market, and so on all influence the performance of construction projects. All of these elements create situations that have an impact on project performance in some way, notably delays.

2.4. Conceptual framework

A conceptual framework is a visual representation that is used to create conceptual differences and bring together diverse ideas in a financial setting (Mulder.P, 2017).The frame work of this study is as shown in pictorial diagram below.

Based on the projects' poor performance with respect to time and cost, this study classified the causes of the poor performance by classifying client, consultant, contractor, and external environment-related factors for poor performances with respect to time and cost. This concept is shown diagrammatically in the figure below.

Figure 2. 1: Conceptual frameworks



Source- Self developed from the study specific objectives

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter encompasses the elements of methodology that will be applied in this study. It covers research design, research approach, study population, sample and sampling procedure, sources of data, data collection tool and data collection procedures, validity and reliability of research instruments and data analysis techniques.

3.2. Research Design

A research design, according to Morgan (2007), is a procedure that helps the researcher to comprehend the relevance of the study and the processes that will be involved. It's a master plan that lays out the techniques and procedures for gathering and evaluating the data.

The major types of research are; Descriptive, Explanatory and Exploratory /Formative Research. According to cooper and Schindler (2008), a descriptive research design involves laying a major emphasis on establishing the nexus between study variables.

Therefore, this study work is designed with descriptive type of research design. The descriptive study will allow the researcher to describe the collected data and helps to know the event that was taken place.

3.3. Research Approach

Research can use quantitative, qualitative, or hybrid methodologies depending on the type of data used. Quantitative research is employed in studies that need the measuring and counting of qualities that are highly dependent on the measurement equipment or instrument used. The method entails the collection of quantitative data that may be submitted to formal and stringent quantitative analysis (Kothari, 2004). It is also frequently focused with obtaining evidence to support or refute a hypothesis including ideas to be assessed.

Hence, this study found the quantitative method appropriate to investigate the factors affecting the performance of road construction projects with the selected variables obtained through in-depth literature review in line with the specific objectives of the research.

3.4. Target Research Population

A population, according to Kothari (2004), is the number of units or things that have comparable characteristics. The entire collection of units for which the research information will be used to make

conclusions is referred to as the target population for a survey. The target population, in this context, refers to the groups of people to whom the survey's conclusions are meant to apply (Paul, 2008).

The target population for this study includes construction professionals working in the selected low performing ongoing road construction projects. These includes the client/AACRA's, consultants' and contractors' professional staffs that are currently working on these selected ongoing road construction projects. The total population of this study is 164 professional employees from the three major stakeholders. These includes: 10 AACRA/Client staff (includes: counterpart Engineers and team leaders), 66 consultants' project staff (includes: Resident Engineers, Quantity Surveyors, draft persons, Surveyors, Material Inspectors and Structural Inspectors) and 88 contractors' project staff (includes: Project managers, Quantity Surveyors, draft persons, Surveyors, Site Engineers, Material Engineers, Structural Engineers, Office Engineers).

3.5. Sampling Design

Sampling is the process of selecting a subset of a population to represent the entire population, with the results representing the rest of the group. Choosing a sample has the benefit of being less expensive and time-consuming than collecting data from a large group of people. The sample size for our survey will normally be determined by the population size. The sample size formula is used to compute the sample size. This formula was used to get results that accurately reflected the intended population. The researcher used to estimate the sample size of the population in the selected ongoing road projects using the sample size estimation formula below. The formula is set forth by (Yemane, 1967). According to Yamane T. (1967) sample size for this project work can be determined by using Eq. 3.1 below;

$$n_o = N/(1+N*e^2) \quad \text{.....(Equation 3.1)}$$

Where: n_o= Sample size;

N = population size; and,

e = precision or error limit.

Picking a confidence level of 95% (*e becomes 5%*), $e = 0.05$ and with N being 164, sample size for total respondents becomes;

Since the number of professionals from the client is not large, census method is used. The samples for contractors and consultants employees is calculated as follows:

Sample size for contractors' staff:

$n_o=88/(1+88*0.05^2)=88/1.22=$**72**

Sample size for consultants' staff:

$n_o=66/(1+66*0.05^2)=66/1.165=$**57**

Therefore, a total of **139** questionnaires are distributed purposively to the construction professionals (the three major stakeholders' staffs (**10** client's staff, **57** consultants' staff and **72** contractors' staff) that are currently working on the selected road construction projects.

3.6. Sampling technique

Purposive or judgmental sampling allows us to apply our judgment to choose samples that will help us answer our research questions and achieve our research goals (Saunders, et al, 2009). As a result, the this study hypothesized that including the project management team and engineering professionals as respondents would offer the essential information on the factors influencing the performance of selected active road construction projects in Addis Ababa. Thus Purposive or judgmental sampling technique is used to distribute the survey questionnaires to acquire participant's perception towards the factors that affect the performance of the road construction works.

3.7. Data Source and Type

The data sources used for this study are from both primary and secondary sources. Primary data is first-hand data or information gathered by researchers on a particular subject in order to analyze a specific problem or answer a specific question.

For this study the primary data is collected from the major stakeholders (client, consultants and contractors) professional staff that are participating in the ongoing road projects through the questionnaire that is distributed to the respondents. Therefore the primary data is gathered using a structured questionnaire.

In utilizing secondary sources, the client's ongoing road projects' report of May, 2022 document is reviewed.

3.8 Data collection Method

A questionnaire that contains important variables that are selected based on a detailed literature review and contextual investigation is prepared. A preliminary questionnaire prepared is distributed to some stakeholders to fill in the form by including additional information that they think worth to be included

in our context. The final questionnaire is then prepared and distributed to respondents while they are at the project site and at their individual offices.

The developed questionnaire contains two parts. The first part is devoted to the professional employees profile data. The second part contains questions related to the factors that affecting performance with respect to time and cost of the ongoing road construction projects. The respondents response is measured on a five Likert rating scale where: Strongly Agree (SA) = 5; Agree (A) = 4; Neutral (N) =3, Disagree (D) = 2; and Strongly Disagree (SD) = 1.

The Questionnaire developed is distributed purposively to the professionals by kindly asking their willingness to fill the Questions.

3.9 Data Analysis and Presentation

In order to have the required result, this study used descriptive statistics in terms of percentages, mean score, standard deviation, tables and graphs to analyze and present the data collected through the questionnaire.

The data obtained from the questionnaire survey used a Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) and it is analyzed to determine the relative importance of various factors that contribute to poor performance with respect to time and cost of the ongoing road construction projects in Addis Ababa.

Primary data were collected and analyzed quantitatively using Statistical Package for Social Science (SPSS 25.0) to determine the factors that contribute to project delays and cost overrun of the projects based on respondents' opinions. The sources of data were the main parties in the construction namely; owner/ client, contractor and consultant.

The Relative Important Index (RII) technique was used to rank and categorize identifiable factors based on their level of contribution. It used to determine the rank of factors that are affecting the ongoing road construction projects performance based on the respondents' opinions. Finally the result of the data analysis is presented by using tables, figures and charts. The rank of each delay and cost overrun factor was calculated using the equation:

$$RII = \sum \frac{W}{A * N}$$

W ≡ is weight given to each factor by the respondents.

A ≡ is highest weight.

N ≡ is the total number of respondents.

Note: $0 \leq RII \leq 1$.

The RII is used to rank (R) the different factors that are causing time and cost overrun of the ongoing road construction projects. The relative relevance of the elements as judged by the three groups of respondents compared using these rankings. Each factor's RII perceived by all respondents were used to assess the general and overall rankings to give an overall picture of the factors of the road construction delays and cost overrun in Addis Ababa. The rank of each item was then determined using the indices (RII).These rankings made it possible to cross compare the relative importance of the elements as perceived by the three groups of respondents. Each item's weighted average for the three groups of respondents is calculated, and rankings (R) are assigned to each item to indicate the three groups' perceptions.

3.10 Reliability

This study assured data quality in all procedures in order to meet the requirements of the objectives of the study. Cronbach's Alpha is a measure of internal consistency of survey questions that determines if the questions have been understood and the data is valid for analysis (Travakol & Dennick, 2011). Therefore, Cronbach's Alpha reliability test is applied in this study on the data that is gathered through the questionnaire to determine the reliability of the data.

Table 3. 1: Reliability Test Cronbach's Alpha Results

Indicators	Number of items	Cronbach's Alpha
Client related time factors	11	0.813
Consultants related time factors	10	0.812
Contractors related time factors	14	0.884
External related time factors	13	0.910
Client related cost factors	11	0.949
Consultants related cost factors	10	0.966
Contractors related cost factors	14	0.978
External related cost factors	13	0.922

Source: Own Survey (2022)

3.11 Validity

The degree to which the conditions of scientific research technique will be followed throughout the process of creating research findings may be defined as research validity. Validity is a prerequisite for a variety of investigations, according to Oliver (2010). There are various types of research validity. Content validity, criterion-related validity, construct validity, internal validity, external validity, concurrent validity, and face validity are the major categories of study validity defined by Cohen et al (2007).

This study tested the content validity. Therefore the questionnaire is evaluated by the internal advisor of this research paper and some professionals working on the construction projects.

3.12 Ethical Considerations

This study made clear that the respondents of the questionnaire to stay obscure and clarification is made on how the information will be gathered and how the data will be utilized. The study took all the fundamental measures to guarantee that every moral aspect of the study process is followed. In particular, the study put forth attempts to guarantee that the respondents comprehend that their interest in the study process is on a voluntary basis, and that they can withdraw whenever of they want. Moreover, the study also took all the appropriate measures to guarantee that all the respondents' identity is kept anonymous.

CHAPTER FOUR

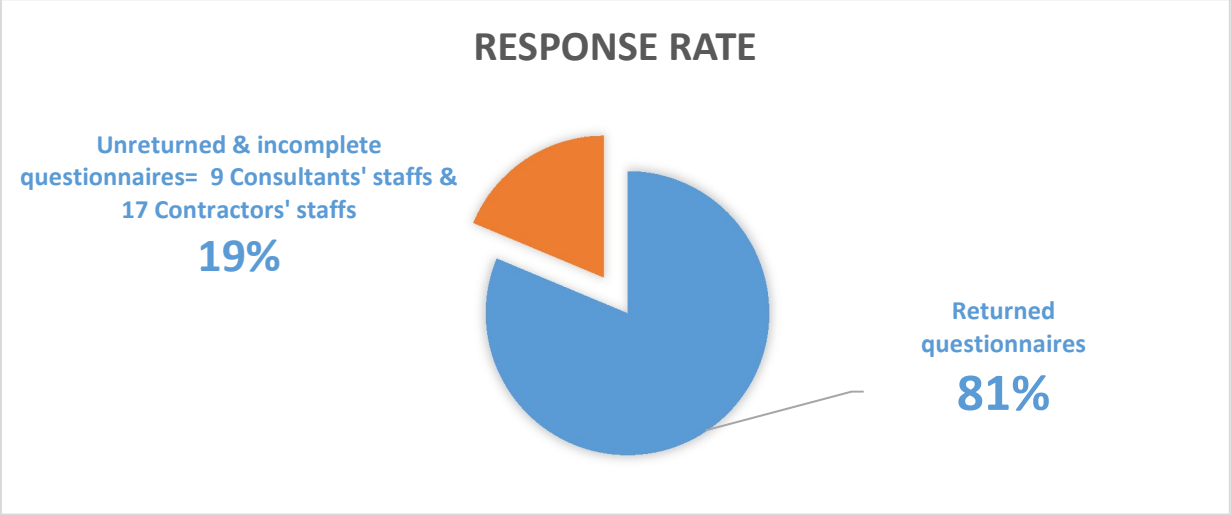
4. RESULTS AND DISCUSSIONS

4.1. Introduction

The purpose of this study was to assess the performance with respect to time and cost of the selected currently underway road construction projects in Addis Ababa. To achieve this broad goal, the study used a questionnaire to collect data from the project's primary stakeholders: the client, consultants' and contractors' professional staff. Thus, this chapter deals with analysis, presentation and interpretation of data obtained through questionnaire. The results of the study are presented in the form of figures and tables by using excel and Statistical Package for Social Science Version 25 (SPSS-25).

4.2. Response Rate

Figure 4. 1: Response rate



Source: Own field survey 2022

The questionnaires were distributed for 139 participants. 113 questionnaires that is 81% of the total is filled completely and returned back. This accounts: 55 questionnaires from Contractors' staff, 48 questionnaires from Consultants' staff and 10 questionnaires from Client's staff. However, 19 (14%) of the participants did not return the paper and 7(5%) participant response were incomplete and thus rejected. This made a non-response of 19%.

Thus, the study realized a response rate of 81% as shown in the figure 4.1 above. According to Babbie (2004), who said that return rates of 50% is acceptable to analyze and publish, 60% is good and 70% is very good, this study's response rate is good.

4.3. Demographic characteristics

Description of the characteristic of the target population gives some basic information about the sample population involved in the study. Thus, the following tables contains about Company membership, gender, age, work experience and educational level of respondents in the study area.

Table 4. 1: Profile of Respondents

S.N	Variance	Type	Frequency	Percent %	Cumulative Percent %
1	Organization Membership	Client	10	8.8	8.8
		Consultant	48	42.5	51.3
		Contractor	55	48.7	100
		Total	113	100	
2	Gender	Male	76	67.3	67.3
		Female	37	32.7	100
		Total	113	100	
3	Age	21-30	15	13.3	13.3
		31-40	60	53.1	66.4
		41-50	36	31.9	98.2
		>50	2	1.8	100
		Total	113	100	
4	Educational status	Diploma	9	8	8
		First Degree	78	69	77
		Second Degree	26	23	100
		Total	113	100	
5	Work Experience	5 and below	20	17.7	17.7
		6-10 years	37	32.7	50.4
		11-15 years	21	18.6	69
		Above 15 years	35	31	100
		Total	113	100	

Source: Own Survey, 2022

The study was conducted by using client, consultant, and contractors. The general description about the respondents is presented in Table 4.1 above by using descriptive statistics such as frequency and percentages. The general information assessed about the respondents includes Organization Membership, gender, sex, education and working experience.

As presented in Table 4.1 above, majority of the respondents were at age level of 31 to 40 years that include 53.1% of the respondents. This group of respondents is followed by age group of 41-50 years that includes 31.9% of the respondents. The smallest group of the respondents was at age level of above 50 years. Another information collected is sex of the respondents. Majority of the respondents were male that include 67.3% of the respondents. But only 32.7% of the respondents were females. The study identified three levels of education of the respondents; Diploma, bachelor's degree and master's degree that comprise8%, 69 % and 23% of the respondents respectively. Majority of the respondents have work experience of 6– 10 years that includes the experience of 32.7% of the respondents. Following these group of respondents, 31% of respondents have experience of above 15 years, and 18.6% of the respondents have work experience of 10-15 years. But only 17.7% of the respondents have work experience of less than 5 years.

The survey result about the background of the respondents suggests that these selected projects of AACRA are being done by educated and experienced employees.

4.4. Factors Affecting Projects Performance with respect to time and cost

Based on the projects' poor performance with respect to time and cost, this study classified the causes of the poor performance by classifying client, consultant, contractor, and external environment-related factors for cost overrun and time delay. This portion of the study shows the findings of the data analysis on the factors that contributed to the projects' poor performance.

4.4.1. Factors Causing Poor Projects Performance with respect to time

Cost overrun and time delay are employed as measures of project performance in this study. The factors that causes of poor project performance with respect to time are discussed in this section. The study classified 48 factors that causes of poor project performance with respect to time into four categories: client-related, consultant-related, contractor-related, and external environment-related aspects, based on previous researches and literature review. The impact of these factors is ranked and given in the tables below based on mean score and relative importance index values.

4.4.1.1.Client Related Factors Causing Poor Project Performance wrt time

The study looked at 11 client-related factors that might lead to a poor project performance with respect to time. The survey results on client-related variables that may cause poor project performance with respect to time are described in Table 4.2 below using mean score, relative importance index and rank.

Table 4. 2: Summary of Client Related Factors that Cause Poor Project Performance wrt time.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Poor awareness creation to local community and utility providers.	4.1	0.82	2	4.792	0.958	3	4.782	0.956	2	4.726	0.945	2
Delay to deliver the site(right of way problem)	4.6	0.92	1	4.896	0.979	1	4.964	0.992	1	4.903	0.980	1
Late in revising & approving of relevant documents	3.9	0.78	3	4.396	0.879	6	4.036	0.807	8	4.177	0.835	7
Delay to payment and finance problem	3.4	0.68	8	4.813	0.963	2	4.382	0.876	5	4.478	0.896	4
Delay in decision-making	3.5	0.7	7	4.625	0.925	4	4.618	0.924	3	4.522	0.904	3
Poor management of the contract	3.6	0.72	5	4.479	0.896	5	4.218	0.844	7	4.274	0.855	6
Change in scope of the project	3.7	0.74	4	3.688	0.738	8	4.291	0.858	6	3.982	0.796	8
Award to list bidder	3.6	0.72	5	3.271	0.654	10	3.273	0.655	11	3.301	0.66	10
Poor coordination with utility offices	3.1	0.62	9	4.396	0.879	6	4.527	0.906	4	4.3451	0.869	5
Poor communication and management	2.9	0.58	10	3.6041	0.7208	9	3.946	0.7890	9	3.708	0.7415	9
Insufficient contract period	2.7	0.54	11	1.604	0.321	11	3.855	0.771	10	2.797	0.559	11

Source: Own Survey, 2022

According to the result from the survey, the first major cause of poor project time performance related to the client is the delay in delivering the site (right of way issue), which is one of the most crucial elements that causes poor project time performance. It is ranked first by all the three stakeholders of the projects, with a mean score of 4.90 and RII of 0.98. This means that the projects are behind schedule mainly because of right-of-way issues in the projects area.

Following the right of way problem, poor awareness creations to local community and utility providers is ranked 2nd with mean score of 4.73 and RII of 0.95. According to the response of consultants it is third reason for project delay but it is ranked as 2nd important reason by contractors and client.

The third and fourth factors are delay in decision-making; and delay to payment and finance problem of the client respectively.

4.4.1.2.Consultants Related Factors Causing Poor Project Performance wrt time

The second group of factors causing poor project performance with respect to time of the projects is consultants'-related factors. The survey result about consultants' related factors are summarized and presented in table 4.3 below.

Table 4. 3: Summary of consultant Related Factors that Cause Poor Project Performance wrt to time.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Consultant's inexperience	3.000	0.5800	9	1.833	0.367	10	3.4	0.6800	10	2.699	0.5380	10
Absence of consultant on site	3.000	0.6000	7	1.8958	0.3792	9	3.6	0.7200	7	2.823	0.5646	9
Delay in the approval of working drawings	3.500	0.7000	3	4.208	0.842	1	4.291	0.851	1	4.186	0.8336	1
Lack of practical (working) knowledge by the consultant	3.200	0.6400	6	1.9583	0.3917	8	3.8909	0.7782	5	3.0088	0.6018	8
Contract management problems	3.400	0.6800	4	3.625	0.725	7	3.509	0.702	9	3.549	0.7097	6
Spent time for approval of test and inspection	3.000	0.6000	7	3.917	0.7833	4	4.073	0.8145	3	3.912	0.7823	4
Design error	4.000	0.8000	1	3.917	0.783	4	4.2	0.84	2	4.062	0.8124	2
Frequent design change	2.900	0.5800	9	3.583	0.733	6	3.982	0.709	8	3.717	0.7080	7
Incomplete design at the time of tender	3.400	0.6800	4	4.104	0.8167	3	3.727	0.7455	6	3.858	0.7699	5
Lack of coordination with consultants' staffs	3.700	0.7400	2	4.104	0.821	2	4.055	0.8109	4	4.044	0.8089	3

Source: Own Survey, 2022

Among the consultant related factors, Delay in the approval of working drawings 1st with mean score of 4.186 and RII of 0.8336. It is ranked 1st based on responses of contractors and consultant and ranked 3rd based on the responses of the client.

The second most important consultant related factor for time delay is Design error committed by consultants. It is ranked 2nd with mean score of 4.062 and RII of 0.8124. This problem is mainly indicated by client who ranked it 1st consultant related problem with mean score of 4.00.

Lack of coordination with consultants' staffs is ranked 3rd based on the overall results. It is ranked 2nd by the client and consultants, 4th by the contractors.

Spent time for approval of test and inspection is among the important factors that caused time delay of the projects. It is ranked 4th with overall mean score of 3.912 and RII of 0.7823. It is ranked 3rd by contractor, 4th by consultant and 7th by client with mean scores of 4.073, 3.917and 3.000 respectively. This suggests spent time for approval of test and inspection is increasing time delay of the projects.

Finally, Incomplete design at the time of tender is ranked 5th with mean score of 3.858 and RII of 0.7699, indicating that incomplete design at the time of tender is resulting on project delay. It is ranked 3rd by consultants, 4th by the client and 6th by the contractors.

4.4.1.3.Contractors Related Factors Causing Poor Project Performance wrt time

Performance of contractors is another important factor for poor performance with respect to time of projects. Performance of the contractor is assessed by using 14 factors. The summary of contractor related factors that cause poor performance with respect to time of the projects is presented in Table 4.4 below.

Table 4. 4**:** Summary of Contractors Related Factors Causing Poor Project Performance wrt to time.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Conflicts with sub-contractor	2.700	0.540	13	4.021	0.804	9	3.546	0.709	5	3.673	0.735	7
Project management problem	3.900	0.540	13	4.292	0.858	6	3.655	0.731	4	3.947	0.768	6
Poor construction methodologies	3.400	0.680	9	4.458	0.892	4	3.436	0.687	7	3.867	0.773	4
Lack of construction experience/ability	3.700	0.740	6	3.771	0.754	12	2.382	0.476	14	3.089	0.618	14

Lack adequate Health and safety for employees at the projects site	3.800	0.760	5	3.875	0.7750	11	2.909	0.582	10	3.398	0.68	10
Inability to provide appropriate equipment on the site	3.300	0.660	10	3.958	0.792	10	2.8	0.568	12	3.336	0.67	12
Contractors slowness in preparation of documents	3.100	0.620	12	3.625	0.7250	13	2.727	0.545	13	3.142	0.628	13
Financial problem	4.700	0.940	1	4.5208	0.9042	2	4.1818	0.8364	1	4.372	0.8743	1
Contractors' poor site management & supervision	4.200	0.840	3	4.5	0.900	3	3.964	0.793	3	4.212	0.842	3
Inadequate planning & scheduling	4.700	0.940	1	4.625	0.925	1	4.073	0.815	2	4.363	0.873	2
Poor workmanship	3.600	0.780	4	4.2917	0.8583	6	2.8909	0.5782	11	3.549	0.715	8
Contractors slowness in site mobilization	3.300	0.660	10	4.042	0.808	8	2.927	0.585	9	3.434	0.687	9
Project inspection problem	3.600	0.7200	7	3.5625	0.7125	14	3.2182	0.6436	8	3.398	0.6796	10
Lack of training	3.500	0.700	8	4.375	0.875	5	3.473	0.695	6	3.858	0.772	5

Source: Own Survey, 2022

Among contractors' related factors, financial problems is the main problem for poor performance with respect to time of the projects. It is ranked 1st with mean score of 4.372 and RII of 0.8743. Client and contractors indicated it as main problem for the poor performance and consultants indicated it as second important cause for time delay.

The second important problem is Inadequate planning & scheduling of the contractors. On overall, it is ranked 2nd with mean score of 4.363 and RII of 0.873; it is ranked 2nd by contractors. However, According to the client and consultants it is a main contractor related factor for the time delay. This indicates that Inadequate planning & scheduling of the contractors resulted on time delay of the projects.

The third problem related to contractor is poor site management & supervision of the contractors. It is ranked 3rd with mean score of 4.212 and RII of 0.842. It is ranked 3rd by all the three stakeholder organizations.

As indicated by responses of mainly consultants, the contractors are using Poor construction methodologies that caused time delay of projects completion. It is overall ranked 4th with mean score of 3.867 and RII of 0.773; it is ranked 9th by client and 7th by contractors with mean scores of 3.400 and 3.436 respectively.

The fifth factor that is hindering projects performance with respect to time is Lack of training of the contractors' junior staffs. It is ranked 5th with mean score of 3.858 and RII of 0. 772.

4.4.1.4.External Related Factors Causing Poor Project Performance wrt time

This study has used external factors as possible causes for poor performance with respect to time of projects. Based literature review and previous studies 14 factors related to external environment were assessed. The survey result about the external factors is summarized in Table 4.5 below.

Table 4. 5**:** Summary of External Related Factors that Cause Poor Project Performance wrt time.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Traffic control problems at site	4.200	0.8400	3	4.021	0.8042	5	3.618	0.7236	5	3.841	0.7681	5
Inclement weather condition	2.500	0.5000	12	3	0.6	13	2.6	0.5200	12	2.761	0.5522	13
Unforeseen ground conditions	3.400	0.6800	6	3.833	0.7667	8	2.636	0.5273	11	3.212	0.6425	10
Problems due to existing structures.	3.300	0.6600	2	4.438	0.888	3	3.982	0.7964	3	4.115	0.8230	2
Regulatory problems/Changes in government regulation & laws	3.400	0.6800	6	3.833	0.7667	8	3.164	0.6327	9	3.469	0.6938	9
Utility problems (electricity, water, telephone)	2.400	0.4800	13	3.396	0.6792	12	2.527	0.5055	13	2.885	0.5770	12
Material price variations (inflation/escalation)	4.700	0.9400	1	4.667	0.9333	2	3.509	0.7018	6	4.106	0.8212	3
Exchange rate fluctuation	4.500	0.9000	2	3.896	0.7792	7	3.400	0.6800	7	3.708	0.7416	7

Major disputes and negotiations	3.100	0.6200	10	3.917	0.7833	6	3.218	0.6436	8	3.504	0.7009	8
Equipment unavailability on the market	2.800	0.5600	11	3.5	0.7000	10	2.982	0.5964	10	3.186	0.6372	11
Shortage of material on the market	3.900	0.7800	4	4.688	0.938	1	4.382	0.8764	1	4.469	0.8938	1
Delay and difficulties of supplier	3.700	0.7400	5	4.396	0.8833	4	3.873	0.7745	4	4.089	0.8177	4
Pandemic diseases (COVID)	3.200	0.6400	9	3.5	0.7000	10	4.182	0.8364	2	3.797	0.7611	6

Source: Own Survey, 2022

Among the external related factors, Shortage of material on the market is ranked 1st with mean score of 4.469 and RII of 0.8938. This factor is ranked 1st based on responses of consultants and contractor but it is ranked 4th by client. This indicates that the projects are delayed due to Shortage of material on the market.

Another major external factor for delay of projects is Problems due to existing structures. It is ranked 2nd with mean score of 4.115 and RII of 0.8230. It is ranked 2nd by client, and 3rd by consultants and contractors.

The third major external factor that is causing poor performance with respect to time of projects is material price variations (inflation/escalation). It is ranked 3rd with mean score of 4.106 and RII of 0.8212. It is ranked 1st by client, 2nd by consultants and 6th contractors.

Delay and difficulties of suppliers is the 4th overall ranked factor with the mean score of 4.089 and RII of 0.8177. It is ranked 4th by both contractors and consultants and ranked 5th by the client. The fifth major external factor is Traffic control problems at site with a mean score of 3.841 and RII of 0.7681.

4.4.2. Factors Causing Poor Project Performance wrt Cost

This portion of the study discusses the reasons behind projects' cost overruns. The study classified 48 factors of cost overrun into four categories: client-related, consultant-related, contractor-related, and external environment-related aspects, based on prior research. The impact of these factors is sorted using RII and shown in the tables below.

4.4.2.1.Client Related Factors Causing Poor Project Performance wrt Cost

The effects of client-related factors on project cost overrun are described in Table 4.6 below using a RII that depicts ten client-related factors relevance in project cost overrun. The factors are graded for client, consultants, and contractors replies based on the RII ratings.

Table 4. 6**:** Summary of Client Related Factors Causing Poor Project Performance wrt to Cost.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Poor awareness creations to local community and utility providers.	4.300	0.860	2	4.667	0.933	4	4.691	0.938	2	4.646	0.9292	3
Delay to deliver the site(right of way problem)	4.400	0.880	1	4.854	0.971	1	4.927	0.985	1	4.850	0.9699	1
Late in revising & approving of relevant documents	3.600	0.720	7	4.396	0.879	8	4.073	0.815	8	4.168	0.8336	8
Delay to payment and finance problem	3.900	0.780	5	4.771	0.954	2	4.600	0.920	4	4.611	0.9221	4
Delay to decision making	3.700	0.740	6	4.625	0.925	5	4.582	0.916	5	4.522	0.9044	6
Poor management of the contract	3.500	0.700	8	4.479	0.896	7	4.218	0.844	7	4.266	0.8531	7
Change in scope of the project	4.300	0.860	2	4.771	0.954	2	4.691	0.938	2	4.690	0.9381	2
Award to list bidder	3.300	0.660	10	3.313	0.663	10	3.273	0.655	11	3.292	0.6584	10
Poor coordination with utility offices	4.200	0.840	4	4.625	0.925	5	4.546	0.909	6	4.549	0.9097	5
Poor communication and management	3.400	0.680	9	3.625	0.725	9	3.982	0.796	9	3.779	0.7558	9
Insufficient contract period	3.300	0.660	10	2.271	0.454	11	3.855	0.771	10	3.133	0.6265	11

Source: Own Survey, 2022

According to the result from the survey, the first major cause of poor project performance with respect to cost related to the client is the delay in delivering the site (right of way issue), which is one of the most crucial elements that causes poor project cost performance. It is ranked first by all the three stakeholders of the projects, with a mean score of 4.85 and RII of 0.97. This means that the projects' cost increase mainly because of right-of-way issues in the projects area.

Following the right of way problem, Change in scope of the project is ranked 2nd with mean score of 4.69 and RII of 0.94. It is ranked 2nd by all stakeholder organizations' staffs.

The other major factor is poor awareness creations to local community and utility providers is ranked 3rd with mean score of 4.65 and RII of 0.9292. According to the response of consultants it is 4th reason for project cost overrun but it is ranked as 2nd important reason by contractors and client.

The fourth and fifth factors are Delay to payment and finance problem; and Poor coordination with utility offices of the client respectively.

4.4.2.2.Consultants Related Factors Causing Poor Project Performance wrt cost

The second group of factors causing poor project cost performance of the projects is consultants'-related factors. The survey result about consultants' related factors are summarized and presented in table 4.7 below.

Among the consultant related factors that cause cost overrun of projects, Design error is ranked 1st with mean score of 4.451 and RII of 0.8336. It is ranked 1st based on responses of the client and contractors, and ranked 2nd based on the responses of the consultant.

The second most important consultant related factor for cost overrun of projects is Delay in the approval of working drawings by consultants. It is ranked 2nd with mean score of 4.195 and RII of 0.839. This problem is mainly indicated by consultants themselves who ranked it 2nd consultants' related problem.

Spent time for approval of test and inspection is ranked 3rd based on the overall results. It is ranked 2nd by the contractors and consultants, 4th by the consultants.

Lack of coordination with consultants' staffs is among the important factors that caused poor cost performance of the projects. It is ranked 4th with overall mean score of 4.044 and RII of 0.809. It is ranked 4th by consultant, 5th by contractors and the client with mean scores of 4.042, 4.109 and 3.700 respectively.

Finally, Incomplete design at the time of tender is ranked 5th with mean score of 3.91 and RII of 0.7823, indicating that incomplete design at the time of tender is resulting poor cost performance of projects. It is ranked 3rd by consultants, 2nd by the client and 9th by the contractors.

Table 4. 7: Summary of Consultants Related Factors Causing Poor Project Performance wrt Cost.

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Consultant's inexperience	3.100	0.6200	9	2.625	0.5250	9	3.927	0.7855	8	3.301	0.6602	10
Absence of consultant on site	3.800	0.7600	2	2.771	0.5542	8	4.036	0.8073	7	3.478	0.6956	8
Delay in the approval of working drawings	3.800	0.7600	2	4.208	0.8417	1	4.255	0.8509	2	4.195	0.839	2
Lack of practical (working) knowledge by the consultant	3.200	0.6400	8	2.625	0.5250	9	4.109	0.8218	5	3.398	0.6796	9
Contract management problems	3.500	0.7000	6	3.625	0.7250	7	3.673	0.7345	10	3.637	0.7274	7
Spent time for approval of test and inspection	3.500	0.7000	6	4.042	0.8083	4	4.255	0.8509	2	4.097	0.8195	3
Design error	4.100	0.8800	1	4.167	0.8333	2	4.709	0.9418	1	4.451	0.8902	1
Frequent design change	2.900	0.5800	10	3.708	0.7417	6	4.146	0.8291	4	3.850	0.7699	6
Incomplete design at the time of tender	3.800	0.7600	2	4.146	0.8292	3	3.727	0.7455	9	3.912	0.7823	5
Lack of coordination with consultants' staffs	3.700	0.740	5	4.042	0.808	4	4.109	0.822	5	4.044	0.809	4

Source: Own Survey, 2022

4.4.2.3.Contractors Related Factors Causing Poor Project Performance wrt Cost

Performance of contractors is another important factor for poor cost performance of projects. Performance of the contractor is assessed by using 14 factors. The summary of contractors' related factors that cause poor cost performance of the projects is presented in Table 4.8 below.

Table 4. 8: Summary of Contractors Related Factors Causing Poor Project Performance wrt Cost

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Conflicts with sub-contractor	3.200	0.640	13	4.08	0.817	9	3.564	0.716	6	3.752	0.752	9
Project management problem	3.500	0.700	11	4.417	0.883	7	3.655	0.731	5	3.965	0.793	5
Poor construction methodologies	3.900	0.780	4	4.458	0.892	6	3.436	0.687	8	3.912	0.782	6
Lack of construction experience/ability	3.700	0.740	9	3.813	0.763	13	2.382	0.476	14	3.106	0.621	14
Lack adequate Health and safety for employees at the projects site	3.800	0.760	7	3.875	0.775	11	2.927	0.585	12	3.407	0.681	11
Inability to provide appropriate equipment on the site	3.400	0.680	12	3.979	0.796	10	2.8	0.56	13	3.354	0.671	13
Contractors slowness in preparation of documents	3.900	0.780	4	4.479	0.896	4	3.673	0.735	4	4.035	0.807	4
Financial problem	4.700	0.940	1	4.625	0.925	2	4.182	0.836	2	4.416	0.883	2
Contractors poor site management & supervision	4.200	0.840	3	4.625	0.925	2	4.182	0.836	2	4.372	0.874	3
Inadequate planning & scheduling	4.700	0.940	1	4.771	0.954	1	4.4	0.88	1	4.584	0.917	1
Poor workmanship	3.900	0.780	4	4.479	0.896	4	3.182	0.636	10	3.797	0.759	8
Contractors slowness in site mobilization	3.200	0.640	13	3.792	0.758	14	3.018	0.604	11	3.363	0.673	12
Project inspection problem	3.800	0.760	7	3.833	0.767	12	3.436	0.687	8	3.637	0.727	10
Lack of training	3.600	0.720	10	4.396	0.879	8	3.473	0.695	7	3.876	0.775	7

Source: Own Survey, 2022

Among contractors' related factors, Inadequate planning & scheduling is the main problem for poor cost performance of the projects. It is ranked 1st with mean score of 4.584 and RII of 0.917. All stakeholders indicated it as main problem for the poor performance with respect to cost of the ongoing road construction projects.

The second important problem is financial problems of the contractors. On overall, it is ranked 2nd with mean score of 4.416 and RII of 0.883; it is ranked 1st by the client. However, According to the contractors and consultants it is the 2nd a main contractor related factor for the cost overrun of projects. The third problem related to contractor is poor site management & supervision of the contractors. It is ranked 3rd with mean score of 4.372 and RII of 0.874. It is ranked 3rd by the client, and 2nd by both contractors and consultants.

As indicated by responses of all the three stakeholder organizations' staffs, Contractors slowness in preparation of documents is causing cost overrun of projects. It is overall ranked 4th with mean score of 4.035 and RII of 0.807.

The fifth major factor related to the contractors' that is causing projects cost overrun is Project management problem. It is ranked 5th with mean score of 3.965 and RII of 0.793.

4.4.2.4.External Related Factors Causing Poor Project Performance wrt cost

This study has used external factors as possible causes for poor performance with respect to cost of projects. Based literature review and previous studies 14 factors related to external environment were assessed. The survey result about the external factors is summarized in Table 4.9 below.

Table 4. 9**:** Summary of External Related Factors Causing Poor Project Performance wrt cost

Variables	Client			Consultant			Contractor			Aggregate		
	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank	Mean	RII	Rank
Traffic control problems at site	4.200	0.760	5	4.021	0.629	13	3.618	0.713	7	3.841	0.681	8
Inclement weather condition	2.500	0.500	12	3	0.65	12	3.746	0.622	11	3.319	0.623	12
Unforeseen ground conditions	3.60	0.720	6	3.833	0.792	6	2.636	0.546	12	3.23	0.666	10
Problems due to existing structures.	3.300	0.660	7	4.438	0.871	4	3.982	0.836	5	4.115	0.835	4
Regulatory problems/Changes in government regulation & laws	3.400	0.640	8	3.833	0.754	8	3.109	0.633	9	3.443	0.685	7
Utility problems (electricity, water, telephone)	2.400	0.480	13	3.396	0.679	11	2.509	0.506	13	2.876	0.578	13
Material price variations (inflation/escalation)	4.700	0.960	1	4.667	0.950	2	4.491	0.906	1	4.584	0.929	1

Exchange rate fluctuation	4.500	0.940	2	4.563	0.813	5	4.346	0.887	2	4.451	0.860	3
Major disputes and negotiations	3.100	0.620	10	3.917	0.750	9	3.218	0.633	9	3.504	0.681	8
Equipment unavailability on the market	2.800	0.540	11	3.5	0.717	10	2.982	0.635	8	3.186	0.662	11
Shortage of material on the market	3.900	0.820	3	4.688	0.954	1	4.382	0.8873	2	4.469	0.910	2
Delay and difficulties of supplier	3.700	0.800	4	4.417	0.883	3	3.873	0.775	6	4.089	0.823	5
Pandemic diseases (COVID)	3.200	0.640	8	3.5	0.763	7	4.182	0.851	4	3.805	0.795	6

Source: Own Survey, 2022

Among the external related factors, Material price variations (inflation/escalation) is ranked 1st with mean score of 4.584 and RII of 0.929. This factor is ranked 1st based on responses all the three stakeholder organizations' staffs. This indicates that the projects' cost is increasing mainly because of material price variations as related to external factors.

Another major external factor for cost overrun of projects is Shortage of material on the market. It is ranked 2nd with mean score of 4.469 and RII of 0.910. It is ranked 1st by consultants, 2nd contractors, and 3rd by and client.

The third major external factor that is causing poor performance with respect to cost of projects is exchange rate fluctuation. It is ranked 3rd with mean score of 4.451 and RII of 0.860. It is ranked 2nd by client and contractors, and 5th by consultants.

Problems due to existing structures is the 4th overall ranked factor with the mean score of 4.115 and RII of 0.835. It is ranked 4th by consultants, 5th contractors and 7th by the client.

The fifth major external factor that cause projects' cost overrun is delay and difficulties of supplier with a mean score of 4.089 and RII of 0.823. It is ranked 4th by client, 3rd by consultants, and 6th by contractor.

4.5 Discussion

The weak performance with respect to time and cost of the projects is caused due to different factors. In this study, factors related to client, consultant, contractor and external environment are identified.

The delayed projects completion is caused by different factors. It is affected by contractor related, consultant related, client related and external environment related factors. Specifically, time delay of the projects is caused by Delay to deliver the site (right of way problem), Poor awareness creations to local community and utility providers, Delay in decision-making of the client, delay to payment and finance problem of the client, Shortage of material on the market, Contractors' Financial problems and Inadequate planning & scheduling of Contractors.

The poor performance with respect to cost of the projects is due to different factors. Among these factors the most important factors includes; Cost overrun of the projects is caused by Delay to deliver the site (right of way problem), Change in scope of the project, Material price variations (inflation/escalation), Poor awareness creations to local community and utility providers, delay to payment and finance problem of the client, Inadequate planning & scheduling of Contractors and Shortage of material on the market.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Summary of the Major Findings

The study identified client, consultant, contractor and external environment-related critical factors that are affecting the selected road construction projects' performance with respect to time and cost.

The major top five client-related factors that are affecting performance with respect to time of projects include: - Delay to deliver the site (right of way problem), Poor awareness creation to local community and utility providers, Delay in decision-making, Delay to payment and finance problem, and Poor coordination of the client with utility offices.

In addition to client-related factors, consultant-related factors are causes for poor performance with respect to time of the projects that include Delay in the approval of working drawings; Design error; Lack of coordination with consultants' staff; spent time for approval of tests and inspection; and incomplete design at the time of tender.

Financial problems; Inadequate planning & scheduling; poor site management & supervision, poor construction methodologies; Lack of training for their junior staff are contractor-related factors that cause poor performance with respect to time of the projects.

The environmental factors that caused project delay were a major shortage of material on the market, Problems due to existing structures, Material price variations, delays and difficulties of suppliers and traffic control problems at the site.

In addition to time factors, the study has identified client, consultant, contractor and external environment-relators that resulted in cost overruns.

The client-related factors that caused poor performance with respect to cost of the projects include a delay to deliver the site (right of way problem), change in scope of the projects; poor awareness creation to the local community and utility providers; delay in payment and finance problems; and Poor coordination with utility offices.

The consultant-related factors that increased the cost of the projects include design error; delay in the approval of working drawings; spent time for approval of test and inspection; lack of coordination with consultants' staff; and incomplete design at the time of tender.

The third group of factors that caused poor performance with respect to cost of the projects are inadequate planning & scheduling of contractors; Financial problems; Contractors' poor site management & supervision; Contractors' slowness in the preparation of documents; and Poor construction methodologies.

Finally, the environmental factors that caused poor performance with respect to cost of the projects are Material price variations (inflation/escalation); Shortage of material on the market; Exchange rate fluctuation; Problems due to existing structures; and delays and difficulties of suppliers.

5.2. Conclusion

The study came to the following conclusions based on the key findings.

- The top seven factors causing poor performance with respect to time of the selected road contraction projects are; - Delay to deliver the site (right of way problem); Poor awareness creation of the client to the local community and utility providers; Delay in the decision-making of the client; Delay to payment and finance problems of the client; the Shortage of material on the market; Contractors' Financial problems; and Inadequate planning & scheduling of Contractors.
- Among the major rank factors causing poor performance with respect to time of projects the first four factors are related to the client. The fifth factor is the Shortage of construction materials on the market which is related to the market condition of Addis Ababa city.
- The sixth and seventh factors are related to the contractors. These are failures to manage the projects' finance; and planning and scheduling problems of contractors.
- In this study among all the factors that might affect the projects' performance with respect to time, the list ranked factor related to consultants is ranked twelfth. This factor is a delay in the approval of working drawings.
- The top seven ranked factors causing poor performance with respect to cost of the selected road contraction projects are; - Delay to deliver the site (right of way problem); Change in scope of the project; Poor awareness creation of the client to the local community and utility providers; Material price variations (inflation/escalation); Delay to payment and finance problems of the client; Inadequate planning & scheduling; Shortage of material on the market; and Poor coordination of the client with utility offices.

- Among the major rank factors causing poor performance with respect to cost of projects, the first three and the fifth factors are related to the client.
- Material price variations (inflation/escalation) and the shortage of construction materials on the market are external factors related to the market condition of the city which ranked third and seventh respectively.
- Inadequate planning & scheduling is contractors' related factor that hinders performance with respect to cost of the ongoing road construction projects, and it is ranked sixth.

➢ Generally this study shows among the top seven ranked factors that cause poor performance with respect to both time and cost of the selected ongoing road construction projects, the higher number of factors are related to the client. The second is related to external factors and the third related to the contractors.

5.2. Recommendations

It's important for construction organization to identify the weakness of performance in order to solve and overcome. Based on the findings of the research, the following recommendations are suggested.

5.2.1. Recommendations for Contractors

Contractors should plan and prepare appropriate schedule for their project works prior to the start of the construction work in order to manage their time and decrease unnecessary costs that may result because of the schedule lag. And the schedule should be updated periodical if changes exist.

Financial problems related to the contractors should be managed by hiring competitive professional finance managers, using the advance payments of projects for appropriate cases and decreasing wastes in the project works.

5.2.2. Recommendations for the client

The client is recommended to hire competitive professional right of way specialists to deal with the government administration offices, urban utility offices and with the local community, in order to clear the site prior to the start of the construction work.

The local community and urban utility offices should be well consulted and aware of the construction projects objectives, to reallocate their properties with a short time before the construction started.

The right of way problem is becoming the start of all problems and a major reason for contractors claims.

Delays related to design-making and releasing interim payments to both the contractors and consultants should be managed by the client by giving concern to the cases and assigning a competitive professionals on the positions.

5.2.3. Recommendations for the Consultants

Consultants should make familiar themselves with up-to-date technologies that expedite their works. They should be capable of preparing a nit and clear designs, and quickly approve the working drawings of the contractors.

5.2.4. Recommendations for the Government Administrations

Since the market condition of the country is affecting the road construction projects, the government bodies should strive to regulate the market conditions. Cement, back fill pavement materials and stone for masonry works are being difficult to find in the city because of different reasons. The government should regulate illegal brokers that cause cost increase and man-made shortage of construction materials in the markets.

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APPENDICES

Annex 1. Questionnaire

Dear Sir/Madam

This questionnaire aims at exploring information regarding the factors affecting the Performance with respect to time and cost of road construction projects that are being constructed in Addis Ababa city. The response will be used as a component of the data that is needed for the Project work which is being conducted as partial fulfillment of an MA program in Project management in Addis Ababa University; Business and Economics Faculty, School of Commerce.

Your genuine, honest and prompt response to the questionnaire will have irreplaceable contribution to the success of the study. Your response will be kept private, and your identity will be protected. Moreover, the information you provide will be used strictly for academic purpose only.

Filling the questionnaire will not take more than 15 minutes. I thank you in advance for the time you devote, effort you make, and consideration you give in filling this questionnaire. If you have any question concerning the items of the questionnaire, you are well come.

Phone no: 0913524343 & E-mail: girumnigusehaile@gmail.com

With Great Respect Gerum Niguse

SECTION - ONE: Personal Profile data

Please read each question carefully and tick (√) to the most appropriate response for each of the following questions.

1. Membership Organization:
   1) Client ( ) 2) Contractor ( ) 3) Consultant ( )
2. Gender:
   1) Male ( ) 2) Female ( )
3. Age:
   1) 20 years and below( ) 3) 31-40 years ( )
   2) 21-30 years ( ) 4) 41-50 years ( ) 5) Above 50 years ( )
4. Educational status:
   1) Diploma ( ) 3) Second Degree ( )
   2) First Degree ( ) 4) Third Degree/PHD ( ) 5) Other ( )
5. Work Experience :
   1) 1-5-year ( ) 3) 11-15-year ( )
   2) 6-10-year ( ) 4) More than 15 Years ( )

SECTION - TWO: Factors Affecting the Performance of road Construction Projects

Below are numbers of factors that may be affecting the performance of road construction projects. From your experience, please express your opinion on the importance of the following factors that are affecting performance of the currently ongoing road construction projects in Addis Ababa city. (Please tick the appropriate box).

No	Cause	Degree of Agreement /Disagreement									
		Time factors					Cost Factors				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I. Client related Factors											
1	Poor awareness creations to local community and utility providers										
2	Delay to deliver the site(right of way problem)										
3	Late in revising & approving of relevant documents										
4	Delay to payment and finance problem										
5	Delay to decision making										
6	Poor management of the contract										
7	Change in scope of the project										
8	Award to list bidder										
9	Poor coordination										
10	Poor communication and management										
11	Insufficient contract period										
	If any other, please specify										
II. Consultant related Factors											
1	Consultant's inexperience										
2	Absence of consultant on site										
3	Delay in the approval of working drawings										
4	Lack of practical (working) knowledge by the consultant										
5	Contract management problems										

6	Spent time for approval of test and inspection										
7	Design error										
8	Frequent design change										
9	Incomplete design at the time of tender										
10	Lack of coordination with consultants' staffs										
	If any other, please specify										
III. Contractor related Factors											
1	Project inspection problem										
2	Conflicts with sub-contractor										
3	Project management problem										
4	Poor construction methodologies										
5	Lack of construction experience/ability										
6	Lack adequate Health and safety for employees at the projects site										
7	Inability to provide appropriate equipment on the site										
8	Contractors slowness in preparation of documents										
9	Financial problem										
10	Poor site management & supervision										
11	Inadequate planning & scheduling										
12	Poor workmanship										
13	Contractors slowness in site mobilization										
14	Lack of training										
	If any other, please specify										
IV. External factors											
1	Traffic control problems at site										
2	Inclement weather condition										
3	Unforeseen ground conditions										
4	Problems due to existing structures.										

5	Regulatory problems/Changes in government regulation & laws										
6	Utility problems (electricity, water, telephone)										
7	Material price variations (inflation/escalation)										
8	Exchange rate fluctuation										
9	Major disputes and negotiations										
10	Equipment unavailability on the market										
11	Shortage of material on the market										
12	Delay and difficulties of supplier										
13	Pandemic diseases (COVID)										
	If any other, please specify										

Annex 2. Overall ranking of factors causing poor performance wrt time of projects using RII

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Weight	RII	Rank
Poor communication and management	5	14	17	50	27	113	419	0.742	26
Delay to deliver the site(right of way problem)	0	0	0	11	102	113	554	0.981	1
Late in revising & approving of relevant documents	0	3	11	62	37	113	472	0.835	11
Delay to payment and finance problem	0	3	4	42	64	113	506	0.896	4
Delay to decision making	0	3	3	39	68	113	511	0.9	3
Poor management of the contract	0	6	15	34	58	113	483	1	9
Change in scope of the project	2	6	15	59	31	113	450	0.796	18
Award to list bidder	10	17	35	31	20	113	373	0.66	38
Poor coordination with utility offices	1	7	9	31	65	113	491	0.9	8
Poor awareness creations to local community and utility providers	0	0	4	23	86	113	534	0.945	2
Insufficient contract period	31	25	16	18	23	113	316	0.559	46
Consultant's inexperience	25	34	27	5	22	113	304	0.538	48
Absence of consultant on site	16	37	32	7	21	113	319	0.565	45
Delay in the approval of working drawings	1	7	7	55	43	113	471	0.834	12
Lack of practical (working) knowledge by the consultant	26	8	29	39	11	113	340	0.602	43
Contract management problems	1	9	53	27	23	113	401	0.710	30
Spent time for approval of test and inspection	0	6	22	61	24	113	442	0.782	19

Design error	5	4	10	54	40	113	459	0.812	16
Frequent design change	2	16	36	37	22	113	400	0.708	31
Incomplete design at the time of tender	6	8	20	42	37	113	435	0.770	22
Lack of coordination with consultants' staffs	0	6	23	44	40	113	457	0.809	17
Project inspection problem	7	16	25	55	10	113	384	0.68	35
Conflicts with sub-contractor	3	17	26	35	32	113	415	0.735	28
Project management problem	1	11	25	44	32	113	434	0.768	23
Poor construction methodologies	3	24	7	30	49	113	437	0.773	20
Lack of construction experience/ability	6	45	20	17	25	113	349	0.62	42
Lack adequate Health and safety for employees at the projects site	10	12	30	45	16	113	384	0.680	35
Inability to provide appropriate equipment on the site	8	34	11	32	29	114	382	0.670	37
Contractors slowness in preparation of documents	9	29	29	29	17	113	355	0.628	41
Financial problem	0	2	4	57	50	113	494	1	6
Poor site management & supervision	1	2	13	53	44	113	476	0.842	10
Inadequate planning & scheduling	0	6	8	38	61	113	493	0.873	7
Poor workmanship	4	21	20	42	26	113	404	0.715	29
Contractors slowness in site mobilization	10	8	44	25	26	113	388	0.687	34
Lack of training	1	11	15	62	24	113	436	0.7717	21

Traffic control problems at site	2	7	32	38	34	113	434	0.768	23
Inclement weather condition	20	29	31	24	9	113	312	0.552	47
Unforeseen ground conditions	13	16	34	34	16	113	363	0.642	39
Problems due to existing structures.	1	3	31	25	53	113	465	0.823	13
Regulatory problems/Changes in government regulation & laws	3	13	50	22	25	113	392	0.694	33
Utility problems (electricity, water, telephone)	14	36	26	23	14	113	326	0.577	44
Material price variations (inflation/escalation)	1	1	30	34	47	113	464	0.821	14
Exchange rate fluctuation	4	9	35	33	32	113	419	0.742	26
Major disputes and negotiations	6	6	40	47	14	113	396	0.701	32
Equipment unavailability on the market	18	12	35	27	21	113	360	0.637	40
Shortage of material on the market	1	2	3	44	63	113	505	0.894	5
Delay and difficulties of supplier	0	3	17	60	33	113	462	0.818	15
Pandemic diseases (COVID)	8	13	12	40	40	113	430	0.7611	25

Annex 3. Overall ranking of factors causing poor performance wrt cost of projects using RII

Variables	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Weight	RII	Rank
Poor communication and management	0	17	19	49	28	113	427	0.756	29
Delay to deliver the site(right of way problem)	0	0	3	11	99	113	548	0.970	1
Late in revising & approving of relevant documents	0	3	12	61	37	113	471	0.834	17
Delay to payment and finance problem	0	1	5	31	76	113	521	0.922	5
Delay to decision making	0	2	6	36	69	113	511	0.904	9
Poor management of the contract	0	6	16	33	58	113	482	0.853	14
Change in scope of the project	0	1	3	26	83	113	530	0.938	2
Award to list bidder	8	20	34	33	18	113	372	0.658	44
Poor coordination with utility offices	0	3	6	30	74	113	514	0.910	7
Poor awareness creations to local community and utility providers.	0	2	5	24	82	113	525	0.929	3
Insufficient contract period	8	34	30	17	24	113	354	0.627	45
Consultant’s inexperience	5	24	39	22	23	113	373	0.660	43
Absence of consultant on site	4	19	34	31	25	113	393	0.696	33
Delay in the approval of working drawings	1	5	9	54	44	113	474	0.839	15
Lack of practical (working) knowledge by the consultant	4	30	16	43	20	113	384	0.680	38
Contract management problems	1	9	44	35	24	113	411	0.727	31
Spent time for approval of test and inspection	0	4	19	52	38	113	463	0.819	19

Design error	2	4	9	24	74	113	503	0.890	10
Frequent design change	2	8	29	40	34	113	435	0.770	27
Incomplete design at the time of tender	3	9	22	40	39	113	442	0.782	24
Lack of coordination with consultants' staffs	0	6	22	46	39	113	457	0.809	20
Project inspection problem	2	11	28	57	15	113	411	0.727	31
Conflicts with sub-contractor	1	13	31	35	33	113	425	0.752	30
Project management problem	1	5	26	46	35	113	448	0.793	23
Poor construction methodologies	3	21	9	30	50	113	442	0.782	24
Lack of construction experience/ability	6	43	22	17	25	113	351	0.621	47
Lack adequate Health and safety for employees at the projects site	9	12	32	44	16	113	385	0.681	35
Inability to provide appropriate equipment on the site	7	34	12	32	28	113	379	0.671	40
Contractors slowness in preparation of documents	5	8	15	35	50	113	456	0.807	21
Financial problem	0	1	3	57	52	113	499	0.883	11
Poor site management & supervision	1	1	6	52	53	113	494	0.874	12
Inadequate planning & scheduling	0	0	9	29	75	113	518	0.917	6
Poor workmanship	0	20	20	36	37	113	429	0.759	28
Contractors slowness in site mobilization	4	15	43	38	13	113	380	0.673	39
Lack of training	0	12	15	61	25	113	438	0.775	26
Traffic control problems at site	6	9	52	25	21	113	385	0.681	35

Inclement weather condition	20	21	24	22	26	113	352	0.623	46
Unforeseen ground conditions	10	16	35	31	21	113	376	0.665	41
Problems due to existing structures.	1	3	23	34	52	113	472	0.835	16
Regulatory problems/Changes in government regulation & laws	2	14	51	26	20	113	387	0.685	34
Utility problems (electricity, water, telephone)	14	36	26	23	14	113	326	0.577	48
Material price variations (inflation/escalation)	0	1	3	31	78	113	525	0.929	3
Exchange rate fluctuation	1	7	11	32	62	113	486	0.860	13
Major disputes and negotiations	5	7	48	43	10	113	385	0.681	35
Equipment unavailability on the market	6	24	33	29	21	113	374	0.662	42
Shortage of material on the market	0	1	4	40	68	113	514	0.910	7
Delay and difficulties of supplier	0	3	15	61	34	113	465	0.823	18
Pandemic diseases (COVID)	0	12	19	42	40	113	449	0.795	22