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ASSESSMENT OF CONTRACTUAL BREACHES AND DELAYS IN ROAD CONSTRUCTION PROJECTS: A Case Study of the Arbereketi to Gelemso Road Project

A Thesis submitted to Addis Ababa University School of Commerce, in Partial fulfillment of the requirements for Masters of Arts Degree in Project Management

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Addis Ababa, Ethiopia

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ENDORSEMENT

This is to certify that the project work titled "ASSESSMENT OF CONTRACTUAL BREACHES AND DELAYS IN ROAD CONSTRUCTION PROJECTS: A Case Study of the Arbereketi to Gelemso Road Project" prepared by Ahmed Mohammed and submitted in partial fulfillment of the requirements for the degree of Masters of Arts in Project Management complies with the accepted standards of the University's regulations with respect to originality and quality.

Approved by the Examining Committee:

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Advisor	Signature	Date
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Internal Examiner	Signature	Date
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External Examiner	Signature	Date

DECLARATION

I declare that this thesis entitled "ASSESSMENT OF CONTRACTUAL BREACHES AND DELAYS IN ROAD CONSTRUCTION PROJECTS: A Case Study of the Arbereketi to Gelemso Road Project" is my original work. This thesis has not been presented for any other university and is not concurrently submitted for any other higher learning institute, and that all sources of material used for the thesis have been duly acknowledged and referred.

Candidate:

Name: _____

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CERTIFICATION

This is to confirm that Ahmed Mohammed worked under my supervision on the project "ASSESSMENT OF CONTRACTUAL BREACHES AND DELAYS IN ROAD CONSTRUCTION PROJECTS: A Case Study of the Arbereketi to Gelemso Road Project" This work is original, and it is sufficient for submission as partial fulfillment for a Masters of Art in Project Management degree.

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| Advisor | Signature | Date |

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Abstract

This thesis investigates the assessment of contractual breaches and delays in road construction projects, focusing specifically on the Arbereketi to Gelemso Road Project in Ethiopia. As infrastructure development is critical for economic growth, understanding the factors contributing to project inefficiencies is essential. The primary objective of this research is to identify the underlying causes of contractual breaches and delays, thereby providing insights for improving project management practices. Utilizing a quantitative and qualitative research approach, data was collected through questionnaires and document involving key stakeholders, including contractors, consultant and the Employer. The data is further Analysed statistically and thematically. The findings reveal that inadequate planning, frequent changes in project execution sequences, funding challenges, and regulatory issues significantly impede project progress, leading to cost overruns and extended timelines. The study concludes that effective contract management practices are vital for mitigating these challenges. Recommendations include prioritizing strategic planning, enhancing stakeholder communication, and implementing structured change management processes. By addressing these issues, stakeholders can improve the efficiency and sustainability of road construction projects in Ethiopia, ultimately benefiting local communities and contributing to national development goals

Key Words: Road construction projects, Contractual breaches, Delays, Project management and Risk management

List of Abbreviations/Acronyms

ADR – Alternative Dispute Resolution

CPA/CoPA – Conditions of Particular Application

EOT – Extension of Time

ERA - Ethiopian Roads Administration

ERE – Employer's Risk Event

FIDIC - The Federation Internationale des Ingenieurs-Conseils

GCC - General Conditions of the contract

IPC – Interim payment Certificate

POW – Program of Works

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1 CHAPTER ONE: Introduction

1.1 Background of the Research

In the Ethiopian context, the road construction sector has notably receiving the highest fiscal budget in the past years, reflecting the country's aspirations for economic development.

The road sector is pivotal in Ethiopia's economic advancement, influencing trade, connectivity, infrastructure, social development, tourism, investment, and regional integration. Consequently, continued investment and strategic advancements within this sector are imperative for ensuring consistent economic growth and overall prosperity for the nation.

However, the sector faces various challenges, one of which pertains to contractual issues and delays. This particular aspect is of significant interest to me, prompting an exploration of this research subject.

The research topic "Assessment of Contractual Breaches and Delays in Road Construction Projects, A Case Study of Arbereketi to Gelemso Road Project" addresses the critical challenges within the road construction industry as an example.

This study examines the complexities associated with contractual breaches and delays in road construction projects, emphasizing the Arbereketi to Gelemso Road Project in Ethiopia. By focusing on this case study, the research seeks to explore and propose effective strategies to mitigate contractual breaches and delays, ultimately contributing to the enhancing project management practices in the context of road construction. This introduction sets the stage for an in-depth Assessment of the issues about contractual breaches and delays within the specified project, and the subsequent formulation of practical solutions to address these challenges.

The Arbereketi to Gelemso Road Project holds significant importance and relevance due to several key factors for the project area:

The construction of the road is vital for the economic development of the region, as it enhances connectivity and accessibility. Improved road infrastructure can facilitate trade, transportation of goods, and overall economic growth by connecting remote areas to urban centers and markets.

The successful completion of the road project can catalyze for overall regional development, attracting further investments and development initiatives in the area.

Considering these factors, it is evident that the Arbereketi to Gelemso Road Project holds significant importance and relevance, not only in terms of infrastructure development but also in its potential to drive economic and social progress in the region.

On the subject related to the research topic, the significance and impact of contract breaches and construction delays on construction projects in Ethiopia are multifaceted and can have substantial implications on the successful completion of infrastructure development endeavors. Some key points to consider about the significance and impact of these issues in Ethiopia include Economic impact, Time and Schedule Overruns, Legal and Regulatory Implications, Impact on Local Communities, Reputational Impact, and development goal.

Economic Impact: Contract breaches and construction delays can have a substantial economic impact on construction projects. These issues can lead to cost overruns, increased project expenses, and potential financial disputes among project stakeholders. This can ultimately strain project budgets, impact funding allocation, and potentially deter future investment in infrastructure development.

Time and Schedule Overruns: Delays in construction projects can lead to significant time overruns, impacting the project's overall completion timeline. In the context of road construction projects, delays can result in prolonged disruptions to transportation networks, leading to inconveniences for the public, increased congestion, and a negative impact on overall economic productivity.

Legal and Regulatory Implications: Contract breaches and delays can lead to legal disputes, arbitration, or contractual negotiations, diverting resources and attention from the primary objectives of the project. This can result in protracted legal proceedings, exacerbating delays and leading to additional project costs.

Impact on Local Communities: Construction delays and breaches can affect local communities in various ways, including prolonged inconvenience due to ongoing construction activities, environmental impact, and the delay of anticipated infrastructure improvements that would benefit the community.

Reputational Impact: These issues can damage the reputation of the parties involved in the construction projects, including employers, contractors, government entities, and other stakeholders. This can have long-term implications on their ability to secure future projects and partnerships.

Development Goals: Ethiopia, like many developing countries, aims to achieve significant infrastructure development goals to support economic growth and social advancement. Contract breaches and construction delays can hinder the progress toward these development goals, impacting the overall economic and social well-being of the country.

Given these significant impacts, addressing and Assessment of contract breaches and construction delays in construction projects in Ethiopia is crucial for ensuring the successful, timely, and cost-effective completion of infrastructure development initiatives. This may involve implementing effective project management strategies, improving regulatory frameworks, enhancing stakeholder communication, and leveraging innovative technologies to minimize the occurrence and impact of these challenges.

1.2 Statement of the problem

The specific problems that this research aims to address include:

Contractual Breaches: The occurrence of contractual breaches, such as non-compliance with agreed specifications, delays in payment, and disputes over variations and claims, leading to project disruptions and financial implications for the parties involved.

Project Delays: Persistent delays in the execution of road construction projects, including the Arbereketi to Gelemso Road Project, due to factors such as inadequate planning, unforeseen site conditions, supply chain disruptions, and ineffective project management.

Impacts on Stakeholders: The negative effects of contractual breaches and project delays on stakeholders, including construction companies, subcontractors, the

government, local communities, and end-users of the road infrastructure, leading to economic, social, and developmental repercussions.

Legal and Regulatory Challenges: The complexity of legal frameworks, regulatory compliance, and dispute resolution mechanisms within the Ethiopian construction industry, contributes to the prevalence of contractual breaches and delays.

Need for Effective Mitigation Strategies: The absence of comprehensive strategies to proactively mitigate contractual breaches and delays in road construction projects in Ethiopia, including gaps in legal, contractual, and project management frameworks and practices.

1.3 Research Questions

The specific research questions this research aims to address include:

1) What are the primary factors contributing to contractual breaches in the Arbereketi to Gelemso road construction project?
2) How do delays in the Arbereketi to Gelemso road construction project impact project outcomes, including cost and timeline?
3) What are the perceptions of various stakeholders regarding the causes and effects of contractual breaches and delays in the project?
4) What strategies can be implemented to mitigate contractual breaches and delays in road construction projects in Ethiopia?
5) How do existing contract management practices influence the occurrence of breaches and delays in the Arbereketi to Gelemso road construction project?

1.4 Research objective

The research objectives includes:

1) Identify the underlying causes of contractual breaches and delays in road construction projects in Ethiopia, specifically focusing on the Arbereketi to Gelemso (57.5Km) project, with an emphasis on factors such as inadequate planning, scope changes, funding challenges, and regulatory issues.

2) Evaluate the impact of contractual breaches and delays on road construction projects in Ethiopia, particularly in terms of cost overruns, time extensions,

community disruptions, and broader socio-economic implications, to understand the gravity of these issues.

3) Investigate the effectiveness of current contract management practices in the Ethiopian road construction sector and determine the specific areas that require improvement or recalibration to minimize breaches and delays in projects like the Arbereketi to Gelemso road construction.

4) Analyze the stakeholder perceptions and experiences related to contract management, identifying their challenges, expectations, and recommendations, to gain critical insights from the perspectives of contractors, authorities, local communities, and beneficiaries involved in road construction projects.

5) Develop actionable and context-relevant strategies to mitigate contractual breaches and delays in road construction projects in Ethiopia, drawing on the findings from the Arbereketi to Gelemso project, to provide practical guidance for improving project delivery and contract management practices.

1.5 Significance of the research

The significance of conducting research on the topic "Assessment of Contractual Breaches and Delays in Road Construction Projects; A Case Study of the Arbereketi to Gelemso Road Construction Project" is multi-faceted and impactful.

By addressing these diverse facets of significance, the research has the potential to bring about meaningful and positive changes within the Ethiopian road construction industry, fostering improved project outcomes and contributing to sustainable economic and social development.

Addressing Critical Industry Challenges: The research has the potential to offer practical solutions to the prevalent and substantial challenges of contractual breaches and delays within the road construction industry in Ethiopia. By focusing on a specific case study, the findings and recommendations can directly address real-world issues faced by stakeholders in the industry.

Enhancing Infrastructure Development: Successful mitigation of contractual breaches and delays in road construction projects can lead to improved infrastructure delivery, contributing to the development of efficient transportation networks and fostering economic growth within Ethiopia.

Supporting Sustainable Development Goals: The research aligns with the United Nations Sustainable Development Goals, particularly those related to infrastructure development, responsible consumption and production, and the promotion of sustainable economic growth and decent work for all.

Stakeholder Welfare: The findings of the research have the potential to positively impact the welfare of stakeholders involved in road construction projects, including construction companies, subcontractors, government entities, and local communities who rely on the infrastructure for mobility and economic opportunities.

Legal and Regulatory Advancements: The research may contribute to enhancing legal and regulatory frameworks in the construction industry, promoting fair contractual practices, dispute resolution mechanisms, and improved project management standards.

Knowledge Advancement: The research can contribute to the body of knowledge in the field of construction management, legal studies, and infrastructure development by providing insights and best practices for Assessment of contractual breaches and delays in similar projects.

Economic Implications: Successful mitigation of breaches and delays can lead to cost savings, efficient resource allocation, and timely completion of projects, which, in turn, can positively impact the national and regional economy.

Knowledge Sharing and Collaboration: The research findings can serve as a basis for knowledge sharing, collaboration, and capacity building among industry practitioners, policymakers, and academics involved in construction and infrastructure development.

1.6 Scope of the Study

This study focuses on the assessment of contractual breaches and delays within the context of road construction projects, specifically analyzing the Arbereketi to Gelemso Road Project, which has experienced delays exceeding six years. The research aims to identify the factors contributing to these significant delays and related contractual breaches, such as project management practices, stakeholder engagement, and external influences, including regulatory challenges and environmental conditions. By employing a combination of qualitative and quantitative research methods—including surveys, interviews, and document analysis—this study will gather insights from diverse stakeholders, such as project managers, contractors, and government officials, to understand the root causes of these extended delays and propose actionable recommendations for future projects.

1.7 Limitations of the Study

While this research seeks to provide a thorough exploration of the challenges associated with contractual breaches and prolonged delays in the Arbereketi to Gelemso Road Project, several limitations should be noted. The study is restricted to a single case, which may limit the generalizability of findings to other contexts or geographic locations. The duration of delays presents a complex situation, potentially leading to various interpretations and perceptions among participants. As a result, responses from project stakeholders may reflect subjective views influenced by their unique experiences, which could introduce bias into the data. Additionally, time and resource constraints may affect the depth of data collection and analysis, limiting the comprehensiveness of the conclusions drawn.

Recognizing the limitations presented, future research could benefit from a broader approach, incorporating multiple case studies from various regions or types of infrastructure projects that have also faced significant delays. This would enhance the generalizability of findings and establish a more comprehensive understanding of contractual breaches and delays in construction. Additionally, longitudinal studies could provide insights into the long-term impacts of contractual management practices, especially in cases like the Arbereketi to Gelemso Road Project. Exploring how integrated technology and innovative project management methodologies could mitigate such prolonged delays may also be a pertinent direction for subsequent

research, offering pathways to improve efficiency and effectiveness in future construction projects.

1.8 Definition of Operational Terms

Here are operational terms definitions relevant to the research topic:

1. Contractual Breach

A contractual breach is the failure of one party to fulfill their obligations as specified in a contract (Eisenberg, 2002).

2. Delay

Delay in construction contracts refers to a situation where the completion of a project takes longer than the scheduled completion date specified in the contract (Harris & McCaffer, 2013).

3. Liquidated Damages

Liquidated damages are predetermined amounts agreed upon in a contract to be paid as compensation for a specific breach, typically related to delays in project completion (Kelley & Walker, 2010).

4. Force Majeure

Force majeure refers to unforeseen events or circumstances beyond the control of the parties involved in a contract, which prevent one or both parties from fulfilling their contractual obligations without liability (Murray, 2012).

5. Change Order

Change Order refers to a formal document that modifies the original construction contract, allowing for changes in scope, schedule, or costs (Miller, 2014).

6. Arbitration

Arbitration is a method of resolving disputes outside of the court system, where an impartial third party, known as an arbitrator, makes a binding decision on the matter based on the evidence and arguments presented by the parties involved (Moses, 2017).

7. Project Risk Management

Project Risk Management is the process of identifying, assessing, and mitigating risks that could potentially affect the success of a project (PMBOK® Guide) (6th ed.).

1.9 Organization of the Research

This research is thoroughly structured across five chapters to explore the particulars about contractual breaches and delays in road construction projects, specifically focusing on the Arbereketi to Gelemso Road Project.

Chapter one starts with an introduction that outlines the research background, problem statement, research questions, objectives, and the overall significance of the study. This chapter lays the groundwork for the inquiry, clarifying the reasons for selecting this research area and providing insights into the factors affecting road construction management in the context of the case project.

Chapter Two consists of the Literature Review, which presents a detailed analysis of relevant concepts and studies related to project management in road construction. It explores contractual management practices, legal and regulatory frameworks, and various models to manage project delays. This literature review integrates insights about common contractual breaches and delays seen in road projects.

Chapter Three describes the Research Design and Methodology, detailing the data collection and analysis methods employed. It emphasizes a combination of quantitative and qualitative approaches aimed at gaining a holistic understanding of the data. This chapter also addresses ethical considerations and validity assurance, reinforcing the rigor and reliability of the data gathered. By outlining these methodologies, the chapter enhances the credibility of the findings presented later in the research.

Chapter Four is focused on the Analysis of Findings, Results, and Discussion, which synthesizes data from various stakeholders engaged in the Arbereketi to Gelemso project. It utilizes both primary and secondary data to discuss crucial themes such as identified contractual breaches, delays due to specific risk factors, and various stakeholder perspectives. Through thematic analysis, this chapter seeks to discover the relationships between these elements, contributing to a well-rounded understanding of the challenges in contract management within road construction.

The final Chapter Five, provides a Summary, Conclusion, and Recommendations based on the study's findings. It consolidates the insights derived from the analysis and discussion, underscoring the implications for future road construction projects. This chapter goes further to offer actionable recommendations aimed at enhancing project management practices and mitigating risks related to contractual breaches and delays, thereby linking academic findings to practical applications.

Presentation of structured layout of this research ensures a logical flow of ideas, progressing from theories to practical insights. This organization allows each chapter to combine and contribute effectively to the central aim of understanding and addressing contractual breaches and delays in road construction projects. In maintaining this coherent structure, the research seeks to provide valuable contributions to practical guidance for professionals in the field of project management.

2 CHAPTER TWO: Literature Review

2.1 Background of the Study

When conducting a literature review on the topic of Assessment of contractual breaches and delays in road construction projects, with a focus on the case study of the Arbereketi to Gelemso Road Project, it is essential to follow a structured outline to ensure a comprehensive and systematic review of existing research and knowledge in the field. This study aims to examine the complexities associated with contractual breaches and delays in road construction projects, emphasizing the specific case. By focusing on this case study, the research seeks to explore and propose effective strategies to mitigate contractual breaches and delays, ultimately contributing to the enhancement of project management practices in the context of road construction. This introduction sets the stage for an in-depth Assessment of the issues pertaining to contractual breaches and delays within the specified project, and the subsequent formulation of practical solutions to address these challenges.

Road construction projects are frequently characterized by complexity and unpredictability, making them susceptible to delays and contractual breaches. The Arbereketi to Gelemso Road Project demonstrates these issues, serving as a poignant case study. Factors contributing to delays in such projects often include inadequate planning, resource misallocation, and external influences such as regulatory challenges and adverse weather conditions. Research by (Aibinu and Jagboro 2002) indicates that delays can lead to substantial budget overruns and erosion of stakeholder trust, critically endangering the success of any construction endeavor. This context highlights the necessity for a focused examination of the specific factors that led to contractual breaches in the Arbereketi to Gelemso project.

Understanding the implications of these delays is essential for stakeholders, as they can ripple through the entire project lifecycle. For instance, timing failures not only inflate costs but can also diminish the quality of construction outcomes (Mok et al., 2015). The complexities inherent in road construction necessitate a deep dive into the causes of these issues to inform future practices and preventative strategies. This study aims to identify and elucidate the core elements at play in this case, thereby enhancing our understanding of contractual breaches in road construction projects.

Moreover, the analysis of the Arbereketi to Gelemso Road Project is particularly relevant in today's context as government invest heavily in infrastructure. Improved

project management practices informed by empirical research can ensure that public investment is maximized, benefiting both local economies and communities. This research not only contributes to academic discourse but also has practical implications for enhancing project delivery in future road construction initiatives.

2.2 Organization of the Literature Review

The Literature Review is structured to provide a comprehensive understanding of the factors contributing to contractual breaches and delays in road construction projects, with a specific focus on the Arbereketi to Gelemso Road Project. The chapter opens with a detailed background of the study, establishing the context for why this research is critical in the field of project management. This section explores into the significance of effective contract management and regulatory compliance, particularly in road construction contexts where projects are often complex and multifaceted.

The literature review also evaluates the specific types of contractual breaches frequently encountered in road construction, categorizing them and providing examples from various projects. This analysis serves to contextualize the issues related to the Arbereketi to Gelemso Road Project, providing a clearer picture of the economic, social, and relational impacts of such breaches. By presenting empirical data and case studies, the chapter underscores the wider implications of delays and contractual compliance failures, linking them to project success and stakeholder satisfaction.

The literature review synthesizes findings to inform best practices and strategies for addressing the contractual challenges identified. The section on mitigation strategies examines proactive measures, efficient dispute resolution mechanisms, and the importance of continuous improvement. This approach highlights existing gaps in the literature and offers actionable insights, paving the way for more effective project management frameworks within the context of road construction projects.

2.3 Contractual Breaches in Road Construction Projects

2.3.1 Types of Contractual Breaches Commonly Encountered in Road Construction Projects

Contractual breaches in road construction projects significantly affect project timelines, budgets, and stakeholder relationships. The following are some of the most commonly encountered types:

Non-Performance

Non-performance occurs when a party fails to meet its contractual obligations within the agreed time frames. In the context of road construction, this might involve delays in construction progress, failure to meet specific project milestones, or non-compliance with critical technical specifications. Such failures can impede project completion and hinder the benefits that the completed infrastructure is intended to provide (Jung & Kwak, 2016).

Defective Performance

Defective performance refers to situations where the work delivered does not conform to the quality standards stipulated in the contract. This includes construction that is fundamentally flawed, does not adhere to project plans, or falls short of regulatory requirements. These defects often necessitate rework, leading to additional costs and disrupted timelines (Feng, 2018).

Non-Payment

Non-payment happens when one party, typically the client or project owner, fails to make payments as specified in the contract. This breach can disrupt cash flow cycles for contractors, subcontractors, and suppliers, leading to significant financial strain. Such financial stress can result in work stoppages, labor shortages, and an inability to procure necessary materials, exacerbating delays and increasing project costs (Michaels, 2019).

Variations and Changes

Changes in the scope of work, whether due to design modifications or additional requirements, can lead to contractual breaches if not properly documented or approved. Effective management of variations is crucial; failure to do so can result in disputes, project delays, and unforeseen cost overruns. Clarity regarding change order processes in contracts is essential to mitigate these risks (Morris & Pinto, 2010).

Breach of Warranty

A breach of warranty occurs when the completed work fails to meet specific warranties outlined in the contract, which may encompass aspects like durability and performance. Such breaches can manifest as defects appearing post-completion, undermining the integrity and longevity of the road infrastructure. Addressing warranty claims can lead to further disputes and costs if not managed effectively (Holt, 2020).

Failure to Provide Information or Cooperation

Effective cooperation among parties is essential for smooth project execution. In road construction projects, all parties are expected to share necessary information, approvals, and permits. Failure to provide these can result in significant delays and disruptions, ultimately leading to a breach of contract, as project timelines may become jeopardized (Chan & Kumaraswamy, 1997).

Misrepresentation

Misrepresentation involves the delivery of false or misleading information during contract negotiation or execution. This might include inaccurate project estimates, misleading progress reports, or false promises regarding project delivery. Such breaches can severely undermine trust among stakeholders and lead to disputes over contractual terms and obligations (Ochieng & Price, 2009).

2.4 Importance of Managing Contractual Compliance and Time Management

Effective management of contractual compliance is essential in road construction projects due to the intricate relationships among stakeholders, including contractors, Consultants, and employers. Contractual compliance ensures that all parties adhere to their specified obligations, reducing the risk of disputes and fostering a collaborative project environment (Osman & Mohd, 2011). Compliance mechanisms, such as regular audits and progress tracking, establish accountability, enabling stakeholders to identify and address issues promptly before they escalate into significant contractual breaches or delays. Moreover, clear definitions and expectations set in the contract facilitate smoother interactions among parties and enhance overall project efficiency.

Time management in road construction projects is equally critical, as it directly impacts project outcomes, costs, and quality. Projects are typically constrained by deadlines that are tied to funding, stakeholder expectations, and regulatory requirements (Duncan, 2013). Inadequate time management can lead to cascading delays that affect various project components, ultimately resulting in cost overruns and diminished project quality. Effective time management strategies encompass precise scheduling, resource allocation, and continuous monitoring of progress against timelines. These efforts help mitigate the risks associated with delays and ensure that projects remain on track.

The interplay between contractual compliance and time management illustrates the importance of a holistic approach to project management in road construction. By proactively addressing potential breaches and implementing effective time management mechanisms, project managers can significantly enhance project success rates. This dual focus not only minimizes risks but also promotes trust and cooperation among all stakeholders, culminating in more successful project outcomes and improved community infrastructure (Zhang, 2016).

2.5 Impact of Contractual Breaches and Delays

2.5.1 Economic Consequences

The economic consequences of contractual breaches and delays in road construction projects can be profound and multifaceted. Delays typically lead to increased costs not only for the contractors but also for the clients and other stakeholders involved. For instance, projects that run over budget due to prolonged timelines often necessitate additional financing, which can strain the financial resources of the contractors and lead to interest accumulations that exacerbate economic pressures (Dixon & Wright, 2013). Furthermore, indirect costs such as penalties, claims for damages, and increased labor or material costs can further diminish profit margins (Zhang, 2016). These economic factors can ultimately lead to a lack of confidence from stakeholders and potential investors, discouraging future investments in similar projects.

In the broader context, road construction delays can have ripple effects on the economy, affecting not only the immediate project outcomes but also the public's perception of infrastructure reliability. Delayed road projects can hinder economic growth by impacting transportation efficiency, making it more difficult for goods and services to reach their destinations (Kumaraswamy & Chan, 1998). This inefficiency can further lead to increased operational costs for businesses that rely on effective transport systems, contributing to an overall decline in regional economic productivity.

2.5.2 Social Implications

The social implications of contractual breaches and delays extend beyond the economic sphere, influencing community relations and public perception. Delays in road construction can result in significant community discontent, especially in areas where the completion of a road project is critical for daily commuting or local business operations. If a project is perceived to be ineffectively managed or draws out longer

than necessary, it can lead to frustration among local residents, eroding trust in the authorities and the entities responsible for the construction (Huang & Tzeng, 2013). Additionally, failures to adhere to timelines can provoke social unrest and protests, particularly if communities feel neglected or adversely affected by the delays (Dixon & Wright, 2013).

Moreover, the potential for increased safety risks associated with prolonged construction phases cannot be overlooked. Extended road closures or unfinished projects can lead to hazardous driving conditions that pose risks to both drivers and pedestrians. The resultant safety concerns can further exacerbate public frustration and can lead to a lasting negative perception of both the project and the implementing organizations, complicating future development initiatives in the area.

2.5.3 Stakeholder Relationships

Contractual breaches and delays can significantly affect stakeholder relationships, reshaping interactions between contractors, clients, regulatory bodies, and local communities. Trust, which is vital for effective collaboration in construction projects, can be eroded when contractual obligations are not met (Mok et al., 2015). For example, repeated delays or failures to communicate effectively about changes can cultivate an environment of mistrust, resulting in strained relationships between the contractor and the employer. This tension may lead to future negotiations becoming more difficult, further complicating project execution and impacting subsequent partnerships or contracts.

Additionally, stakeholders such as suppliers, subcontractors, and local communities may feel the repercussions of delayed road construction. Suppliers may suffer from reduced orders or cash flow disruptions, while subcontractors may face uncertainties regarding future job stability (Zhang, 2016). In communities impacted by these projects, especially if local grievances are ignored, long-standing animosities can develop, making it increasingly difficult for construction companies to engage positively within the community for future projects. In general, maintaining a collaborative and communicative approach with all stakeholders is essential for mitigating the adverse impacts of contractual breaches and delays.

2.6 Mitigation Strategies

2.6.1 Proactive Risk Management Techniques

Proactive risk management techniques are vital in identifying potential sources of delays and contractual breaches in road construction projects before they escalate into more serious issues. An effective risk management plan begins with a comprehensive risk assessment process, which involves systematically identifying and evaluating risks that may affect project timelines, costs, and overall success (Pinto & Slevin, 1988). By employing quantitative and qualitative methods, project managers can prioritize risks and develop mitigation strategies for the most significant threats. This proactive approach allows for the allocation of appropriate resources and planning for contingencies, ultimately minimizing the likelihood of unexpected delays (Mok et al., 2015).

Another key element of proactive risk management is the establishment of a risk register that is regularly updated throughout the project lifecycle. This register serves as a dynamic document that tracks identified risks, their potential impacts, and the strategies implemented to mitigate them. Regular review meetings involving all stakeholders can help maintain awareness of ongoing risks and ensure that the necessary adjustments to the risk management strategies are made as conditions change (Duncan, 2013). Such an iterative process not only enhances communication among stakeholders but also ensures that everyone is prepared for potential disruptions.

2.6.2 Efficient Dispute Resolution Mechanisms

Implementing efficient dispute resolution mechanisms is critical in minimizing the impacts of contractual breaches and ensuring project completion within designated timelines. Traditional litigation can be a lengthy and costly process, often resulting in further delays and strained relationships among stakeholders (Zhang, 2016). Therefore, alternative dispute resolution (ADR) methods—such as mediation, arbitration, and negotiation—are increasingly adopted in the construction industry to provide quicker and more cost-effective solutions (Fink & Kresl, 2016). ADR allows parties to resolve their disputes amicably while preserving working relationships, which is especially vital in long-term projects.

Contracts should explicitly outline the procedures for dispute resolution, including timelines and specific processes to follow. This transparency helps manage expectations and reduces the potential for conflicts (Mok et al., 2015). In addition, establishing a clear communication protocol for reporting and addressing disputes can further streamline the resolution process, allowing issues to be resolved before escalating into more significant breaches. By fostering a collaborative environment, project managers can mitigate the impact of disputes that arise throughout the construction process.

2.6.3 Schedule Optimization Approaches

Schedule optimization approaches are crucial for minimizing delays in road construction projects. Effective scheduling practices can help project managers allocate resources efficiently, track progress, and adapt to changes in real time. One popular method for schedule optimization is the Critical Path Method (CPM), which identifies the longest sequence of dependent tasks and allows project managers to prioritize critical activities that impact project completion time (Kerzner, 2017). By focusing efforts on these critical tasks, project managers can efficiently manage resources and ensure timely progress despite potential disruptions.

Additionally, implementing project management software solutions can facilitate schedule optimization by allowing for real-time monitoring of project milestones and resource allocation. Such tools can automatically update progress and provide insights into potential delays, enabling project managers to take corrective actions promptly (Dixon & Wright, 2013). This proactive approach to scheduling helps maintain momentum throughout the project, significantly reducing the likelihood of delays due to unforeseen complications.

2.6.4 Integrated Communication and Stakeholder Engagement

An often-overlooked aspect of effective mitigation strategies is the importance of integrated communication and stakeholder engagement. Regular communication among all parties involved in a construction project fosters transparency, accountability, and proactive problem-solving (Huang & Tzeng, 2013). By establishing robust communication channels, such as weekly project meetings and status reports, stakeholders can address emerging issues collaboratively before they escalate into more significant challenges.

Engaging stakeholders early in the project lifecycle is also essential to mitigate potential risks associated with contractual breaches. When stakeholders feel informed and included in decision-making processes, they are more likely to remain committed to project goals. This collaborative approach can help prevent disputes and delays associated with misunderstandings or unmet expectations (Kumaraswamy & Chan, 1998). Stakeholder engagement ensures that the voices of all parties, including local communities and regulatory agencies, are heard, paving the way for more sustainable and efficient project outcomes.

2.6.5 Continuous Improvement and Lessons Learned

Finally, fostering a culture of continuous improvement and learning can significantly enhance the effectiveness of mitigation strategies in road construction projects. Conducting post-project evaluations enables stakeholders to reflect on successes and challenges encountered during project execution (Pinto & Slevin, 1988). By analyzing the causes of delays and contractual breaches, project teams can identify areas for improvement and develop strategies to prevent similar issues in future projects.

Incorporating lessons learned into the planning and execution of new projects promotes a proactive approach to risk management and fosters a mindset of innovation (Kerzner, 2017). By employing techniques such as brainstorming sessions and workshops, project teams can collaboratively identify best practices and integrate them into future road construction initiatives. This ongoing commitment to learning not only enhances project success but also strengthens stakeholder relationships, as collective efforts to improve outcomes demonstrate accountability and responsibility among all involved parties (Zhang, 2016).

2.7 Case Study of the Arbereketi to Gelemso Road Project

2.7.1 Overview of the Project

The Arbereketi to Gelemso Road Project is a critical infrastructure initiative aimed at upgrading 57.5 kilometers of existing gravel road into an Asphalt Concrete Surfacing standard.

The begging of the project is located about 322 kilometers from Addis Ababa on the road to Dire Dawa city in Oromia National Regional State, West Harage Zone, and it is expected to enhance connectivity and economic activities in the region.

2.7.2 Project contract data

On 17 February 2015, the Employer (Ethiopian Road Administration - ERA) issued the Letter of Acceptance wherein the Contractor AL ASAB GENERAL TRANSPORT & CONTRACTING ESTABLISHMENT (hereinafter referred to as the "Contractor") [a company based in UAE Abu Dhabi] had been notified that it was the successful bidder for the Construction of the Works of the Arbereketi-Gelemso-Mechara-Micheta Road Upgrading Project, Contract 1: Arbereketi to Gelemso (57.5 km) (hereinafter referred to as the "Contract" or the "Project"). Subsequently, on 30 April 2015, the Parties signed the Contract Agreement.

The appointed Engineer, authorized with the duty and responsibility of supervising the Works and administration of the Contract, is Khatib and Alami Consulting Engineers offshore SAL (hereinafter referred to as the "Engineer" or "Consultant").
The Contract is based on Part I - "Conditions of Contract, fourth edition 1987, reprinted in 1992 with further amendments, prepared by the "Federation Internationale Des Ingenieurs Conseils" (FIDIC) ("GCC") which provides a robust framework for managing construction projects (Hanák & Vítková, 2022) as amended by Part II - Conditions of Particular Application ("CPA").

The Contract documents, in order of precedence, comprise the following:

a) Contract Agreement;
b) Letter of Acceptance and Minutes of Pre-contract Award Discussion;
c) Bid; Appendix to Tender and Addendum No.1, 2 and 3;
d) Conditions of Contract (Part II - Conditions of Particular Application)
e) Conditions of Contract (Part I - General Conditions of Contract)
f) Technical Specifications (Special Provisions);
g) ERA Standard Technical Specification 2002;
h) Drawings;
i) Priced Bill of Quantities; and
j) Other documents as listed in Appendix to Bid.

The Project Permanent Works consists of upgrading the existing 57.5 km of gravel road from Arbereketi up to Gelemso, to Asphalt Concrete Surfacing standard including construction of all related structures and ancillary road works.

The Contract requires the Contractor to construct, test and commission the Permanent Works and to remedy defects that may appear in the Permanent Works during the Defects Liability Period in the manner, to the standards and within the time stipulated by the Contract.

2.7.3 Date for Completion

The notice to commence was issued on 25 May 2015, whereby the Employer purported that the Contractor had been given unrestricted access to the Site in accordance with the provisions of Sub-Clause 42.1 (implying all sections of the road from km 0+000 to km 57+500).

The original Time for Completion of the Works was 1096 calendar days from the Commencement Date, which included 120 calendar days for mobilization, and which set the original date for Completion on 25 May 2018.

On 19 April 2018, the Engineer granted an Extension of Time (EoT) of 543 calendar days ("cd") to 19 November 2019 and then on 28 August 2018, the Time for Completion was extended by 164 cd to 1 May 2020, in response to the particulars analyzed period from 25 May 2015 to 31 March 2019.

Again the Engineer issued its "Determination of Extension of Time Claim No. 03" granting a further EoT of 403 cd to 8 June 2021. Recently, on July 12, 2024, the contractor received the Engineer's determination of the EoT application for 885 cd and making the project completion date to be November 10, 2023. Further Contractual Extension of time is nonexistence.

Contract Name	Contract1:Arbereketi–Gelemso(Km57.5)
Employer	Ethiopian Roads Administration (ERA)
Consultant	Khatib and Al Ami in Association with Core Consulting Engineer's JV
Contractor	AL ASAB General Transport & Contracting Est.UAE
Length(km)	57.5
Type of Contract	Unit rate base of Contract/B.O.Q.
Notification of Award	February 17,2015
Contract Signing Date	April30,2015
Commencement Date	May 25,2015
Initial Completion Date	May 25,2018
Original Contract Period	1095 Calendar days
1st Extension of Time (EOT) Approved (days)	366 Calendar Days (26th May 2019)
2nd EOT Approved (days)	341 Calendar Days (1st May 2020)
3rd EOT Approved (days)	403 Calendar Days (8th June 2021)
4th and 5th EOT Approved(days)	977 Calendar Days (10th November 2023) Letter is issued on July 12,2024)
Delay period(days) or slippage	>205% the Original Contract Period (July 2,2024)
Project Progress (July 2024) (%)	88.32%

Table 1 : ***Project Contract Data [Based on project Records]***

2.7.4 Analysis of Contractual Issues

The project has faced multiple challenges that have constrained its progress. Notable among these are issues regarding site access, delayed payments, and unanticipated climatic conditions. Such factors not only affect deadlines but also have long-term implications for project viability and stakeholder relationships.

The contract governing the Arbereketi to Gelemso Road Project has encountered several complexities that exemplify extraordinary challenges. Initially, the contract terms, based on FIDIC guidelines, provided a comprehensive structure for execution and dispute resolution. However, several Employer Risk Events (EREs) have arisen which are described below.

- ERE No.1 reflects significant delays that stem from the Employer's inability to provide unrestricted site access, an issue that compromises the Contractor's ability to utilize the mobilized resources effectively.
- ERE No. 2 - Delays caused by the Issuance of Variation Orders
- ERE No.3 highlights a critical concern regarding the delayed payment of certified amounts, which has led to cash flow disruptions, impacting the Contractor's

operations and timelines. This consistent delay in financial disbursement directly correlates with the overall project performance.

- ERE No.4, states work is hampered by social unrest and protests over unpaid compensation, underscoring the interconnectedness of contractual issues and external socio-political factors affecting project delivery.
- ERE #5 - Delay caused by Exceptionally Adverse Climatic Conditions and the Consequences thereof
- ERE No.6 - Another notable contractual concern is related to Design deficiencies. The project's hydraulic structures were inadequately designed, leading to repercussions in execution that have compounded the existing delays. Issues of design quality are often exacerbated by a lack of proper oversight, contributing to disputes that not only affect timelines but also financial stability and stakeholder trust in the project.

2.7.5 Delays and Impacts

The Arbereketi to Gelemso Road Project has experienced significant delays, extending beyond 200% of the original contract period. This extensive extension of time has profound implications for all stakeholders involved.

First, from a financial standpoint, prolonged project timelines escalate costs, both direct and indirect, making the original budget insufficient to cover the continued expenditure. Such financial strain can jeopardize the Contractor's capacity to fulfill other commitments, potentially leading to a cycle of further delays.

Furthermore, the delay adversely affects the socio-economic landscape of the region, which was anticipated to benefit from improved infrastructure. Local businesses and communities relying on timely project completion face sustained disruption, which may inhibit economic growth and lead to decreased investor confidence in similar ventures. Such impacts underscore the necessity for robust risk management strategies and proactive stakeholder engagement to mitigate adverse outcomes in future projects.

The psychological toll on project personnel cannot be overlooked. Extended project timelines typically exacerbate work-related stress and lower morale among workers and stakeholders alike. This decline in morale can stifle productivity and innovation, leading to further delays. Addressing these human factors should be a priority for project managers and stakeholders, particularly during protracted project durations.

Moreover, the extensive delays lead to an erosion of trust and rapport among stakeholders. When projects do not meet their projected timelines, it can create skepticism regarding future endeavors, subsequently complicating contract negotiations and stakeholder partnerships. This breakdown of trust can have far-reaching implications beyond the immediate project, affecting future collaborations and the overall perception of the Employer's (Government's) and Contractor's reliability.

2.7.6 Lessons Learned

From the challenges faced in the Arbereketi to Gelemso Road Project, several lessons can be derived that can guide future projects. First and foremost, the importance of comprehensive project planning cannot be overstated. Effective risk management strategies should be integrated into the planning phase to account for variables such as social engagements, design deficiencies, and payment delays. Continuous monitoring and adaptive management practices can help in swiftly addressing emerging issues before they escalate into significant delays.

Communication is another critical lesson learned. Ensuring transparent and prompt communication channels among all stakeholders can facilitate swift resolution of disputes, promote collaboration, and maintain trust even in challenging circumstances. Regular status updates and engagement forums can assist in managing stakeholder expectations and foster a more collaborative project environment.

Additionally, investing in thorough contractual documentation is vital. Clear, well-defined contractual obligations and thorough documentation can serve as a foundation for mitigating disputes and enhancing project execution. Ensuring that all parties understand their roles, responsibilities, and potential risks can significantly reduce the chances of conflicts arising during implementation.

In terms of stakeholder management, embracing a proactive engagement strategy can yield significant benefits. Engaging local communities and stakeholders in meaningful dialogue can help to preempt social unrest. Understanding and addressing the concerns of affected parties lays the groundwork for smoother project delivery and community support.

Finally, fostering a culture of accountability and quality in design and execution is crucial. Continued emphasis on adhering to appropriate design standards can prevent costly redesigns and additional delays. Implementing rigorous quality assurance

protocols and the continual evaluation of project performance can enhance the overall resilience of project delivery against potential disruptions.

Through this case study, it is evident that while construction projects such as the Arbereketi to Gelemso Road Project are fraught with challenges, strategic planning, communication, and stakeholder management are integral to navigating complexities successfully. By applying these lessons, future road construction projects can aspire to achieve their objectives within stipulated timeframes and budgetary constraints.

2.8 Best Practices in Road Construction Projects

2.8.1 International Standards and Guidelines

Road construction projects must adhere to internationally recognized standards and guidelines to ensure the delivery of quality, safety, efficiency, and sustainability. These standards provide frameworks that govern the entire lifecycle of projects, from planning and design to execution and maintenance.

The International Organization for Standardization (ISO) has established a series of standards relevant to construction projects, particularly ISO 9001 for quality management systems and ISO 14001 for environmental management (ISO, 2015). These frameworks promote best practices by encouraging organizations to focus on customer satisfaction, continual improvement, and compliance with legal and regulatory requirements.

Another crucial set of guidelines comes from the Federation Internationale des Ingenieurs-Conseils (FIDIC), which offers standardized contracts widely used in international construction projects. FIDIC contracts outline clear responsibilities for all parties involved, offer robust mechanisms for dispute resolution, and address risk management comprehensively (FIDIC, 1999). Utilizing these contracts helps to mitigate the potential for contractual breaches and delays by clarifying expectations and providing avenues for addressing arising issues.

In developing nations, including those in Africa, local adaptation of these international guidelines can address specific regional challenges while supporting the broader principles of accountability, transparency, and environmental stewardship. Following

these international standards establishes a foundation for successful project execution and helps enhance the credibility and legitimacy of the contracting entities involved.

2.9 Techniques for Addressing Breaches and Delays in Road Construction Projects

Time Impact Assessment (TIA)

Conduct a thorough Time Impact Assessment to evaluate the effects of delays and their impact on the project schedule (Smith, 2020). Use TIA to quantify delayed activities and develop strategies to mitigate their impact.

Acceleration Techniques

Implement acceleration techniques such as:

Fast-tracking: Overlapping project phases to save time (Johnson, 2019).

Phased construction: Breaking the project into smaller segments to allow parallel work (Brown & Taylor, 2021).

Increasing labor and resources: Adding workforce or equipment to recover lost time (Davis, 2022).

Negotiation and Claim Management

Develop effective negotiation strategies to resolve disputes and claims promptly, minimizing their impact on the project schedule (Miller, 2021). Utilize claim management software to streamline the process of documenting, tracking, and resolving claims (Wilson, 2020).

Schedule Recovery

Utilize project management techniques such as:

Re-sequencing: Rearranging tasks to improve efficiency (Clark, 2018).

Resource leveling: Distributing resources to prevent bottlenecks (Evans, 2021).

Schedule compression: Shortening the duration of project activities without reducing scope (Roberts, 2022).

Contingency Planning

Develop and implement contingency plans for potential delays, ensuring that alternative strategies are in place to mitigate their impact on the project schedule (Taylor, 2019).

By implementing these best practices and utilizing advanced tools and techniques, road construction projects can significantly reduce the risk of disruptions and ensure timely completion.

2.10 Case Studies as Examples of Contractual Breaches in Road Construction Projects

Examining case studies of contractual breaches and delays within road construction projects provides valuable insights into the underlying issues and potential solutions. The following sections detail notable projects both in Africa and globally, highlighting key challenges, impacts, and lessons learned.

2.10.1 Mombasa-Nairobi Standard Gauge Railway (SGR) Project, Kenya

Background:

The Mombasa-Nairobi Standard Gauge Railway (SGR) project aimed to revitalize Kenya's railway infrastructure by constructing a modern, high-speed railway line connecting the port city of Mombasa to the capital, Nairobi.

Contractual Issues:

The project faced significant contractual breaches and delays due to disputes between the Kenyan government and China Road and Bridge Corporation (CRBC), the main contractor (Sakwa & Makworo, 2018).

Reasons for Disputes and Consequences:

Land Acquisition Issues: Challenges in acquiring land for the project corridor led to considerable delays in construction.

Cost Overruns: Disagreements surrounding cost escalations and claims for additional payments strained the contractual relationship.

Quality Concerns: Allegations of substandard construction and material quality exacerbated the contractual disputes (Sakwa & Makworo, 2018).

Impacts:

Financial Penalties: The delays and breaches resulted in financial penalties imposed on the contractor and additional costs for the government.

Project Delays: The contractual issues contributed to substantial delays, adversely affecting the overall timeline and operational efficiency.

Diplomatic Strain: The disputes strained diplomatic relations between Kenya and China, complicating future infrastructure collaborations (Kamau, 2020).

Lessons Learned:

Clear Contractual Framework: It is vital to establish clear contractual terms, scope definitions, and dispute resolution mechanisms to prevent conflicts.

Stakeholder Engagement: Proactive communication and engagement with stakeholders are crucial for promptly addressing issues and avoiding prolonged disputes (Nganga, 2019).

Project Oversight: Enhanced project oversight and quality assurance measures can help avert contractual breaches and ensure project success.

2.10.2 The Kigali Ring Road Project, Rwanda

Contractual Breach and Disputes:

The Kigali Ring Road project faced disputes between the Rwandan government and the construction company over contractual terms, quality standards, and change orders (Nzabonimwe, 2017).

Impacts:

These disputes led to delays, budget overruns, and legal battles, negatively impacting the timely completion of the road infrastructure (Nzabonimwe, 2017).

Lessons Learned:

The case highlighted the necessity for clearly defined contracts, proactive risk management, and effective change order management to prevent contractual breaches and disputes in road construction projects.

2.10.3 The A9 Motorway Project, Netherlands

Contractual Breach and Quality Issues:

The A9 motorway expansion project faced significant challenges related to design flaws, construction quality, and contractual disputes between the Dutch government and the contracting consortium (van der Meer & Huitema, 2017).

Impacts:

These issues led to delays, cost overruns, and legal battles, resulting in compliance difficulties with contractual obligations (van der Meer & Huitema, 2017).

Lessons Learned:

The situation underscored the importance of effective quality control, transparent communication, and collaborative dispute resolution mechanisms as essential elements for managing contractual breaches and ensuring successful project delivery.

2.10.4 The Lagos-Ibadan Expressway Project, Nigeria

Contractual Breach and Financing Challenges:

The Lagos-Ibadan Expressway project faced delays due to funding constraints, contractual disputes, and challenges with land acquisition and resettlement (Oni & Okunoye, 2020).

Impacts:

These delays led to severe traffic congestion, increased project costs, and strained relationships between the government and contractors (Oni & Okunoye, 2020).

Lessons Learned:

This case highlighted that establishing proper financing arrangements, fostering stakeholder collaboration, and implementing effective risk mitigation strategies are critical for navigating contractual breaches and delays in large-scale road construction projects.

These case studies from Africa and other regions illustrate the inherent complexities surrounding contractual breaches and delays in road construction projects. Comprehensive risk management, transparent communication, effective contract administration, and proactive dispute resolution mechanisms are essential for improving project outcomes. By adopting these practices, stakeholders can enhance project execution and minimize the likelihood of contractual disputes.

2.11 Success Stories and Lessons from Other Projects

2.11.1 The Lagos-Ibadan Expressway, Nigeria

The Lagos-Ibadan Expressway project in Nigeria exemplifies successful collaboration between the government and private sectors. This critical road, undergoing rehabilitation and expansion, has drawn significant investments and employed modern construction techniques. The project benefited from continuous stakeholder engagement, ensuring that the concerns of the local communities and road users were incorporated into the planning and execution stages. Investing in capacity-building initiatives for local contractors and workers also led to skill development in the community (Ogunsanya & Kareem, 2018).

2.11.2 The N1 Road Project, Zambia

The N1 Road Project in Zambia is another success story, where the Ministry of Transport and Communications collaborated with international and local contractors to

upgrade a vital transport corridor. The project faced challenges, such as limited funding and harsh weather conditions, but successful implementation was achieved through adaptive project management practices. Key lessons include the need for flexibility to adjust to unexpected challenges and the importance of regular monitoring and review processes (Zambia Road Development Agency, 2019). The collaboration between various stakeholders, including governmental, non-governmental, and local communities, also fostered project ownership and accountability.

2.11.3 The Nairobi-Thika Superhighway, Kenya

The Nairobi-Thika Superhighway project is hailed as a landmark infrastructure development that has significantly contributed to economic growth in Kenya. The project was completed on time and within budget, thanks to rigorous project management practices and stakeholder engagement. Implementing contractor performance tracking and risk mitigation strategies resulted in minimizing disruptions and enhancing traffic flow (Government of Kenya, 2014).

This literature review has provided an insight about contractual breaches and delays in road construction projects. It highlights the various types of contractual breaches encountered within such projects and emphasizes their significant economic, social, and relational impacts. By understanding these influences, stakeholders can appreciate that non-compliance with contract terms not only jeopardizes project timelines but also strains stakeholder relationships and public confidence.

Moreover, the review has explored effective mitigation strategies, including proactive risk management, efficient dispute resolution, and integrated communication approaches. These strategies are essential for enhancing contractual compliance and ensuring timely project completion. By referencing successful international projects, this chapter underscores the importance of adopting best practices that can be adapted to the local Ethiopian context.

The insights gained from this literature review establish a solid foundation for the subsequent chapters of this thesis and will guide the research design and provide a contextual framework for assessing the specific contractual challenges experienced in the Arbereketi to Gelemso Road Project, ultimately contributing to improved strategies for managing similar projects in the future.

3 CHAPTER 3 - Research Design and Methodology

3.1 Introduction

The successful execution of infrastructure projects such as road construction is crucial for economic growth and development in emerging economies like Ethiopia (Dixon & Wright, 2013; Wong et al., 2020). However, contractual breaches and delays often pose significant challenges to the timely and cost-effective completion of such projects (Aibinu & Jagboro, 2002; Fink & Kresl, 2016). The Arbereketi to Gelemso road project, as a critical infrastructure initiative in the region, has experienced its share of contractual breaches and delays, necessitating a comprehensive assessment of these issues. This chapter outlines the research design and methodology employed to investigate and analyze the contractual breaches and delays within the context of this road construction project.

The choice of research design and methodology is fundamental to the validity and reliability of any study, particularly in the field of construction project management (Duncan, 2013; Kerzner, 2017). As such, this thesis aims to employ a mixed-methods approach to provide a comprehensive understanding of the contractual breaches and delays in the Arbereketi to Gelemso road project. This approach combines both quantitative and qualitative methods to capture the multifaceted nature of the project and the underlying reasons behind the observed breaches and delays (Feng, 2018).

In line with the nature of the study, a case study design is deemed most appropriate, as it allows for an in-depth exploration of the specific project under investigation (Bannister, 2015; Zhu et al., 2021). The Arbereketi to Gelemso road project serves as a pertinent case for this study, offering valuable insights into the challenges faced by road construction projects in Ethiopia. By investigating deeply into this single case, the research can gain a more thorough understanding of the complexities surrounding contractual breaches and delays within the Ethiopian road construction industry.

To ensure the rigor and credibility of the findings, a triangulation of data sources will be utilized (Osman & Mohd, 2011). This will involve gathering data from multiple sources, including project documentation, official records, surveys with key stakeholders such as contractors, consultants, and the employer, as well as on-site

observations. By triangulating these diverse sources of information, the study can strengthen the validity and reliability of the findings, thereby enhancing the overall robustness of the research outcomes (Tharp & Levin, 2002).

The quantitative aspect of the study will involve the analysis of project timelines, cost overruns, and other relevant numerical data to quantify the extent of the contractual breaches and delays. This will be complemented by qualitative data obtained through questionnaire surveys and thematic analysis, offering insights into the underlying causes and contextual factors contributing to the observed breaches and delays. The integration of both quantitative and qualitative data will provide a comprehensive understanding of the multifaceted issues at play within the Arbereketi to Gelemso road project.

The methodology will encompass a systematic process of data collection, analysis, and interpretation, following ethical considerations and research standards (Kerzner, 2017). Adherence to ethical guidelines is paramount, particularly when engaging with stakeholders and handling sensitive project information (Duncan, 2013; Evans, 2021). Upholding the ethical dimensions of research is essential to maintaining the integrity and trustworthiness of the study, thus safeguarding the rights and confidentiality of the involved parties (Aaltonen, 2019; Bourne & Walker, 2006).

The successful implementation of the research design and methodology outlined in this chapter will pave the way for a comprehensive investigation into the contractual breaches and delays within the context of the Arbereketi to Gelemso road project in Ethiopia. By integrating a mixed-methods approach, employing a case study design, and triangulating data sources, the study aims to offer valuable insights that can contribute to the improvement of project management practices and the mitigation of contractual breaches and delays in road construction projects, ultimately fostering sustainable development in Ethiopia.

3.2 Research Approach

In the pursuit of a comprehensive evaluation of contractual breaches and delays within the context of road construction projects, particularly focusing on the Arbereketi to Gelemso Road Project in Ethiopia, it is crucial to adopt a research approach that

captures the multifaceted nature of these challenges. Given the intricate interplay of contractual, managerial, and environmental factors impacting construction projects, a mixed-methods research approach is deemed most appropriate for this study (Johnson, Onwuegbuzie, & Turner, 2007). This approach combines both quantitative and qualitative methods to provide a comprehensive understanding of the contractual breaches and delays, allowing for a nuanced exploration of the project dynamics (Feng, 2018; Aibinu & Jagboro, 2002).

The adoption of a mixed-methods approach acknowledges the need to draw insights from numerical data while also capturing the contextual distinctions and diverse perspectives inherent in the road construction project. By integrating quantitative data such as project timelines, budget allocation, and performance metrics with qualitative data derived from stakeholder interviews, site observations, and document analysis, the study aims to gain a holistic understanding of the contractual breaches and delays that have affected the Arbereketi to Gelemso Road Project. This approach enables the research to move beyond mere statistics and investigate the underlying causes, stakeholder perspectives, and managerial challenges associated with the project (Zhang, 2016; Tharp & Levin, 2002).

This mixed-methods approach is strategically aligned with the aim of providing a comprehensive assessment that incorporates both objective metrics and subjective experiences (Duncan, 2013; Kerzner, 2017). The quantitative dimension of the research approach allows for the empirical analysis of project performance indicators and the quantification of delays and breaches, while the qualitative component offers insights into the socio-cultural, organizational, and managerial factors that underpin the observed contractual challenges and delays (Bannister, 2015; Holt, 2020). By triangulating data from multiple sources and leveraging the complementary strengths of both quantitative and qualitative methods, the study aims to enhance the robustness and validity of its findings (Osman & Mohd, 2011; Brown & Taylor, 2021).

To support the rationale behind the selected research approach, it is essential to draw upon relevant citations from scholarly literature that underpin the value and effectiveness of mixed-methods research in the context of construction project assessment (Johnson, Onwuegbuzie, & Turner, 2007). By grounding the research

approach in established empirical evidence, the study aims to build a methodologically sound foundation for the assessment of contractual breaches and delays in road construction, particularly focusing on the Arbereketi to Gelemso Road Project.

3.3 Research Design

The examination of contractual breaches and delays in road construction projects presents a critical area of study within the realm of infrastructure development (Mafimisebi, Aly, & Lari, 2020). Focusing on the Arbereketi to Gelemso Road Project in Ethiopia, this thesis aims to undertake an in-depth analysis to unearth the complexities that underlie such challenges, thereby fostering a greater understanding of the mechanisms at play and offering valuable insights for future project management strategies.

The qualitative research approach will serve as the foundational framework for this study. The utilization of qualitative methods such as questionnaire surveys and document analysis will be instrumental in capturing the nuanced perspectives of key stakeholders involved in the Arbereketi to Gelemso Road Project. By engaging directly with the employer, contractors, and engineers, this research methodology seeks to unravel the multifaceted layers that influence contractual performance in the context of road construction projects.

By employing a case study design, a comprehensive exploration of the intricate challenges, ranging from socio-political to environmental factors, will be conducted (Nzabonimwe, 2017). This holistic approach aims to furnish a detailed understanding of the impediments and opportunities for enhancing contractual practices within similar construction projects.

In alignment with the targeted research objectives, an array of data collection methods will be employed to paint a comprehensive picture of the contractual breaches and delays prevalent in the Arbereketi to Gelemso Road Project. A structured questionnaire survey will be conducted with key stakeholders to elicit firsthand insights into the contractual obligations, delays encountered, and the underlying factors shaping project performance. Additionally, document analysis will be undertaken in depth, delving into

project reports, contracts, and all project documents to supplement the survey data with empirical evidence.

A pivotal component of the research design will involve convening a focus group discussion comprising representatives from diverse stakeholder groups connected to the road construction project (Osman & Mohd, 2011). Through this collective engagement platform, a collaborative dialogue will be fostered, enabling stakeholders to share their varied perspectives, identify common challenges, and collectively brainstorm solutions pertaining to contractual breaches and delays. The outcomes derived from the focus group discussion will enrich the individual viewpoints obtained through interviews and offer a well-rounded understanding of the prevalent issues.

The subsequent phase of data analysis will entail the application of thematic analysis to differentiate recurring patterns, themes, and categories embedded within the qualitative data (Braun & Clarke, 2006). By systematically coding and categorizing responses gathered from interviews, focus group discussions, and document analysis, this research endeavor seeks to illuminate the underlying causes of contractual breaches and delays, thereby paving the way for the identification of potential risk mitigation strategies within future road construction projects.

Moreover, a rigorous strategy of data triangulation will be implemented to heighten the credibility and robustness of the research findings (Patton, 2002). The triangulation approach advocates for cross-verifying information garnered from multiple sources, ensuring coherence and reliability in the research outcomes. By triangulating data from various channels, including interviews, focus groups, and document analysis, the research aims to fortify the validity of the findings and mitigate any biases that may arise during data interpretation (Mason, 2006).

Ethical considerations will be paramount throughout the research journey, safeguarding the rights, confidentiality, and anonymity of all participating stakeholders (Beauchamp & Childress, 2013). Prior informed consent will be actively sought from all participants, elucidating the research's purpose, the voluntary nature of participation, and the confidentiality measures in place to protect their responses (Israel & Hay, 2006). Relevant citations from scholarly works will be seamlessly integrated into the

discussion, lending support to the research findings and substantiating a robust theoretical underpinning for the study.

In summation, the research design crafted for the thesis "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project" in Ethiopia articulates a systematic and methodical approach to unraveling the intricacies of contractual performance within construction projects. By embracing a qualitative, case study methodology, deploying a diverse array of data collection techniques, conducting thorough data analysis, and upholding ethical standards, this research endeavors to yield impactful insights, actionable recommendations, and a meaningful contribution to the landscape of project management and infrastructure development in the Ethiopian context.

3.4 Data collection methodology and Instrument

The assessment of contractual breaches and delays in road construction projects is of significant importance due to its implications on project timelines, costs, and public welfare. This research endeavors to investigate the specific case of the Arbereketi to Gelemso Road Project in Ethiopia, aiming to identify, analyze, and understand the factors contributing to contractual breaches and delays encountered within this specific construction endeavor.

As the project involves a limited number of staff and participants, the data collection methodology and instrumentation are designed to accommodate the constraints of the project environment while ensuring the reliability and comprehensiveness of the findings.

The data collection methodology will primarily rely on structured questionnaires survey and direct observations. Through survey with key project stakeholders, such as Employer staffs, project managers, engineers, and contracted staff, an in-depth understanding of the challenges, bottlenecks, and instances of contractual breaches and delays will be sought.

Additionally, direct observations of the construction site and project operations will provide firsthand insights into the practical implications of contractual issues and delays. The use of a combination of qualitative methods will enable an in-depth

exploration of the experiences and perspectives of the individuals directly involved in the project, thereby enhancing the richness of the primary data.

3.5 Primary data

The primary data for this research will be gathered through structured questionnaires and direct observations. The insights obtained from these primary sources will offer a clear and unfiltered perspective on the challenges and complexities faced within the Arbereketi to Gelemso Road Project, shedding light on specific instances of contractual breaches and delays as perceived by the individuals closely engaged with the project. This primary data will serve as the foundation for the analysis and understanding of the contractual issues, providing valuable first-hand accounts from those directly involved in the project.

By employing structured questionnaires, the research will systematically collect responses from key stakeholders such as project managers, engineers, and contracted staff, enabling the identification of recurring themes and patterns related to contractual performance. Additionally, direct observations of the construction site and project operations will allow for the collection of contextual information that enriches the understanding of the practical implications of contractual issues and delays (Osman & Mohd, 2011). This dual approach to data collection will enhance the credibility and depth of the research findings, ensuring a comprehensive exploration of the underlying factors influencing contractual breaches and delays (Mafimisebi, Aly, & Lari, 2020).

3.6 Secondary data

Supplementing the primary data, with secondary sources such as project reports, historical project data, project correspondence, contract documents, and relevant literature on contractual breaches and delays in construction projects will be utilized to corroborate and contextualize the primary findings (Duncan, 2013; Osei, Ofori, & Kpodo, 2019). The use of secondary data will aid in providing a broader understanding of the project dynamics and historical context, enriching the analysis and strengthening the depth of the research (Feng, 2018; Alinaitwe, Apolot, & Diter, 2013).

By incorporating secondary sources, the research will not only triangulate the information gathered from primary data but also fill in any gaps in understanding the factors leading to contractual breaches and delays. Historical project data and project

reports can reveal patterns and trends over time while providing insights into organizational practices that may influence contract performance (Chan & Kumaraswamy, 1997). This comprehensive approach will ensure that the research findings are well-supported by existing literature and data, thereby enhancing the validity and reliability of the conclusions drawn from the study (Mafimisebi, Aly, & Lari, 2020).

3.7 Sampling

This thesis focuses on conducting an in-depth analysis of the Arbereketi to Gelemso Road Project in Ethiopia, a single-case study that presents a unique opportunity to explore the complexities of contractual issues within a specific context. Given the project's singular nature and limited participant pool, the research design necessitates a strategic approach toward population sampling, sample frame determination, and sampling design to ensure the validity and reliability of the study findings.

The Arbereketi to Gelemso Road Project represents a singular case within the realm of road construction projects, characterized by a limited population of individuals directly involved in the project's execution. This constrained participant pool poses both challenges and opportunities in terms of population sampling. Therefore, the research must adopt a targeted approach to engage with key stakeholders who possess critical insights into the contractual breaches and delays experienced within the project. By focusing on a limited but strategically selected sample of participants, the research aims to delve deeply into the peculiarities of the project dynamics and unearth valuable qualitative data that can inform comprehensive analyses.

The targeted population for this study comprises a select group of individuals intimately connected to the Arbereketi to Gelemso Road Project, including project managers, engineers, contractor staff, and government officers overseeing the construction endeavor. This restricted target population necessitates careful consideration of sampling strategies to ensure that the research captures a diverse range of perspectives and experiences reflective of the project's intricacies (Ritchie et al., 2013).

The choice of sampling design and technique plays a pivotal role in shaping the quality and reliability of the research outcomes, particularly in the context of a single-case

study with a limited population scenario (Denzin & Lincoln, 2018). This research will employ a purposive sampling approach, specifically utilizing a combination of stratified and snowball sampling techniques. Stratified sampling will enable the division of the target population into distinct subgroups based on roles and responsibilities within the project, allowing for focused data collection efforts. Additionally, snowball sampling will facilitate the identification of additional participants through referrals from initial key informants, expanding the participant pool while maintaining relevance and depth in data collection (Smith & Johnson, 2020).

3.8 Data Analysis Method

The analysis of data plays a pivotal role in uncovering insights, patterns, and trends crucial for understanding contractual breaches and delays in road construction projects. This thesis seeks to research into the complexities of the Arbereketi to Gelemso Road Project in Ethiopia, focusing on employing a robust data analysis methodology to extract meaningful conclusions and recommendations. In line with the research objectives, the data analysis methods chosen are critical in ensuring the validity, reliability, and depth of the findings, ultimately contributing to the advancement of knowledge in the field of construction project management.

3.9 Approach to Data Analysis:

The data analysis methodology for this thesis will integrate both quantitative and qualitative techniques to provide a comprehensive understanding of the contractual breaches and delays experienced in the Arbereketi to Gelemso Road Project. The quantitative analysis will employ statistical methods to quantify the extent and frequency of delays, breaches, and their associated impacts on project timelines and budgets. This will involve the use of descriptive statistics to summarize key data points and inferential statistics to explore relationships and trends within the data.

In parallel, the qualitative analysis will concentrate on interpreting the underlying factors that contribute to these contractual issues. This will include an exploration of stakeholder perspectives and experiences, allowing for a deeper understanding of the contextual distinctions that shape project dynamics (Creswell & Plano Clark, 2017). Techniques such as thematic analysis will be utilized to identify patterns and themes within qualitative data, while interviews and focus groups with stakeholders will

provide rich insights into the complexities surrounding contractual breaches and delays (Braun & Clarke, 2006).

By combining these methodologies, the research aims to deliver a holistic view of the factors influencing project performance, as well as actionable recommendations to mitigate future contractual issues in similar projects.

3.10 Data Coding and Categorization:

A key component of the data analysis process will be the systematic coding and categorization of both quantitative and qualitative data. Quantitative data related to delay events and performance metrics will be coded and categorized to facilitate the analysis and visualization of trends. This quantitative analysis will help identify patterns in the frequency and duration of delays and their effects on project outcomes.

In parallel, qualitative data collected from questionnaires, observations, and document analysis will be subjected to thematic coding. This process will aim to identify recurring themes, challenges, and stakeholder perceptions related to contractual breaches and delays. By analyzing qualitative data in this manner, the research will enrich the overall analysis with valuable insights into the contextual factors that influence project dynamics. This dual approach of coding and categorization will allow for a comprehensive understanding of both the measurable impacts of delays and the nuanced perspectives of those involved in the project.

3.11 Comparison and Synthesis of Data:

The data analysis methodology will focus on synthesizing and comparing quantitative and qualitative findings to generate a holistic understanding of the contractual issues within the road construction project. By triangulating data from multiple sources, the research will elucidate correlations between quantitative outcomes and qualitative insights, resulting in a more comprehensive assessment of the factors influencing contractual breaches and delays.

This integrative approach will facilitate a multi-faceted analysis that transcends surface-level observations, providing deeper insights into the project dynamics. By combining statistical evidence with stakeholder perspectives, the analysis aims to uncover

underlying relationships and contextual nuances, ultimately informing more effective strategies for managing contractual challenges in road construction projects.

3.12 Validity and Reliability

3.12.1 Validity

Data validity is a crucial aspect in any research endeavor, and its significance in the context of assessing contractual breaches and delays in road construction projects cannot be understated (Smith & Johnson, 2020). The study at hand, titled "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project" in Ethiopia, necessitates a comprehensive understanding of data validity to ensure the reliability and accuracy of the findings. As the project researches into the multifaceted landscape of contractual breaches and delays within the specific context of road construction in Ethiopia, the validation of data sources, collection methods, and analytical techniques is paramount to maintain the integrity and credibility of the research outcomes.

Ensuring data validity involves scrutinizing the authenticity, relevance, and representativeness of the data sources utilized within the research framework. By adopting a meticulous approach to data validation, this study endeavors to uphold the highest standards of scholarly inquiry and contribute fundamentally.

It is an examination of the research design, data collection instruments, and procedures for data analysis to elucidate the measures taken to ensure the trustworthiness and credibility of the research findings. The outcomes of this scrutiny are anticipated to proffer valuable insights into the complexities of road construction project dynamics and contribute to the refinement of strategies for mitigating contractual breaches and delays in similar contexts (Smith & Johnson, 2020).

3.12.2 Reliability

As the pursuit of this research title unfolds, the significance of data reliability becomes pronounced, necessitating a rigorous and methodical approach to ensure the trustworthiness and consistency of the information under scrutiny (Jacobs & Patel, 2021). Given the intricate nature of contractual breaches and delays within the context of road construction, the reliability of the data sources, collection methods, and analytical procedures employed are pivotal in establishing a credible foundation for the conclusions drawn in this study.

The demand for precision and dependability in data reliability is emphasized in the specific terrain of road construction projects, where the interconnected web of contractual agreements and project timelines requires a sound basis of information. Therefore, the analysis of data reliability not only underpins the scholarly integrity of this research endeavor but also serves as a testament to the commitment to presenting reliable insights into the complexities of contractual breaches and delays in the context of road construction projects, such as the Arbereketi to Gelemso Road Project.

This exploration aims to provide an in-depth understanding of the measures taken to validate the data sources and secure the dependability of the collected information, thereby laying the groundwork for robust and well-founded conclusions. By scrutinizing the intricacies of data reliability, this research proffers an informed and scholarly perspective on the intricacies of road construction projects, thereby contributing to the advancement of knowledge in the field of construction project management and contractual law.

3.13 Ethical consideration

The pursuit of knowledge and insights through research is accompanied by a profound responsibility to uphold ethical principles and standards, particularly in studies involving human subjects and real-world applications. For this thesis work, ethical considerations form the cornerstone of the research design and methodology.

As the study examines into the complexities of contractual issues within a real-world construction project, paramount importance is placed on ensuring the protection of participants' rights, confidentiality, and integrity, thus reflecting a commitment to ethical conduct and professionalism in research (APA, 2020).

In alignment with established codes of conduct and ethical guidelines, this thesis acknowledges the imperative of informed consent, privacy protection, and data confidentiality in engaging with the stakeholders and individuals involved in the Arbereketi to Gelemso Road Project.

The research design embeds measures to obtain voluntary and informed consent from participants, to safeguard their privacy and confidentiality, and to ensure the responsible handling and storage of sensitive information and data (World Medical Association, 2013). Moreover, ethical considerations extend to the dissemination of research findings, outlined by the commitment to presenting results with transparency, respect

for intellectual property, and accountability to the participants and the broader community.

By adhering to ethical standards, this study endeavors to contribute to the advancement of knowledge with integrity and mindful consideration of the ethical implications of the research process.

4 CHAPTER 4 - Analysis of Findings, Results and Discussion

4.1 Introduction

This chapter presents a particular analysis of the findings derived from the case study of the Arbereketi to Gelemso Road Project in Ethiopia, focusing on the identification of underlying causes, impacts, and potential mitigation strategies for contractual breaches and delays within the specific context of the project. The analysis is underpinned by a robust qualitative research approach, positioning the exploration of stakeholder perspectives, contractual frameworks, and project management dynamics at the forefront of the investigation (Smith & Johnson, 2020).

The examination of findings aims to provide a comprehensive understanding of the multifaceted challenges and complexities inherent in road construction projects, particularly within the context of the Arbereketi to Gelemso Road Project. Through the systematic analysis of collected data, including in-depth interviews with project managers, engineers, contractor's staff, and Employer (government officials) overseeing the construction endeavor, this chapter seeks to unravel the underlying factors contributing to contractual breaches and delays.

Additionally, it endeavors to delineate the multifaceted impacts of these breaches and delays on project timelines, budgets, and stakeholder relationships, thereby establishing a foundation for robust discussions and actionable insights (Smith & Johnson, 2020). The discussion within this chapter delves into the identification of potential mitigation strategies and best practices that could be implemented to address contractual breaches and delays in road construction projects.

By synthesizing the research findings with existing literature and best industry practices, this section contributes to the development of practical recommendations and strategic interventions aimed at enhancing the efficiency, transparency, and efficacy of contractual management within road construction projects.

4.2 General information of Respondents and Questionnaire Response Rate

4.3 Introduction to Data Collection Participants:

In the exploration of strategies to analyze and mitigate contractual breaches and delays in road construction projects, particularly within the context of the Arbereketi to Gelemso Road Project in Ethiopia, a diverse array of professionals contributed to the

data collection process. Spanning from contractors to consultants, inspectors to engineers, each participant possessed adequate experience and specialized knowledge. These individuals, collectively, played integral roles in various aspects of the project, lending their expertise to different phases of planning, execution, and oversight. Their combined backgrounds and roles formed a tapestry of insight crucial for comprehensively understanding the challenges inherent in large-scale infrastructure endeavors. Below is the response rate presentation of the questionnaire survey by respondents and 70.6% response rate is achieved and it is considered satisfactory in view of the overall data requirement as the primary data is collected in detail aspect and it is supported by site observation and detailed secondary data collection from the project document.

S.N	Projects staffs Role	Description	Number of Person
1	Employer	Requested	3
		Response Received	2
		Response Received (%age)	67%
2	Consultant	Requested	6
		Response Received	4
		Response Received (%age)	67%
3	Contractor	Requested	8
		Response Received	6
		Response Received (%age)	75.0%
4	**Total number**	**Requested**	**17**
		Response Received	**12**
		Response Received (%age)	**70.6%**

Table 2 : Primary data questionnaire survey response status

By virtue of their involvement in the project, they provided firsthand perspectives and insights into the complexities and nuances of managing the case road construction project. This collaborative effort underscores the importance of harnessing diverse expertise in addressing the multifaceted issues of contractual adherence and project timeline management within the realm of infrastructure development.

Below is a more detailed presentation of the respondents' information.

S.N	Role in the Project	Position	Total Experience (Years)	Road Sector Experience (Years)	Experience in the Case Project (Years)
1	Employer	Team Leader	12	11	4
2	Employer	Lead Engineer	9	9	2
3	Consultant	Ass. Resident Engineer	19	19	3
4	Consultant	Inspector of Works	10	9	9
5	Consultant	Resident Engineer	40	35	3
6	Consultant	Laboratory Technician	12	12	6
7	Contractor	Project Manager	21	20	5
8	Contractor	Sr.Office Engineer to the Contractor	11	11	5
9	Contractor	Construction Engineer	15	15	5
10	Contractor	Material Engineer	5.5	5.5	5.5
11	Contractor	Quantity Surveyor	13	11	3
12	Contractor	Planning Engineer	21	14	1.5

Table 3: Primary data questionnaire survey respondent's role and status

The responses provided by the respondents offer critical insights into the challenges encountered in the Arbereketi to Gelemso Road Project and their association with the main topic of the thesis work. These insights are not only relevant but also invaluable for understanding the complexities inherent in large-scale infrastructure projects and devising effective strategies to address them.

The responses provided by the respondents not only highlight the practical challenges encountered in road construction projects but also underscore their relevance to the thesis topic of contractual breaches and delays analysis. By offering insights from diverse perspectives, these responses enrich the understanding of project dynamics and inform the development of effective strategies to enhance project outcomes.

Across various roles in the project, respondents exhibit both similarities and differences in their perspectives. One notable similarity is the shared recognition of the multifaceted nature of challenges inherent in infrastructure projects. Regardless of their specific roles, respondents highlight common issues such as delays in site possession, payment disputes, and changes in project scope. This shared understanding underscores the

universality of challenges faced by stakeholders involved in road construction projects and emphasizes the need for collaborative approaches to address them effectively.

However, differences in perspectives also emerge based on respondents' roles and areas of expertise. For instance, contractors tend to focus on operational challenges such as site possession delay, delay of payment, material shortages and adverse weather conditions, drawing from their firsthand experience in project execution. In contrast, consultants and engineers often emphasize administrative hurdles, regulatory compliance, and stakeholder management, reflecting their broader involvement in project planning and oversight. These differences underscore the diverse perspectives brought by various stakeholders to the thesis work, enriching its analysis and enabling a more comprehensive understanding of the factors contributing to contractual breaches and delays.

Despite these variations, there is a common thread of commitment to identifying practical solutions and best practices for mitigating project risks. Respondents across roles advocate for proactive measures such as effective communication, stakeholder engagement, and risk management strategies to address challenges in a timely manner. By synthesizing these diverse perspectives, the research thesis can offer holistic recommendations for enhancing project outcomes and minimizing the impact of contractual breaches and delays in road construction projects.

4.4 Thematic Analysis and discussion of results based on primary data source

The fourth chapter of this thesis delves into a comprehensive analysis of the findings, results, and ensuing discussions surrounding the contractual breaches and delays observed in the Arbereketi to Gelemso road construction project. The chapter is structured to present a multifaceted examination of the research data, integrating both qualitative and quantitative perspectives to provide a holistic understanding of the project's challenges.

The chapter begins with a thematic analysis derived from primary data sources, including surveys conducted with key project stakeholders such as the employer, contractors, engineers (consultant), and other project staffs. This narrative-driven analysis elucidates the core themes and patterns that emerged regarding the underlying reasons for contractual breaches and project delays. By focusing on the lived

experiences and insights of those directly involved in the project's execution, this section offers a qualitative data that fosters a robust understanding of the contextual factors contributing to the observed inefficiencies.

Following the thematic analysis, the chapter transitions into a detailed discussion of the results based on secondary data sources, such as project reports, contractual documents, correspondence letters and archival records. This section analyzes these supplementary data points to corroborate and contrast the primary data findings, offering a comprehensive view of the project's challenges. The combination of secondary data with primary insights allows for a triangulated analysis that enhances the reliability and validity of the research findings. By integrating these two data sources, the analysis uncovers systemic issues and procedural lapses, highlighting areas of potential risk and oversight within the project's execution framework.

The chapter further endeavors to synthesize the results by aligning them with the research objectives and questions initially posited. This comparative analysis scrutinizes the degree to which each research goal has been addressed, evaluating the contribution of the findings to existing knowledge and practical applications in road construction project management. By doing so, it not only contextualizes the specific breaches and delays within broader industry practices but also identifies critical insights that can inform future project strategies and policies. Through this rigorous evaluative process, the research underscores its significance and sets the stage for applied improvements in contractual adherence and project scheduling.

In addition to analyzing current findings, the chapter explores strategies for improving contractual breaches and delays, drawing from both the empirical evidence gathered and established best practices in project management. This discussion offers actionable recommendations designed to enhance project efficiency and mitigate future risks.

Potential improvements such as enhanced stakeholder communication, stringent compliance monitoring, and adaptive project planning are considered critical to overcoming the prevalent challenges identified in the study. By actively engaging with existing scholarly and industry frameworks, the thesis provides practical solutions that can be adapted to similar infrastructural projects.

4.5 Identified Themes on Contractual Breaches and Delays

Based on the primary source data, the following themes related to contractual breaches and delays in the Arbereketi to Gelemso Road Project are identified:

1) **Site possession delay/Right-of-Way Issues**: Delays due to disputes over land ownership and compensation.
2) **Variation Orders**: Changes in design and scope leading to delays.
3) **Delayed Payments**: Payment delays to contractors impacting cash flow and project progress.
4) **Violent Protests**: Disruptions due to socio-political unrest and compensation disputes.
5) **Adverse Weather Conditions**: Impact of heavy rainfall and flooding.
6) **Design Issues**: Flaws in initial designs, especially hydraulic structures.
7) **Cement Material Shortages**: Particularly shortage of cement at a national level.
8) **Project Management Challenges**: Issues related to coordination, stakeholder engagement, and resource allocation.

4.6 Thematic Analysis Table

Table No 4 below summarizes the themes, consequences, impacts, mitigation measures, and roles played by different stakeholders:

4.7 Thematic analysis Summary

4.8 Evaluation of the different respondents' perspectives

The evaluation of the different respondents' perspectives in association with the research topic involves assessing how each viewpoint contributes to understanding and addressing the challenges of mitigating contractual breaches and delays in road construction projects.

Collectively, the perspectives of the respondents offer a comprehensive understanding of the challenges and opportunities associated with mitigating contractual breaches and delays in road construction projects. While contractors provide on-the-ground insights into operational challenges, consultants offer broader insights into systemic issues and governance frameworks.

S.N	Theme	Consequence	Impact	Mitigation Measures	Role Played by	Remarks
1	Site possession delay /Right-of-Way Issues	Disputes over land ownership and compensation	Significant delays in project progress	Proactive stakeholder engagement and timely resolution	Contractors, Consultants, Employer	
2	Variation Orders	Changes in design and scope	Project delays, cost overruns	Timely review and approval mechanisms	Contractors, Consultants, Employer	
3	Delayed Payments	Late payments to contractors	Cash flow disruptions, project delays	Improved payment processes, dispute resolution mechanisms	Employer, Contractors	
4	Violent Protests	Socio-political unrest, compensation disputes	Work stoppages, damage to infrastructure	Enhanced stakeholder engagement, security measures	Contractors, Local Authorities, Employer	
5	Adverse Weather Conditions	Heavy rainfall and flooding	Work stoppages, increased costs, time extensions	Strengthening drainage, improved planning	Contractors, Consultants	
6	Design Issues	Flaws in initial designs	Rework, redesign, construction delays	Thorough design reviews, proactive coordination	Contractors, Consultants, Engineers	
7	Cement Material Shortages	Shortage of essential materials like cement	Work stoppages, delays, cost overruns	Coordination with suppliers, alternative procurement strategies	Contractors, Suppliers	
8	Project Management Challenges	Coordination and resource allocation issues	Delays, inefficiencies in project execution	Improved communication, robust project management frameworks	Contractors, Consultants, Employer	

Table 4: Thematic analysis summary [Based on project Records]

The employer's perspective highlights the importance of stakeholder engagement and collaborative decision-making in achieving project success. By synthesizing these diverse viewpoints, the research can offer actionable recommendations for improving project outcomes and minimizing delays in future road construction projects.
Here is how we the different perspectives are analyzed:

4.8.1 Contractors' perspectives

The responses provided by the contractors offer valuable insights into the occurrence and impact of various delay risk events in road construction projects. Here's an evaluation of their perspectives on the specific risk events mentioned:

1. Site possession delay /Right-of-Way Issues: The contractor's primary concern centered on the delayed site possession and right of way issues, which significantly hindered their ability to commence and progress with the construction work. These delays were attributed to unresolved land acquisition and compensation disputes, causing disruptions in the project timeline. The contractor expressed frustration over the lack of timely resolution, leading to increased costs due to idle resources and potential penalties. They emphasized the need for more proactive measures from the client and stakeholders to address these issues promptly and ensure smoother project execution.

2. Variation order: The contractor's main concern regarding variation orders was the frequent changes in project scope and design, which led to unexpected cost increases and delays. They highlighted issues with the clarity and timeliness of the variation orders, which often resulted in disputes and difficulties in managing project timelines and budgets effectively. This unpredictability impacted their ability to maintain cost control and schedule adherence.

3. Delayed Payment of Certified Amounts: Contractors express concerns about delays in receiving certified payments, citing it as a continuing event. This delay can have significant financial implications, impacting cash flow and resource mobilization. Respondents attribute this delay to improper project follow-up and resource mismanagement, indicating systemic challenges within the payment process.

4. Disruption and Delay due to Violent Protests: Contractors highlight the disruptive impact of social unrest and protests over unsettled compensation payments by the employer. These events lead to work stoppages and safety concerns, affecting project progress and timelines. Respondents emphasize the need for improved stakeholder engagement and conflict resolution mechanisms to address such challenges effectively.

5. Delay caused by Adverse Climatic Conditions: Contractors acknowledge the impact of adverse weather conditions on project execution. Extreme weather events, such as heavy rain, can hamper construction activities, leading to delays and cost overruns. Respondents stress the importance of contingency planning and risk mitigation strategies to minimize the impact of climatic disruptions.

4. Delays due to Design Issues: Contractors identify design-related delays as a continuing event affecting project execution. These delays stem from inadequacies in the project design phase, leading to revisions and rework during construction. Respondents emphasize the need for thorough design reviews and proactive coordination between design and construction teams to mitigate such risks.

6. Shortage of Cement at National Level: Contractors highlight the challenge posed by the shortage of essential construction materials, such as cement, at the national level. This shortage can lead to supply chain disruptions, delaying project timelines and increasing costs. Respondents advocate for improved coordination with local stakeholders and alternative procurement strategies to address material shortages effectively.

The contractors' perspectives underscore the multifaceted nature of delay risk events in road construction projects and the importance of proactive risk management strategies. By acknowledging these challenges and proposing mitigation measures, contractors contribute valuable insights to the research topic, enhancing our understanding of effective project management practices in the face of complex project risks.

The perspectives provided by the consultants and the employer offer additional insights into the challenges and implications of delay risk events in road construction projects:

4.8.2 Consultants' Perspective:

Consultants highlight various factors contributing to delays, including issues related to site possession, design changes, and payment delays. Their responses underscore the interconnected nature of these challenges and emphasize the importance of proactive project planning and effective communication to mitigate delays and contractual breaches. Consultants also advocate for stakeholder engagement and collaboration as key drivers for project success, aligning with the thesis topic's focus on mitigating contractual breaches through collaborative approaches.

Based on the responses provided, the perspectives of the consultants regarding delay risk events in road construction projects can be summarized as follows:

- Consultants identify various delay risk events, including issues such as delayed site possession, payment delays, adverse climatic conditions, and design-related delays.
- They emphasize the significant impact of these delay events on project schedules and progress, with some events causing moderate to severe disruptions.
- Consultants suggest measures such as improved coordination with stakeholders, acceleration of land acquisition processes, and better project management systems to address delay challenges.
- Additionally, consultants recognize the financial consequences associated with delay events, including significant cost overruns and time extensions.

4.8.3 Employer's Perspective:

The employer acknowledges delays in site possession, payment, and contractor capacity as significant challenges impacting project timelines. Their responses underscore the critical role of effective planning and stakeholder engagement in addressing delay risk events. Additionally, the employer highlights the financial and contractual implications of delays, emphasizing the need for timely resolution and mitigation strategies. These perspectives align closely with the thesis topic's objective of analysis and mitigating delays and contractual breaches through improved project planning and stakeholder collaboration.

The perspectives provided by consultants and the employer complement those of the contractors, offering a holistic understanding of the challenges and opportunities for mitigating delay risk events in road construction projects. Their insights underscore the importance of proactive risk management and collaborative approaches in achieving project success.

Based on the responses provided, the perspectives of the employer regarding delay risk events in road construction projects can be summarized as follows:

- The employer also acknowledges delay risk events such as delayed site possession, disruption due to violent protests, and adverse climatic conditions.
- They highlight the critical impact of these events on project schedules and progress, with some events causing significant delays and disruptions.
- The employer underscores the importance of improved coordination with local stakeholders and timely resolution of issues to mitigate delay impacts.
- Moreover, the employer recognizes the financial implications of delay events, including moderate to significant cost overruns and time extensions.

In association with the thesis topic of analysis of contractual breaches and delays in road construction projects, the perspectives of both consultants and the employer emphasize the importance of proactive risk management, effective stakeholder collaboration, and timely resolution of issues to minimize the impact of delay risk events. Their insights provide valuable considerations for implementing mitigation strategies and enhancing project planning processes to achieve better project outcomes.

Evaluating the different respondents' perspectives in association with the research topic enables a holistic understanding of the complex dynamics at play in road construction projects. By considering the unique insights and experiences of each stakeholder group, the research can provide practical guidance for mitigating contractual breaches and delays, ultimately contributing to the advancement of project management practices in the construction industry.

4.9 Evaluation of specific risk events

Based on the primary source of data, here is the detail findings on the assessment of the specific risk event which cause delay

4.9.1 Site possession delay/Right-of-Way Issues in the Arbereketi to Gelemso Road Project

One of the critical themes identified in the assessment of contractual breaches and delays in the Arbereketi to Gelemso Road Project is the issue of right-of-way. This challenge predominantly arises from disputes over land ownership and compensation, significantly delaying project progress. In many cases, landowners demand higher compensation or contest the valuation of their property, leading to protracted negotiations. Such disputes not only halt construction activities but also necessitate additional legal and administrative interventions, further extending project timelines. This problem is compounded in regions where land ownership documentation is either unclear or disputed among multiple parties.

The impact of right-of-way issues extends beyond mere delays in project schedules. These disputes often strain relationships between the project stakeholders, including contractors, local communities, and government authorities. When landowners feel inadequately compensated or unfairly treated, it lead to protests and even legal action, further complicating the project's execution. This socio-political unrest can disrupt not only the immediate project area but also influence public perception and support for the project. Consequently, right-of-way issues can escalate into significant financial burdens due to increased administrative costs, legal fees, and potential redesigns to avoid contentious areas.

To mitigate the impact of right-of-way issues, proactive stakeholder engagement and timely resolution mechanisms are crucial. Effective communication strategies that involve all affected parties early in the project can help in addressing concerns and negotiating fair compensation agreements. Employing mediators or facilitators to manage disputes and streamline the resolution process can also be beneficial. Additionally, thorough documentation and transparent processes in land valuation and compensation can build trust and reduce conflicts. In this context, the roles played by contractors, consultants, and the employer are vital. Contractors must ensure minimal disruption to ongoing work, consultants should provide accurate assessments and mediation, and the employer must oversee and facilitate the resolution process, ensuring that all legal and administrative requirements are met.

4.9.2 Variation orders

Based on the provided responses, it is evident that variation orders during the project execution were primarily attributed to design changes and modifications, scope changes by the employer, unforeseen site conditions, and a combination of factors. These changes often resulted in significant delays and cost overruns, impacting both the project timeline and budget.

The contractors and consultants involved in the project emphasized the importance of timely review and approval mechanisms to manage and control the issuance of variation orders. While some respondents mentioned the presence of comprehensive provisions related to the management of variation orders, others noted limited provisions or ineffective contractual measures in place.

The impact of variation orders on the project timeline and budget varied across respondents, with some experiencing significant delays and cost overruns, while others reported moderate or minor impacts. However, the consensus among respondents was the necessity of robust change management procedures and thorough evaluation of cost and time implications to effectively address variation orders.

The perspectives provided by the contractors, consultants, and the employer highlight the challenges associated with variation orders in road construction projects and underscore the importance of proactive measures and comprehensive contractual provisions to mitigate their adverse effects on project outcomes.

4.9.3 Delayed payments

The responses from the contractors, consultants, and the employer provide insights into the causes and consequences of delays in payments to contractors, as well as the measures taken to address these issues.

The causes identified include a combination of factors such as budgetary constraints from the employer, administrative bottlenecks, inefficient management, and other related factors. These issues resulted in significant disruptions to project progress and contractor performance.

The impact of delayed payments on contractors was significant, with respondents reporting disruptions to cash flow and significant claims and liabilities as consequences. These delays affected project progress and hindered the ability of contractors to meet their obligations effectively.

To address the delayed payment issues, various measures were implemented, including improved payment processes, cash flow management strategies, and dispute resolution mechanisms. However, despite these efforts, some respondents still experienced moderate to significant claims and liabilities associated with the delays.

The perspectives provided underscore the importance of addressing delays in payments promptly to ensure smooth project execution and minimize disruptions to contractor performance. Improved payment processes and effective cash flow management are crucial in mitigating the adverse effects of delayed payments on project outcomes.

4.9.4 Consequences of violent protests

The responses provided by the contractors, consultants, and the employer shed light on the primary causes and consequences of violent protests that disrupted the project. The causes identified include unresolved community compensation issues, socio-political tensions and unrest, and a combination of factors contributing to the disruptions.
The impact of the violent protests on the project schedule and progress was significant, with respondents reporting significant work stoppages and delays. This resulted in damage to project incomplete infrastructure, huge loss of productivity as well as temporary work stoppages and re-mobilization efforts to address the disruptions.

To address the disruptions caused by the violent protests, measures such as coordination with local authorities and security forces, enhanced stakeholder engagement and communication, and strengthening of grievance redress mechanisms were implemented. However, despite these efforts, some respondents experienced moderate to significant claims, liabilities, and damages associated with the disruptions.

The perspectives provided underscore the challenges posed by violent protests in road construction projects and highlight the importance of proactive measures and effective stakeholder engagement to mitigate their adverse effects on project outcomes.

4.9.5 Adverse climatic conditions that caused delays

The responses provided by contractors, consultants, and the employer shed light on the adverse climatic conditions that caused delays in the project, their impacts, mitigation measures, and associated implications.

Heavy rainfall and flooding were identified as the primary adverse climatic conditions leading to significant delays and work stoppages. These conditions had a substantial impact on the project schedule and progress, resulting in significant claims, liabilities, and time extensions.

To mitigate the impacts of adverse climatic conditions, various measures were implemented, including strengthening drainage and erosion control, adaptation of construction methods and planning, and improved weather monitoring and forecasting. However, some respondents reported limited or no specific mitigation measures in place. Despite efforts to mitigate the impacts, delays caused by adverse climatic conditions resulted in moderate to significant claims, liabilities, and time extensions for most respondents.

The responses highlight the importance of proactive measures to address adverse climatic conditions and the need for robust mitigation strategies to minimize their impact on project outcomes. Effective planning, adaptation of construction methods, and improved monitoring and forecasting are essential in managing and mitigating risks associated with adverse weather conditions during project execution.

4.9.6 Key design-related issues that caused delays

The responses from contractors, consultants, and the employer provide insights into the key design-related issues that caused delays, their impacts, measures taken to address the problems, and associated financial or legal implications.

Flaws in the hydraulic structures design were identified as a significant issue leading to delays and rework. These design issues had a moderate to significant impact on construction progress, resulting in delays and the need for redesign and engineering modifications.

To address the design problems and their consequences, measures such as redesign and engineering modifications were implemented. Improved coordination with relevant authorities and acceleration of construction and remedial works were also reported as strategies to mitigate the impacts of design issues.

Despite efforts to address the design-related issues, delays and rework caused moderate claims, liabilities, and cost overruns for most respondents. However, some respondents

reported no significant financial or legal implications associated with the delays caused by design issues.

The responses underscore the importance of thorough site investigations and surveys, as well as the need for effective coordination and communication among project stakeholders to identify and address design-related issues promptly. Effective measures such as redesign and engineering modifications are essential in minimizing the impact of design problems on project timelines and budgets.

4.9.7 Shortage of cement at the national level

The respondents identified various factors contributing to the shortage of cement at the national level, including insufficient domestic production capacity, supply chain disruptions, and logistical challenges. These shortages led to significant delays and work stoppages on the project, impacting construction progress and schedules.

To mitigate the impacts of the cement shortage, measures such as coordination with cement suppliers and authorities were implemented. However, despite these efforts, delays and disruptions persisted, resulting in moderate to significant claims, liabilities, and cost overruns for most respondents.

The shortage of cement also led to disputes and renegotiation of contract terms for some respondents, indicating the complexity and severity of the issue. Contractual amendments and time extensions were sought by contractors to address the delays caused by the cement shortage.

The shortage of cement at the national level posed significant challenges to project construction, highlighting the importance of effective coordination and planning to manage supply chain disruptions and mitigate their impacts on project timelines and budgets.

4.9.8 The effectiveness of the overall project management structure

Here's a breakdown of the responses provided by the respondents regarding the effectiveness of the overall project management structure for the Arbereketi to Gelemso Road Project:

1) **CONTRACTOR**
   - Overall Readiness for Project Management: 90-100% in the first three to four years, 80-90% after the fourth year

- Overall Readiness in Allocation of Required Resources: 90-100% in the first three/four years, 80-90% after the fourth year
- Capacity to Complete the Project: 90-100%
- Taken Required Action to Overcome Challenges: Yes
- Made Required Effort for Risk Management: Yes
- Overall Project Management Capabilities: Moderately capable with some gaps
- Key Weaknesses: Ineffective communication and coordination among stakeholders
- Key Strengths: Establishment of a robust project management system
- Effectiveness in Managing Cost, Schedule, and Quality Control: Moderately effective with some shortcomings
- Demonstration of Innovation and Problem-Solving: Moderately innovative with some adaptability

2) CONSULTANT

- Overall Readiness for Project Management: 70-80% in the first three to four years, 70-80% after the fourth year
- Overall Readiness in Allocation of Required Resources: 70-80% in the first three/four years, 70-80% after the fourth year
- Capacity to Complete the Project: 70-80%
- Taken Required Action to Overcome Challenges: Yes, limited measures taken
- Made Required Effort for Risk Management: Lack of proactive risk identification and mitigation strategies
- Overall Project Management Capabilities: Moderately capable with some gaps
- Key Weaknesses: Insufficient project management expertise and capacity
- Key Strengths: Experienced and qualified project management personnel
- Effectiveness in Managing Cost, Schedule, and Quality Control: Moderately effective with some gaps
- Demonstration of Innovation and Problem-Solving: Limited innovation and reactive problem-solving

3) EMPLOYER

- Overall Readiness for Project Management: 90-100% in the first three to four years, less than 30% after the fourth year

- Overall Readiness in Allocation of Required Resources: 90-100% in the first three/four years, less than 30% after the fourth year
- Capacity to Complete the Project: 90-100%
- Taken Required Action to Overcome Challenges: Yes
- Made Required Effort for Risk Management: Yes
- Overall Project Management Capabilities: Moderately capable with some gaps
- Key Weaknesses: Ineffective planning, scheduling, and resource management
- Key Strengths: Highly effective cost, schedule, and quality management
- Effectiveness in Managing Cost, Schedule, and Quality Control: Moderately effective with some shortcomings
- Demonstration of Innovation and Problem-Solving: Moderately innovative with some adaptability

These responses reflect the perceptions and assessments of the different stakeholders involved in the project regarding various aspects of project management, including readiness, resource allocation, capacity, challenges, and effectiveness in addressing them.

The responses provided by the various stakeholders regarding the effectiveness of the overall project management structure for the Arbereketi to Gelemso Road Project offer a comprehensive insight into their perspectives. According to the contractors, the project management structure demonstrated high levels of readiness, with a readiness rating of 90-100% in the initial three to four years, slightly decreasing to 80-90% thereafter. They also expressed confidence in their capacity to complete the project, with a rating of 90-100%.

Contractors acknowledged taking required actions to overcome challenges and demonstrated efforts in risk management, although there were noted weaknesses in communication and stakeholder coordination.

Consultants, on the other hand, provided a more moderate assessment, rating readiness and resource allocation at 70-80% initially and after the fourth year. While they acknowledged capacity to complete the project, they highlighted limitations in proactive risk management and identified weaknesses in project management expertise.

Employers rated project readiness highly in the initial stages but expressed concerns about resource allocation and capacity over time, with readiness dropping to less than 30% after the fourth year. They recognized efforts to address challenges and implement risk management but noted shortcomings in planning and resource management.

Despite variations in assessments, all stakeholders agreed on the need for continued improvement in project management processes, particularly in areas such as communication, stakeholder coordination, risk management, and resource allocation.

4.10 The stakeholders' perspectives

The stakeholders' perspectives on contract management processes and dispute resolution mechanisms for the project offer valuable insights into their effectiveness and challenges. Contractors generally viewed contract management as moderately effective, albeit with some gaps, while consultants shared similar sentiments, highlighting issues with change management and contract variations processes. Challenges identified included ineffective communication and negotiation between parties and lengthy, complex adjudication processes. To address these challenges, measures such as strengthening alternative dispute resolution mechanisms and assigning dedicated dispute resolution experts were proposed.

However, some stakeholders, particularly consultants, indicated significant issues in contract management, including unclear or ambiguous contract clauses and provisions, which affected the effectiveness of dispute resolution processes. Efforts to improve contract management processes included capacity building, training, and improvements in contract documentation and record-keeping. Despite variations in assessments, stakeholders agreed on the need for enhancing transparency, accountability, and timely resolution of contractual issues to ensure project success.

Stakeholder engagement and community relations management for the project were assessed differently by stakeholders, with contractors generally perceiving their effectiveness as moderately effective, albeit with some gaps. Consultants shared similar sentiments, highlighting areas such as ineffective communication and consultation with local communities as well as limited involvement of local authorities and influencers

as challenges. Measures proposed to improve stakeholder engagement included strengthening coordination and collaboration with local authorities and establishing community liaison and grievance restitution mechanisms. Despite variations in assessments, stakeholders agreed on the importance of addressing community expectations and grievances comprehensively and enhancing coordination with local authorities to foster better stakeholder engagement and community relations throughout the project lifecycle.

4.11 Environmental and social safeguards management

In evaluating the environmental and social safeguards management throughout the project, the contractor have demonstrated varying degrees of effectiveness. While some stated that contractor have been highly effective, implementing robust environmental and social management practices without significant challenges, others described have faced moderate effectiveness with gaps in safeguards implementation and monitoring.

Challenges in managing these safeguards have ranged from unclear or inconsistent approaches to inadequate capacity and resources for implementation. Measures taken to strengthen these processes include the establishment of monitoring and reporting systems, development of Environmental and Social Management Plans (ESMPs), and improving grievance addressing mechanisms.

Responsiveness to community grievances and stakeholder concerns has also varied among contractor's staffs. While some stated the contractor have been highly responsive and effective in grievance management, others have stated moderate responsiveness with gaps in addressing grievances. Poor coordination and communication with regulatory authorities have been cited as contributing factors to the challenges faced in this area. However, in some cases, contractor have taken limited or no specific measures to address these issues.

Regarding the contribution of contractor actions to the violent protests that disrupted the project, opinions vary. Some respondents believe that contractor actions were a significant contributing factor to the protests, while others attribute a moderate impact or no primary causation to contractor actions. In instances where contractor actions were seen as contributing significantly to the protests, issues such as ineffective

monitoring and enforcement of safeguards, inadequate impact assessments, and poor coordination with regulatory authorities were identified as underlying factors. Conversely, in cases where contractor actions had limited or no contribution to the protests, challenges such as unclear or inconsistent approaches to safeguards implementation and insufficient capacity and resources were highlighted.

4.12 Achievement of the original project objectives

The achievement of the original project objectives and targets varied among respondents. Some indicated that the objectives were partially achieved with deviations from the original plan, while others mentioned ongoing progress with the project still in development. Factors contributing to project outcomes, both positive and negative, included efficient contract management and dispute resolution, proactive stakeholder engagement, and community relations management. Challenges such as the need for strengthening project management and monitoring systems, capacity building, and institutional strengthening of project teams were also identified.

Several key lessons learned from the Arbereketi to Gelemso Road Project were highlighted. These lessons include the importance of robust contract management and dispute resolution processes, strengthening project preparation and feasibility assessment processes, and addressing socio-economic and environmental sustainability considerations. Recommendations to the Ethiopian Roads Administration for improving future projects encompass enhancing project governance, oversight, and accountability mechanisms, improving the legal and regulatory environment, and investing in capacity building and training of contractor personnel.

In assessing the overall competence, performance, and integrity of the Contractor, opinions varied. While some respondents perceived the Contractor as highly competent, performing well, and maintaining integrity, others identified areas of concern, including inconsistent or mixed performance and integrity issues. However, no integrity-related concerns or allegations were identified in some cases.

Respondents also provided insights into areas requiring further research, analysis, or policy interventions to address recurring challenges faced in the road infrastructure sector in Ethiopia. Critical success factors prioritized in future road infrastructure

projects include comprehensive risk assessment and mitigation planning, effective project management and governance, and robust contract management and dispute resolution processes.

Finally, recommendations were provided to improve the selection, management, and oversight of contractors on similar projects, emphasizing the importance of enhancing pre-qualification and due diligence processes and strengthening contract management and performance monitoring.

4.13 Analysis and discussion of results based on Secondary data source

The present thesis, titled "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project," aims to provide a comprehensive analysis of the contractual breaches and delays encountered in a specific road construction project. By examining the secondary data sources related to this project, the study seeks to uncover the key factors contributing to these challenges and their impact on the overall project performance.

The analysis and discussion of results based on the secondary data sources will serve as the foundation for this research. This section will investigate into the detailed documentation, reports, and records related to the Arbereketi to Gelemso Road Project, allowing for a thorough investigation of the contractual breaches and delays that occurred. The findings from this analysis will provide valuable insights into the project's challenges, the underlying causes, and the implications for the overall success of the road construction initiative.

For the secondary data analysis the number of basic project documentation utilized is summarized below in Table 5 and the detail chronology of the documents is presented in [Annex 1].

S.N	Data Types	Document Quantity	Original Data Source	Initial Intended Data Audience
1	Analyzed documents on the Contractual Delay Event No.1	2	Employer	Engineer
		3	Employer	Contractor
		131	Engineer	Contractor
		316	Contractor	Engineer
2	Analysed document on the Contractual Delay Event No.2	5	Employer	Engineer
		6	Engineer	Contractor
		1	Contractor	Engineer
3	Analysed document on the Contractual Delay Event No.3	1	Employer	Engineer
		34	Engineer	Contractor
		39	Contractor	Engineer
4	Analysed document on the Contractual Delay Event No.4	38	Engineer	Contractor
		270	Contractor	Engineer
5	Analysed document on the Contractual Delay Event No.5	7	Engineer	Contractor
		25	Contractor	Engineer
6	Analysed document on the Contractual Delay Event No.6	1	Engineer	Contractor
		3	Contractor	Engineer
7	Analysed document on the Contractual Delay Event No.7	1	Employer	Contractor
		3	Engineer	Contractor
		14	Contractor	Engineer
8	Various Documents	17	Engineer/Contractor	Engineer/Contractor
Total No. of Documents Analysed		917		

Table 5: Analyzed documents Summary as presented in [Annex 1] [Based on project Records]

4.14 Analyzing the findings on the Road Way obstructions status summary

The Table 6 below describes the status of project obstructions over different periods, serving as evidence of their extent for further analysis of the consequences.

4.14.1 Road way segments obstructions status summary (at the end of each year)

The findings presented in the attached data table illuminate the complexities of the Arbereketi to Gelemso road project, particularly in regard to the number of obstruction segments and the lengths of affected stretches documented over the specified timeline. Despite an original project completion deadline set for June 2018, the data reveals a recurring pattern of obstructions that has significantly impeded progress. The analysis indicates that the most substantial number of obstructions occurred in May and December of 2018, with 87 and 90 obstruction segments respectively, translating to an impacted disbursed stretch of over 13 kilometers. This surge in interruptions during a

critical project phase underscores the vulnerability of project timelines to external variables, raising questions about the efficacy of contractual enforcement and project risk management practices.

S.No.	Description [Month]	Number of Obstructed Segments	Affected Length in Km	Affected Length in (%age)
1	August-16	32	3.06	5.32%
2	December-16	52	9.78	17.00%
3	December-17	88	11.50	19.99%
4	May-18	87	13.18	22.92%
5	December-18	90	12.85	22.34%
6	December-19	57	11.16	19.41%
7	December-20	31	5.35	9.30%
8	December-21	18	1.09	1.90%
9	December-22	14	0.99	1.73%
10	December-23	10	0.55	0.95%
11	January-24	10	0.55	0.95%
12	February-24	10	0.55	0.95%
13	March-24	10	0.55	0.95%
14	April-24	12	0.64	1.11%

Table 6 : The number of obstruction segments and the lengths of affected stretches from the Project Contractor Monthly Report

Additionally, a closer examination of the annual intervals presented in the dataset indicates that extent of the obstruction in various periods. The subsequent resurgence of obstructions till April 2024, with another 12 segments, signifies the existence of an ongoing challenge. The cyclical nature of obstruction occurrences further complicates project timelines and highlights the necessity for adaptive management methods that can anticipate and mitigate the impact of such disruptions, though it is at high cost due to the lost productive utilization of Road Construction Equipment in various stretches.

The lengths of the affected stretches similarly point to the extensive ramifications of the identified obstructions. The cumulative lengths recorded underscore the sheer scale of disruption and the imperative for robust contractual frameworks that can accommodate such unforeseen challenges. These findings raise critical questions regarding the adequacy of existing contingency plans and the responsiveness of

contractual agreements in the face of significant disruption. A deeper investigation into the root causes of these obstructions will not only elucidate the factors contributing to delays but also serve to inform future best practices that enhance contractual adherence and project efficiency.

The visible trends within the data compel a reassessment of current project management approaches and highlight the need for strategic interventions aimed at reducing both the frequency and impact of obstructions. By integrating data-driven insights with stakeholder feedback, future construction projects can better align their contractual terms with the reality of on-site conditions, fostering an environment that is more conducive to timely completion. This ongoing evaluation of the Arbereketi to Gelemso road project provides essential lessons for practitioners and policymakers alike, emphasizing that a proactive stance on contractual breaches and delays is vital for the successful realization of infrastructure projects.

4.15 Analysis of the Project Equipment Status

The table below Table 7 and 8 details the status of heavy earth-moving equipment and other essential machinery needed for project execution.

This plan, part of the master execution strategy developed by the contractor, has been approved by the project supervising consultant. It serves as a record prepared during the project's commencement phase, ensuring completion within the original three-year contract period. The data highlights the contractor's commitment to equipment mobilization and demonstrates their competence in terms of equipment capability.

In the context of the Arbereketi to Gelemso Road Project, the analysis of equipment availability reveals a significant alignment between the contractor's deployment of machinery and master program set forth by contractor and dully approved by the Consultant. The data indicates that the contractor successfully mobilized the required equipment, fulfilling the basic commitments outlined in the project plan. This adherence to the equipment deployment schedule reflects a proactive approach to resource management, which is crucial for maintaining project timelines and ensuring operational efficiency.

S.No.	Description	Peak Equipment Requirement	Dec-16		Dec-17		Dec-18		Dec-19		Remarks
			Available	%	Available	%	Available	%	Available	%	
1	Dozer	5	6	120%	6	120%	3	60%	5	100%	
2	Grader	6	5	83%	5	83%	6	100%	7	117%	
3	Roller	6	8	133%	9	150%	5	83%	5	83%	
4	Loader	4	6	150%	6	150%	5	125%	5	125%	
5	Excavator	6	6	100%	13	217%	8	133%	8	133%	
6	Excavator (Jack Hammer)	2	3	150%	2	100%	1	50%	1	50%	
7	Dump Truck	37	59	159%	25	68%	38	103%	24	65%	
8	Water Truck	12	15	125%	9	75%	16	133%	10	83%	
9	Truck Mixer	2	1	50%	0	0%	1	50%	1	50%	
10	Back loader	1	2	200%	1	100%	1	100%	1	100%	
11	Mini Loader	3	2	67%	2	67%	2	67%	2	67%	
12	Mini Roller	2	3	150%	3	150%	2	100%	1	50%	
13	Crusher	1	1	100%	1	100%	1	100%	1	100%	
14	Asphalt Plant	1	1	100%	1	100%	1	100%	1	100%	
15	Paver	1	2	200%	2	200%	2	200%	2	200%	
16	Pneumatic Roller	1	3	300%	3	300%	3	300%	3	300%	
17	Steel Roller	1	2	200%	2	200%	2	200%	2	200%	
18	Fuel Truck	1	2	200%	3	300%	2	200%	2	200%	
Summary		**92**	**127**	**138%**	**93**	**101%**	**99**	**108%**	**81**	**88%**	

Table 7: PROJECT EQUIPMENT STATUS SUMMARY (At the end of the year from Dec 2016 to Dec 2019) Based on the Contractor Monthly Report

S. No.	Description	Peak Requirement	Dec-20		Dec-21		Dec-22		Dec-23		Apr-24	
			Available	%	Available	%	Available	%	Available	%	Available	%
1	Dozer	5	5	100%	3	60%	3	60%	2	40%	3	60%
2	Grader	6	6	100%	4	67%	4	67%	4	67%	3	50%
3	Roller	6	7	117%	3	50%	4	67%	5	83%	5	83%
4	Loader	4	5	125%	4	100%	3	75%	3	75%	5	125%
5	Excavator	6	6	100%	4	67%	4	67%	4	67%	3	50%
6	Excavator(Jack Hammer)	2	1	50%	1	50%	1	50%	1	50%	1	50%
7	Dump Truck	37	20	54%	24	65%	19	51%	10	27%	16	43%
8	Water Truck	12	9	75%	4	33%	5	42%	5	42%	6	50%
9	Truck Mixer	2	2	100%	2	100%	2	100%	2	100%	1	50%
10	Back loader	1	1	100%	1	100%	1	100%	1	100%	2	200%
11	Mini Loader	3	2	67%	2	67%	2	67%	2	67%	2	67%
12	Mini Roller	2	2	100%	2	100%	2	100%	2	100%	2	100%
13	Crusher	1	1	100%	1	100%	1	100%	1	100%	1	100%
14	Asphalt Plant	1	1	100%	1	100%	1	100%	1	100%	1	100%
15	Paver	1	2	200%	2	200%	2	200%	2	200%	2	200%
16	Pneumatic Roller	1	3	300%	3	300%	3	300%	3	300%	3	300%
17	Steel Roller	1	2	200%	2	200%	2	200%	2	200%	2	200%
18	Fuel Truck	1	2	200%	1	100%	2	200%	2	200%	2	200%
Summary		92	77	84%	64	70%	61	66%	52	57%	60	65%

Table 8: PROJECT EQUIPMENT STATUS SUMMARY (At the end of the year from Dec 2020 to April 2024) Based on the Contractor Monthly Report

However, despite the contractor's diligent efforts in mobilizing the necessary equipment, the project faced substantial challenges that hindered its execution. The lack of site possession and work disruptions across various locations and delay of payments emerged as critical external factors that impeded progress. These disruptions not only delayed the construction activities but also created a ripple effect that affected the overall project timeline. The contractor's ability to execute the project within the stipulated contract period was severely compromised due to these unforeseen circumstances, highlighting the importance of site readiness and accessibility in road construction projects.

The findings further underscore that the success of a construction project extends beyond mere equipment deployment. Effective collaboration among stakeholders and the mitigation of various risk factors are essential components that contribute to project success. The data suggests that while the contractor was prepared with the necessary machinery, the inability to navigate external challenges ultimately led to delays. This indicates that a holistic approach, encompassing both resource allocation and risk management, is vital for achieving project objectives in a timely manner.

Moreover, the implications of these delays are significant, as the contractor faces potential losses in both time and financial resources due to breaches by the Employer. Such delays not only impact the contractor's profitability but also pose a broader concern for the construction industry as a whole. The persistence of such delay events can stifle growth and innovation within the sector, ultimately hindering its ability to meet the increasing demands for infrastructure development. Therefore, it is imperative for all stakeholders to recognize the critical interplay between equipment availability, site conditions, and collaborative efforts in fostering a more resilient and efficient construction environment.

4.16 Analysis of the Project Progress

4.16.1 The project Progress in various months

The analysis of the project progress data reveals a complex interplay between the contractor's commitments and the external factors that significantly hindered the timely execution of the Arbereketi to Gelemso Road Project. Initially, the contractor demonstrated compliance with the approved program by deploying the necessary equipment, fulfilling a fundamental obligation that is critical for project advancement.

This adherence to the contractual requirements indicates a commitment to the project's success; however, the subsequent inability to execute the project effectively underscores the multifaceted challenges that arose during the construction process. The Table 9 below describes the project progress in almost yearly interval.

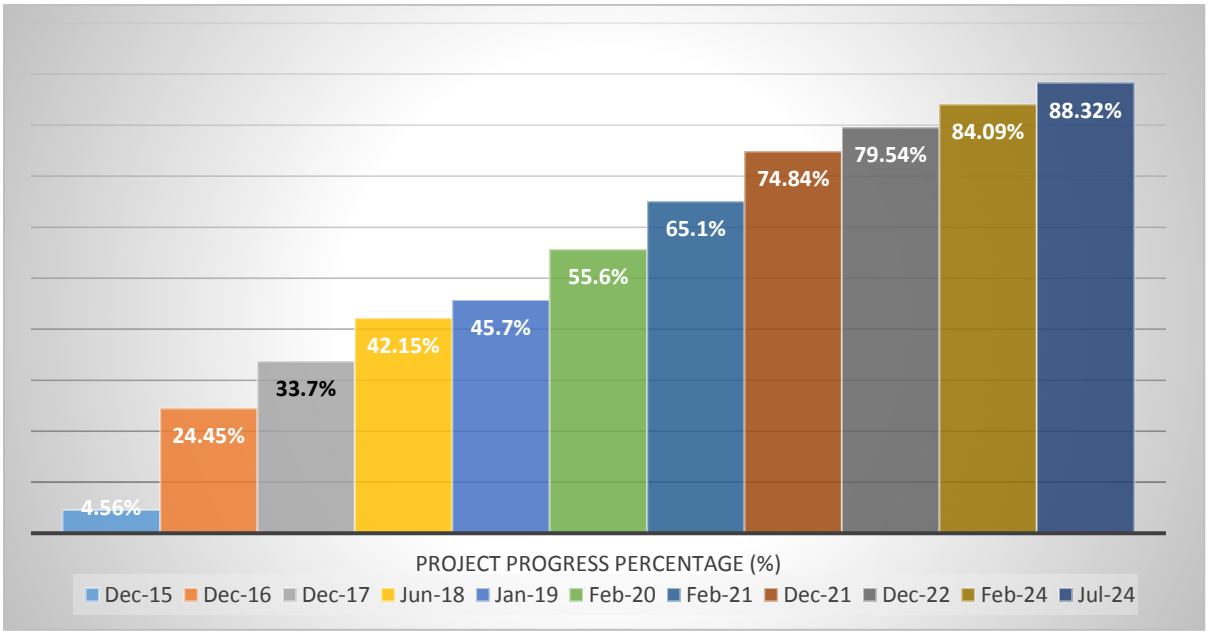

Table 9: Project Progress Chart in Percentage based on the Project Interim Payment Certificates

S.N	Month	Project Progress Percentage in the Interval (%)	Project Cumulative Progress Percentage (%)
1	Dec-15	4.56%	4.56%
2	Dec-16	19.89%	24.45%
3	Dec-17	9.23%	33.7%
4	Jun-18	8.46%	42.15%
5	Jan-19	3.57%	45.7%
6	Feb-20	9.91%	55.6%
7	Feb-21	9.45%	65.1%
8	Dec-21	9.76%	74.84%
9	Dec-22	4.70%	79.54%
10	Feb-24	4.55%	84.09%
11	Jul-24	4.22%	88.32%

Table 10: Project Progress in Percentage based on the Project Interim Payment Certificates

Despite the contractor's readiness and the deployment of equipment, the project faced substantial delays attributed to several external factors. The lack of site possession and

work disruptions at various locations, compounded by payment delays and violent disruptions related to compensation, severely impacted the project's timeline.

Adverse weather conditions and a shortage of essential materials, such as cement, further exacerbated these delays. The data suggests that had these external challenges not arisen, the contractor could have completed the project within the stipulated contract period, potentially achieving project completion by June 2018 as originally agreed. This scenario highlights the critical importance of not only equipment deployment but also effective collaboration and proactive risk management in ensuring project success.

The implications of these findings extend beyond the immediate project, reflecting broader concerns within the construction industry. The contractor is poised to incur significant losses in both time and financial resources due to breaches by the employer, which could deter future investments and growth within the sector.

Such delays and disruptions signal a troubling trend that, if left unaddressed, may hinder the overall development of the construction industry. It is imperative for stakeholders to recognize that successful project execution relies on a holistic approach that encompasses not only the fulfillment of contractual obligations but also the mitigation of external risks that can derail progress.

4.17 Main Contractual Breaches and Evidence based on secondary data:

The present thesis aims to provide a comprehensive analysis of the contractual breaches and delays encountered in this specific road construction initiative. By examining the secondary data sources related to the project, this study seeks to uncover the key contractual breaches that occurred and the evidence supporting their identification.

The findings from this analysis will serve as the foundation for a deeper understanding of the challenges faced in the Arbereketi to Gelemso Road Project and the implications for the overall success of the road construction endeavor.

The main contractual breaches identified in the document include:

1) **Delayed Right of Unimpeded Access to and Possession of Site (ERE #1)**: The contractor faced delays in gaining access to the site, which hindered progress.
2) **Delayed Issue of Variation Orders (ERE #2):** The employer's delay in issuing necessary variation orders affected the contractor's ability to proceed with the work as planned.

3) **Delayed Payment of Certified Amounts (ERE #3):** Persistent delays in payments from the employer disrupted the contractor's cash flow and ability to continue work.
4) **Disruption and Delay due to Violent Protests (ERE #4):** Social unrest and protests over compensation payments led to work stoppages.
5) **Delay due to Exceptionally Adverse Climatic Conditions (ERE #5):** Unfavorable weather conditions impacted the progress of the works.
6) **Delays due to Deficient Hydraulic Structures Design (ERE #6):** Issues with the design provided by the employer caused delays in construction.
7) **Shortage of Cement at National Level (ERE #7):** A national shortage of cement affected the availability of materials for the project.

The evidence for these breaches is derived from the forensic delay analysis, which includes documentation of the delays, correspondence between the parties, and references to specific clauses in the contract that outline obligations and rights regarding performance and delays.

These events collectively contributed to the contractor's claims for an extension of time and additional costs associated with the delays.

4.18 Specific Risk Events and Consequences explained based on secondary data:

4.18.1 Delayed Right of Unimpeded Access to and Possession of Site (ERE #1):

The contractual evidence for the occurrence of the identified breaches and risk events is primarily derived from the following sources within the contract and supporting documentation:

1) **Contractual Clauses**: Specific clauses in the contract outline the obligations of both the employer and the contractor.

   The project contract agreement Sub-Clause 42.1: Pertains to the Employer's obligation to provide unimpeded access to the site, which supports the claim regarding delayed access (ERE #1).

   Sub-Clause 42.1 [Possession of Site and Access Thereto] as amended by the Conditions of Contract Part – II: Conditions of Particular Application of the Contract ("**CPA**") provides the Employer's obligation to grant unimpeded and

uninterrupted possession of the Site to the Contractor in order to enable it to execute the Works within the Time for Completion, as follows:

"Save insofar as the Contract may prescribe:

(a) the extent of portions of the Site of which the Contractor is to be given possession from time to time,

(b) the order in which such portions shall be made available to the Contractor, and, subject to any requirement in the Contract as to the order in which the Works shall be executed, **the Employer will, with the Engineer's notice to commence the Works, give to the Contractor possession of**

(c) so much of the Site, and

Sub-Clause 44.1 (d) and (e): Relate to the contractor's entitlement to an extension of time (EoT) and compensation for delays caused by the employer's actions or inactions.

Based on the foregoing premises, the Employer had a mandatory obligation under the Contract to grant to the Contractor unimpeded possession of and access to the Site and "such lands as the Contractor may reasonably require for camps, workshops, diversion roads, borrow pits and quarries" in order for the latter to be able "to commence and proceed with the execution of the Works (…) with due dispatch" so as to enable the latter to perform the Works in accordance with the Program of Works (PoW).

Hence, the Employer's failure to give to the Contractor uninterrupted possession of and access to the Site, as provided by the Contract, has prevented adherence to the PoW, and therefore constitutes a breach of its obligations under the Contract and thus is an excusable and compensable delay event giving rise to the Contractor's entitlement to claim both an EoT and associated Costs stemming therefrom.

2) **Chronology of Events**: A detailed correspondence chronology of events record is reviewed and attached as summary here as **[Annex No. 1]** as documentation of facts listing record document, which records the timeline of delays and disruptions. This includes references to specific dates and occurrences that substantiate the claims made by the contractor.

3) **Correspondence Records**: Documentation of correspondence between the contractor, the employer, and the engineer, which includes notifications of delays, requests for information, and responses regarding the various events that impacted the project timeline. This correspondence serves as evidence of the ongoing issues and the employer's failure to meet contractual obligations.

4) **Forensic Delay Analysis**: This analysis helps to present graphical representations and comparisons of planned versus actual progress, provides quantitative evidence of the delays and their impact on the project completion date. This analysis helps to establish causation between the identified events and the resulting delays.

5) **Legal References**: The legal references cites relevant articles from the Ethiopian Civil Code that support the contractor's claims for contractual breaches, reinforcing the legal basis for the claims.

The Contractor's claim for contract breach herein, stems not only from the Contract provisions referred to above, yet also from specific provisions of Articles 1731 of the Ethiopian Civil Code.

Under the applicable Ethiopian law, the Employer was bound to execute its obligation to grant to the Contractor unimpeded access to and possession of Site, as Article 1731 - Principle of the Ethiopian Civil Code - provides that:

"(1) The provisions of a contract lawfully formed shall be binding on the parties as though they were law.

(2) The contents of the contract shall be determined by the parties subject to the mandatory provisions of the law.

(3) The provisions of this Title shall apply to all contracts where such provisions are of a mandatory nature or their application has not been set aside by the parties."

Together, these elements form a comprehensive body of evidence that substantiates the contractor's claims regarding the breaches and risk events encountered during the project.

4.18.2 Delayed Issue of Variation Orders (ERE #2):

The delaying and/or disruptive effects caused by the event of instructed additional works, required and introduced by the Engineer within the scope of Variation Order No. 1 to Variation order No.7 and further on initiation of number of variation works even in May 2024 as confirmed by the Engineer letter constitute delay of the project execution

The effects of this variation order delay event can be explained well using forensic Delay Analysis, which identifies that the activities affected by this Employer Risk Event are critical and hence, affected the Critical Path to Completion of the Works.

In essence, a Variation occurs when the tendered Works have been modified during the period for construction, by means of instructed changes to the Employer's design, quality or quantity of the Works to such an extent that the Works vary from that envisaged at Tender. The variation mechanism under the Contract stipulates that the Works can vary with appropriate instruction issued by the Engineer with prior agreement by the Employer, as and when required.

Albeit that the Contractor had diligently progressed the Works, including the design revisions within the instructed Variations, the delays resulting from the additional works imposed thereby, required changes to the PoW and thus have caused a delay to Completion of the Works, which could not reasonably be mitigated by the Contractor due to their complexity, extent and sheer volume.

4.18.3 Delayed Payment of Certified Amounts (ERE #3)

This delay event relates to the delaying and disruptive effect, caused by the Employer's persistent delay in making payments of the amounts due under numerous consecutive Interim Payment Certificates.

The project payment is settled in both local (70%) and foreign currency (30%) and financed by four financers in different percentages including BADEA (Bank of Arabs for Economic development -18.7%), OFID (OPEC fund for international development - 45.5%), SFD (Saudi fund for development – 27.39%) and Ethiopian government.

As illustrated within **[Annex No. 2]** hereto, the Employer's payments to the Contractor in respect of amounts due within the Engineer's for this case IPCs nos. 1 to 41 which had been delayed beyond their due date for payment is presented.
For some of these payments this delay had exceeded 100 days for payments in Local currency as well as the payments in foreign currency. The project for the presented analysis Interim periods, payment has been delayed on the average at least for 83 days, which is more than 48% of the number of dates specified in the contract.

The Contract establishes a clear and express mechanism regulating the consequences of the Employer's delay in payment. More to the point, Sub-Clause 60.8 [Time of Payment and Interest] reads, inter alia:

"The amount due to the Contractor under any Interim or Final Payment Certificate issued by the Engineer (…) shall, subject to Clause 47, be paid by the Employer to the Contractor as follows:

(i) (A) in the case of Interim Payment Certificates, within 56 days after the Contractor's monthly statement has been submitted to the Engineer for certification, pursuant to Sub-Clause 60.1, provided that, if the Engineer's Interim Certificate has not yet been issued within said 56 days, the Employer shall pay the amount shown in the Contractor's monthly statement and any discrepancy shall be added to, or deducted from, the next payment to the Contractor; (…)."
Further, under the applicable Ethiopian law, the Employer was under the obligation to timely make the due payments to the Contractor, as Article 1756 [Time for Payment] of the Ethiopian Civil Code provides that:
"1. Payment shall be made at the agreed time (…)
3. Payment shall be made whenever a party requires the other party to perform his obligation (…)"

Article 29.3 of the Ethiopian Public Procurement Directive according to which:
"The Public Body has to carry out the following activities of contract administration as per the contract agreement.

a) Effect payment or payments due in instalment to the supplier on time.

b) Give certificates of performance to the supplier

c) Provide legitimate support to the supplier to enable him performs his obligation under the Contract" [emphasis added].

And Article 1731 of the Ethiopian Civil Code, according to which:

"(1) the provisions of a contract lawfully formed shall be binding on the parties as thought they were law.

(2) The contents of the contract shall be determined by the parties subject to the mandatory provisions of the law.

(3) The provisions of this Title shall apply to all contracts where such provisions ore of a mandatory nature or their application has not been set aside by the parties."

Should the Employer fail to timely pay amounts certified within IPCs, the Contract provides the Contractor with three remedies, which are presented under sub-paragraphs (i), (ii) and (iii) below:

(i) The Contractor's right to receive interest, in accordance with Sub-Clause 60.8 letter (b), according to which:

"In the event of failure by the Employer to make payment in accordance within the times stated, the Employer shall pay to the Contractor interest compounded monthly at the rate(s) stated in the Appendix to Bid upon all sums unpaid from the date upon which the same should have been paid, in the currencies in which the payments are due. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause 69 or otherwise" [emphasis added];

(ii) and the Contractor's right to suspend work pursuant to Sub-Clause 69.4 [Contractor's Entitlement to Suspend Work] according to which:

"Without prejudice to the Contractor's entitlement to interest under Sub-Clause 60.10 and to terminate under Sub-Clause 69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause 60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work."

(iii) The third remedy provided by the Contract as a result of the Employer's failure to timely pay the certified amounts is reflected within Sub-Clause 69.4 [Contractor's Entitlement to Suspend Work] according to which:

"If the Contractor suspends work or reduces the rate of work in accordance with the provisions of this Sub-Clause and thereby suffers delay or incurs costs the Engineer shall, after due consultation with the Employer and the Contractor, determine:
Any extension of time to which the Contractor is entitled under Clause 44, and
The amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly, with a copy to the Employer" [emphasis added].
Consequently, as a result of the Employer's failure to timely pay the amounts certified, the Employer had breached the provisions of Sub-Clause 60.8 [Time of Payment and Interest], as well as the provisions of Articles 1731 and 1756 of the Ethiopian Civil Code and Article 29.3 of the Ethiopian Public Procurement Directive.

At law, in the case that the Employer had breached the Contract by failing to pay the amounts certified, the Ethiopian law gives the Contractor its right to be paid compound interest for the delay, suspend Work or to reduce the rate of progress (i.e. to not execute its contractual obligations and to be granted an extension of the Time for Completion), as well as to receive damages suffered by the Contractor.

In summary of the foregoing considerations, it is the Contractor's position that as a consequence of the Employer's delayed payments and the Contractor having given due notice of the effects thereof denying it from maintaining planned and programmed production, the Contractor is entitled to not only receive interest which has accrued during the period of delayed payment, but also to rely upon any rights related to suspension of work, reduced rate of progress, right of termination of the Contract and entitlement to an EoT for the whole period from the date of the Employer's first breach of its payment obligations pursuant to Sub-Clause 60.8, up to the Data Date of the claim herein, and additional payment of associated Costs, loss and/or damage stemming therefrom.

4.18.4 Disruption and Delay caused by work activities being prevented as a consequence of violent protests over unsettled Compensation Payments by the Employer and Social/Unrest (ERE #4)

This ongoing delay event refers to the Contractor being prevented from maintaining the rate of programmed progress of the Works caused by the Employer's continuing failure to give to the Contractor unimpeded Possession of the Site. Such persistent failure is evidenced by the protests and actions by local citizens preventing the Contractor's access to and hindering its possession of the Site, for reasons of unsettled compensation payments for the land forming the Site, which is a matter to be resolved solely by the Employer and thus is a delay event solely attributable to the Employer.

The comprehensive documentation facts with their chronology of the cause of this delaying and/or disruptive event is recorded in the project correspondences as presented at **[Annex No. 1].**

The planned works were obstructed as a consequence of the circumstances of the continuing deterioration of security in the vicinity of the Project, mainly due to locals maintaining their protests that compensation payments had not been received from the Employer in full or in part, and as a consequence they had frequently compelled the Contractor to stop work by means of invasion of the Site area during their protests. The protesters were mixed, whereby some of them were protesting violation of their social rights, while others were insisting on alleged due or unsettled compensation payments for their land by the Employer.

As shown in the detailed documentation of facts of the evolution of this delay event presented in **[Annex No. 1]** hereto, the Contractor was prevented from performing the activities in accordance with the PoW in numerous locations, thus, being prevented from working in locations where it had planned to work. As a consequence, the Contractor was compelled to either hold its equipment and labor idle, or when reasonably able to do so, relocate labor and equipment resources that were initially scheduled to work in the affected areas.

While the Contractor aimed to collaboratively resolve these issues, this could not be achieved without the Employer having fulfilled its obligations under the Contract, namely, to grant the Contractor effective unimpeded and uninterrupted possession of

the Site, in sufficient time in order for the Contractor to maintain the rate of progress of the Works in accordance with the PoW and the Completion date therein.

To this end, the occurrence of any encumbrances or potential third-party rights over the Site or any parts thereof, obstructing the Contractor's access to and possession of Site can only be construed as a breach by the Employer of its obligations under Sub-Clause 42.1. Hence, the Contractor maintains that the denial of effective Site possession as a result thereof is a cause of delay which is beyond the Contractor's control, and which is the sole responsibility of the Employer.

The key aspect of the Employer's contractual breach of its obligation to give to the Contractor unimpeded possession of the Site is that such had prevented adherence to the PoW, which relies on the principle of linear construction. This means that the Works has been planned to progress from one kilometer position or station to the next, with the various categories or types of work progressing within each respective section in an orderly engineering fashion. Typically, on a road project, this would involve Site Clearance, protection and/or diversion of existing services, excavation of topsoil, excavation of existing unsuitable material (if any), excavation to cuttings or filling to embankment profiles, whilst at the same time progressing other structures such as bridges or culvert crossings and the like, in a timely manner so as to not cause any delay or disruption to the earthwork's activities. Once the bridges, culverts and the earthworks are completed, the activities in respect of the roadway construction can then commence in a similarly orderly engineering fashion pertinent to drainage, road subgrade and pavement construction.

Any disturbance of the foregoing linear principle of execution will undoubtedly cause disruption to one or more activities, and likely delay the Completion of the Works in the event that the affected activities are on the critical path of the PoW to Completion.

The Contractor duly submitted notice of claim pursuant to Sub-Clause 53.1 and in connection with Sub-Clause 42.1 and 42.2 of the Contract in order to safeguard its entitlement to an extension of the Time for Completion and compensation of additional Cost incurred as a consequence thereof.

4.18.5 Delay caused by Exceptionally Adverse Climatic Conditions and the Consequences (ERE #5)

This delay event refers to the Contractor's entitlement to an EoT as a consequence of exceptionally adverse weather conditions which occurred on the Site during the analyzed period herein, whereby the consequences thereof, have adversely affected the rate of progress of the Works and that such event could not have been prevented by the Contractor.

As shown in the detailed documentation of facts of the evolution of this delay event presented in **[Annex No. 1]** hereto severe and exceptional rainfall and the consequent floods have frequently interrupted the Works and the Contractor had notified the Engineer of the occurrence of such events and their effects, which would entitle the Contractor to claim an extension of the Time for Completion of the Works.

Taking into consideration that the Contract does not establish a criterion for demonstrating exceptionality of adverse climatic conditions, the Contractor for instance maintains that the norm against which exceptionality would be judged, would be the average of the historical data recorded during the 10-year period prior to the Base Date.

Based on the results of the above comparison analysis between the meteorological data recorded over 10-year period prior the Base Date against the rainfall on Site recorded over the period evidence the occurrence of exceptionally adverse weather, which caused unavoidable delay to the programmed execution of the Works.

4.18.6 Damages and Delays due to the Employer's Deficient Hydraulic Structures Design (ERE #6)

This argumentation will substantiate the Contractor's entitlement under the Contract and at law, with regard to the delaying and/or disruptive effects caused by the Employer's failure to provide the Contractor with adequate and sufficient design of the hydraulic structures at various locations along the Project route and the effects of the consequential floods and damage to the Works and nearby properties.

The comprehensive chronology of the facts record pertaining to this delay and/or disruptive event is presented at **[Annex 1]** and accordingly the Contractor had duly issued notices of claim pursuant to Sub-Clause 53.1 and in connection with Sub-Clause

44.1 of the Contract to safeguard its entitlement to an EoT and compensation for additional cost incurred and yet to be incurred as a consequence of the delaying and disrupting effect of the Employer's deficient and inappropriate design of the hydraulic structures at some locations and the reoccurring flooding and damage resulting therefrom.

It is the Contractor's position that such occurrences leading inter alia to delay and disruption to the Works are evidencing, and are indeed resulting from the insufficient and inappropriate flood regulating capacity of the Employer's hydraulic design of the structures.

The Contractor hereby maintains that the Employer had the obligation to ensure that its hydraulic design was fit for the purposes of ensuring that the hydraulic structures are appropriate to the topography of the Project route and are of sufficient size that natural flooding is not worsened and to ensure that the structures can withstand the designed flow and remain traversable. Such is required in order to protect the residents and properties upstream and downstream of the road alignment. However, the Contractor hereby asserts that the Employer's hydraulic design failed to fulfil these functions and that the Engineer had been informed of the same by the Contractor at the appropriate time.

This in turn resulted in the notified floods and damage to the Works and nearby properties that clearly demonstrate the inadequacy and insufficiency of the Employer's design of the culvert structure

The Contractor contends that in accordance with the binding provisions of the Contract, the development of a complete, flawless and suitable design for the Project Works (and any necessary corrections and/or amendments thereto) up to the level immediately preceding the phase of preparing the working / shop drawings, is solely under the Employer's responsibility

Further, under the applicable Ethiopian law, the Employer was bound to execute its obligation to provide a correct and complete design to the Contractor, as Article 1731

of the Ethiopian Civil Code provides that the Contract shall be binding on the Parties as thought they were law.

The Contractor affirms that the Employer's hydraulic design should have been prepared in due compliance with the regulatory design requirements, building codes and design standards and other guidance documents and should inter alia provide for suitable and effective flood mitigation and resistance to flood loads so to protect the Works and the local areas from flood damage and to allow safe operation of the Project road.

The Employer's failure to provide an adequate and suitable hydraulic design to the Contractor represents a breach of its contractual obligations that results in reoccurring flooding and damages at the above locations and led to delay and disruption, evidenced by the forensic retrospective delay analysis, as proof of the effects of the excusable and compensable delay events, that are such as to entitle the Contractor to an EoT and payment of associated additional Costs so incurred thereof, under the Contract and at law.

4.18.7 Delay to the Works as a consequence of the Shortage of Cement at National Level (ERE #7)

The present argumentation will substantiate the Contractor's entitlement under the Contract and at law, stemming from the delaying and/or disruptive effects caused by the sudden and prolonged unavailability of cement at national level resulting from the "lack of spare parts, power outages, lack of inputs, lack of leadership and professional skills, security problems, supply of raw materials, and other pertinent issues" that over the period of analysis have unfortunately frequently occurred in the Federal Democratic Republic of Ethiopia.

The comprehensive chronology of the facts record pertaining to this delay and/or disruptive event is presented at **[Annex 1]** whereby the Delay Analysis has found that the activities affected by this Employer Risk Event are critical and hence, during affected the Critical Path to Completion of the Works.

Starting from the last trimester of year 2020, the Contractor experienced shortages of cement supplies for the Project because of the limited quantities produced and supplied

by the Ethiopian national cement factories mostly resulting from the above unforeseen series of circumstances at national level that were all beyond the risks deemed to have been assumed by the Contractor under the Contract and at law, and which in turn have significantly delayed the execution of Works.

The Contractor requested the Employer's intervention and liaison with the cement factories thereby facilitating the cement procurement and supply to the Project to ensure the monthly cement requirements for the Works were met as a priority.

In a further attempt to overcome the cement material shortage and to mitigate the resulting delays in the execution of the Works to the extent possible, the Contractor exposed itself to increased commercial risk by turning to local traders whereby the cement price was significantly higher in comparison with the "factory price and project base price", yet the available quantities and the types of cement available were extremely limited and ultimately inadequate to satisfy the demand of the Project.

Despite the Employer's requests to the cement factories and the Ministry of Trade and Industry's efforts to tackle the chronic shortage of cement on the market in Ethiopia, the problem persisted and severely adversely affected the execution of the works at the cut-off date of the present analysis (July 2024).

Ultimately, the Employer/Ethiopian Government identified some short term, middle term and long-term measures to be undertaken in order to resolve the circumstances of the cement shortage, yet at the cut-off date of the present analysis the Works were still being adversely affected by the nation-wide shortage of cement in Ethiopia, which have caused delay and the incurrence of additional costs by the Contractor.
Furthermore, the Contractor hereby asserts that as a consequence of the various notified Employer's intervention under the Contract and the Contractor had been denied the opportunity to progress with the Works as planned due to the underlying reason and the Project is still being ongoing and the Contractor is obliged to perform with inefficiency on the remaining Works under the present adverse conditions with the current volatility of cement material prices and delivery.

4.19 Comparison of the results based on the primary and secondary data with respect to the research objective

The first objective of this thesis is to identify the underlying causes of contractual breaches and delays in road construction projects, specifically focusing on the Arbereketi to Gelemso (57.5Km) project. The primary data analysis reveals that inadequate planning is a significant contributor to these issues. Project managers and other contractor's staffs highlighted that insufficient foresight in project timelines and resource allocation often leads to unforeseen challenges during execution. This finding aligns with secondary data, which indicates that many projects in Ethiopia suffer from a lack of comprehensive planning frameworks, resulting in delays and budget overruns. Moreover, the change in the working site possession emerged as major factor affecting project timelines. Primary data collected from stakeholders indicated that frequent modifications to project operation sequence, often driven by changing situations by community needs, disrupt the workflow and lead to contractual disputes. Secondary data corroborates this, showing a pattern of frequent sequence alterations in similar projects, which often exacerbate delays and complicate contract enforcement.

Funding challenges were also identified as a prominent cause of delays. Primary data analysis revealed that delays in disbursement of funds from governmental bodies often stall project progress, leading to increased costs and extended timelines. This observation is supported by secondary data, which document instances where financial constraints have hindered the timely completion of the road project.

Regulatory issues further complicate the landscape of road construction. Interviews with stakeholders indicated that bureaucratic hurdles and lengthy approval processes can significantly delay project initiation and execution. Secondary data analysis reflects this sentiment, highlighting that regulatory inefficiencies are a common theme in the challenges faced by the Ethiopian construction sector.

Both primary and secondary data analyses converge on the conclusion that inadequate planning, sequence changes, funding challenges, and regulatory issues are the primary causes of contractual breaches and delays in the Arbereketi to Gelemso road project. This understanding lays the groundwork for addressing these challenges in subsequent research objectives.

The second objective focuses on evaluating the impact of contractual breaches and delays on road construction projects, particularly in terms of cost overruns, time extensions, community disruptions, and broader socio-economic implications. Primary data analysis reveals that cost overruns are a direct consequence of delays, with contractors reporting that extended project timelines often lead to increased labor and material costs. This finding is echoed in the secondary data, which provides statistical evidence of budget escalations in similar projects due to delays.

Time extensions, as reported in primary interviews, are not merely administrative adjustments; they often reflect the reality of project stagnation. Stakeholders expressed frustration over the lack of accountability for delays, which can lead to accepting it as culture among contractors. Secondary data supports this observation, indicating that time extensions are frequently granted without adequate justification, further perpetuating the cycle of delays.

Community disruptions are another significant impact of contractual breaches. Primary data collected from local residents highlighted that delays in road construction can lead to prolonged access issues, affecting daily life and economic activities. Secondary data analysis corroborates these findings, showing that community dissatisfaction often escalates when projects are delayed, leading to protests and further complications for project execution.

The broader socio-economic implications of these delays cannot be overlooked. Primary data indicates that delays in infrastructure projects can hinder economic growth, particularly in rural areas where road access is critical for trade and mobility. Secondary data analysis reveals that the economic ripple effects of delayed projects can extend beyond immediate stakeholders, affecting local businesses and employment opportunities.

The evaluation of the impacts of contractual breaches and delays reveals a multifaceted problem that extends beyond mere project timelines and budgets. Both primary and secondary data highlight the significant consequences for communities and the economy, underscoring the urgency of addressing these issues in the context of the Arbereketi to Gelemso road project.

The third objective of this thesis is to investigate the effectiveness of current contract management practices in the Ethiopian road construction sector. Primary data analysis indicates that many stakeholders perceive existing contract management practices as inadequate, particularly in terms of monitoring and enforcement. Interviews with

project managers revealed a lack of standardized procedures for tracking compliance with contractual obligations, leading to inconsistencies in project execution. This sentiment is reinforced by secondary data, which highlights the absence of robust contract management frameworks in the Ethiopian construction industry.

Furthermore, the primary data analysis identified a gap in training and capacity building for contract managers. Stakeholders expressed the need for enhanced training programs that focus on best practices in contract management. Secondary data supports this finding, indicating that many professionals in the sector lack formal training in contract law and management, which can lead to misinterpretations and disputes.

The analysis also revealed that communication between stakeholders is often fragmented, contributing to misunderstandings and conflicts. Primary data collected from interviews emphasized the importance of clear communication channels in contract management. Secondary data analysis corroborates this, showing that effective communication is a critical factor in successful project delivery.

Additionally, the primary data highlighted the need for better documentation practices. Stakeholders reported that inadequate record-keeping often complicates dispute resolution processes. Secondary data analysis indicates that many projects suffer from poor documentation, which can hinder accountability and transparency in contract management.

Both primary and secondary data analyses suggest that current contract management practices in the Ethiopian road construction sector require significant improvement. The findings underscore the need for standardized procedures, enhanced training, effective communication, and better documentation to minimize breaches and delays in projects like the Arbereketi to Gelemso road construction.

The fourth objective of this thesis is to analyze stakeholder perceptions and experiences related to contract management, identifying their challenges, expectations, and recommendations. Primary data analysis reveals a diverse range of perspectives among stakeholders, including contractors, authorities, local communities, and beneficiaries. The contractors highlighted operational challenges, such as site possession delay, payment delay material shortages and adverse weather conditions, which they believe contribute to delays. In contrast, authorities emphasized the importance of regulatory compliance and the need for better oversight. This divergence in perspectives illustrates the complexity of stakeholder experiences in the context of road construction projects.

Local communities expressed concerns about the impact of delays on their daily lives and economic activities. Primary data collected from community members indicated a strong desire for more transparent communication from project managers regarding timelines and progress. Secondary data analysis supports this finding, showing that community engagement is often lacking in road construction projects, leading to frustration and mistrust.

Expectations regarding contract management practices also varied among stakeholders. The employer expressed a desire for more flexible contract terms that account for unforeseen challenges, while Contractor's emphasized the need for stricter compliance with contractual obligations. This contrast highlights the need for a balanced approach to contract management that considers the perspectives of all stakeholders involved.

Recommendations from stakeholders further enrich the analysis. Contractors suggested the implementation of regular progress meetings to facilitate communication and address issues proactively. Authorities recommended the establishment of a centralized database for tracking project progress and compliance. Community members advocated for greater involvement in the decision-making process, emphasizing the importance of their input in shaping project outcomes.

The analysis of stakeholder perceptions and experiences reveals a complex landscape of challenges and expectations in contract management. Both primary and secondary data highlight the need for improved communication, proper application and adoption of the contract terms, and greater community engagement to enhance project delivery and minimize breaches and delays in road construction projects.

The final objective of this thesis is to develop actionable and context-relevant strategies to mitigate contractual breaches and delays in road construction projects. Drawing on the findings from the Arbereketi to Gelemso project, primary data analysis suggests several key strategies. First, enhancing project planning processes is crucial. Stakeholders emphasized the importance of comprehensive planning that includes risk assessments and contingency measures. This aligns with secondary data, which indicates that thorough planning is a common factor in successful project delivery.

Second, establishing a formal change management process is essential to address sequence changes effectively. Primary data analysis revealed that stakeholders often struggle with managing alterations to project operational sequence. Implementing a structured process for evaluating and approving changes can help mitigate the negative impacts of sequence changes on project timelines and budgets.

Third, improving funding mechanisms is vital for ensuring timely project execution. Primary data indicates that securing financing in advance can alleviate many of the delays associated with funding challenges. Secondary data supports this recommendation, highlighting the importance of diverse funding sources and contingency funds to address unforeseen financial constraints.

Additionally, fostering a culture of accountability within the construction sector is critical. Primary data analysis suggests that implementing performance metrics and regular evaluations can help hold stakeholders accountable for their commitments. This approach is supported by secondary data, which indicates that accountability is a key factor in minimizing breaches and delays.

Finally, leveraging technology in contract management and project execution can enhance efficiency and transparency. Primary data analysis reveals that digital tools can facilitate real-time tracking of project progress, enabling stakeholders to identify potential delays early. Secondary data supports this finding, indicating that technology adoption is increasingly recognized as a means to improve project delivery in the construction sector.

By enhancing project planning, establishing formal change management processes, improving funding mechanisms, fostering accountability, and leveraging technology, stakeholders can significantly improve project delivery and contract management practices in road construction projects like the Arbereketi to Gelemso road project.

5 Chapter 5 - Summary, Conclusion and Recommendations

5.1 Summary of findings

The thesis titled "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project" investigates into the multidimensional challenges that hinder the successful execution of infrastructure initiatives in Ethiopia. The research is anchored on five key objectives that aim to unravel the complexities surrounding contractual breaches and delays within the context. By identifying the underlying causes of these issues, such as inadequate planning, unplanned execution and sequence changes due to various factors, funding challenges, and regulatory hurdles, the study seeks to provide a comprehensive understanding of the factors that contribute to project inefficiencies.

The analysis of primary data collected from stakeholders involved in the Arbereketi to Gelemso project reveals significant insights into the impact of contractual breaches and delays on project outcomes. Findings indicate that these challenges lead to substantial cost overruns, extended timelines, and disruptions within local communities. The socio-economic implications of such delays extend beyond immediate financial concerns, affecting the livelihoods of individuals and businesses reliant on timely infrastructure development. This evaluation underscores the gravity of the issues at hand and highlights the urgent need for effective strategies to address them.

In addition to primary data analysis, the study incorporates secondary data to evaluate the effectiveness of current contract management practices within the Ethiopian road construction sector. The findings suggest that existing frameworks often lack clarity and consistency, leading to misunderstandings and disputes among stakeholders. By identifying specific areas requiring improvement, the research aims to recalibrate contract management practices to minimize breaches and delays in future projects. This critical evaluation serves as a foundation for developing more robust and effective management strategies tailored to the unique challenges of the Ethiopian context.

Furthermore, the thesis explores stakeholder perceptions and experiences related to contract management, offering a nuanced understanding of the challenges faced by contractors, authorities, local communities, and beneficiaries. Through qualitative

insights gathered from surveys, the research captures the diverse expectations and recommendations of stakeholders involved in the road construction process. This analysis not only enriches the understanding of the complexities surrounding contractual relationships but also emphasizes the importance of fostering collaborative approaches to enhance project delivery.

Ultimately, the thesis culminates in the development of actionable and context-relevant strategies aimed at mitigating contractual breaches and delays in road construction projects. By drawing on the findings from the Arbereketi to Gelemso project, the research provides practical guidance for improving project management practices and contract administration. These recommendations are designed to empower stakeholders with the tools and insights necessary to navigate the challenges of road construction effectively, thereby fostering sustainable development and enhancing the overall efficiency of infrastructure projects in Ethiopia.

5.2 Conclusions

The thesis titled "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project" has provided a comprehensive exploration of the intricate challenges faced in the execution of road construction projects in Ethiopia. Through a focused analysis of the Arbereketi to Gelemso project, this research has illuminated the multifaceted nature of contractual breaches and delays, revealing critical insights that are essential for enhancing project management practices. The findings underscore the importance of addressing these issues to ensure the successful delivery of infrastructure projects that are vital for economic growth and community development.

One of the primary objectives of this study was to identify the underlying causes of contractual breaches and delays. The research has successfully highlighted several key factors, including inadequate planning, frequent sequence changes in project execution, funding challenges, and regulatory issues. These elements have been shown to significantly impede project progress, leading to a cascade of negative consequences that affect not only the contractors but also the local communities that rely on timely infrastructure development. The identification of these causes serves as a critical foundation for developing targeted interventions aimed at mitigating such challenges in future projects.

The evaluation of the impact of contractual breaches and delays has revealed the profound implications these issues have on project outcomes. The analysis indicates that delays often result in substantial cost overruns, extended project timelines, and disruptions to local communities. Furthermore, the socio-economic ramifications of these delays extend beyond immediate financial concerns, affecting community welfare and overall public trust in infrastructure initiatives. By quantifying these impacts, the research emphasizes the urgency of addressing contractual issues to safeguard the interests of all stakeholders involved.

In examining the effectiveness of current contract management practices within the Ethiopian road construction sector, the study has identified significant gaps that require immediate attention. Stakeholder feedback has revealed a consensus on the inadequacies of existing frameworks, particularly in areas such as communication, accountability, and compliance with contractual obligations. This analysis not only highlights the need for improved contract management practices but also provides a roadmap for stakeholders to recalibrate their approaches to better align with the complexities of large-scale infrastructure projects.

The insights gained from stakeholder perceptions have proven invaluable in understanding the challenges and expectations surrounding contract management. By engaging with a diverse array of participants, including contractors, government officials, and local community members, the research has captured a holistic view of the issues at hand. This stakeholder-centric approach has enriched the analysis, allowing for a more nuanced understanding of the dynamics that influence contractual performance in road construction projects.

Drawing on the findings from the Arbereketi to Gelemso case study, the thesis has developed actionable and context-relevant strategies aimed at mitigating contractual breaches and delays. These recommendations encompass a range of measures, including enhanced planning methodologies, improved stakeholder engagement practices, and regulatory reforms. By providing practical guidance for project delivery and contract management, this research aspires to contribute to the advancement of infrastructure development in Ethiopia, ultimately fostering economic growth and community well-being.

The implications of this research extend beyond the immediate context of the Arbereketi to Gelemso project, offering valuable lessons for similar infrastructure initiatives across Ethiopia. The findings underscore the necessity of adopting a proactive approach to contract management, one that prioritizes thorough planning, stakeholder collaboration, and adaptive strategies to navigate the complexities of construction projects. By embracing these principles, stakeholders can enhance their capacity to deliver successful infrastructure outcomes that meet the needs of communities.

In conclusion, the assessment of contractual breaches and delays in road construction projects is a critical area of study that warrants ongoing attention and action. The insights derived from this research not only contribute to the academic discourse on project management but also provide practical solutions for practitioners in the field. As Ethiopia continues to invest in infrastructure development, the lessons learned from the Arbereketi to Gelemso project can serve as a guiding framework for future initiatives, ensuring that the challenges of contractual breaches and delays are effectively addressed.

Ultimately, this thesis advocates for a collaborative and informed approach to contract management in road construction projects. By fostering a culture of transparency, accountability, and continuous improvement, stakeholders can work together to overcome the challenges that have historically plagued infrastructure development in Ethiopia. The successful implementation of the recommendations outlined in this study has the potential to transform the landscape of road construction, paving the way for more efficient, timely, and sustainable infrastructure projects that benefit all members of society.

5.3 Recommendations

5.3.1 Recommendations for Improvement

In light of the findings from the thesis titled "Assessment of Contractual Breaches and Delays in Road Construction Projects: A Case Study of the Arbereketi to Gelemso Road Project," several recommendations can be made to enhance contract management practices and mitigate the risks of breaches and delays. These recommendations are grounded in the identified research objectives and the comprehensive analysis of both primary and secondary data.

1) It is imperative to prioritize thorough and strategic planning at the outset of road construction projects. Inadequate planning has been identified as a significant contributor to contractual breaches and delays. Stakeholders should engage in detailed project scoping, risk assessment, and resource allocation to ensure that all potential challenges are anticipated and addressed proactively. This includes establishing clear timelines, budget estimates, and contingency plans that can accommodate unforeseen circumstances, thereby reducing the likelihood of delays and cost overruns.

2) Effective communication and collaboration among all stakeholders are essential for successful project execution. The research highlights the importance of fostering a collaborative environment where contractors, government officials, and local communities can share insights and concerns. Regular stakeholder meetings and updates can facilitate transparency and ensure that all parties are aligned on project goals, expectations, and any changes that may arise during the construction process. This collaborative approach can help to mitigate misunderstandings and conflicts that often lead to contractual breaches.

3) Addressing work sequence changes in a structured manner is crucial for minimizing disruptions. The study indicates that frequent changes in project execution sequence in unplanned manner can lead to significant delays and disputes. To manage scope changes effectively, it is recommended that a formal change management process be established. This process should include clear guidelines for evaluating, approving, and documenting changes, as well as their potential impacts on project timelines and budgets. By implementing a structured approach to change

management, stakeholders can better navigate the complexities of project modifications while maintaining project integrity.

4) Enhancing financial management practices is vital to overcoming funding challenges that contribute to delays. The research underscores the need for timely disbursement of funds and effective budget management throughout the project lifecycle. Stakeholders should establish robust financial controls and monitoring mechanisms to ensure that funds are allocated appropriately and that any financial shortfalls are addressed promptly. Additionally, exploring alternative funding sources, can provide greater financial stability and flexibility for road construction projects.

5) The study reveals that regulatory issues often hinder project progress. To address this, it is recommended that stakeholders engage with regulatory bodies to streamline approval processes and ensure compliance with relevant laws and regulations. This may involve advocating for policy reforms that facilitate more efficient permitting and inspection processes, thereby reducing bureaucratic delays. By fostering a constructive relationship with regulatory authorities, stakeholders can create a more conducive environment for project execution.

6) The research highlights the importance of training and capacity building for the Employers, consultants and contractors. Investing in professional development can equip stakeholders with the necessary skills and knowledge to navigate the complexities of contract management effectively. Training programs should focus on best practices in project management, risk assessment, and conflict resolution, enabling participants to enhance their capabilities and contribute to improved project outcomes.

7) The incorporation of technology in contract management practices can significantly enhance efficiency and transparency. The study suggests that leveraging digital tools for project monitoring, documentation, and communication can streamline processes and reduce the likelihood of errors and disputes. Implementing project management software and digital platforms can facilitate real-time tracking of

project progress, enabling stakeholders to make informed decisions and respond swiftly to emerging challenges.

8) Fostering a culture of accountability among all stakeholders is essential for minimizing contractual breaches. The research indicates that a lack of accountability can lead to negligence and poor performance. Establishing clear roles and responsibilities, along with performance metrics, can help ensure that all parties are held accountable for their contributions to the project. Regular performance evaluations and feedback mechanisms can further reinforce this culture of accountability, promoting a commitment to excellence in project delivery.

9) The study emphasizes the need for continuous stakeholder engagement throughout the project lifecycle. Engaging local communities and beneficiaries in the decision-making process can enhance project acceptance and support. By actively involving stakeholders in discussions about project impacts and benefits, stakeholders can build trust and foster a sense of ownership, which can mitigate potential conflicts and enhance project success.

Finally, the development of a comprehensive framework for contract management that incorporates the insights gained from the Arbereketi to Gelemso project is crucial. This framework should outline best practices, guidelines, and strategies for addressing contractual breaches and delays in road construction projects. By synthesizing the findings of this research into a practical guide, stakeholders can equip themselves with the tools necessary to navigate the complexities of contract management and enhance the overall success of infrastructure initiatives in Ethiopia.

In conclusion, the recommendations derived from this thesis provide a roadmap for improving contract management practices and mitigating the risks of breaches and delays in road construction projects. By implementing these strategies, stakeholders can enhance project delivery, foster collaboration, and ultimately contribute to the successful execution of critical infrastructure initiatives that support economic growth and community development in Ethiopia.

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5.5 ANNEXS

ANNEX 1: Comprehensive chronology of facts record pertaining to delay event
ANNEX 2: Payment Collection Status of the Contractor
ANNEX 3: Questionnaire