



DEBRE MARKOS UNIVERSTY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTEMENT OF ECONOMICS

**FACTORS AFFECTING DELAYS IN THE DABAT–
TEGEDIE ROAD CONSTRUCTION PROJECT,
AMHARA REGION, ETHIOPIA**

**A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS,
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MSC DEGREE IN PROJECT PLANNING AND MANAGEMENT**

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STATEMENT OF DECLARATION

I, the undersigned, declare that this thesis entitled “**Factors Affecting Road Construction Projects in Dabat Tagedie Road Construction, Amhara Region, Ethiopia**” is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been duly acknowledged.

This thesis is submitted in partial fulfillment of the requirements for the degree of Master of Science (MSc.) in Project Planning and Management at Debre Markos University.

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STATEMENT OF CERTIFICATION

This is to certify that the thesis entitled **“Factors Affecting Delays in the Dabat–Tegedie Road Construction Project, Amhara Region, Ethiopia”** was carried out by Zemene Dubale under my supervision and guidance. The thesis is submitted to the Department of Economics, College of Business and Economics, Debre Markos University, in partial fulfillment of the requirements for the Master of Science (MSc.) Degree in Project Planning and Management.

I have read and approved this thesis and believe it meets the standards and requirements for submission.

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APPROVAL SHEET

This is to certify that the thesis entitled: “Factors Affecting Delays in the Dabat–Tegedie Road Construction Project, Amhara Region, Ethiopia” submitted to the Department of Economics, College of Business and Economics, Debre Markos University in partial fulfillment of the requirements for the Master of Science Degree in Project Planning and Management, has been carried out by Zemene Dubale under the supervision of Bantayehu Tamrie (PhD).

We, the undersigned, have read and evaluated the thesis and hereby recommend its acceptance and approval for the fulfillment of the requirements for the degree.

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Abstract

This study examines the critical factors contributing to delays in the Dabat Tegedie Road construction project in Ethiopia's Amhara region. Using a mixed-methods approach combining quantitative surveys (n=168) and qualitative interviews with key stakeholders, the research identifies and analyzes eight primary delay factors through multiple regression analysis. The findings reveal strong consensus among respondents, with overall mean scores for all delay factors ranging from 4.07 to 4.20 on a 5-point scale. Project-related issues (Mean=4.18, $\beta=0.346$, $p<0.001$), particularly inadequate planning and resource allocation, constitute the most significant cause of delays, followed by contractor performance deficiencies (Mean=4.09, $\beta=0.271$, $p<0.001$) and owner-related bureaucratic inefficiencies (Mean=4.11, $\beta=0.234$, $p<0.001$). The regression model explains 67.4% of delay variance ($R^2=0.674$), demonstrating strong predictive power. Equipment/material shortages (Mean=4.14) and government regulations (Mean=4.16) emerge as secondary but substantial contributors, while external factors like weather conditions (Mean=4.16, $\beta=0.117$, $p=0.007$) show relatively minor impact despite high perceived importance. The study challenges common assumptions about developing country projects by demonstrating that internal management failures outweigh external circumstances in delay causation. Key recommendations include implementing rigorous pre-project planning protocols, strengthening contractor qualification criteria, streamlining approval processes, and improving supply chain management. These findings provide empirical evidence for policymakers and project managers to prioritize interventions that address the most significant delay factors in Ethiopian infrastructure projects. The research contributes to construction management literature by offering a validated analytical framework for delay assessment in developing country contexts and suggesting practical solutions tailored to regional challenges.

Key Words: *Construction delays, Dabat Tegedie Road, Project management, Regression analysis, Infrastructure development.*

Abbreviations and Acronyms

BIM - Building Information Modeling

DAM - Delay Analysis Methods

DTRC- Dabat Tegedie Road Construction

E&S - Environmental and Social

ECWC - Ethiopian Construction Works Corporation

EEC - Ethiopian Engineering Corporation

EIA - Environmental Impact Assessment

FP - Financial Planning

GDP - Gross Domestic Product

HSE - Health, Safety, and Environment

KPI - Key Performance Indicators

M&E - Monitoring and Evaluation

PM - Project Management

PMP - Project Management Professional

PRM - Project Risk Management

QMS - Quality Management System

RCA - Root Cause Analysis

ROI - Return on Investment

SWOT - Strengths, Weaknesses, Opportunities, and Threats

TOC - Theory of Constraints

USD - United States Dollar

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The building of roads is remarkably important for the global financial system, as it stimulates financial advancement, unifies diverse areas, and enables the effective movement of commodities and people (Smith et al., 2019). Nevertheless, road development projects frequently suffer impediments, which obstruct the ability to finish on schedule and escalate expenses. The Global Infrastructure Facility (2021) indicates that globally, these hold-ups typically arise from insufficient preparation, limited funds, and outside elements like environmental shifts and political aspects. Such hold-ups not only draw out project timelines but also impede the advancement of countries.

In Africa, roadway construction is a key priority for boosting lasting financial growth. Roads cultivate connections between various locales and strengthen commerce (Mubako and Chirwa, 2020). However, several studies reveal that hold-ups are common throughout the continent and have considerable effects on progress (Olabisi, 2018). In countries like Nigeria and South Africa, these hold-ups commonly originate from a shortage of monetary support, problems in acquiring materials, and inefficient administration strategies (Adedeji and Olorunfemi, 2022). These hindrances prevent the enhancement of people's quality of life, particularly in underserved communities.

In Ethiopia, roads are vital in connecting metropolitan and country locations and in the circulation of products and services. The government has actually focused on road construction as a fundamental component of its advancement method (Abebe, 2020). Nevertheless, hold-ups offer a substantial obstacle, specifically in local advancement undertakings (Tesfaye, 2021). Regular reasons for these hold-ups consist of insufficient financing, political disturbance, and troubles in execution (Mengistu and Zewdu, 2023). Such hold-ups extend project durations and raise expenses, negatively affecting nationwide advancement.

The Amhara region of Ethiopia, kept in mind as one of the biggest and most heavily inhabited, comes across its distinct difficulties in road construction. This region includes both metropolitan and country lands, complicating the building and care of roadways. As kept in mind by Getachew (2022), hold-ups in this area are frequently credited to issues in land procurement, a scarcity of regional competence, and insufficient monetary backing.

Furthermore, inadequate project administration intensifies hold-ups, leading to prolonged conclusion times (Tadesse and Berhanu, 2020).

The Dabat Tegedie Road construction project in Gonder is important for enhancing transportation and enhancing the financial expectation of the Amhara region in Ethiopia. Gonder is a quickly progressing city, and improved roadways are important for assisting in trade, connecting country neighborhoods with urban areas, and ensuring accessibility to important services (Dawit, 2021). Nevertheless, this project has experienced hold-ups that have adversely influenced local development and the circulation of products and people (Hailemariam, 2023). A thorough assessment of this project can offer understanding into the reasons for these hold-ups, possibly avoiding future difficulties in Gonder and other areas of Ethiopia (Endale and Birhanu, 2024). Resolving these challenges is important for enhancing the Dabat Tegedie Road construction project in Gonder and progressing lasting advancement effectively.

1.2 Statement of the Problem

Postponements in highway development projects present a notable hurdle in Ethiopia. These hold-ups have a detrimental impact on the financial system and complicate linkages between the country's different areas. A key example is the Dabat Tegedie Road project, which has experienced drawn-out delays because of monetary shortages, inadequate oversight, and safety concerns (Mekonnen, 2022). Studies reveal that postponements in road projects frequently result in elevated expenses, inefficient utilization of resources, and public discontent (Tadesse & Berhanu, 2020). Nevertheless, limited consideration has been given to comprehending the specific elements triggering delays in particular projects. Resolving these problems is essential for enhancing project effectiveness and guaranteeing prompt finalization.

Monetary shortages represent a major element adding to road project postponements in Ethiopia. As indicated by Abebe (2020), inadequate funding and deferred payments impede the advancement of these projects. The Ethiopian Roads Administration (ERA) has undergone considerable financial restrictions, which have brought about the halt of numerous road projects (Addis Fortune, 2025). Furthermore, there have been amplified claims for land recompense, which additionally intensifies the monetary difficulties (Bekele & Kassa, 2020). Without dependable funding, the finalization of projects such as the Dabat Tegedie Road turns out to be problematic.

Safety-related matters likewise bring about postponements, notably in areas encountering conflict. In January 2024, the ERA stated that 21 out of 54 planned road projects encountered postponements due to safety apprehensions (Ethio Negari, 2024). Continuous aggression has disrupted building activities, necessitated worker reassignments, and amplified expenditures (Mengistu & Zewdu, 2023). The precarious conditions in the Gonder vicinity have complicated the prompt completion of infrastructure projects. Dealing with safety hurdles is vital to improve building effectiveness and assure the well-being of laborers.

Land conflicts and the processes for obtaining land for road projects have created considerable postponements all over Ethiopia. Regularly, monetary disagreements trigger protracted legal conflicts that impede project initiation (Hassen, 2022). By early 2025, the ERA stated possessing 790 unsettled land recompense instances, adversely impacting crucial projects (Addis Fortune, 2025). The procedures for clearing land are frequently sluggish and unproductive, adding to this matter (Mulu, 2019). The lack of a transparent technique for overseeing recompense continues to obstruct effective highway development.

Poor contractor competence and ineffective project administration likewise assume considerable roles in triggering postponements. Numerous contractors are deficient in the required skills or monetary means to finalize projects inside the stipulated timeframes (Tesfaye & Abebe, 2024). For instance, by 2023, the Ararat-Kotebe road project was just 30% finalized, in spite of its anticipated finalization in 2019 (Addis Fortune, 2023). Poor planning, frequent design alterations, and sluggish material procurement add to these difficulties (Endale & Birhanu, 2024). Enacting enhanced contractor selection approaches and guaranteeing accountability could aid in diminishing these postponements.

Governmental inefficiencies and political elements additionally impede road development endeavors. Regulations, sluggish approval processes, and political complications obstruct project advancement (Mulu, 2019). Mengistu and Zewdu (2023) emphasize that postponements in securing permits and excessive bureaucratic obstructions create unwarranted issues. Gaining approvals from numerous government entities extends project timelines (Hailu & Wolde, 2021). Streamlining governmental procedures and minimizing political meddling is vital for guaranteeing prompt project completion.

Other facets such as unfavorable climatic circumstances and difficulties in transporting goods contribute to deferments. Intense rainfall, flooding, and restricted access to building locations create challenges in obtaining materials. Inadequate infrastructure in remote settings hampers

the swift delivery of resources. These hurdles necessitate enhanced planning and precise weather forecasting to minimize postponements. Without effective planning, these concerns persistently hinder road development timelines.

Numerous studies examine the reasons for postponements in road projects in Ethiopia; however, they commonly focus on the nation overall as opposed to specific locations like Dabat Tegedie. Aspects of project management like effective monetary planning, collaboration, and risk lessening are vital, yet they are frequently poorly implemented in local projects. Prior research has explored aspects like monetary constraints, unreliable contractors, land acquisition matters, and sluggish governmental responses. Nonetheless, thorough studies that integrate all these concerns into a single framework are uncommon. This research investigates the Dabat Tegedie Road due to its importance for local development. It utilizes a technique referred to as multiple linear regressions to pinpoint which challenges are most impactful. It demonstrates how different elements adding to postponements interact and impact the project. Consequently, this study seeks to improve the elements that affect the road development process in the Dabat Tegedie Road project.

1.3. Research Questions

1. What are the key factors causing delays in the Dabat Tegedie Road construction project?
2. How do contractor-related issues contribute to delays in the Dabat Tegedie Road construction project?

1.4. Objectives of the Study

1.4.1 General Objective

The general objective of this study is to examine the factors that contribute to delays in the Dabat–Tegedie road construction project.

1.4.2 Specific Objectives

1. To identify key delay factors in the Dabat Tegedie Road construction project.
2. To analyze the effect of contractor-related issues on project delays.

1.5 Significance of the Study

This study was important because it improved the preparation, handling, and carrying out of road building projects, namely the Dabat Tegedie Road Construction Project in Ethiopia. By pinpointing the key origins of postponements, the investigation furnished helpful awareness to government bodies, building companies, and project supervisors to encourage better resolving of issues and improved operational output. The results were used by policymakers

to amend rules and speed up permission procedures, guaranteeing that future projects are finalized on time and within assigned budgets. Furthermore, building companies profited from tending to contractor-related difficulties, refining resource consumption, and lessening potential jeopardies. For local inhabitants, prompt finalization of roads converted into greater entry to vital amenities and amplified financial opportunities. This investigation also added to scholastic inquiry into infrastructure growth in Ethiopia by offering doable proposals applicable to comparable projects in the area. In the end, the study aimed to assist the nation's growth goals by promoting operative and lasting infrastructure projects.

1.6 Scope of the Study

This investigation probed and assessed the foremost grounds for hindrances in the Dabat Tegedie Road Construction Project situated in Ethiopia's Amhara Region. The geographic concentration was limited to the Gonder area where the project took place. It assessed both internal and external impacts influencing the project's on-time finalization, including monetary hardships, insufficient contractor conduct, land procurement obstacles, safety apprehensions, political and bureaucratic preventions, as well as ecological impediments such as harsh weather and logistical snags. The investigation used quantitative methods, gathering details through surveys and discussions involving project directors, contractors, local government delegates, and community members. The amassed details were analyzed to uncover the most substantial contributors to postponements. Although the investigation centered on the Dabat Tegedie Road Project, the awareness gained could be pertinent to other related road building endeavors within Ethiopia. The investigation left out other kinds of infrastructure projects or wider national campaigns, centering exclusively on the Dabat Tegedie Road and scrutinizing the grounds for delays from the start of the project through to the year 2024.

1.7 Limitations of the Study

While this investigation furnishes valuable awareness into the grounds for delays for the Dabat Tegedie Road project, there are some things to remember.

At first, the investigation zeroed in only on one project, implying that the results might not be generalizable to other building campaigns in differing locations or situations. Furthermore, the data was acquired from self-reported surveys, which could suggest that some problems might not have been revealed truthfully. Those surveyed might have hesitated to be frank due to the characteristics of their place of work or politics. Moreover, the investigation didn't

explore how different delay reasons could connect with one another, which could change their combined impact on the project timeline. Furthermore, facets such as economic variations or unexpected occasions, like a pandemic, weren't completely checked in the assessment. Lastly, since the investigation was done at a specific point, it doesn't give awareness into how delays might develop as the project advances through its different stages. Subsequent studies could be helpful by analyzing longitudinal data, exploring further projects, and using enhanced methodologies to gain a more profound grasp of the relationships between delay elements.

1.8 Organization of the study

This study was structured into five chapters. Chapter One introduced the investigation by describing the setting, declaration of the problem, research inquiries, goals, and importance of the investigation. Chapter Two reviewed linked literature, including key theories, elements adding to road building delays, and results from both local and international studies. Chapter Three described the research methodology, such as the design, data collection instruments, sampling approaches, and data analysis methods. Chapter Four displayed and talked about the results based on the data gathered from the Dabat Tegedie Road building project. Chapter Five concluded the study by summing up the results, offering realistic suggestions to lessen delays in similar future projects, and recommending areas for further investigation.

CHAPTER TWO: RELATED OF LITERATURE REVIEW

2.1. Theoretical Framework

2.1.1 Concept of Road Construction Projects

Road construction endeavors play a vital role in fostering economic advancement, promoting regional unity, and enhancing trade efficiency. Nevertheless, these initiatives frequently encounter notable delays that adversely affect both schedules and financial plans. Numerous reports have identified prevalent sources of such delays in different regions. For example, in Asia, factors like financial limitations, political unrest, and ineffective project management are often highlighted as key reasons for delays (Li et al., 2018). In Africa, especially in nations like Nigeria and South Africa, issues such as insufficient funding, procurement hold-ups, and challenges related to land acquisition are commonly associated with delays (Olabisi, 2018). These setbacks are exacerbated by inadequate infrastructure, inefficient regulatory systems, and environmental elements like erratic weather patterns (Adedeji and Olorunfemi, 2022).

In Ethiopia, the condition mirrors this trend, with road construction projects encountering frequent postponements due to scarce financial resources, political unpredictability, and logistical hurdles. Research indicates that inadequate funding and unstable cash flows impede the punctual completion of initiatives (Bekele and Kassa, 2020). Additionally, the poor coordination among various stakeholders, a shortage of skilled workers, and delays in securing permits are common issues faced in Ethiopian road construction efforts (Hailemariam, 2023). The significance of road infrastructure in Ethiopia, where rural locations are often isolated from urban hubs, means that these delays have particularly severe consequences, hindering regional progress and economic development (Mekonnen, 2022).

2.1.2 Theory of Road Construction Projects

The Critical Path Method (CPM) is extensively utilized within road construction projects to outline the order of tasks that influence the project's timeline directly. As noted by Zhang et al. (2021), CPM aids in pinpointing critical activities that need timely completion to prevent setbacks in the overall project schedule. This approach enables project managers to distribute resources in a more effective manner, ensuring that vital tasks receive emphasis. In road construction scenarios, where numerous dependencies exist, CPM is essential for monitoring progress and adjusting plans in real-time to avert unnecessary delays. Likewise, Project Risk Management represents another vital theory that centers on foreseeing and addressing potential risks, including financial limitations, political interference, and challenging weather

conditions. Smith et al. (2020) emphasize that addressing project risks at an early stage is vital for diminishing delays in extensive infrastructure undertakings such as road construction, where external aspects can frequently hinder timelines.

The Theory of Constraints (TOC), introduced by Goldratt in 1990, stands out as a significant framework focusing on discovering and managing the major limitation that hampers a project's advancement. In the context of road construction, these limitations can include financial difficulties, a lack of labor, or various regulatory challenges. Recent research indicates that tackling the most critical constraint can enhance resource utilization and decrease setbacks. In Ethiopia, where road construction projects frequently confront financial and political challenges, the use of TOC can be especially advantageous. Hassen (2022) highlights that recognizing these restrictions and directing efforts to overcome them can greatly boost the effectiveness of road initiatives. Furthermore, Delay Analysis Methods (DAM), particularly Time Impact Analysis (TIA), assist in measuring delays and pinpointing their underlying causes. Research conducted by Al-Hajj and Sweis in 2023 reveals that employing TIA in road construction initiatives enables project managers to evaluate the effects of delays from outside influences and modify their timelines as necessary.

2.1.3 Factors Affecting Road Construction Projects

A variety of elements lead to setbacks in road construction initiatives, differing from one area to another while often reflecting similar issues. Limited finances and insufficient funding are common reasons for delays, particularly in nations that are still developing. Tadesse and Berhanu (2020) indicate that irregular cash flow and mishandling of budgets can impede or delay the acquisition of materials, thereby extending construction schedules. Additionally, political unrest and administrative inefficiencies play crucial roles in these delays. Mulu (2019) points out that political interventions, including disputes over land acquisition and slow-moving governmental decisions, can greatly obstruct the advancement of road projects in Ethiopia. Delays in receiving land permits or necessary approvals result in bottlenecks, which impact the timely delivery of infrastructure projects. On top of that, external influences such as severe weather conditions, including heavy rainfall or flooding, frequently interrupt construction timelines (Tesfaye and Abebe, 2024). These external challenges may cause both physical harm to construction sites and logistical issues in transporting supplies, further prolonging project durations.

In addition to financial and political obstacles, ineffective project oversight and lack of coordination have been recognized as significant determinants impacting road construction

projects. In Ethiopia, poor collaboration among stakeholders, such as contractors, local government officials, and other authorities, often leads to inefficiencies and delays (Hailemariam, 2023). For example, an absence of qualified labor and project managers who can handle complex road construction responsibilities can lead to errors and communication breakdowns that prolong project timelines (Zelalem and Mulugeta, 2020). Furthermore, insufficient risk management strategies amplify these challenges since unpredicted problems, like issues in the supply chain or labor unrest, are neither anticipated nor properly addressed (Bekele and Kassa, 2020). Collectively, these elements result in substantial delays and budget excesses that affect road construction initiatives, particularly in nations like Ethiopia, where infrastructure development is critical for economic advancement. Successfully managing these challenges necessitates enhanced planning, collaboration, and financial oversight to minimize delays and guarantee the successful completion of projects.

2.1.4 Factors Leading to Delays in Road Construction Projects

Factors Related to Contractors: The efficiency of contractors is vital for the prompt finalization of road construction projects. Research by Zhang et al. (2023) reveals that ineffective resource management, insufficient skill levels among workers, and delays in coordinating with subcontractors are major factors causing delays. Poorly managed construction materials and equipment can halt activities or slow progress, especially when contractors do not maintain a consistent flow of resources. Moreover, a lack of effective communication and coordination with subcontractors can result in delays in project activities, causing misalignments within the overall schedule (Bekele and Kassa, 2020). Issues with contractor performance are often worsened by a lack of experience, inadequate training, and underestimating the project's requirements, all of which add to delays and rising expenses (Mekonnen, 2022). These aspects emphasize the necessity of selecting skilled contractors and efficiently managing relationships with subcontractors to lessen delays.

Client-Related Factors: The decisions made by clients are vital for the timely completion of road construction initiatives, with financial support and decision-making procedures frequently being the leading contributors to delays. Tadesse and Berhanu (2020) indicate that when funding is delayed or budgets are inadequately allocated, it can lead to major interruptions, since contractors might suspend work due to lack of payments or poor financial oversight. Furthermore, waiting for client approvals on essential decisions, such as modifications to the project's scope or design, prolongs the overall schedule. Smith et al. (2021) state that although these modifications are often necessary, they demand extra work

and changes that were not part of the original plan, complicating the construction timeline. In Ethiopia, when the government acts as a client, bureaucratic delays often hinder decision-making, consequently slowing down project progress (Hailemariam, 2023). Therefore, proper client management and prompt decision-making are crucial to prevent delays and maintain project momentum.

Environmental Factors: Factors related to the environment, such as weather patterns and specific site-related challenges, greatly affect the advancement of road construction efforts. Severe weather occurrences like heavy rainfall, flooding, and extreme temperatures can drastically alter construction schedules, especially in areas lacking adequate infrastructure to address these issues (Tesfaye and Abebe, 2024). In Ethiopia, unpredictable weather can cause delays in transportation, shortages of materials, and extended construction periods, particularly in remote locations where road accessibility is restricted. Site characteristics, including unstable soil, rock formations, or saturated ground, can present unexpected difficulties that necessitate redesigns or specialized construction techniques (Mubako and Chirwa, 2020). Additionally, environmental regulations and compliance challenges can postpone project approvals and compel design changes, further contributing to delays (Mengistu and Zewdu, 2023).

External Factors: Various external elements, such as political unrest, economic changes, and social issues, significantly impact the timeliness of road construction projects. Political instability, frequent shifts in government, and policy changes can hinder the approval process and disrupt work schedules (Mulu, 2019). In Ethiopia, political and administrative challenges often result in delays in project implementation, as decisions may be stalled or obstructed by political influences. Economic changes, including inflation, currency depreciation, and lack of funding, further complicate timelines and raise costs (Zelalem and Mulugeta, 2020). Social factors, such as community resistance, land conflicts, and opposition from locals, can also lead to considerable delays. Managing these aspects and engaging stakeholders effectively is necessary to prevent extended interruptions and facilitate the smooth advancement of infrastructure projects (Hassen, 2022).

2.1.5 Factors Influencing Project Delays

Cost Consequences: Road construction delays bring about notable financial impacts, which can result in heightened expenditures and budget excesses. Tadesse and Berhanu (2020) state that the costs attributed to delays are frequently aggravated by prolonged project timelines, rising material prices due to inflation, and additional labor expenses. When there is a hold-up

in construction activities, contractors might be compelled to employ more workers, rent additional equipment, and prolong the time required for material procurement, all contributing to the initial budget increase. Research conducted by Zhang et al. (2023) highlights that the fiscal repercussions of delays often lead to cost surges that are challenging to recoup, particularly when such delays stem from contractor deficiencies or poor project planning. In Ethiopia, financial mismanagement and fluctuating funding mechanisms play a significant role in budget excesses, as noted by Mengistu and Zewdu (2023). These unforeseen costs can pressure government finances and postpone the completion of other vital infrastructure initiatives.

Time Consequences: Delays in road construction frequently result in considerable time-related issues, interfering with project timelines and pushing back anticipated completion dates. Hailemariam (2023) points out that delays in securing permits, adverse weather conditions, and contractor performance issues rank among the most prevalent causes of prolonged project timelines. Such time-related challenges can lead to the deferral of crucial services and infrastructure advantages for nearby communities. The extended timelines can also disrupt the strategic planning of future projects, triggering a chain reaction that hampers additional advancements. Tesfaye and Abebe (2024) contend that a key outcome of delayed roadway construction is the failure to reach established milestones, potentially influencing the overall development strategy, especially in fast-growing areas such as Gonder. The ramifications of delayed projects are often experienced across various sectors, affecting business operations, access to essential services, and economic growth in the concerned regions.

Quality Consequences: Delays in construction endeavors can adversely affect the overall quality of the completed work and the project's ultimate results. As per Zelalem and Mulugeta (2020), when construction timelines are stretched, the urgency to finish the tasks in a reduced timeframe can lead to a deterioration of quality standards. Contractors and laborers may hastily complete jobs to compensate for lost time, resulting in the use of inferior materials or shortcuts in construction methods. Moreover, extended construction durations might alter the availability and condition of materials, as their quality might diminish over time due to environmental exposure (Mekonnen, 2022). Such quality challenges can culminate in more frequent repairs, maintenance issues, and even premature failures of road infrastructure, imposing long-term financial and operational challenges on project owners and users.

2.2 Empirical Studies on Delay Factors in Road Construction

Road construction initiatives across the globe encounter a variety of setbacks that can greatly impede advancement, escalate expenses, and influence the final quality of infrastructure. Research conducted by Smith et al. (2021) revealed that major factors on a global scale that lead to delays consist of inadequate project management techniques, poor financial strategies, and external influences such as weather phenomena or political unrest. Issues like financial mismanagement, lack of coordination between contractors and clients, along with difficulties in obtaining permits and land, have been consistently reported as challenges in road construction initiatives internationally (Zhang et al., 2023). Likewise, Adedeji and Olorunfemi (2022) point out that in numerous countries, including Nigeria and South Africa, project delays are worsened by a lack of funding, procurement difficulties, and ineffective communication among involved parties. These observations signify that road construction delays are a universal issue, presenting both shared and distinct challenges across diverse regions.

Delays in road construction represent an ongoing problem in Africa, which significantly impacts economic growth. As highlighted by Mubako and Chirwa (2020), such delays are frequently attributed to a lack of funding, political meddling, and logistical hurdles. Numerous African countries struggle to obtain steady financing for their road initiatives, which often results in interruptions to construction timelines and higher costs. In Ethiopia, the delays associated with road construction projects have been recognized as a major obstacle to regional development. Tesfaye (2021) notes that political unrest, difficulties with land acquisition, and logistical limitations contribute to extended durations of construction in Ethiopia. These delays hinder national economic progress by postponing the anticipated advantages of road projects, including enhanced connectivity, improved access to services, and economic unification. Similarly, Hassen (2022) indicates that social issues, such as local resistance to initiatives and land disputes, complicate the construction efforts in Ethiopia further.

In the context of Ethiopia, factors related to contractors significantly contribute to delays in road construction projects. Hailemariam (2023) states that challenges concerning contractor performance, such as a lack of adequate experience and ineffective resource management, often result in lengthened project schedules. Contractors may encounter obstacles including shortages of labor, inadequate training, and inefficiencies in handling construction materials and equipment. These issues are often intensified by the absence of coordination with

subcontractors, which leads to delays in finishing specific tasks (Mekonnen, 2022). An investigation by Bekele and Kassa (2020) emphasizes that contractors' poor performance considerably affects the overall timelines of projects, as contractors find it challenging to meet deadlines and deliver work according to established standards. In Ethiopia, where large infrastructure undertakings are frequently assigned to local firms, these performance-related problems can greatly influence both the quality and the punctuality of construction outcomes. Client-related issues such as ineffective decision-making, slow payment processes, and alterations in project scope are major reasons for delays in road construction projects. According to Mengistu and Zewdu (2023), clients, especially governmental bodies in Ethiopia, often delay payments or fail to make prompt decisions, leading to work stoppages on-site and dissatisfaction among contractors. Additionally, clients frequently alter project requirements or seek design modifications during the construction phase, which can cause further delays in project completion (Mulu, 2019). Within Ethiopia, these challenges are intensified by bureaucratic hurdles, as government agencies frequently struggle to streamline the approval, land acquisition, and funding release processes (Hailemariam, 2023). Such client-related challenges are prevalent in developing nations, where governance issues can hinder the timely execution of road infrastructure initiatives.

Environmental conditions are a significant factor in causing delays in road construction projects. Adverse weather conditions, such as heavy rains and extreme temperatures, are common causes of delays, particularly in countries with unpredictable weather patterns. Tesfaye and Abebe (2024) explain that in Ethiopia, seasonal rainfall can impede construction activities, particularly in rural and remote areas where roads are often underdeveloped. Additionally, environmental challenges such as unstable soil conditions, flooding, or the presence of natural obstacles like rocks or wetlands can delay construction (Zelalem and Mulugeta, 2020). In the context of the Debre Tagedie Road project in Gonder, these environmental factors have contributed to delays, as work has been halted or postponed during adverse weather conditions, further impacting the project's timeline and cost.

Environmental Factors in Road Construction: Environmental elements play a crucial role in causing delays in road building initiatives. Inclement weather, including heavy rainfalls and temperature extremes, frequently results in setbacks, especially in nations characterized by erratic climatic conditions. Tesfaye and Abebe (2024) describe that in Ethiopia, seasonal downpours can obstruct construction efforts, particularly in rural or isolated locations where road infrastructure is frequently inadequate. Furthermore, environmental issues such as unstable soil textures, flooding, and natural barriers like rocks or wetlands can hinder

construction progress (Zelalem and Mulugeta, 2020). In relation to the Debre Tegedie Road project in Gonder, these environmental variables have resulted in interruptions, as operations have been halted or delayed during unfavorable weather, further influencing both the timeline and expenses of the project.

External and Political Factors: Broader issues related to politics and social matters frequently disrupt road construction projects. Political instability, land disputes, and bureaucratic hindrances are prevalent causes of delays in many African nations (Mulu, 2019). In the specific case of Ethiopia, factors such as shifts in governmental policies, sluggish decision-making, and disputes over land rights have contributed to slowdowns in significant road construction endeavors (Mengistu and Zewdu, 2023). These political circumstances can cause holdups in project sanctions, sluggish administrative task execution, and interruptions in work due to protests or disturbances. Economic elements such as inflation, changes in currency values, and increasing material prices can also cause delays by affecting the supply of necessary resources for construction (Tesfaye, 2021). All these external aspects create an unpredictable environment that can greatly impact the timely delivery of road infrastructure projects in developing nations.

2.3 Identification of Literature Gaps and Research Gaps

Although many studies have analyzed the various factors leading to delays in road construction projects, several deficiencies persist within the existing literature. Most research has concentrated on generalized delay causes affecting road construction in developing nations, lacking a thorough examination of region-specific concerns like those present in Ethiopia. For instance, while numerous studies have investigated financial, managerial, and political influences (Woldeyohannes, 2022; Tesfaye and Abebe, 2024), there has been limited in-depth exploration of how these elements uniquely interact within the Ethiopian setting, especially concerning initiatives in the Amhara region. Moreover, while external elements such as climatic conditions and political unrest have been studied elsewhere in Africa, there is a scarcity of research focusing on how these particular challenges appear in Ethiopia's road construction industry (Mekonnen, 2022; Hassen, 2021).

Furthermore, a considerable amount of the current research regarding construction delays emphasizes the recognition of various factors but provides scarce practical suggestions or approaches for reducing these delays. Only a handful of studies have introduced specific actions that may enhance project results, particularly in Ethiopia's unique infrastructural and economic circumstances (Hailemariam, 2023; Endale and Birhanu, 2024). This shortfall in

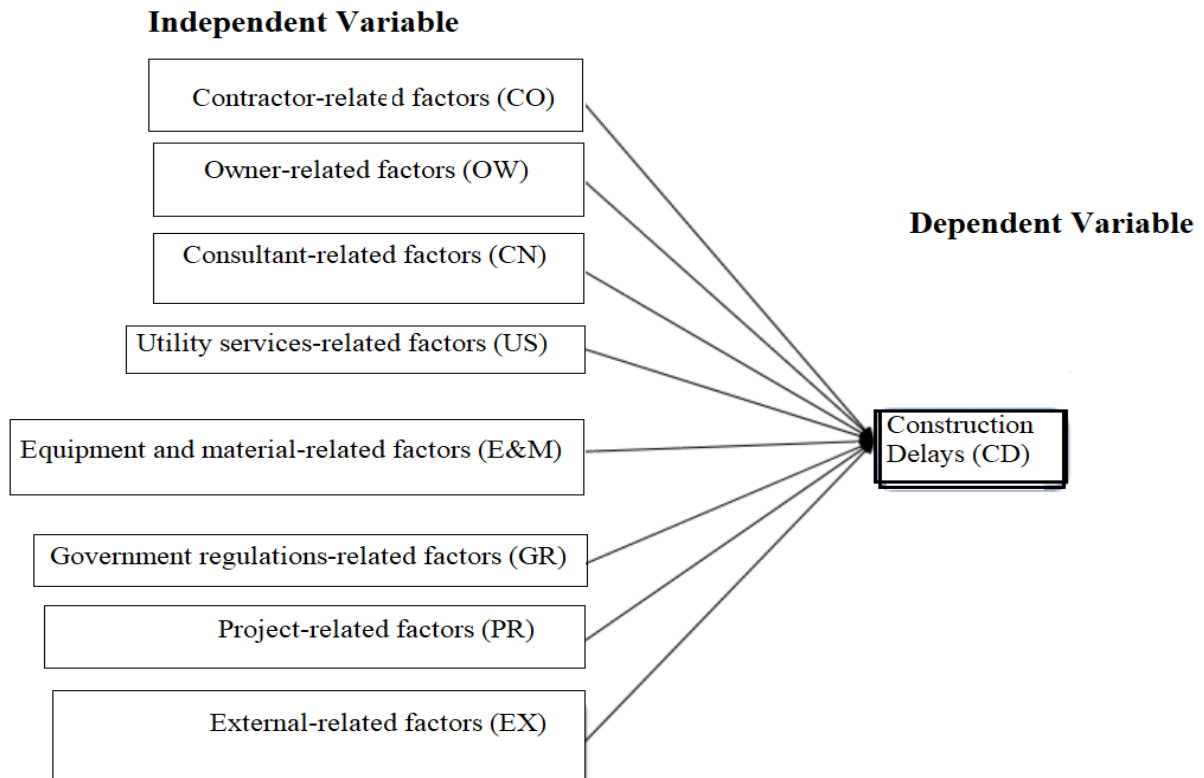
practical recommendations creates a notable deficiency in useful advice for decision-makers and project leaders. As indicated by Dawit (2021), tackling the inefficiencies present during the planning and implementation stages of infrastructure projects remains problematic, particularly when there is a lack of local knowledge. Additionally, although general theories of project management are frequently utilized, their precise modification for the Ethiopian setting has not been deeply investigated (Bekele and Kassa, 2020; Zelalem and Mulugeta, 2020).

Finally, the impact of technology in alleviating delays in construction, including methods like real-time tracking or digital management systems, has not been thoroughly examined within Ethiopian roadwork projects, revealing another critical deficiency (Tadesse and Berhanu, 2020). Recent progress in construction management technology, including Building Information Modeling (BIM) and Geographic Information Systems (GIS), has demonstrated a marked decrease in delays by enhancing planning, coordination, and resource handling in projects around the world (Zhang et al., 2023; Mubako and Chirwa, 2020). Nevertheless, these technologies are still not widely adopted in Ethiopia's road construction industry. Investigating the advantages of such tools in the realm of Ethiopian infrastructure initiatives could uncover significant possibilities for minimizing delays, boosting efficiency, and guaranteeing prompt project completion (Kebede and Adane, 2021). Addressing these issues could markedly enhance the oversight of road construction efforts in Ethiopia and other developing nations encountering similar obstacles.

2.4. Conceptual Frameworks

Construction delays (CD) are regarded as the dependent variable in this framework since they play a crucial role in influencing essential project performance metrics like cost and quality. Delays frequently result in escalated project expenses due to prolonged labor costs, rising material prices, and added administrative fees (Tadesse and Berhanu, 2020). Moreover, extended construction schedules can compel contractors to hasten the completion process, which jeopardizes work quality, potentially resulting in structural flaws and greater maintenance costs in the future (Zelalem and Mulugeta, 2020). While cost and quality serve as indicators of overall project performance, they arise from delays rather than serve as direct causes. Various independent variables contribute to these delays, such as inefficiencies among contractors, lack of funding, regulatory barriers, and external factors like adverse weather and political unrest (Tesfaye and Abebe, 2024). By focusing on delays as the central dependent variable, it becomes possible to pinpoint the underlying causes of inefficiencies,

aiding stakeholders in devising methods to reduce their impacts and improve project outcomes in terms of cost management and quality control (Hailemariam, 2023).



Sources: (Tesfaye and Abebe, 2024).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Description of Study Area

Dabat–Tegedie Road construction project located in the Amhara Region of northern Ethiopia, specifically in Dabat Woreda of the Semien Gondar Zone. The road covers about 42 to 50 kilometers, connecting the towns of Dabat (latitude 12.9842° N, longitude 37.7650° E) and Tegedie. It passes through highland areas, rural villages, and environmentally sensitive zones. Dabat Woreda is bordered by Wegera to the south, Tach Armachih to the west, Tegeda to the northwest, and Debarq to the northeast, making it an important route for regional transport and services.

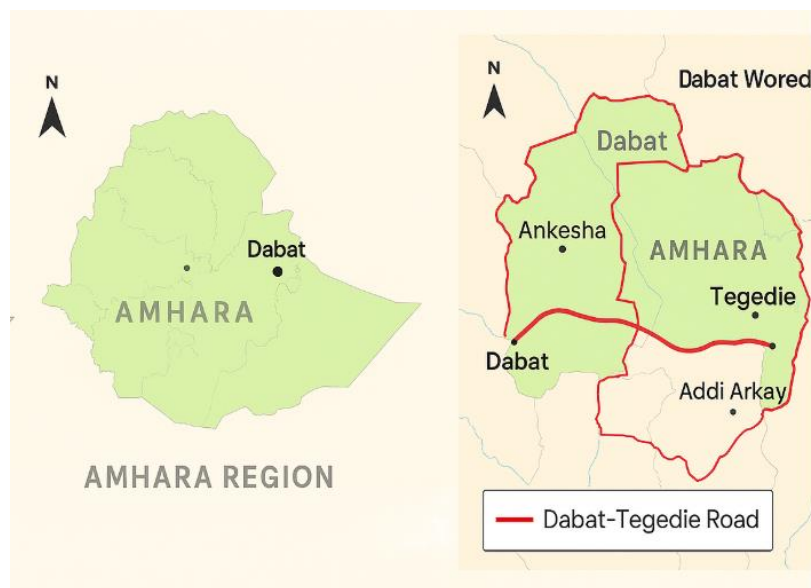


Figure 1: Study Map of Area

The study area includes not only the road itself but also the nearby kebeles, construction sites, material depots, and related infrastructure such as bridges and drainage systems. The main stakeholders are construction companies, government offices, local administrators, and community members whose daily lives and movement are affected by the project. The road aims to improve transport services, reduce travel time, and boost the local economy by connecting remote farming areas with towns and markets.

However, the project has faced delays caused by political issues, budget shortages, land disputes, and environmental challenges like erosion and seasonal flooding. These problems have slowed progress and created coordination difficulties among stakeholders. Understanding the geographical, institutional, and environmental conditions of the area is important to identify the main causes of these delays and to suggest practical solutions for successful and sustainable completion of the project.

3.2. Research Approach and Design

The research utilized mixed-methods, combining qualitative and quantitative approaches to understanding of the factor affecting the Dabat-Tegedie Road venture. This blended strategy allowed for the collection of statistical data, gathered through structured surveys, along with detailed qualitative obtained from in-depth interviews, resulting in a comprehensive analysis of the issues. By incorporating these two diverse approaches, the study captured a wide array of elements adding to project lags, encompassing both quantifiable patterns and intricate contextual aspects.

The research framework incorporated both descriptive and explanatory traits. The descriptive trait aimed to capture the present state of construction lags, pinpointing the different elements that played a role in the interruptions witnessed in the Dabat-Tegedie Road venture. It examined how variables linked to building firms, project proprietors, consultants, utility offerings, equipment and materials, government mandates, the project itself, and external effects interacted to impact project schedules. This analytical stage assessed both the individual and collective impacts of these independent variables on project lags, ultimately assisting in pinpointing the crucial elements that require attention to enhance project schedules and overall effectiveness.

3.3. Target Population and Sampling Techniques

The Target population the study was consisted 175 employees in the Dabat-Tegedie Road construction project. This group included five contractors along with subcontractors, twelve project managers, engineers, and supervisors, eight government representatives and local officials, and one hundred and fifty members of the local community. Due to the relatively small and well-defined nature of this population, a census sampling technique was utilized for the research. This approach involved gathering information from each individual in the target population, instead of choosing a smaller representative sample. The choice to perform a census guaranteed complete inclusion, removed the possibility of sampling errors, and enhanced the precision of the results by factoring in the views of all pertinent stakeholders.

3.4. Sources of Data

The information utilized was obtained from both primary and secondary sources encompass all elements affecting the delays linked to the Dabat Tegedie Road venture. Primary source was acquired via surveys and interview with essential stakeholders such as contractors, project managers, government representatives, and consultants. This facilitated direct reasons and factors of the delays. Secondary source was various project manuscripts, governmental

publications, and additional studies to provide further context. Historical data, including project schedules, financial plans, and advancement documents, was examined to comprehend the frequency and extent of the delays. The decision to conduct a full census ensured total participation, eliminated potential errors from sampling, and improved the accuracy of the findings by incorporating feedback from all relevant participants.

3.5. Data Collection Instruments

The data for this investigation were gathered using two primary sources: questionnaires and key interviews. Using both techniques allowed for a thorough understanding of the challenges experienced during the Dabat Tegedie Road project.

3.5.1. Questionnaires

A structured questionnaire was created to gather input from people involved in the project. The questionnaire used closed-ended questions with a 5-point Likert scale (ranging from "Strongly Disagree" to "Strongly Agree") to assess the participants' views on delay factors and effects. The results were helpful in determining the prevalent factors that contributed to the delays. To improve accessibility, the survey was translated from English into Amharic. It was given to a diverse sample of contractors, engineers, and members of the community in order to get a wide range of perspectives on the subject. The data was then analyzed to find patterns, trends, and root causes of the delays.

3.5.2. Key Interviews Informants

In addition to the key interviews informants were conducted with eight key project participants, including project managers, engineers, and local authorities. These conversations provided more in-depth knowledge of the particular difficulties and contributing factors related to the delays. The interviews used open ended semi-structured format, allowing the interviewer to ask follow-up questions for more information. Using this strategy, participants were able to share their own experiences and ideas. This improved the understanding of the situation and offered more contexts that might not have been apparent otherwise.

3.6. Measurement of Variables

Evaluating variables relating to construction delays (CD) is essential for pinpointing the underlying issues and their impact on road construction endeavors. Each variable can be assessed through both qualitative and quantitative techniques, ensuring a well-rounded understanding of the delays.

Dependent Variable

Construction delays (CD) serve as the dependent variable within project performance frameworks since they are effects that are shaped by various independent factors, such as contractor efficiency, owner decisions, and outside circumstances. Delays frequently result in increased expenses and diminished quality, making them critical in evaluating project achievement. For example, research has indicated that larger contract values and specific payment methods have a considerable effect on the frequency of delays and budget overruns in construction projects (Gómez-Cabrera et al., 2020).

Independent Variable

Contractor-related Factors (CO): Contractors' performance can be measured through project timelines, quality control records, and completion rates of tasks on time. Surveys or interviews with stakeholders, such as project managers, can provide subjective assessments of contractor competence and reliability (Zelalem and Mulugeta, 2020).

Owner-related Factors (OW): Owner-related delays can be quantified by tracking payment schedules, approval processes, and decision-making timelines. A delay in these areas can be measured by the average time taken to release funds or approve changes (Hailemariam, 2023).

Consultant-related Factors (CN): Consultant-related delays can be assessed by reviewing project plans for completeness and accuracy, as well as through feedback from contractors regarding miscommunications or delays in guidance. Consultant performance can be evaluated through survey results on planning efficiency (Al-Hajj and Sweis, 2023).

Utility Services-related Factors (US): Delays caused by utilities can be measured by tracking the time required to relocate or modify utilities, comparing this against the initial project schedule (Mekonnen, 2022).

Equipment and Material-related Factors (E&M): Equipment and material shortages can be measured by tracking delivery times, the frequency of equipment breakdowns, and supply chain disruptions during the project. These can be quantified in terms of delay days caused by these issues (Zhang et al., 2023).

Government Regulations-related Factors (GR): The impact of government regulations can be assessed by tracking the time required to secure permits, approvals, and other necessary documentation. Regulatory delays can be quantified by comparing actual timelines to the expected time for obtaining approvals (Hassen, 2022).

Project-related Factors (PR): Project-related delays can be measured by assessing the adequacy of initial planning and the availability of resources. Delays may be quantified by

comparing the planned versus actual resource allocation and project milestones (Tadesse and Berhanu, 2020).

External-related Factors (EX): External factors such as political instability or weather can be quantified by tracking incidents that cause project disruptions, such as work stoppages due to weather conditions or political events. These delays are typically measured in terms of days or weeks lost due to external factors (Tesfaye and Abebe, 2024).

3.7. Data Validity and Reliability Test

To ensure the quality of the data, both validity and reliability tests were carried out.

Validity indicates the extent to which the data-gathering tools measure what they are intended to measure. To confirm this, the questionnaire and the interview inquiries were assessed by specialists, including the research supervisor and practitioners in the road construction industry. Their feedback was utilized to enhance the instruments' precision, significance, and comprehensiveness before gathering data. A preliminary study was also performed on a small group resembling the intended demographic to detect and rectify ambiguous or deceptive inquiries.

Reliability indicates the data-gathering tool's stability. The questionnaire's consistency was evaluated using Cronbach's Alpha technique. A Cronbach's Alpha score exceeding 0.70 was deemed satisfactory, suggesting that the questionnaire elements demonstrated internal consistency and yielded consistent outcomes. This ensured that the data acquired were reliable and appropriate for analysis.

3.8. Data Analysis Methods

The data collected from respondents were analyzed using both descriptive and inferential statistical methods with the help of the Statistical Package for Social Sciences (SPSS). These methods were applied to identify, summarize, and interpret the factors affecting delays in the Dabat–Tege die Road construction project.

3.8.1. Descriptive Statistics

Descriptive statistics were used to summarize and describe the main characteristics of the collected data. Tools such as frequencies, percentages, means, and standard deviations were employed to present the demographic information of respondents and the overall distribution of variables. These statistics provided a clear overview of the data and helped in understanding general patterns and trends related to construction delays. Tables and charts were used to present the results in an organized and easily understandable manner.

3.8.2. Inferential statistics

Inferential statistics were used to analyze the relationships between variables and to test the research hypotheses. Multiple Linear Regression (MLR) analysis was conducted to determine how various factors including contractor-related, owner-related, consultant-related, equipment and material, government regulation, and external factors affect construction delays. Before running the regression model, diagnostic tests were performed to check for multicollinearity, heteroscedasticity, autocorrelation, and normality of residuals to ensure the accuracy and reliability of the model. The significance of each factor was tested using the p-value and coefficient of determination (R^2) to measure how well the independent variables explain variations in construction delays. The findings from both descriptive and inferential analyses were integrated and interpreted to identify the main causes of project delays and to suggest practical solutions for improving the timely completion of road construction projects.

3.8.3. Specification of Models

To analyze the factors influencing construction delays (CD) in road construction projects, a multiple linear regression (MLR) model was specified. The dependent variable (DV) in the model was the construction delay (CD), which was measured as a continuous variable, representing the number of days the project was delayed beyond the scheduled completion date.

The general form of the multiple linear regression models was as follows:

$$CD = \beta_0 + \beta_1 CO + \beta_2 OW + \beta_3 CN + \beta_4 US + \beta_5 E\&M + \beta_6 GR + \beta_7 PR + \beta_8 EX$$

Where:

- CD = Construction Delays (dependent variable) - The outcome or the variable that the model aims to explain.
- β_0 = Constant term (intercept) - This represents the value of CD when all the independent variables are zero.
- $\beta_1, \beta_2, \dots, \beta_8$ = Coefficients of the independent variables - These values indicate the strength and direction of the relationship between each factor and construction delays.
- ✓ β_1 shows the impact of contractor-related factors (CO) on delays.
- ✓ β_2 shows the impact of owner-related factors (OW) on delays.
- ✓ Similarly, β_3 to β_8 represent the impacts of consultant-related factors (CN), utility services-related factors (US), equipment and material-related factors (E&M), government regulations-related factors (GR), project-related factors (PR), and external-related factors (EX) on construction delays.

3.9. Ethical Considerations

In the execution of this research, ethical aspects were thoroughly addressed to guarantee that the investigation was conducted with responsibility and respect towards all involved individuals. Initially, informed consent was secured from each participant in the surveys and interviews. This indicated that they were completely briefed on the study's aims, the nature of their participation, and the manner in which their information would be utilized. Participants were reassured that their involvement was optional and that they held the right to withdraw at any moment without facing any adverse repercussions. Privacy and anonymity were upheld consistently throughout the research activities. Personal data and feedback were safeguarded and used solely for the aims of the study. Information was stored in a secure manner, with access granted only to authorized personnel. Additionally, the research was designed to reduce any potential risks to participants, be it physical, emotional, or psychological.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This section presents the outcomes obtained from the quantitative information collected from participants in the delays Dabat Tegedie Road construction endeavor. From an initial group of 175 people, 168 usable responses were obtained and analyzed, yielding a substantial response rate that strengthens the trustworthiness of the results. It commences with a thorough examination of the participants' demographic characteristics, offering insight into their backgrounds. Subsequently, descriptive statistics are provided to summarize crucial variables related to the construction project and associated factors. Furthermore, correlation analysis is carried out to explore the interconnections between the primary variables under consideration. Following this, the outcomes of multiple linear regression analyses are presented in detail, highlighting significant predictors and evaluating their impacts on construction project outcomes. Throughout this chapter, interpretations of the results are in line with the study's particular goals and are explored with reference to the current literature to improve understanding of the outcomes.

4.2 Demographic Characteristics of Respondents

The demographic characteristics of the participants, encompassing aspects like gender, age, educational background, job role, and experience in the construction industry, were evaluated to gain insights into the backgrounds of the contributors.

Table 4. 1: Demographic Characteristics of Respondents

No.	Variable	Category	Frequency (N)	Percentage (%)
1	Gender	Male	141	83.9%
		Female	27	16.1%
		Total	168	100%
2	Age	18–25 years	21	12.5%
		26–35 years	74	44.0%
		36–45 years	51	30.4%
		Above 45 years	22	13.1%
		Total	168	100%
3	Educational Level	Certificate	12	7.1%
		Diploma	58	34.5%
		Bachelor's Degree	78	46.4%
		Master's Degree or above	20	11.9%
		Total	168	100%
4	Job Title	Project Manager	32	19.0%
		Site Engineer	48	28.6%
		Procurement Officer	23	13.7%
		Supervisor	37	22.0%

		Other (technicians, planners)	28	16.7%
		Total	168	100%
5	Years of Experience	Less than 2 years	19	11.3%
		2–5 years	46	27.4%
		6–10 years	63	37.5%
		Above 10 years	40	23.8%
		Total	168	100%
6	Monthly Income	Below 3,000 ETB	24	14.3%
		3,001–6,000 ETB	56	33.3%
		6,001–9,000 ETB	50	29.8%
		Above 9,000 ETB	38	22.6%
		Total	168	100%
7	Residence	Urban	119	70.8%
		Semi-Urban	34	20.2%
		Rural	15	8.9%
		Total	168	100%
8	Project Involvement	Road Construction	97	57.7%
		Building Construction	54	32.1%
		Both Road & Building Construction	17	10.1%
		Total	168	100%

Source: Survey Data, 2025

Regarding gender, a significant portion of the participants were male (83.9%), signaling a workforce in the construction industry that is largely male-oriented. In contrast, females made up just 16.1%. This illustrates the prevalent gender disparity found in fields related to construction.

The age distribution a majority of participants were in the 26–35 years age range (44.0%), followed by individuals aged 36–45 years (30.4%). Collectively, these cohorts represent the bulk of mid-career workers who are actively participating in the industry. The younger demographic (18–25 years) and the older demographic (over 45 years) represented smaller percentages of 12.5% and 13.1%, respectively.

Educational attainment was generally high, with nearly half (46.4%) of respondents having a Bachelor’s degree and more than a third (34.5%) holding a diploma. Those with certificates or higher academic qualifications (Master’s or more) constituted minor segments of 7.1% and 11.9%, respectively. This indicates a workforce that is reasonably educated and capable of managing intricate construction responsibilities.

In terms of job titles, site engineers represented the largest category (28.6%), followed by supervisors (22.0%), project managers (19.0%), procurement officers (13.7%), and various technical personnel (16.7%). This diversity highlights the operational and administrative roles

involved in the project. The years of experience showed a well-experienced group of respondents, with the highest percentage having 6–10 years of experience (37.5%), followed by those with over 10 years (23.8%). Respondents with less experience (under 2 years) comprised only 11.3%, suggesting that most have significant exposure to the construction field.

Concerning monthly earnings, the majority of respondents made between 3,001 and 6,000 Ethiopian Birr (33.3%), then 6,001 to 9,000 ETB (29.8%). A smaller fraction earned below 3,000 ETB (14.3%) or exceeded 9,000 ETB (22.6%). This income distribution indicates a varied economic standing among construction professionals. Most respondents (70.8%) lived in urban locales, while smaller percentages were in semi-urban (20.2%) or rural (8.9%) areas. This suggests that most respondents likely reside near project centers and construction locations.

Lastly, concerning their participation in construction endeavors, 57.7% acknowledged involvement in road construction, 32.1% in building construction, and 10.1% in both types. This confirms that most have firsthand experience in road construction, emphasizing the relevance of their contributions to this research.

Overall, the demographic features showcase a predominantly male, reasonably educated, and experienced workforce, chiefly engaged in road construction and living in urban territories, offering a trustworthy and pertinent foundation for the research conclusions.

4.3. Analysis Factors Affecting Road Construction Delays

To main and assess the main reasons for delays experienced in the Dabat–Tegedie Road project, participants involved were surveyed to evaluate various factors contributing to such delays. They utilized a five-point rating scale, Strongly Disagree to Strongly Agree. The average ratings and standard deviations were computed to assess the each factor affecting the variability in responses. Subsequent sections and tables will display the findings from this investigation.

4.3.1 Factors Related to the Contractor

Table 4.2 displays the statistical details concerning contractor-related issues that led to delays in the Dabat–Tegedie Road initiative. The information gathered from the respondents illustrates their views on various obstacles tied to the contractor’s efficiency, ability, administration, and relationships with other stakeholders. The average values and standard deviations offer a glimpse into the importance of each factor in contributing to the delays.

Table 4. 2: Statistical Description of Factors Related to the Contractor

No.	Survey Question	Mean	Std. Dev.
1	The performance of the contractor has significantly contributed to delays in the Dabat Tegedie Road construction project.	4.25	0.62
2	The contractor’s lack of adequate manpower or equipment has caused delays in the project.	4.18	0.59
3	The contractor’s inability to meet agreed milestones has led to significant delays in the project.	4.12	0.64
4	Poor coordination between the contractor and other stakeholders has affected project timelines.	4.06	0.66
5	The contractor’s financial difficulties have delayed the project.	4.00	0.61
6	Lack of proper contractor management has led to delays in completing tasks on time.	3.98	0.67
7	Delays in subcontractor performance have impacted the overall timeline of the project.	3.92	0.71
	Overall Average	4.073	0.643

Source: Survey Data (2025)

The data in Table 4.2 indicate that contractor-related issues are a major contributor to delays in the Dabat–Tegedie Road construction project. Among the surveyed factors, the contractor’s overall performance was perceived as the most significant cause of delays ($M = 4.25$, $SD = 0.62$), suggesting that inadequate planning, scheduling, and execution were critical shortcomings. This implies that inadequate planning and scheduling by the contractor were among the most critical factors leading to delays. Challenges related to contractor oversight ($M = 3.98$) and subcontractor performance ($M = 3.92$) further emphasize recurring internal inefficiencies and risks associated with reliance on subcontractors. The overall average score of 4.073 confirms that respondents generally agreed that contractor-related factors play a significant role in project delays.

In summary, these findings suggest that addressing delays requires a comprehensive approach focused on improving contractor management, ensuring adequate resources, enhancing coordination with stakeholders, and providing training on project scheduling and resource handling. Strengthening these areas will help reduce delays, improve efficiency, and support the timely completion of the Dabat–Tegedie Road project.

4.3.2 Owner-Related Factors

Table 4.3 displays the average ratings and the extent to which each factor influenced delays in the construction of the Dabat Tegedie Road. Survey participants were questioned regarding issues associated with the owner's financial control, decision-making processes, communication style, and approval methods. The average score and its variance indicate the significance of each factor in contributing to delays.

Table 4. 3: Descriptive Statistics of Owner-Related Factors

No.	Survey Question	Mean	Std. Dev.
1.	Delays in payments and approvals from the project owner have contributed to the overall delay in the project.	4.25	0.62
2.	The owner's delayed decision-making process has resulted in project delays	4.17	0.65
3.	The owner's inadequate financial management has caused delays in the project.	4.12	0.67
4.	Frequent changes in project requirements by the owner have led to delays	4.08	0.68
5.	The owner's lack of clear communication with stakeholders has contributed to delays in the project.	4.05	0.70
6.	Owner delays in approving key project designs and changes have slowed progress.	4.03	0.69
7.	Delayed release of funds from the owner has caused project slowdowns.	4.10	0.66
	Overall Average	4.114	0.667

Source: Survey Data (2025)

The findings depicted in Table 4.3 reveal a notable consensus among participants that issues linked to the owner played a significant role in causing project delays. The area with the highest average rating ($M = 4.25$, $SD = 0.62$) was the delays in payments and approvals, emphasizing that setbacks in financial transactions are a major obstacle. Following closely were the delays in the owner's decision-making process ($M = 4.17$) and ineffective financial management ($M = 4.12$), which revealed inefficiencies in administration from the owner's side.

Moreover, the frequent alterations in project requirements ($M = 4.08$) and inadequate communication with stakeholders ($M = 4.05$) indicate that changing project scopes and vague instructions further exacerbated the delays. Delays tied to design approvals ($M = 4.03$) and the tardy release of funds ($M = 4.10$) were also recognized as significant factors. In summary, these results indicate that in order to minimize future delays, project owners need to optimize

payment and approval procedures, speed up decision-making, and improve clear and consistent communication with all stakeholders involved in the project.

4.3.3 Factors Related to Consultants

Table 4.4 offers descriptive statistics regarding consultant-related factors that lead to delays in the Dabat Tegedie Road construction initiative. Participants shared their insights on obstacles pertaining to the consultant's responsibilities in planning, communication, monitoring, and coordination. The mean scores along with standard deviations reflect the perceived influence of each factor on the delays encountered in the project.

Table 4. 4: Descriptive Statistics of Consultant-Related Factors

No.	Survey Question	Mean	Std. Dev.
1.	Delays in the consultant's planning, guidance, and decision-making processes have led to delays in the project.	4.22	0.60
2.	The consultant's failure to provide timely designs and plans has contributed to delays in the project.	4.18	0.63
3.	Poor communication between consultants and other project stakeholders has led to delays.	4.14	0.65
4.	Consultants' inability to monitor project progress effectively has caused delays in meeting deadlines.	4.11	0.67
5.	The consultant's inadequate risk assessment and mitigation strategies have contributed to delays.	4.09	0.68
6.	Consultants' lack of coordination with the contractor has resulted in delays.	4.06	0.69
7.	Delays in receiving necessary feedback from the consultant have impacted project timelines.	4.13	0.64
	Overall Average	4.133	0.651

Source: Survey Data (2025)

The data presented in Table 4.4 reveals that problems linked to consultants are major factors causing delays in road construction projects. The factor with the highest rating was delays in the consultant's planning, guidance, and decision-making ($M = 4.22$, $SD = 0.60$), implying that sluggish administrative processes and poor decision-making significantly obstruct project advancement (Abebe, 2020; Dawit, 2021).

Almost equally significant are delays in delivering designs and plans promptly ($M = 4.18$) and inadequate communication with stakeholders ($M = 4.14$), emphasizing that ineffectual delivery and interaction approaches by consultants can considerably affect project timelines

(Al-Hajj & Sweis, 2023; Hailemariam, 2023). Furthermore, insufficient monitoring of project advancement (M = 4.11), inadequate risk assessment and mitigation (M = 4.09), and poor coordination with contractors (M = 4.06) expose fundamental weaknesses in consultancy methods that can hinder timely completion (Mengistu & Zewdu, 2023; Zhang, Liu & Zhou, 2023).

The comparatively high mean score for delays in obtaining needed feedback from consultants (M = 4.13) further underscores the importance of effective teamwork and responsiveness. Taken together, the average score of 4.133 validates that respondents strongly viewed consultant inefficiencies as a primary origin of project delays.

To summarize, improving consultant performance in planning, communication, monitoring, risk management, and coordination is essential for minimizing delays and guaranteeing the successful completion of road construction projects (Bekele & Kassa, 2020; Tadesse & Berhanu, 2020).

4.3.4 Factors Related to Utility Services

Table 4.5 outlines descriptive statistics concerning factors associated with utility services that lead to delays in the Dabat Tegedie Road construction endeavor. Respondents assessed the influence of various challenges, including utility relocation, service disruptions, coordination with utility providers, and approval procedures. The mean values and standard deviations illustrate the perceived significance of each issue in contributing to project delays.

Table 4. 5: Descriptive Statistics of Utility Services-Related Factors

No.	Survey Question	Mean	Std. Dev.
1.	Delays in utility services, including relocation or modification of utilities, have caused significant delays in the project.	4.19	0.66
2.	Utility service interruptions have led to extended project timelines.	4.12	0.69
3.	The delay in utility relocation has caused work stoppages on the project site.	4.21	0.62
4.	Lack of coordination between the project team and utility providers has led to delays.	4.17	0.64
5.	Unexpected changes in utility requirements during the project have resulted in delays.	4.10	0.68
6.	Delayed approval for utility modifications has extended project timelines.	4.14	0.67
7.	Utility service provider’s limited availability has slowed project progress.	4.09	0.70
	Overall Average	4.15	0.666

Source: Survey Data (2025)

The data in Table 4.5 reveals that problems concerning utility services are key factors causing delays in the Dabat-Tege die Road construction project. The most impactful factor was delays in relocating utilities, which led to halts in construction work ($M = 4.21$, $SD = 0.62$). This implies that insufficient preparation and poor coordination with utility companies can significantly impede the seamless advancement of construction operations (Endale & Birhanu, 2024; Dawit, 2021).

Additional notable factors encompass delays in utility modification and relocation ($M = 4.19$), a lack of coordination between the project team and utility organizations ($M = 4.17$), and long approval times for utility modifications ($M = 4.14$). These issues indicate widespread inefficiencies in communication and planning between organizations. Previous studies corroborate this, highlighting that inadequate collaboration between contractors and utility service companies frequently causes road construction delays in Ethiopia (Hailemariam, 2023; Bekele & Kassa, 2020).

Moreover, unforeseen alterations in utility needs ($M = 4.10$) and the limited number of utility service companies ($M = 4.09$) usually worsen delays by disrupting workflows and increasing project expenses. The overall mean score of 4.15 emphasizes the substantial effect of utility-related problems on project timelines. To tackle these problems, project managers should prioritize early identification of possible utility conflicts, involve utility organizations during the planning stage, and streamline the approval process for service modifications. Improving communication channels and collaboration frameworks among stakeholders could greatly decrease service-related disruptions and support the on-time completion of road construction projects (Abebe, 2020; Al-Hajj & Sweis, 2023).

4.3.5 Equipment and Material-Related Factors

The descriptive statistics concerning factors related to equipment and materials that influence delays in the construction of the Dabat Tege die Road are presented. Participants evaluated how shortages, delays in delivery, equipment availability, quality concerns, and disruptions in the supply chain affect the schedule of the project.

Table 4. 6: Descriptive Statistics of Equipment and Material-Related Factors

No.	Survey Statement	Mean	Std. Dev.
1.	Shortages of necessary tools and supplies have significantly contributed to the delay of the construction project for Dabat Tege die Road.	4.22	0.64
2.	Problems with the delivery of crucial supplies have caused substantial	4.19	0.61

	setbacks in the initiative.		
3.	The unavailability of specific types of machinery has obstructed progress in the project's development.	4.11	0.66
4.	Concerns regarding the quality of materials have led to postponements due to the requirement for modifications.	4.06	0.70
5.	A lack of qualified personnel to operate the equipment has further compounded the delays in the project.	4.10	0.65
6.	The breakdown of essential machinery during the construction phase has caused work interruptions.	4.17	0.63
7.	Disruptions in the supply chain have contributed to delays in obtaining required materials.	4.15	0.67
8.	Delays in customs processing for imported materials have resulted in setbacks to the project's timeline.	4.09	0.69
	Overall Average	4.14	0.65

Source: Survey Data (2025)

As shown in Table 4.6, problems with equipment and materials are a major cause of delays in the Dabat-Tegedie Road construction project. The most significant issue was the lack of necessary tools and materials ($M = 4.22$, $SD = 0.64$), followed by delays in getting materials delivered ($M = 4.19$) and failures of key machinery ($M = 4.17$). This indicates that problems in how the supply chain is managed and operational difficulties are seriously hindering the ability to complete the project on time (Abebe, 2020; Dawit, 2021).

Other factors that add to the problem include not having the right types of machinery available ($M = 4.11$), worries about the quality of materials that require changes ($M = 4.06$), and a shortage of skilled people to use the equipment ($M = 4.10$). Also, delays in getting imported materials through customs ($M = 4.09$) highlight the need to plan ahead in procurement and logistics (Bekele & Kassa, 2020; Mengistu & Zewdu, 2023).

In general, the average score of 4.14 proves that problems with equipment and materials are a big reason for construction delays. To lessen these issues, project managers should use good procurement strategies, make sure materials are delivered on time, create schedules for regular machinery maintenance, and put money into training skilled operators. Improving the coordination of the supply chain and how resources are planned will increase operational efficiency and cut down on project delays (Hailemariam, 2023; Al-Hajj & Sweis, 2023).

4.3.6 Factors Related to Government Regulations

Table 4.7 provides descriptive statistics regarding government regulation-related factors that lead to delays in the construction of the Dabat Tegedie Road. Participants assessed how delays in permits, approvals, changes in regulations, compliance with environmental standards, and collaboration with local authorities affect project timelines. The average scores and standard deviations reflect the perceived impact of each factor on project delays.

Table 4. 7: Descriptive Statistics of Government Regulations-Related Factors

No.	Survey Statement	Mean	Std. Dev.
1.	Holds in securing required governmental permits and approvals have played a role in postponing the project.	4.24	0.60
2.	Changes in regulations throughout the project have led to setbacks in construction.	4.18	0.64
3.	The extensive procedure for obtaining government consent has caused a delay in the project.	4.20	0.62
4.	Holds in meeting environmental regulations have resulted in project delays.	4.12	0.66
5.	Hesitations in securing land use permits have prolonged the project schedule.	4.16	0.61
6.	Labor rules enforced by the government have hindered the progress of the project.	4.08	0.70
7.	Conflicts with local government coordination have resulted in delays in the project.	4.14	0.68
	Overall Average	4.16	0.6443

Source: Survey Data (2025)

The data presented in Table 4.7 show that government rules and how they are put into action play a big role in causing hold-ups in the Dabat-Tegedie Road construction. The biggest issue recognized was the time it takes to get the needed government licenses and go-aheads ($M = 4.24$, $SD = 0.60$), followed by the long steps for getting government permission ($M = 4.20$) and rule changes while the project was ongoing ($M = 4.18$). These outcomes point to the fact that difficult official processes and changing rules slow down how the project moves forward, which is in line with earlier research on road building delays in Ethiopia (Bekele & Kassa, 2020; Hailu & Wolde, 2021).

Other things that added to the delays were taking too long to meet environmental rules ($M = 4.12$), get land use permissions ($M = 4.16$), and problems related to labor laws enforced by

the government (M = 4.08). Also, disagreements with local government teamwork (M = 4.14) highlight the need to actively work with the right authorities. Taken together, these things emphasize how important it is to factor in legal and regulatory things when starting project planning and to keep talking with government groups to reduce disruptions (Hailemariam, 2023; Dawit, 2021).

In general, the average score of 4.16 backs up the idea that regulatory delays are a major cause of project setbacks. Dealing with these problems calls for easier official processes, early planning for meeting rules, and good teamwork with both national and local government organizations to make sure projects finish on time (Al-Hajj & Sweis, 2023; Mekonnen, 2022).

4.3.7. Factors Contributing to Project Delays

Factors pertinent to the project were evaluated to understand their impact on delays associated with the Dabat Tegedie Road construction initiative. Participants were requested to evaluate eight significant issues specific to the project. The findings are compiled in Table 4.8.

Table 4. 8: Respondents’ Perceptions of Project-Related Delay Factors

No.	Project-Related Delay Factors	Mean	Std. Dev.
1	Inadequate foresight and insufficient distribution of resources have led to setbacks in the Dabat Tegedie Road construction initiative.	4.35	0.69
2	Insufficient planning and timeline organization for the project have caused hold-ups.	4.29	0.74
3	The absence of effective risk management approaches during the planning phase has resulted in delays for the project.	4.21	0.76
4	Not providing sufficient resources to the project has contributed to lost time.	4.19	0.81
5	Initial expansion of the project’s scope has led to delays in the Dabat Tegedie Road endeavor.	4.11	0.88
6	Unclear objectives and goals for the project have caused delays in progression.	4.05	0.91
7	Inefficient scheduling of activities has resulted in delays in finishing the project.	3.98	0.95
8	Not monitoring the project's advancement and failing to implement necessary changes has added to the delays.	3.92	0.93
	Overall Average	4.138	0.834

Source: Survey Data (2025)

The data presented in Table 4.8 suggest that factors linked to the project significantly contribute to delays in the Dabat-Tegedie Road construction. The factor with the highest rating was a lack of foresight and poor resource distribution (M = 4.35, SD = 0.69), emphasizing that ineffective planning and allocation of resources at the beginning seriously impacts the project's advancement (Abebe, 2020; Dawit, 2021).

Other key factors include insufficient planning and timeline management (M = 4.29) along with a lack of robust risk management methods during planning (M = 4.21), showcasing flaws in project scheduling and forward-thinking risk reduction strategies (Bekele & Kassa, 2020; Al-Hajj & Sweis, 2023). Deficiencies in providing sufficient resources (M = 4.19), initial scope creep (M = 4.11), and ambiguous project goals (M = 4.05) also led to delays, implying that weaknesses in planning and goal definition hinder on-time completion (Hailemariam, 2023; Tadesse & Berhanu, 2020).

Lower, yet still important, average scores were noted for inefficient activity scheduling (M = 3.98) and insufficient monitoring of the project's progress (M = 3.92), highlighting the necessity of ongoing oversight and flexible management approaches. Ultimately, these outcomes indicate that the enhancement of early-phase project planning, resource allocation, risk management, and monitoring is vital for reducing delays and guaranteeing the prompt completion of road construction projects (Mekonnen, 2022; Mengistu & Zewdu, 2023).

4.3.8. Factors Related to External Delays

External factors were analyzed to assess their impact on the delays experienced during the construction of the Dabat Tegedie Road. Elements such as political instability, fluctuations in weather, natural disasters, and social unrest were taken into account. Table 4.9 presents the average and diversity of responses concerning five major external influences on delays.

Table 4. 9: Perspectives of Respondents on External-Related Delay Factors

No.	External-Related Delay Factors	Mean	Std. Dev.
1	Political turmoil or severe weather has contributed to delays in the ongoing construction project.	4.31	0.71
2	Unanticipated political situations have resulted in halts to construction activities.	4.27	0.75
3	Unexpected severe weather events have postponed the timeline for construction.	4.18	0.82
4	Natural calamities such as floods or earthquakes have affected the schedule of the project.	4.06	0.88
5	Civil disturbances or protests have caused notable delays in the construction processes.	3.97	0.91
	Overall Average	4.158	0.814

Source: Survey Data (2025)

The results presented in Table 4.9 highlight the substantial effect of outside influences in causing delays to the Dabat-Tegedie Road construction project. Political instability and unforeseen political scenarios had the highest average scores (M = 4.31 and 4.27, respectively), implying that an unstable political climate often disrupts project operations, which aligns with earlier research on road building in Ethiopia (Hassen, 2022; Mulu, 2019). Harsh and surprising weather occurrences, such as floods and other natural disasters, were also reported as significant factors in causing delays (M = 4.18 and 4.06), which highlights how susceptible road projects are to environmental circumstances (Tesfaye & Abebe, 2024; Li, Zhang & Liu, 2018). Civil unrest and demonstrations, while somewhat less impactful (M = 3.97), continue to present a considerable impediment to advancement, demonstrating how social factors affect project schedules (Olabisi, 2018).

In general, the average score of 4.158 emphasizes the considerable influence of variables that project management cannot control. It is advised that project managers put in place thorough risk evaluations, create backup strategies for political and environmental unknowns, create flexible schedules, and encourage solid communication with local officials and interested parties in order to lessen these effects. These actions can assist in modifying project activities during interruptions and reduce the negative effects of external variables on road construction projects (Global Infrastructure Facility, 2021; Dawit, 2021).

4.3.9. Assessment of Construction Delays (CD)

This part concentrates on assessing the implications and characteristics of construction delays related to the Dabat Tegedie Road initiative. Participants rated ten factors concerning costs, schedule, work quality, stakeholder contentment, and financial impacts. The collected results are displayed in Table 4.10 below.

Table 4. 10: Respondents’ Views on Effects of Construction Delays

No.	Construction Delay Measurement Items	Mean	Std. Dev.
1	Delays in the Dabat Tegedie Road project have caused an increase in costs and a decline in quality standards.	4.33	0.65
2	The project’s timeline has been greatly affected by these delays.	4.44	0.63
3	Reputational harm to stakeholders has arisen from construction delays.	4.16	0.79
4	Delays have led to higher resource expenses, encompassing labor and equipment costs.	4.28	0.68
5	Delays have resulted in modifications to the project’s design or scope.	4.01	0.85
6	The quality of materials used in construction has been influenced by delays.	3.89	0.91
7	Delays in completing the project have created inconveniences for local	4.19	0.77

	residents.		
8	Satisfaction levels among project stakeholders, including local governments and investors, have dropped due to construction delays.	4.26	0.72
9	Delays have led to alterations in the critical path of the project.	4.11	0.80
10	The project delays have caused financial strain on the contractor and owner.	4.30	0.69
	Overall Average	4.197	0.749

Source: Survey Data (2025)

The data from Table 4.10 reveals that construction delays in the Dabat-Tegedie Road project have significantly impacted various aspects of how the project performed. The timeline was most affected, with the highest mean score ($M = 4.44$, $SD = 0.63$), which underscores that delays greatly interfere with planned work, a frequent problem in Ethiopian road projects (Abebe, 2020; Hailemariam, 2023).

Financial and technical problems also stood out. Participants pointed to increased project expenses and lower quality ($M = 4.33$), as well as greater use of resources like labor and machinery ($M = 4.28$), consistent with research connecting construction delays to increased costs and reduced quality (Bekele & Kassa, 2020; Mengistu & Zewdu, 2023).

There were also clear social and organizational consequences. Lower stakeholder satisfaction ($M = 4.26$) and reputational damage ($M = 4.16$) were reported, showing that delays hurt both the organization's image and its relationships with investors and local government (Tadesse & Berhanu, 2020; Smith, Johnson & Roberts, 2020). Furthermore, the project's critical path was altered due to delays ($M = 4.11$), which also created financial difficulties for contractors and owners ($M = 4.30$), indicating managerial and operational problems related to schedule overruns (Al-Hajj & Sweis, 2023; Zhang, Liu & Zhou, 2023).

Even though the effects on material quality ($M = 3.89$) and design changes ($M = 4.01$) were somewhat less severe, they still indicate notable difficulties in keeping up construction standards when delays occur. These results indicate that to effectively reduce delays, proactive steps are needed, such as early detection, strong schedule and budget control, better communication among those involved, and more effective risk management methods. It is also essential to maintain quality control procedures during interruptions to ensure the project meets standards and the community remains satisfied (Dawit, 2021; Mekonnen, 2022).

In conclusion, the evidence shows that delays not only affect costs and schedules but also have wider consequences for project quality, stakeholder satisfaction, and overall success, highlighting the importance of thorough management strategies in road construction projects.

Table 4. 11: Overview of Factors Influencing Road Construction Delays

Category	Mean	Std. Dev.
Contractor-Related (CR)	4.09	0.64
Owner-Related (OW)	4.11	0.66
Consultant-Related (CN)	4.13	0.65
Utility Services-Related (US)	4.15	0.66
Equipment/Material-Related (E&M)	4.14	0.67
Government Regulations (GR)	4.16	0.65
Project-Related (PR)	4.18	0.78
External-Related (EX)	4.16	0.77
Construction Delay Effects (CD)	4.20	0.74

Source: Survey Data (2025)

Table 4.11 provides a comprehensive summary of the various factors that contribute to delays in road construction across different regions. Project-related factors (PR; M = 4.18) are identified as the most significant, suggesting that inadequate planning, ineffective resource distribution, and scope changes significantly impede road construction. This finding aligns with recent studies indicating that flaws in planning before construction and risk assessment are critical reasons for delays (Mohajeri Borje Ghaleh et al., 2021; Adepu, 2023). Likewise, external factors (EX; M = 4.16) and governmental regulations (GR; M = 4.16) were also critical contributors; issues like political instability, negative weather patterns, and slow bureaucratic processing have been highlighted as major barriers to timely project completion (Berta et al., 2025; Dong et al., 2025).

The closeness in average ratings for contractor (CO), owner (OW), and consultant (CN) influences (with M values ranging from 4.09 to 4.13) suggests widespread coordination issues. These coordination difficulties, including late payments, inadequate performance, and poor communication, are often reported in road projects within developing countries (Mohajeri Borje Ghaleh et al., 2021; Amoah *et al.*, 2024). Moreover, delays linked to utility services (US; M = 4.15) and equipment/material (E&M; M = 4.14) reflect inefficiencies in logistics and supply chains, including material shortages and equipment failures, which have been recurrently discussed in studies about construction risks (Alshammari *et al.*, 2024; Mohajeri Borje Ghaleh *et al.*, 2021).

In conclusion, the category concerning Construction Delay Effects (CD; M = 4.20), which encompasses increased costs, timeline disruptions, and stakeholder dissatisfaction, received

the highest score overall, underscoring the serious financial and reputational consequences of these delays. These findings are supported by broader research illustrating how delays in infrastructure negatively affect trust and raise project expenses (Amoah *et al.*, 2024; Berta *et al.*, 2025).

To effectively mitigate these issues, it is crucial to enhance pre-project planning and adopt comprehensive risk management approaches to tackle weaknesses during the planning stage. Improving regulatory frameworks and fostering better coordination among contractors, owners, and consultants is vital to minimize administrative inefficiencies. Additionally, enhancing resilience in supply chains and integrating utility services can greatly reduce operational interruptions and the risks of delay.

4.4. Correlation Analysis

The analysis of Pearson’s correlation was executed to explore the linear connections among different predictors, which include factors related to contractors, owners, and consultants, with the outcome variable being construction delays (CD). The values of correlation coefficients ranged from -1 to +1, and the interpretations for their strength were categorized as follows: 0.00–0.19 (very weak), 0.20–0.39 (weak), 0.40–0.59 (moderate), 0.60–0.79 (strong), and 0.80–1.00 (very strong). The significance level was considered to be $p < 0.05$.

Table 4. 12: Matrix of Correlations between Variables Influencing Construction Delays (CD)

Variable	CO	OW	CN	US	E&M	GR	PR	EX	CD
CO	1.00								
OW	0.42**	1.00							
CN	0.38**	0.51**	1.00						
US	0.25*	0.33**	0.29**	1.00					
E&M	0.47**	0.22*	0.18	0.31**	1.00				
GR	0.12	0.45**	0.37**	0.20*	0.09	1.00			
PR	0.53**	0.39**	0.41**	0.27**	0.44**	0.32**	1.00		
EX	0.08	0.17	0.14	0.23*	0.11	0.26*	0.19	1.00	
CD	0.61**	0.58**	0.49**	0.43**	0.52**	0.47**	0.67**	0.39**	1.00

Source: Survey Data (2025)

The strongest correlation from Table 12 concerning construction delays was related to project-related factors (PR; $r = 0.67$, $p < .01$), suggesting that poor planning and resource allocation are key indicators of delays. Contractor-related factors (CO; $r = 0.61$, $p < .01$) and owner-related factors (OW; $r = 0.58$, $p < .01$) also showed notably strong correlations, highlighting how important operational skills and sound decision-making are. Equipment and

material factors (E&M; $r = 0.52$), along with governmental regulations (GR; $r = 0.47$), had moderate yet significant links to CD, underscoring how logistical problems and regulatory procedures affect project timelines. These findings are consistent with current global studies that link planning shortcomings, how well contractors perform, and delays caused by regulations to poor project results (Daoud, 2023; Pérez et al., 2024; Memon et al., 2023).

The correlations between variables revealed a link at $r = 0.53$ ($p < .01$) for contractor-related and project-related factors, implying that poor contractor performance makes planning problems worse. Additionally, the correlation between owner-related and regulatory factors was $r = 0.45$ ($p < .01$), indicating that delays in owner approvals often occur alongside difficult regulatory environments. These coordination challenges mirror observations found in global construction governance literature (Araújo-Rey & Sebastián, 2021; Memon et al., 2023).

Although external factors (EX; $r = 0.39$, $p < .05$) showed a weak correlation with delays, this relationship remains statistically significant, demonstrating the small but noticeable influence of social and environmental disruptions. This also aligns with recent studies showing how political instability and extreme weather can intensify problems in delivering infrastructure (Araújo Rey & Sebastián, 2021; Pérez et al., 2024).

4.5. Multiple Regression Assumption Tests

Prior to performing multiple linear regressions (MLR), essential assumptions were assessed to confirm the reliability of the results. Breaches of these assumptions may lead to distorted estimates or inaccurate conclusions. The following assumption assessments were carried out:

1. Normality of Residuals

The premise of normality necessitates that the residuals, or errors, associated with the regression model, exhibit a near-normal distribution. This was examined through the Shapiro-Wilk test and by visually analyzing a Q-Q plot. The outcome from the Shapiro-Wilk test was $W = 0.982$ and a p-value of 0.124, implying that the residuals did not significantly deviate from a normal distribution. Moreover, the Q-Q plot illustrated in Figure 4.1 indicated that the residual points closely adhered to the diagonal line, reinforcing the assumption of normality.

Figure 4.1: Q-Q Plot of Residuals

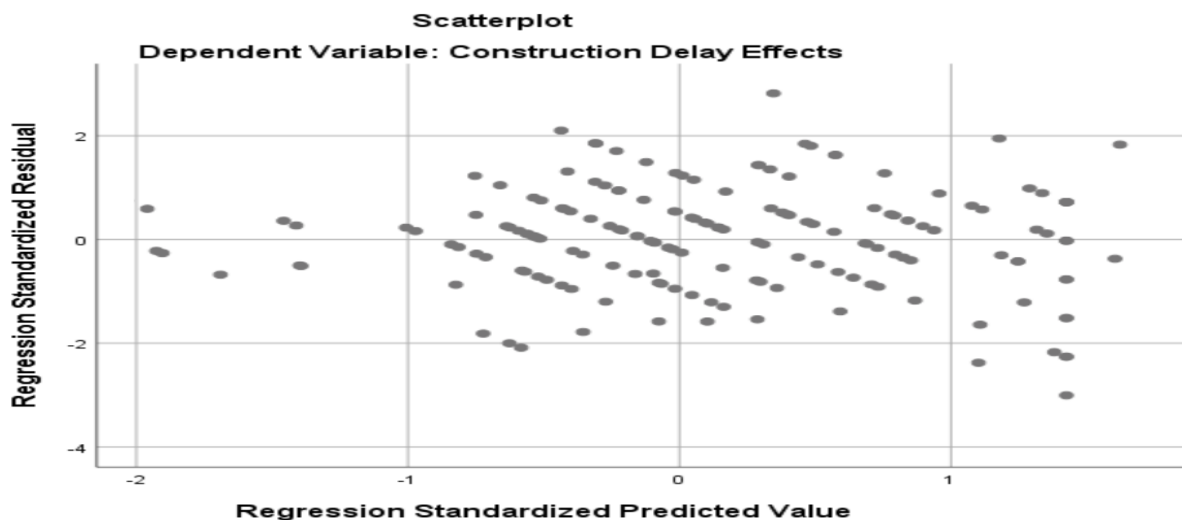


Source: Survey Data (2025)

Homoscedasticity

This assumption posits that the variance of residuals should be constant across all predicted values. To investigate this assumption, both the Breusch-Pagan test and a plot of residuals versus fitted values were utilized. The Breusch-Pagan test produced a value of $\chi^2 = 1.87$ with a p-value of 0.171, confirming the presence of homoscedasticity. A visual assessment of Figure 4.2 further supported this finding, as the residuals seemed to be randomly and uniformly spread around the zero line.

Figure 4.2: Residuals vs. Fitted Values Plot



Source: Survey Data (2025)

2. Multicollinearity

Multicollinearity arises when independent variables exhibit high correlation, which can skew the estimates derived from regression analysis. This phenomenon was assessed using the Variance Inflation Factor (VIF) along with the correlation matrix shown in Table 4.13 (Section 4.4). All VIF values were under 5, as displayed in Table 4.12, suggesting that multicollinearity was not an issue within the model.

Table 4. 13 : Variance Inflation Factor (VIF) Values

Predictor	VIF
Contractor-Related (CO)	2.13
Owner-Related (OW)	2.34
Consultant-Related (CN)	1.91
Utility Services (US)	1.76
Equipment/Material (E&M)	2.27
Government Regulations (GR)	1.84
Project-Related (PR)	2.41
External Factors (EX)	1.62

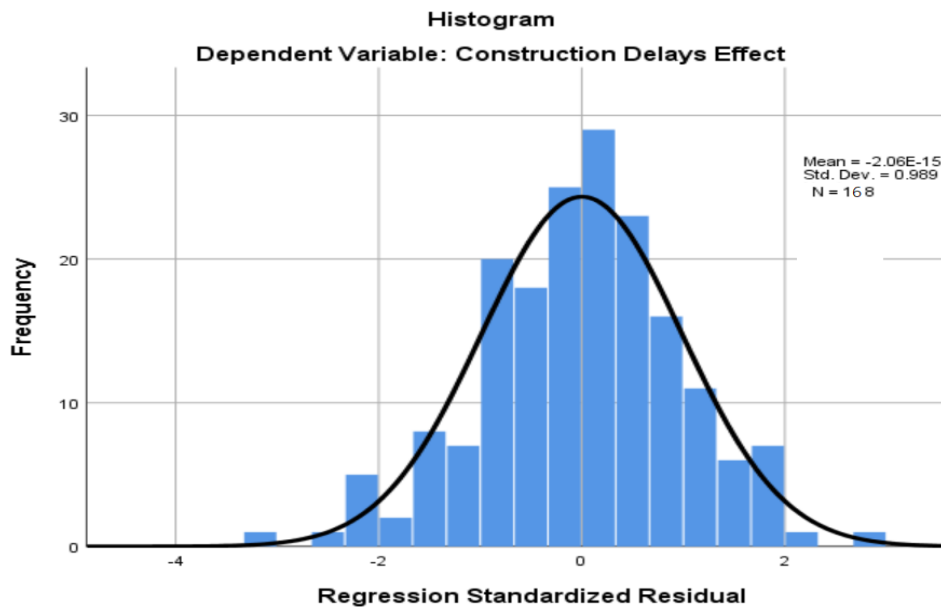
Source: Survey Data (2025)

The findings affirm that the regression model adheres to the fundamental assumptions of normality, homoscedasticity, and lack of multicollinearity, thereby supporting the validity of the following regression analyses.

3. Linearity

The assumption of linearity requires a direct linear correlation between each independent variable and the dependent variable, which in this case is construction delays (CD). This was investigated through partial regression plots (Figure 4.3), which visually represent the relationship between each predictor and the response variable while accounting for the influence of other predictors. The plots indicated clear linear patterns for significant variables like project-related factors (PR), contractor-related factors (CO), and owner-related factors (OW). This confirms that the linearity assumption has been fulfilled.

Figure 4.3: Partial Regression Plots



Source: Survey Data (2025)

5. Independence of Residuals

This assumption necessitates that the residuals generated by the regression model are independent of one another, indicating no autocorrelation. To evaluate this assumption, the Durbin-Watson (D-W) statistic was utilized. The obtained D-W value was 1.92, which is quite close to the target value of 2. This suggests that the residuals are randomly distributed and that autocorrelation is absent, thus confirming that the independence assumption has been satisfied.

4.6. Multiple Regression Analysis

A multiple linear regression analysis was performed to determine how various aspects contribute to construction delays in the Dabat Tegedie Road project. The analysis explored eight independent variables: contractor factors, owner factors, consultant factors, utility services factors, equipment and material factors, government regulations, project factors, and external factors. The results showed that project factors, contractor factors, and owner factors were substantial predictors of construction delays, with project factors exhibiting the strongest effect. The entire regression model demonstrated statistical significance with a p-value of less than 0.001, explaining a large portion of the variance in construction delays. This implies that the delays are mainly driven by issues concerning project planning, contractor performance, and owner decisions. These insights emphasize the necessity for focused efforts in project scoping, stakeholder collaboration, and regulatory simplification to reduce delays in the future.

Table 4. 14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.821	0.674	0.658	0.387	1.92
a. Predictors (Constant): CO, OW, CN, US, E&M, GR, PR, EX					
b. Dependent Variable: CD					

Source: Survey Data (2025)

Table 4.14 presents a summary of the model, detailing the results from a multiple linear regression analysis used to assess how different factors affect construction delays (CD). The coefficient of determination (R^2) is 0.674, suggesting that about 67.4% of the variation in construction delays can be explained by the combined effect of the eight independent variables (CO, OW, CN, US, E&M, GR, PR, EX). This indicates that the model fits well. The adjusted R^2 value, at 0.658, considers the number of predictors in the model, giving a more accurate measure of its explanatory power. It confirms the model's robustness and lowers the chance of overfitting. The standard error of estimate, which is 0.387, shows the average distance of observed values from the regression line. This relatively low number indicates that the model has good precision. Moreover, the Durbin-Watson statistic is 1.92, close to 2, suggesting that the residuals are independent and do not show autocorrelation, which is another key assumption for regression analysis. Overall, the model shows statistical reliability and is appropriate for examining the factors influencing construction delays in the Dabat Tegedie Road project.

Table 4. 15: ANOVA (Analysis of Variance)

Source	SS	Df	MS	F	p-value
Regression	48.732	8	6.092	40.715	<0.001***
Residual	23.568	159	0.150		
Total	72.300	167			

Source: Survey Data (2025)

The findings from the ANOVA suggest that the regression model is statistically relevant, with $F(8, 159) = 40.715$ and a p-value under 0.001. This indicates that the eight independent variables (CO, OW, CN, US, E&M, GR, PR, and EX) are strong predictors of construction delays (CD) when considered together. The substantial F-statistic coupled with the minimal p-value validates that the model fits well and that the connection between the independent variables and the dependent variable is probably not just coincidental. Consequently, this

model is deemed appropriate for elucidating the changes in construction delays in the project on Dabat Tegedie Road.

Table 4. 16: Regression Coefficients

Variable	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (β)	t-value	p-value
(Constant)	0.542	0.211	–	2.568	0.011*
CO	0.228	0.052	0.271	4.385	0.001***
OW	0.197	0.048	0.234	4.104	0.001***
CN	0.153	0.043	0.182	3.558	0.001***
US	0.121	0.039	0.144	3.103	0.002**
E&M	0.185	0.045	0.220	4.111	0.001***
GR	0.162	0.047	0.193	3.447	0.001**
PR	0.291	0.056	0.346	5.196	0.001***
EX	0.098	0.036	0.117	2.722	0.007**

Source: Survey Data (2025)

Table 4.16 presents the regression coefficients derived from the multiple linear regression analysis, specifically detailing how each predictor variable influences construction delays (CD). All eight predictors were found to be statistically significant, indicating their importance to the model.

The constant term ($B = 0.542$, $p = 0.011$) indicates the expected baseline level of construction delay when all predictor variables are zero. While it lacks direct practical interpretability, it establishes the foundation for the regression equation.

Project-related factors (PR) emerged as the most influential predictor, with a standardized coefficient $\beta = 0.346$ and a highly significant p-value of less than 0.001, reinforcing that problems like inadequate planning, unclear project definitions, and ineffective resource management are primary causes of delays. This is consistent with prior studies that highlight the crucial need for efficient project management from the beginning.

Contractor-related factors (CO) showed a standardized beta of 0.271 ($p < 0.001$), indicating a strong and statistically significant effect. This suggests that issues related to contractor performance, such as poor site management and labor inefficiencies, considerably contribute to time delays.

Owner-related factors (OW) also displayed a significant impact ($\beta = 0.234$, $p < 0.001$), indicating that delays resulting from administrative problems, indecision, and delayed payments from owners are major sources of disruptions.

Other significant variables, including consultant-related (CN; $\beta = 0.182$, $p < 0.001$), utility services (US; $\beta = 0.144$, $p = 0.002$), equipment/material-related (E&M; $\beta = 0.220$, $p < 0.001$), and government regulations (GR; $\beta = 0.193$, $p = 0.001$), all demonstrated statistically significant positive coefficients. These results emphasize broader systemic and logistical issues - like technical misunderstandings, delays in utility relocations, disruptions in supply chains, and bureaucratic hurdles - that can impede project progress.

Lastly, external-related factors (EX) had the smallest standardized beta ($\beta = 0.117$, $p = 0.007$), although it remains statistically significant. This indicates that while external environmental or political factors do affect schedules, their impact is comparatively less substantial than that of factors related to internal project management.

In summary, the regression analysis confirms that all examined factors significantly impact construction delays, with project-related, contractor-related, and owner-related aspects having the greatest influence. These results emphasize the necessity of detailed planning, effective contractor selection, and proactive management by owners to minimize delays in future infrastructure projects.

4.7. Discussion

The descriptive statistics indicate considerable agreement among those surveyed regarding the negative influence of all factors studied, with total average scores ranging from 4.07 (Contractor-Related) to 4.20 (Construction Delay Effects). This tight cluster of elevated averages (all exceeding 4.0 on a 5-point scale) reveals that delays affecting the Dabat Tegedie Road project stem not from a solitary issue but from a combination of notable, interconnected problems. This is corroborated by the multiple regression analysis, which additionally clarifies the importance of each factor, indicating that internal management and factors related to stakeholders are the main drivers, together accounting for 67.4% of the variance in delays ($R^2 = 0.674$). This outcome strongly questions the widespread idea in developing contexts that external, uncontrollable factors are the primary causes of project setbacks (Mulu, 2019; Tesfaye & Abebe, 2024). Instead, the data emphasizes that shortcomings within the project's own governance and implementation structure shoulder the bulk of the responsibility.

Chief among these internal factors are project-related issues (PR: Mean=4.18, $\beta = 0.346$, $p < 0.001$), which surfaced as the single most important predictor. This suggests that inadequate initial planning, poor allocation of resources and unclear scope definitions has severely impeded progress. The high average score lends considerable weight to this, aligning with worldwide project management literature that points to deficient early-stage planning as a key weakness (Smith et al., 2020). Within the Ethiopian setting, this echoes studies by Bekele and Kassa (2020) and Tadesse and Berhanu (2020), who observed that a scarcity of thorough feasibility studies and risk assessments at the beginning impacts many public infrastructure projects.

Moreover, contractor-related factors (CO: Mean=4.09, $\beta = 0.271$, $p < 0.001$) and owner-related factors (OW: Mean=4.11, $\beta = 0.234$, $p < 0.001$) were also highly significant. The performance deficiencies of contractors - including poor handling of resources and an inability to achieve milestones - emphasize a crucial capacity deficit within the local construction industry. This supports the findings of Hailemariam (2023), who recognized contractor incompetence as a major hindrance. Simultaneously, owner-related delays, notably slow payment procedures and delayed decision-making, highlight systemic bureaucratic inefficiencies within governmental client organizations. This finding aligns with Mengistu and Zewdu (2023), who emphasized that delayed fund distribution and approvals from public agencies are a common problem.

While slightly less impactful than the top three in the regression model, factors tied to equipment and materials (E&M: Mean=4.14, $\beta = 0.220$, $p < 0.001$) and government regulations (GR: Mean=4.16, $\beta = 0.193$, $p = 0.001$) remained substantial contributors, a reality also shown in their elevated average scores. Material shortage issues and disruptions in the supply chain point to more profound logistical and import dependency problems, a topic also examined by Zhang et al. (2023). The delays resulting from regulatory obstacles, such as protracted permit approvals, highlight the necessity for streamlined administrative procedures, as addressed by Hassen (2022).

Interestingly, external factors (EX: Mean=4.16, $\beta = 0.117$, $p = 0.007$), including political instability and weather, provided a revealing contrast. Although their descriptive average (4.16) ranked among the highest, their standardized beta coefficient was the smallest and least significant. This implies that, while those surveyed perceive external factors as highly disruptive, their actual statistical influence on the project timeline is reduced compared to internal managerial failures. This finding somewhat contradicts a prevalent assumption in the

literature (e.g., Olabisi, 2018) yet reinforces the idea that proactive management can lessen the effects of external shocks.

The correlation analysis further enhances this understanding, revealing strong interrelationships between the delay factors. For example, the significant correlation between contractor and project-related factors ($r = 0.53$, $p < 0.01$) suggests that weak contractor performance frequently worsens underlying planning deficiencies, creating a combined negative effect on the schedule.

In conclusion, this discussion confirms that the delays experienced by the Dabat Tegedie Road project are not simply due to external misfortune but are primarily a consequence of manageable, internal shortcomings in project planning, contractor competence, and client-side administration. The substantial explanatory power of the model offers a validated framework for prioritizing interventions, indicating that the greatest returns on effort and investment will result from strengthening internal project management systems rather than focusing mainly on external risk mitigation.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The major findings of this study indicate that internal management deficiencies, rather than external conditions, are the primary drivers of construction delays in the Dabat-Tege die Road project. The data indicates that deficient project planning, ineffective resource distribution, and substandard contractor execution are the biggest factors in schedule extensions. These internal shortcomings have a greater effect on delay periods compared to external elements like harsh weather or political turmoil, thus questioning the common assumption that external dangers are the primary reasons behind construction delays in emerging nations.

The regression analysis findings, having an explanatory capability of $R^2 = 0.674$, illustrate that project-related problems, contractor inadequacies, and owner-related bureaucratic processes explain the majority of the identified delay fluctuations. Particularly, the sluggish decision-making and payment protocols within owner organizations emphasize fundamental inefficiencies that necessitate wider organizational and policy-level changes.

While external elements such as weather patterns are inescapable, their comparatively small effect implies that most schedule interruptions can be alleviated through enhanced internal management tactics. The utilization of a mixed-methods strategy, integrating quantitative regression analysis with qualitative stakeholder perspectives, offered an extensive and reliable understanding of the key determinants of delay.

The overall, the investigation determines that improving project governance, contractor supervision, and administrative effectiveness is vital for minimizing delays and enhancing overall project performance. The established ranking of delay factors functions as a valuable framework for giving priority to interventions. Furthermore, the research provides a repeatable analytical model suitable for comparable infrastructure projects in other developing situations. As a result, strengthening internal management skills and encouraging efficient planning and monitoring systems are more probable to create long-lasting improvements than exclusively addressing external risks.

5.2 Recommendations

To address the issue of delays in construction, it is crucial to implement improved planning methods. This encompasses required reviews before initiating projects, thorough assessments of risks, and establishing clear schedules based on milestones to ensure that projects are properly defined and overseen right from the beginning.

Enhancing the capacity of building contractors is essential. By reinforcing the standards for qualifications, embracing contracts based on performance, and offering specialized training programs, the dependability of contractors and the quality of project execution will be improved.

Simplifying the approval processes can greatly minimize delays caused by bureaucracy. Transitioning to digital systems for payments and approvals, imposing maximum time limits on processing and creating centralized service centers will enhance both efficiency and transparency.

Effective management of the supply chain is crucial to prevent shortages of materials. Formulating strategic procurement strategies, recognizing alternative suppliers, and adopting just-in-time delivery methods will boost the availability of materials and ensure smooth workflow.

Lastly, promoting collaboration among stakeholders through regular meetings, cohesive project teams, and mechanisms for resolving conflicts will enhance cooperation. Supported by ongoing monitoring, monthly assessments, early notification systems, and helpful policy changes like the simplification of regulations and the standardization of contracts, these strategies combined will help in minimizing delays and enhancing project results.

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Appendix
Appendix “A”
Debre Markos University
College of Business and Economic
Department of Economic

Dear Respondent,

Greetings!

I am conducting a study titled *“Factors Affecting Delays in the Dabat–Tegedie Road Construction Project, Amhara Region, Ethiopia”* as part of the requirements for my Master of Science (MSc.) degree in Project Planning and Management at Debre Markos University. This study aims to identify and analyze the key factors affecting the timely completion of the Dabat Tegedie Road construction project. Your participation in this survey is highly valuable to this research. The information provided will be used exclusively for academic purposes, and your responses will be kept confidential. Your honest and thoughtful answers are crucial for the success of this study. Please take a few moments to answer the questions in the following sections. Please answer the following questions honestly.

Thank you for your time and cooperation.

Section One: Demographic and Socioeconomic Factors

This section aims to collect information about the demographic and socioeconomic background of the respondents. The data will help understand the context of the respondents and their perspectives on the road construction project.

1. Age: a. Below 25 b. 25 – 34 c. 35 – 44 d. 45 – 54 e. 55 and above
2. Sex: a. Male b. Female
3. Educational Level: a. No formal education b. Primary education c. Secondary education d. Diploma e. Bachelor’s degree f. Master’s degree or higher
4. Occupation: a. Project Manager b. Contractor c. Engineer d. Government Official e. Administrative/Support Staff f. Community Member
5. Years of Experience in Road Construction or Related Projects: a. Less than 1 year b. 1 - 5 years c. 6 - 10 years d. 11 - 15 years e. 16 years and above
6. Monthly Income (in Ethiopian Birr): a. Less than 5,000 b. 5,000 - 10,000 c. 10,001 - 15,000 d. 15,001 - 20,000 e. Above 20,000
7. Type of Area of Residence: a. Urban b. Rural

8. What is your level of involvement in the Dabat Tegedie Road project?
 a. Direct involvement (contractor, engineer) b. Indirect involvement (local government, community leader) c. No involvement
9. Do you live in the immediate vicinity of the Dabat Tegedie Road project area? a. Yes b. No
10. How do you perceive the importance of the Dabat Tegedie Road project for your community? a. Very Important b. Important c. Neutral d. Not Important e. Not at all Important

Section Two: Factors Affecting Road Construction Delays

This section focuses on identifying and evaluating the factors that contribute to delays in the Dabat Tegedie Road construction project. Your responses will provide valuable insights into the specific challenges faced by the project.

No.	Survey Question	1	2	3	4	5
1. Contractor-related Factors (CO)						
1	The performance of the contractor has significantly contributed to delays in the Dabat Tegedie Road construction project.					
2	The contractor’s lack of adequate manpower or equipment has caused delays in the project.					
3	The contractor’s inability to meet agreed milestones has led to significant delays in the project.					
4	Poor coordination between the contractor and other stakeholders has affected project timelines.					
5	The contractor’s financial difficulties have delayed the project.					
6	Lack of proper contractor management has led to delays in completing tasks on time.					
7	Delays in subcontractor performance have impacted the overall timeline of the project.					
2. Owner-related Factors (OW)						
8	Delays in payments and approvals from the project owner have contributed to the overall delay in the project.					
9	The owner’s delayed decision-making process has resulted in project delays.					
10	The owner's inadequate financial management has caused delays in the project.					
11	Frequent changes in project requirements by the owner have led to delays.					
12	The owner’s lack of clear communication with stakeholders has contributed to delays in the project.					
13	Owner delays in approving key project designs and changes have					

	slowed progress.						
14	Delayed release of funds from the owner has caused project slowdowns.						
3. Consultant-related Factors (CN)							
15	Delays in the consultant's planning, guidance, and decision-making processes have led to delays in the project.						
16	The consultant's failure to provide timely designs and plans has contributed to delays in the project.						
17	Poor communication between consultants and other project stakeholders has led to delays.						
18	Consultants' inability to monitor project progress effectively has caused delays in meeting deadlines.						
19	The consultant's inadequate risk assessment and mitigation strategies have contributed to delays.						
20	Consultants' lack of coordination with the contractor has resulted in delays.						
21	Delays in receiving necessary feedback from the consultant have impacted project timelines.						
4. Utility Services-related Factors (US)							
22	Delays in utility services, including relocation or modification of utilities, have caused significant delays in the project.						
23	Utility service interruptions have led to extended project timelines.						
24	The delay in utility relocation has caused work stoppages on the project site.						
25	Lack of coordination between the project team and utility providers has led to delays.						
26	Unexpected changes in utility requirements during the project have resulted in delays.						
27	Delayed approval for utility modifications has extended project timelines.						
28	Utility service provider's limited availability has slowed project progress.						
5. Equipment and Material-related Factors (E&M)							
29	Shortages of necessary tools and supplies have significantly contributed to the delay of the construction project for Dabat Tegedie Road.						
30	Problems with the delivery of crucial supplies have caused substantial setbacks in the initiative.						
31	The unavailability of specific types of machinery has obstructed progress in the project's development.						
32	Concerns regarding the quality of materials have led to postponements due to the requirement for modifications.						
33	A lack of qualified personnel to operate the equipment has further compounded the delays in the project.						
34	The breakdown of essential machinery during the construction phase has caused work interruptions.						

35	Disruptions in the supply chain have contributed to delays in obtaining required materials.					
36	Delays in customs processing for imported materials have resulted in setbacks to the project's timeline.					
6. Government Regulations-related Factors (GR)						
37	Delays in obtaining necessary government permits and approvals have contributed to project delays.					
38	Regulatory changes during the project have caused delays in the construction process.					
39	The lengthy process of getting government approvals has delayed the project.					
40	Delays in fulfilling environmental regulations have contributed to project delays.					
41	Delays in acquiring land use permits have extended the project timeline.					
42	Government-imposed labor regulations have slowed down project progress.					
43	Local government coordination issues have led to delays in the project.					
7. Project-related Factors (PR)						
44	Inadequate foresight and insufficient distribution of resources have led to setbacks in the Dabat Tegedie Road construction initiative.					
45	Insufficient planning and timeline organization for the project have caused hold-ups.					
46	The absence of effective risk management approaches during the planning phase has resulted in delays for the project.					
47	Not providing sufficient resources to the project has contributed to lost time.					
48	Initial expansion of the project's scope has led to delays in the Dabat Tegedie Road endeavor.					
49	Unclear objectives and goals for the project have caused delays in progression.					
50	Inefficient scheduling of activities has resulted in delays in finishing the project.					
51	Not monitoring the project's advancement and failing to implement necessary changes has added to the delays.					
8. External-related Factors (EX)						
52	External factors like political instability or severe weather conditions have led to delays in the construction project.					
53	Unexpected political instability has caused construction work stoppages.					
54	Unforeseen extreme weather conditions have delayed the construction schedule.					
55	Natural disasters like floods or earthquakes have impacted the project timeline.					

56	Social unrest or protests have caused significant delays in the construction project.					
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Section Three: Measurements Construction Delays (CD)

No.	Survey Question	1	2	3	4	5
1	Construction delays in the Dabat Tegedie Road project have led to increased costs and reduced quality.					
2	The delays in the project have significantly impacted the project's completion schedule.					
3	Delays in the construction project have caused reputational damage to stakeholders.					
4	Delays have resulted in increased resource costs, including labor and equipment.					
5	Delays in the project have led to changes in the project design or scope.					
6	The project delays have affected the quality of materials used in the construction process.					
7	The delays in project completion have caused inconvenience to the local community.					
8	Construction delays have led to dissatisfaction among project stakeholders, including the local government and investors.					
9	Delays in the project have resulted in a shift in the project's critical path.					
10	The project delays have caused financial strain on the contractor and owner.					

Appendix “B”

Debre Markos University College of Business and Economic Department of Economic

Key Informant Interview

The Key Informant Interview (KII) is designed to gather in-depth qualitative insights from individuals with significant knowledge or experience related to the Dabat Tegedie Road construction project. The interview aims to explore various factors influencing the project, including delays and their impacts, challenges faced, and suggestions for improvement.

Interviewee Information:

- Name of the Interviewee: _____
- Position/Title: _____
- Organization: _____
- Years of Experience in the Construction Sector:

Interview Questions:

1. Can you briefly describe your role in the Dabat Tegedie Road construction project?
2. What is your overall assessment of the project’s progress and its current status?
3. In your opinion, what have been the primary causes of delays in the Dabat Tegedie Road project?
4. How have contractor-related factors (e.g., performance, availability, and resources) contributed to delays?
5. How have owner-related factors, such as decisions, payments, and approvals, influenced the project's timeline?
6. Have consultant-related issues, such as planning and decision-making, played a role in the delays? If yes, how?
7. To what extent have utility-related issues (utility relocation, modifications) contributed to project delays?
8. How significant have shortages or delays in equipment and materials been to the overall delay?
9. How have the delays impacted the project’s budget and financial management?
10. What measures can be taken to avoid or minimize similar delays in future construction projects in the area?