

***Factors Affecting the Performance of Public Construction Projects:  
A Study in Selected building construction Projects in Jimma Town,  
Ethiopia***

***A Thesis Submitted to the School of Graduate Studies of Jimma  
University in Partial Fulfilment of the Requirements for the Award  
of the Degree of Master of art in Project management***

**By:**

**HUSSIEN MOHAMMED**

Under the guidance of

**Abel Worku (Ass.prof)**

**And**

**Medihanit Getinet (lecturer)**



**COLLEGE OF BUSINESS & ECONOMICS  
DEPARTMENT OF PROJECT MANAGEMENT**

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JIMMA, ETHIOPIA**

## **CERTIFICATE**

This is to certify that the thesis entities “Factors Affecting the Performance of Public Construction Projects: A Study in Selected building construction Projects in Jimma Town, Ethiopia” has been Submitted to Jimma University for the award of Master of art in project Management and Finance; and is a record of valuable thesis work carried out by Mr. Hussien Mohammed, under our guidance and supervision

Therefore we hereby declare that no part of this thesis paper has been submitted to any other university or institution for the award of any degree of diploma.

Main Adviser’s Name	Date	Signature
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Co-Advisor’s Name	Date	Signature
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## ***DECLARATION***

I hereby declare that this thesis paper entitled “Factors Affecting the Performance of Public Construction Projects: A Study in Selected building construction Projects in Jimma Town, Ethiopia” has been carried out by me under the guidance and supervision of Abel Worku (Ass.prof)and Medihanit Getinet (MSc).

The thesis paper is original and has not been submitted for the award of any degree or diploma to any university or institution.

Researcher’s Name

Date

Signature

Hussein Mohammed

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## ABSTRACT

Despite a significant allocation from the annual public budget to public construction projects, achieving alignment with the country's development goals remains a challenge in terms of schedule, cost, and quality. This research delved into the factors influencing the success of public construction projects in Jimma Town. The study, based on a sample of 61 respondents from randomly selected on-going projects, employed quantitative analysis through descriptive and inferential statistics using SPSS version 20.

The analysis, which included frequency distributions, mean, and standard deviation, prioritized factors using the Relative Importance Index (RII). Pearson correlation assessed associations between independent and dependent variables, and ordinal regression analysis explored the contribution of selected variables to project performance. The outcomes, represented visually through tables and figures, revealed ten pivotal factors significantly shaping project outcomes.

Foremost among these factors is the proficiency and experience of project managers, closely followed by resource availability tailored to project needs and contractors' financial capacities. The study underscores the interdependence of these aspects, wherein experienced team members, committed contractors, and effective on-site management also play substantial roles. Moreover, the research highlights the significance of effective contract administration and managerial skills. In contrast, external factors like economic conditions and political dynamics exhibit a lesser influence on project performance.

These findings provide stakeholders with a strategic roadmap to enhance project outcomes. Key areas for improvement include fostering skilled leadership, optimizing resource management, and facilitating effective communication among project contributors. Stakeholders are recommended to prioritize on-going training for project managers, enhance oversight of contractor performance, and develop strategies for managing external factors. By addressing these key aspects, stakeholders can contribute to the successful execution of public construction projects in Jimma Town, aligning them more closely with the nation's development objectives.

**Keywords: budget, construction, Jimma town, Performance, public,**

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## **ACRONYMS OR ABRIVATIONS**

**DCE:** Defence Construction Enterprise

**GDP:** Gross Domestic product

**NBE:** National Bank of Ethiopia

**NPC:** National planning Commission

**RII:** Relative importance Index

**TOC:** The theory of constraints

# CHAPTER ONE

## 1. INTRODUCTION

The efficient execution of public construction projects is a critical factor in achieving the goals of development and infrastructure enhancement. However, numerous challenges can impact the performance of these projects, encompassing aspects such as scheduling, budget adherence, and quality maintenance. Understanding the factors that influence the success of public construction projects is essential for governments, stakeholders, and practitioners alike. This paper delves into an exploration of the multifaceted elements that affect the performance of such projects, aiming to shed light on the complexities involved and offer insights for improved project planning, management, and implementation.

### 1.1. Background of the Study

The construction sector plays a significant role in a country's progress, both in terms of economic and non-economic aspects. It aids in the development of infrastructure and industries and has an impact on national economic growth by generating government revenue, fostering job growth, and developing basic infrastructure. The industry also creates job opportunities for a diverse range of workers, including those with varying skill levels and women, and generates income for the general population.

In Ethiopia, the construction sector is the major catalyst of growth and the industry sector growth has been largely driven by the construction sub-sector (NPC, 2016). The construction sub-sector's share in the industry sector increased from 54.8 percent in 2015 to 71.4 percent in 2018. In addition, the construction sectors share in the Gross domestic product (GDP) rise from 4 percent in 2010 to 8.5 in 2015 and 19.28 in 2018 (NBE, 2018).

The construction sector in Ethiopia confronts numerous difficulties in its operations despite being a significant contributor to the country's economy. These challenges include but are not limited to insufficient funding, poor project management practices, and limited technical expertise.

According to several studies (Sinesilassie, 2016; Gadisa & Zhou, 2019; Teshome, 2022) construction projects are crucial for the economic development and infrastructure improvement of many developing countries, including Ethiopia. However, inadequate project planning, poor communication and coordination among project stakeholders, ineffective procurement processes, financial problems, and inadequate project monitoring and evaluation can contribute

to project failure (Molla et al., 2020; Sibū & Mekonen, 2020, Regassa, 2011). In Ethiopia, government-sponsored building construction projects are common and funded by the government, aiming to provide essential services and facilities to the public, such as schools, hospitals, and government offices (Yada & Yadeta, 2016; Gadisa & Zhou, 2019; Belay et al., 2021). However, government-sponsored building construction projects face challenges such as inadequate funding, poor project management practices, and limited technical expertise (Sinesilassie, 2016; Yada & Yadeta, 2016).

Despite the growing body of research on the performance of public construction projects in Ethiopia, there remains a research gap regarding the specific factors influencing project performance in Jimma Town. Previous studies have predominantly focused on the construction industry at a national or city level, such as Addis Ababa, with limited attention given to the unique context of Jimma Town (Sibū & Mekonen, 2020; Molla et al., 2020). While studies conducted in other regions have identified factors such as inadequate planning and scheduling, poor site management, and financial challenges as contributors to project performance gaps (Regassa, 2011; Molla et al., 2020), it is essential to examine these factors within the specific context of Jimma Town. Additionally, factors like project manager ignorance, lack of understanding, and disagreement have been identified as critical in determining project success or failure (Mengistu & Mahesh, 2019).

Therefore, a focused study is needed to investigate the factors affecting the performance of public construction projects in Jimma Town, Oromia region, Ethiopia providing insights and recommendations tailored to the unique challenges and opportunities present in this particular setting.

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

The objective of Ethiopia's public construction sector is to achieve efficient and effective construction projects that are completed on time, within budget, and meet the required quality standards. However, the current status of the construction industry in Ethiopia is hampered by various challenges. For instance, The study by Belay et al., (2021) aims to investigate the extent of cost overrun and schedule delays in building and road infrastructure projects across Ethiopia, the finding of the study showed that the average cost overrun for building construction projects is 35%, whereas the average delay is 143%. This means that, on average, the projects took 143% longer to complete than initially planned or scheduled. For road infrastructure projects, the average cost overrun is 18%, and the average delay is 110%,

indicating projects took 110% longer than initially planned. Similarly, a study by Ayalew et al., (2016) witnessed that the amount of schedule slippage ranges between 61-80% and that of planned costs and other variables such as risk, quality, resources utilization, and safety deviates in the range 21-40% from predetermined requirements or anticipated at the beginning of the project.

A significant challenge is the insufficient availability of skilled manpower, leading to low-quality work and project delays. Another challenge is the inadequate use of technology during construction, leading to inefficiencies and increased costs. Furthermore, poor project management practices and procedures, such as inadequate planning, monitoring, and control, often cause project delays and cost overruns. Moreover, difficulty in project financing, delayed issuance of designs and working drawings, shortage of availability of imported construction materials, design errors, and complexity, delay in progress payments, late start and resource mobilization to site, inaccurate site investigation reports, and price inflation were the most significant factors for low performance of construction projects. The situation is compounded by inadequate procurement processes, including substandard bid documentation and evaluation procedures, often resulting in inadequate contractor selection and poor project outcomes (Ayalew et al., 2016;Kuhil & Seifu, 2016;Sebsibe, 2019; Abera, 2021; Wubet et al., 2021; Teshome, 2022).

Despite attempts by several stakeholders to address these challenges, there are still disparities between the desired state and the current state of the construction industry in Ethiopia. The available literature shows that these gaps may be attributed to factors such as inadequate availability of skilled manpower, inadequate utilization of technology, poor project management practices and procedures, substandard procurement processes, the absence of a robust legal and regulatory framework, insufficient funding and financing, and weak institutional capacity. Overcoming these challenges requires a joint effort from various stakeholders, including the government, private sector, and civil society, to implement policy and institutional reforms that promote sustainable and inclusive development. Government has a vision to build an internationally competitive construction industry by 2025 (Mengistu & Mahesh, 2019).

In Oromia, public building construction projects face significant challenges in terms of cost, time, quality, and leadership performance (Yada & Yadeta, 2016). A study conducted in Jimma town revealed that environmental factors play a primary role in project execution and

performance, followed by material and client-related factors (Mustefa et al., 2021). A recent study aimed to determine the factors affecting project quality in public universities in eastern Ethiopia. The researchers used primary data and identified several factors, including project management, design, procurement, construction, and external factors (Aenet & Maniha, 2023).

Therefore, realizing the Ethiopian vision requires critical intervention through careful identification of major challenges of the industry. In this regard, further research is needed to identify and analyze these factors, as well as to develop effective strategies to overcome the challenges and ensure the successful delivery of essential services and facilities to the public.

Despite previous research shedding light on the factors hindering construction project performance in Ethiopia, there is limited research specifically addressing these variables in the context of public building construction projects in Jimma Town, Oromia Region, Ethiopia. Most studies have focused on a national or city level, overlooking the unique circumstances of Jimma Town. Therefore, a targeted study is necessary to examine the factors influencing the performance of public construction projects in Jimma Town, providing tailored insights and recommendations to address the specific challenges and opportunities in this setting.

### **1.3. Research Questions**

Consequently, the study addressed the following basic questions.

How do various factors interact to influence the overall performance of public construction projects in Jimma Town, Ethiopia, and what is the extent of their impact and importance on project outcomes?

### **1.4. Objective of the study**

#### **1.4.1. General objective**

The main objective of the study was to examine the factors influencing the performance of public construction projects in Jimma Town, oromia region, Ethiopia.

#### **1.4.2. Specific objective**

Specific objectives that derived from the general objective and addressed in this study were:

- i. Assess the impact of organizational culture, organizational structure, and resource availability on the performance of public construction projects in Jimma Town.

- ii. Evaluate the influence of leadership and competence, team composition, and team motivation on the performance of public construction projects in Jimma Town.
- iii. Examine the relationship between procurement strategy, supplier selection, and contract management on the performance of public construction projects in Jimma Town.
- iv. Investigate the impact of contractor commitment, site management, and financial capability on the performance of public construction projects in Jimma Town.
- v. Analyze the influence of legal and regulatory factors, economic factors, and political and social factors on the performance of public construction projects in Jimma Town.

### **1.5 Research Hypothesis:**

The research aims to investigate the impact of various factors on the performance of public construction projects in Jimma Town.

HA: There is significant and positive relationship between organization-related factors (organizational culture, organizational structure, and resource availability) and the cost performance of public construction projects in Jimma Town.

HA: There is significant and positive relationship between project manager and team-related factors (leadership and competence, team composition, and team motivation) and the cost performance of public construction projects in Jimma Town.

HA: There is significant and positive relationship between procurement and contract-related factors (procurement strategy, supplier selection, and contract management) and the cost performance of public construction projects in Jimma Town.

HA: There is significant and positive relationship between contractor and supplier-related factors (contractor performance and supplier relationships) and the cost performance of public construction projects in Jimma Town.

HA: There is significant and positive relationship between external and work environment-related factors (legal and regulatory factors, economic factors, and political and social factors) and the cost performance of public construction projects in Jimma Town.

### **1.6 Significance of the study**

This research holds significant importance for various stakeholders in the construction industry. The findings will provide valuable insights into the factors influencing the

performance of public construction projects in Jimma Town, enabling project managers and decision-makers to address these factors and improve project outcomes. Additionally, the study will contribute to the existing body of knowledge on project management, specifically in the context of public construction projects in Ethiopia.

### **1.7 Scope of the study**

This study concentrated on public building construction projects within Jimma Town, analyzing five essential factors: aspects related to contractors and suppliers, external and work environment considerations, factors associated with project managers and teams, organizational influences, and elements related to procurement and contracts. The research employed a quantitative approach, utilizing primary data collection methods such as surveys to gather relevant information directly from key stakeholders engaged in the specified public building construction projects.

### **1.8 Limitations of the study**

Acknowledging the geographical and temporal limitations, this study aimed for optimal effectiveness by focusing exclusively on public building construction projects within Jimma Town. It is essential to recognize that while the findings offer valuable insights, they may not be universally applicable to all construction projects throughout Jimma town. The study strategically examined five crucial factors comprising: contractor and supplier-related considerations, external and work environment-related dynamics, factors associated with project managers and teams, organizational influences, and elements related to procurement and contracts. For the study to be at its best, it would ideally encompass a broader range of construction projects in Jimma Town. The research adopted a targeted methodology, utilizing primary data collection methods such as surveys, interviews, and observations. However, to further enhance its comprehensiveness, the study would benefit from a more extensive representation

## **1.9 Organization of the thesis**

This study was organized into five consequential chapters. The first chapter dealt with the introduction part of the paper, comprising the background of the study, statement of the problem, the objectives of the study, and the scope & limitations of the study. The second chapter focused on a review of literature related to the topic of this study. The third chapter dealt with the research methodology, design, and approaches used throughout the data collection and analysis. The fourth chapter presented the overall findings of the study, which prevailed about the most important and frequently occurring impacts on construction projects, specifically targeting those four elements of project output. The last chapter, chapter five, encompassed the conclusion and recommendation part of the study.

## **CHAPTER TWO**

### **2. REVIEW OF RELATED LITERATURE**

#### **2.1. Theoretical literature review**

##### **2.1.1. Complexity Theory**

Project management systems are dynamic systems that undergo changes over time and are difficult to predict, much like natural systems. Projects can be complex due to various factors, including their structure, uncertainty, dynamics, and social aspects. Complexity theory is a relevant concept in project management, as it can influence project planning and control. Complexity can hinder the clear identification of goals and objectives, affect the selection of project management methodologies, and impact project performance (Jose, 2018).

Complexity theory is concerned with defining the ideal future state of the system and trying to close the gap, and it can be applied to project management to identify the ideal project state and the gaps between the current and ideal states. Complexity is a word that is often heard in discussions about project and program performance today, and it is notoriously difficult to define (Thompson et al., 2016).

The research conducted among construction project managers identified key complexity elements of the construction project from the contractor's perspective, including the size of the project, the number of stakeholders involved, the level of uncertainty, and the level of interdependence between project components (Nikolić & Cerić, 2022) According to the definition of complexity, it is a dynamic state that has an unknown outcome and an increased level of difficulty since one does not know if or how the system will behave (Herszon & Keraminiyage (2014). Complexity theory offers a perspective to studying complex systems in a manner that does not reduce the system to individual components, and it can be used to examine complex systems in health services research (Thompson et al., 2016)

##### **2.1.2. Constraints theory**

The theory of constraints (TOC) offers a management approach that emphasizes effective organizational management through system thinking and constraint management (Kohli & Gupta, 2010). The philosophy of TOC-based management focuses on three levels of change:

the organization's mindset, the measures that drive the organization and the methods employed within the organization (Gupta & Boyd, 2008).

In construction projects, the presence of needs and constraints in a multi-party working environment adds complexity to project management (Lau & Kong, 2006). To ensure effective project management, these constraints must be properly managed. Jacob and McClelland (2001) state that most projects are challenging to manage due to uncertainty and conflicting commitments related to deadlines, budgets, and project content.

The triple constraint criteria (time, scope, and cost) have been widely accepted in project management as measures of project success. Project managers consider these three constraints crucial to meet project requirements and achieve success. Optimizing these three aspects ensures project quality and timely completion. However, the triple constraints are interconnected, meaning that changes in one constraint can impact the other two, ultimately affecting project deliverables to a significant extent (Hamid, Ghafoor, & Shah, 2012).

This study is based on the triple constraint theory, which acknowledges that delays in project completion are a common problem in the construction industry. These delays not only have immeasurable costs to society but also have detrimental effects on the parties involved in the contracts (Ondari & Gekara, 2013). Other factors that measure project performance include cost and quality requirements (Nwachukwu & Emoh, 2011).

### **2.1 3. Theory of Performance**

The Performance theory presents a conceptual framework that helps in understanding how performance is achieved and improved. It identifies six fundamental concepts that underpin performance. Performance can be carried out by individuals or groups and involves generating outcomes that are valued. The process of developing performance is incremental and is influenced by various factors. Elger (2007) suggests that effective performance improvement requires reflective practice, immersion in a positive environment, and adopting a performer's mind-set. High levels of performance are characterized by enhancements in quality, capability, capacity, knowledge, skills, and motivation. This results in meeting stakeholder expectations, reducing waste/complaints, taking on more challenging tasks, increasing throughput, enhancing knowledge and skills, and developing professionalism. Overall, the theory of Performance provides a comprehensive framework for understanding and improving performance in various contexts.

#### **2.1.4. Performance Measurement Theory**

Mbugua et al., (1999) and Love & Holt, (2000) are two academic papers that have discussed the distinctions between performance indicators, measures, and performance measurement.

- Performance indicators are specific criteria or variables used to evaluate performance in a particular context, usually quantitative, and used to track progress toward goals or objectives. They provide information on current performance, areas for improvement, and changes over time. The selection of performance indicators is based on their relevance and reliability, as emphasized by (Mbugua et al., 1999; Love & Holt, 2000). Measures are the actual data or values collected for performance indicators and can be quantitative or qualitative. They are obtained through surveys, observations, tests, or other methods, and are used to assess performance. Measures are tangible data points used to calculate performance and compare it against standards or benchmarks, and track changes over time, as highlighted by (Mbugua et al., 1999; Love & Holt, 2000).
- Performance measurement is the process of using performance indicators and measures to evaluate performance and provide feedback. It involves collecting, analyzing, and interpreting data from performance indicators and measures to assess how well an entity or system is performing. Performance measurement is used for decision-making, accountability, and performance improvement at various levels, such as organizational, departmental, or individual levels. This comprehensive assessment and decision-making process is emphasized by (Mbugua et al., 1999; Love & Holt, 2000) as a broader concept of performance measurement.

Overall, it encompasses the use of performance indicators and measures to inform decision-making at different levels.

## **. 2.2. Empirical literature review**

### **2.2.1 The construction industry in Ethiopia**

The construction industry consists of various individuals and groups who play different roles throughout a project, such as the client, designer, contractor, sub-contractors, specialists, construction managers, and consultants (Sinesilassie et al., 2017). They are all involved from the start to the end of the project. The construction industry has a significant impact on a country's socio-economic development as it directly or indirectly affects all economic activities. It contributes to the national output and stimulates the growth of other sectors through a complex network of connections. The social economy, health sector, aviation, and cultural and creative sectors are examples of industries that have a significant impact on economic growth and employment. The construction industry, along with other sectors, promotes inclusive and sustainable economic growth, employment, and decent work for all.

The construction industry in Ethiopia is a crucial driver of economic growth, supported by substantial investments in infrastructure and residential buildings by the government. Infrastructure projects such as roads, railways, dams, industrial parks, and housing developments have played a significant role in achieving double-digit economic growth over the past decade. According to a report by Research and Markets (2023), the construction market in Ethiopia is projected to grow at an annual average rate of over 8% until 2026. The country's 10-year development plan emphasizes infrastructure development and encourages public-private partnerships, focusing on areas such as transport infrastructure, road construction, energy projects, real estate, and industrial parks. As stated by Negesa, (2022), The Ethiopian construction industry's significance cannot be overstated, as it has substantial impacts on various sectors' efficiency and productivity.

However; the construction industry in Ethiopia has been recognized as facing several challenges that influence its performance, development, and growth. Several studies have been conducted to determine the factors affecting the quality and performance of construction projects in public universities and government building construction projects in Ethiopia. According to Serani et al., (2020), construction projects often deviate from the original contract duration and budget due to various known and unknown factors. Another study conducted by Belay et al., (2021), revealed that infrastructure projects in Ethiopia with contract amounts exceeding 100 million Ethiopian birr experience an average time delay of 175%. Some projects even exceed the planned schedule by up to 327%, resulting in significant cost implications.

Similarly, some building projects with contract amounts ranging from 50 million to 100 million experience delays of 300% beyond the contract period.

Addressing these challenges is crucial to ensure successful construction projects that contribute to the country's economic growth. Private companies play a pivotal role in improving efficiency within Ethiopia's construction sector. The government's 10-year development plan, which focuses on infrastructure development and encourages public-private partnerships, is expected to fuel further growth in the construction industry. Thus, it is essential to overcome the obstacles faced by the industry to ensure that construction projects align with the planned schedule, cost, and quality (Sibu, 2020).

### **2.2.2 Overview of public construction projects and their importance**

Public construction projects refer to infrastructure development initiatives intended for public use, including educational institutions, hospitals, government buildings, and other public service facilities. These projects are classified based on building codes and safety requirements, which impact project specifications, cost, and timeline. Public construction projects are often intricate, involving various stakeholders such as architects, engineers, project managers, contractors, subcontractors, suppliers, and regulatory authorities.

In Ethiopia, public construction projects play a significant role in the construction industry. In Ethiopia, the effectiveness of public construction projects has been significantly impacted by various factors, including the lack of competence among project owners, conflicts among project participants, inadequate management of human resources, and ignorance and lack of knowledge among project managers (Sinesilassie et al., 2017). As argued by Ayalew et al., (2016), a majority of large-scale public construction projects are suffering from poorly managed project planning, operations, and functionality. Furthermore, the delay in project schedules can reach as high as 80%, and the cost escalation exceeds the planned budget by up to 40%. These challenges in project quality, time delays, and cost increases are posing significant obstacles to the economic and construction industry development of the country.

### **2.2.3 Performance measurement in the construction industry**

Different stakeholders involved in public building construction projects may have varying objectives. The success of a project is typically measured by its ability to address the intended objectives for which it was conceived (Bryde & Robinson, 2005). Researchers emphasize that project success is determined by meeting the needs and requirements of project stakeholders.

The stakeholders in public building construction projects encompass government agencies, project designers, contractors, and the community for whom the project is intended. In many cases, the government serves as the client, while the community represents the beneficiaries of the project (Wang et al., 2015). According to (Wang et al., 2015), key stakeholders in construction projects, such as the client, consultants, and contractor, have distinct roles and responsibilities. The client is responsible for procuring the construction contractor through bidding or tendering and encouraging independent and professional project management services provided by the consultant. The consultant and contractor, in turn, perform their technical, organizational, and human responsibilities for the project. The contractor is responsible for executing the construction in accordance with relevant technical, management, and contract specifications (Wang et al., 2015). While stakeholder interests may sometimes overlap or conflict, the project implementing agency should strive to harmonize these interests to achieve project success (Koskela, and Howell, 2002).

There appears to be a general agreement among researchers in construction management that the performance of a construction project can be evaluated based on time, cost, and quantity measures. However, these evaluation parameters have been a subject of controversy within the construction industry, with differing opinions among clients, contractors, and consultants. The evaluation of project performance arises from the stakeholders' need to assess the effectiveness of pre-contract plans and procedures in relation to the post-construction outcomes, with the ultimate goal of achieving value for money. Research in the construction industry has focused on identifying and addressing factors that hinder project performance by exploring various procurement options for more efficient project execution.

According to Sunil & Mohan (2001), the key metrics for measuring the overall success of construction projects include time, cost, quality targets, and participant satisfaction. Pitagorsky (1998), highlights that a successful project should meet the expectations of the client and sponsors by achieving objectives within the constraints of time and cost, while also fostering positive relationships among project stakeholders. Additionally, Olawale & Sun, (2010) asserts

that a project is deemed successful when it is completed within the scheduled time, within the allocated budget, and meets the required quality standards. Conversely, a project that fails to meet any of these objectives is considered a failure.

#### **2.2.4 Construction Project Performance**

Construction performance can be assessed using various performance indicators such as time, quality, cost, client satisfaction, health, safety, and overall business performance, as argued by Enshassi et al., (2009). They further highlight that time, cost, and quality are the three main dimensions of performance evaluation. This view is supported by Chan & Chan, (2004), who also consider cost, time, and quality as the fundamental performance indicators in construction projects. Different parties involved in construction projects may have their own interpretations of project performance, but researchers generally agree that time, cost, and quality are critical measures of project success, often referred to as the "golden triangle" (Le-Hoai et al., 2008). On the other hand, King (2015) emphasizes that sound project management practices should align with stakeholder interests, including meeting the intended purpose, achieving the desired level of quality, adhering to time and cost constraints, and ensuring safety and environmental protection.

#### **2.2.5. Factors affecting the construction project Performance**

##### **i. Client-related factors**

The client's role in construction activities is crucial and determines whether a project succeeds or fails. The client's main objective is to achieve the desired outcome by effectively designing, planning, and executing the construction process. The client's knowledge and skills are vital for project success. How the client perceives their role impacts their decision-making, especially in the early stages of the project. It is essential for clients to have a clear understanding of quality requirements to ensure complete satisfaction. As the project owner, the client is responsible for minimizing risks and ensuring that the project is carried out successfully (Aswed et al., 2020).

Various factors related to the client can have a significant impact on construction projects. These factors include inadequate initial planning, delayed payments, lack of awareness regarding project progress, improper selection of consultants, choosing contractors with weak financial stability, a negative attitude from selected contractors, lack of client knowledge, new proposal requests from newly hired personnel, and insufficient financial strength. These factors

can result in increased costs, project delays, and unsatisfactory outcomes. Client satisfaction is a crucial aspect of the construction industry, and it is determined by the contractor's ability to meet the client's expectations (Nawi et al., 2018). In Malaysia, client-related factors have been identified as a cause of delays in public projects, with slow decision-making being a prominent factor. Clients hold a vital role in construction projects, and their involvement and input can significantly enhance project performance. Hence, clients should prioritize their objectives, have a clear understanding of quality requirements, and actively engage in project management to ensure successful project outcomes (Aswed et al., 2020). The client factors exact high level of negative influence on success in construction project management in Nigeria especially in the public sector (Nwachukwu, 2009).

The client's primary and crucial role is to provide financing for the project, as finance is a critical factor in ensuring project success. Failure to secure project funds can lead to delays and even project abandonment (Kamotho, 2014). Construction projects can be funded through various sources. Kamotho (2014) identified that the inability of developers to make timely payments was a major cause of delays in building construction projects. Sambasivan and Soon (2007) discovered that client-related factors, such as finance and payment for completed work, owner interference, slow decision-making, and unrealistic contract durations imposed by owners, influenced project completion in Malaysia. Similar findings were also observed by Abd El-Razek et al. (2008) in projects in Egypt. In a study by Muhwezi, Acai, and Otim (2014) conducted in Uganda, client-related factors were identified as the second most significant cause of delays in building projects, following consultant-related factors. The study suggested that clients should ensure that their demands for design changes during the construction period do not negatively impact critical activities to avoid causing delays.

## **ii. Contractor-related factors**

Contractors are professionals authorized to carry out construction projects that have been conceived and designed by consultants and supervised by them. They can be classified as either local or international, with local contractors further categorized as national or regional. Examples of contractors include civil engineering contractors, structural contractors, and water and sanitation contractors for roads, housing, and water projects, respectively (Kamotho, 2014).

According to Nwachukwu and Emoh (2011), contractors and subcontractors are individuals or firms that undertake construction work in exchange for a contracted price. Contractors can be

further classified as prime contractors or subcontractors. Prime contractors have a contractual relationship with the project owner, while subcontractors have a contractual relationship with either the prime contractor or another subcontractor (Kamotho, 2014).

Contractors are selected based on factors such as price, experience in specific types of construction projects, and their reputation or track record in delivering high-quality work within the budget and on time. In many cases, there is a trade-off between price, experience, and track record. However, choosing the lowest bid does not always result in a project being completed within the specified time and budget (Choge & Muturi, 2014).

Contractors play a significant role in project completion, and factors related to contractors can influence the outcome. Sambasivan and Soon (2007) found that contractor-related factors leading to delays included subcontractor issues, site management problems, improper construction methods, planning errors, and insufficient contractor experience. Kaliba et al. (2009) identified major causes of delays and cost overruns as financial deficiencies on the part of the contractor, procurement problems with materials, staffing issues, and equipment unavailability. Koushki and Kartam (2004) identified inadequate or inefficient equipment, tools, and plants, as well as unreliable sources of materials in the local market, as key factors affecting cost and time overruns. Mydin, Sani, Salim, and Alias (2014) found that poor site management, financial problems, coordination issues, construction mistakes, delays in material delivery, low labor productivity, material shortages on-site, poor labor skills and labor shortages were contractor-related factors that hindered project completion in the Malaysian construction industry.

### **iii. Consultant-related factors**

Consultants are professionals in the construction industry who possess a degree-level qualification and are responsible for conceptualizing and designing building projects. Their counterparts, the contractors, execute these projects. Consultants in construction projects typically include engineers, quantity surveyors, and architects. They provide supervision and inspection to ensure the quality of the work and, in some cases, act on behalf of the client to ensure that the project adheres to the specified requirements.

Sambasivan and Soon (2007) discovered that consultant-related factors that affected project completion were related to contract management, preparation, and approval of drawings, quality assurance, and waiting time for approval of tests and inspections. Kaliba et al. (2009)

also found that consultants influenced project completion through contract modifications, changes in design drawings, poor coordination on-site, inadequate supervision, and changes in specifications.

Abd El-Razek et al. (2008) identified coordination problems and poor communication as consultant-related factors that negatively impacted project completion. Additionally, according to Madhura and Desale (2013), delays in approving major changes in the scope of work by the consultant, late reviews and approvals of design documents, and inadequate project management assistance for execution were among the factors that hindered project completion in construction projects.

#### **iv. External factors**

There are certain external factors that are beyond the control of the client, contractor, and consultant but can still have an impact on project completion time. Mydin et al. (2014) identified several external factors that can affect the completion of construction projects. These include weather conditions at the project site, poor site conditions, delays in manufacturing building materials, changes in laws and regulations, transportation delays, delays in performing final inspections and certifications, shortages of materials in the market, and shortages of equipment and tools in the market.

A study conducted on building projects in Uganda by Muhwezi et al. (2014) revealed that unfavorable weather conditions, legal disputes among project participants, shortages of construction materials, unexpected surface and subsurface conditions, delays in manufacturing materials, and accidents during construction were the main factors that hindered project completion. The study recommended that all project stakeholders collaborate to mitigate disputes during the construction period to avoid prolonging the project timeline due to litigation. It further advised stakeholders to ensure proper planning to account for unforeseen events that may extend the construction period, increase costs, and cause damage to property or injury to project personnel.

Understanding these factors is crucial for improving the performance of construction projects. By addressing client-related issues, such as financial capacity and owner interference, ensuring contractors' financial capacity and control over resources, considering consultant-related factors such as experience and coordination, and mitigating external factors such as political interference and material availability challenges, project performance can be enhanced. These

findings provide valuable insights for project stakeholders, enabling them to develop strategies and implement measures that lead to successful project outcomes.

### **2.2.6 Factors Affecting project performances in Ethiopia**

In order to consider a project successful, it is necessary for it to meet the requirements of cost, quality, and time constraints (Kaliba et al., 2009). Sambasivan and Soon (2007) conducted a study on the factors contributing to delays in completing construction projects in Malaysia and categorized them into eight groups. These factors include client-related factors, consultant-related factors, contractor-related factors, material-related factors such as material quality and shortages, labor and equipment-related factors, contract-related factors, contract relationship-related factors, and external factors.

In a study conducted by Regassa, (2011), factors affecting the timely completion of road construction projects under the Defence Construction Enterprise (DCE) were investigated. The study found that improper project planning practices had the highest impact on project completion delay, followed by poor project monitoring practices, inadequate leadership skills, ineffective procurement processes, lack of top management support, and financial problems, as well as external factors. The DCE should focus on clearly indicating critical paths, allocating time, and developing contingency plans to effectively manage unforeseen factors.

The research conducted by Sinesilassie, (2016) identified several determinants that impact the success or failure of public construction projects in Ethiopia. The study revealed that factors such as project manager ignorance, lack of understanding, and disagreements were the most significant contributors to project failure. On the other hand, factors such as scope clarity, owner competence, project manager competence, and effective interaction were identified as the most important success factors (Ephrem Girma Sinesilassie, 2016).

A study was undertaken by Belay et al., (2016), to identify and prioritize the key success factors in building construction projects in Bole Sub City, Addis Ababa. The results indicated that successful projects were contingent upon competent and efficient project leaders who possessed effective decision-making skills, well-defined project objectives, sufficient funding, and robust project monitoring. To enhance project success, contractors should prioritize the appointment of capable project leaders, while clients should ensure adequate funding and clear project objectives for all stakeholders involved.

A study conducted by Yada & Yadeta, (2016) examines the challenges faced by construction projects under the Oromia Industry and Urban Development Bureau in Ethiopia, specifically related to timely project completion, staying within budget, and maintaining quality. The study argues that delays in site furnishing and delivery, financial issues, and inadequate planning were the major contributors to time performance challenges. On the other hand, changes in design and fluctuations in cost were found to be the most significant factors affecting cost performance. The survey also identified that professional education, relevant work experience, and training of project leaders were critical factors influencing leadership performance.

Ayalew et al., (2016) argued that the adoption of standard project management procedures, tools, and techniques within the Ethiopian construction industry is unsatisfactory. Safety, risk, and time management were identified as areas that are significantly lacking and present major challenges for project managers.

A study conducted by Sinesilassie et al., (2017) aimed to identify the determinants that impact the cost performance of public construction projects in Ethiopia. The findings revealed seven success factors and six failure factors. It was observed that clear scope definition and competent project management had a positive influence on cost performance, while conflicts among project participants and lack of knowledge on the part of the project manager had a negative impact. The article highlights the importance of investing in education and training to develop skilled professionals and technicians who can deliver high-quality construction projects (Sinesilassie et al., (2017).

A study conducted by Gadisa & Zhou, (2019), which examined the reasons for the poor performance of public construction projects in Ethiopia, identified several factors related to contractor performance, owner capability, project design-procurement process, and project contract management as contributing to the issue. The study identified ten key factors that influenced the poor performance, including insufficient contractor capacity, weak project site management and supervision, inadequate project management skills and capabilities of the owner, change orders, delayed payment, lack of comprehensive project plans between parties, and incomplete project design, increasing material prices, ineffective project schedules and cost management, increasing market prices, and devaluation of the currency. These factors were found to negatively impact the performance of public construction projects in Ethiopia (Gadisa & Zhou, 2019).

In a study conducted by Gebremedhin, (2019) on the performance of construction projects, specifically focusing on the case of defence construction enterprise, the findings revealed that procurement planning, material waste, equipment malfunctions, cash flow issues, and financial difficulties were identified as factors that negatively affected project performance. Additionally, the study noted that the lack of quality management systems, leadership, stakeholder engagement, and communication were also contributing factors to poor project performance. The study recommended that the company should prioritize improving resource and stakeholder management in order to enhance overall project performance.

A recent study by Habte, (2021) on the construction of condominium housing developments in Addis Ababa, revealed that delays and cost overruns were primarily caused by poor planning and scheduling, inaccurate time estimation, fluctuations in material prices, and lack of accountability for work. Additional factors identified included inadequate monitoring and evaluation, inefficient management of equipment and materials, and unskilled personnel.

A study by Ephrem & Tripathi, (2019) identified critical factors affecting schedule performance in Ethiopian public construction projects from the perspective of engineers. The study found that factors such as lack of skilled labor, inadequate planning, and poor communication were responsible for impacting project performance. According to (Sibu, 2020) public construction projects exhibited significant variations in schedule, cost, and quality. Contractor-related, client-related, consultant-related, and external factors contributed to performance variations. Schedule variance affected cost variance positively, and quality variance influenced schedule variance positively. The study recommends improving planning, scheduling, and site management, addressing project financing challenges, implementing proper construction methods, and enhancing subcontractor control are important actions to improve public construction project performance.

A study conducted in the Bole Sub-City of Addis Ababa focused on government building construction projects and examined the factors influencing their implementation (Molla et al., 2020). The study identified time, cost, quality, and productivity as key independent variables affecting the performance of building construction. Through questionnaires distributed to 120 respondents including owners, consultants, contractors, and officials, the study validated 46 factors across nine categories such as project management, project design, project financing, and project implementation. The findings highlighted that cost, time; quality, productivity, and customer satisfaction were the most influential factors impacting project performance.

A study conducted by Abera, (2021) aimed to identify the challenges or constraints that commonly affect the successful completion and delivery of public building construction projects in West Shoa Zone, Oromia, Ethiopia. The findings revealed that inflation, inadequate design and specification, poor planning, monitoring, and feedback mechanism, delay in solving design problems, and limited financing capability of the owner were the most significant challenges faced.

Another study conducted in Ethiopia aimed to identify the factors affecting project quality in public universities situated in the eastern region by Aenet & Maniha, (2023), by utilizing primary data, the study determined that project management, project design, project financing, and project implementation had an impact on the quality of construction projects in public universities. The study recommended that project managers should prioritize these factors to enhance the quality of construction projects in public universities.

### **2.3. Identified literature gap**

The review of scholarly literature reveals that construction projects in Ethiopia face significant challenges that affect their performance. Specifically, inadequate funding and poor project management practices are identified as critical factors that cause delays, cost overruns, and low-quality results. In addition, the lack of technical expertise, skilled labor, and access to building materials also poses challenges to project performance.

The successful delivery of construction projects is crucial for the country's economic and social development, as they provide essential services and facilities to the public. Thus, it is vital to develop strategies to address the challenges identified in this study and improve project performance. One potential approach is to establish more effective project management practices that include thorough planning, coordination, monitoring, and evaluation mechanisms. Adequate funding for these projects is also necessary to ensure they are sufficiently resourced to achieve their goals.

Furthermore, addressing the challenges related to technical expertise, skilled labor, and access to building materials can also enhance project performance. Targeted training and capacity-building programs could help develop skills, and efforts could be made to improve access to these resources.

Despite previous research shedding light on the factors hindering construction project performance in Ethiopia, there is limited research specifically addressing these variables in the

context of public building construction projects in Jimma Town, Oromia Region, Ethiopia. Most studies have focused on a national or city level, overlooking the unique circumstances of Jimma Town. Therefore, a targeted study is necessary to examine the factors influencing the performance of public construction projects in Jimma Town, providing tailored insights and recommendations to address the specific challenges and opportunities in this setting.

## **2.4 Conceptual framework of the study**

The foundation of this study's conceptual framework is constructed by combining relevant academic literature concerning construction project performance. This framework comprises distinct independent variables, namely: Organization-related factors, Procurement, and contract-related aspects, Project manager and team-related considerations, Contractor and supplier-related factors, and External and work environment factors. The dependent variable encompassed within this framework is the Performance of Projects.

### **Independent Variables: Factors Affecting Performance of Projects**

#### **I. Organization Related-Factors**

**Organizational Culture:** The values, beliefs, and norms within the organization that influence project management practices and overall project success.

**Organizational Structure:** The arrangement of roles, responsibilities, and reporting lines within the organization that impacts decision-making and coordination of project activities.

**Resource Availability:** The extent to which necessary resources, such as skilled personnel, funding, and infrastructure, are accessible for project implementation.

#### **II. Procurement and Contract Related-Factors**

**Procurement Strategy:** The chosen approach for obtaining goods and services, such as selecting suppliers and types of contracts, can impact project outcomes.

**Supplier Selection:** The process of identifying and choosing reliable suppliers who can meet project requirements and deliver quality products or services.

**Contract Management:** The efficient administration and oversight of contracts to ensure compliance, minimize risks, and resolve disputes.

#### **III. Project Manager and Team Related-Factors**

Leadership and Competence: The project manager's ability to provide effective guidance, decision-making, and motivation to the project team.

Team Composition: The selection and composition of project team members with relevant skills and expertise to perform project tasks. Team Motivation: The level of enthusiasm, commitment, and cooperation displayed by team members toward achieving project goals.

#### **IV. Contractor and Supplier Related-Factors**

Contractor Performance: The performance of external contractors and suppliers in meeting contractual obligations and delivering products or services on time and to the required quality.

Supplier Relationships: The quality of communication, collaboration, and trust between the project team and external contractors or suppliers.

#### **V. External and Work Environment Related-Factors**

Legal and Regulatory Factors: The influence of laws, regulations, and government policies that can affect project execution and compliance.

Economic Factors: The impact of economic conditions, such as inflation rates or exchange rates, on project costs and viability.

Political and Social Factors: The influence of political stability and social factors on the project's progress and stakeholders' attitudes.

#### **Dependent Variables: Project Performance as Measured By**

3.1 **On Budget (Cost)** Cost Performance: The degree to which the project stays within the approved budget and efficiently manages financial resources.

3.2 **On Schedule (Time)** Schedule Performance: The extent to which the project adheres to the planned timeline, meets deadlines, and completes tasks on time.

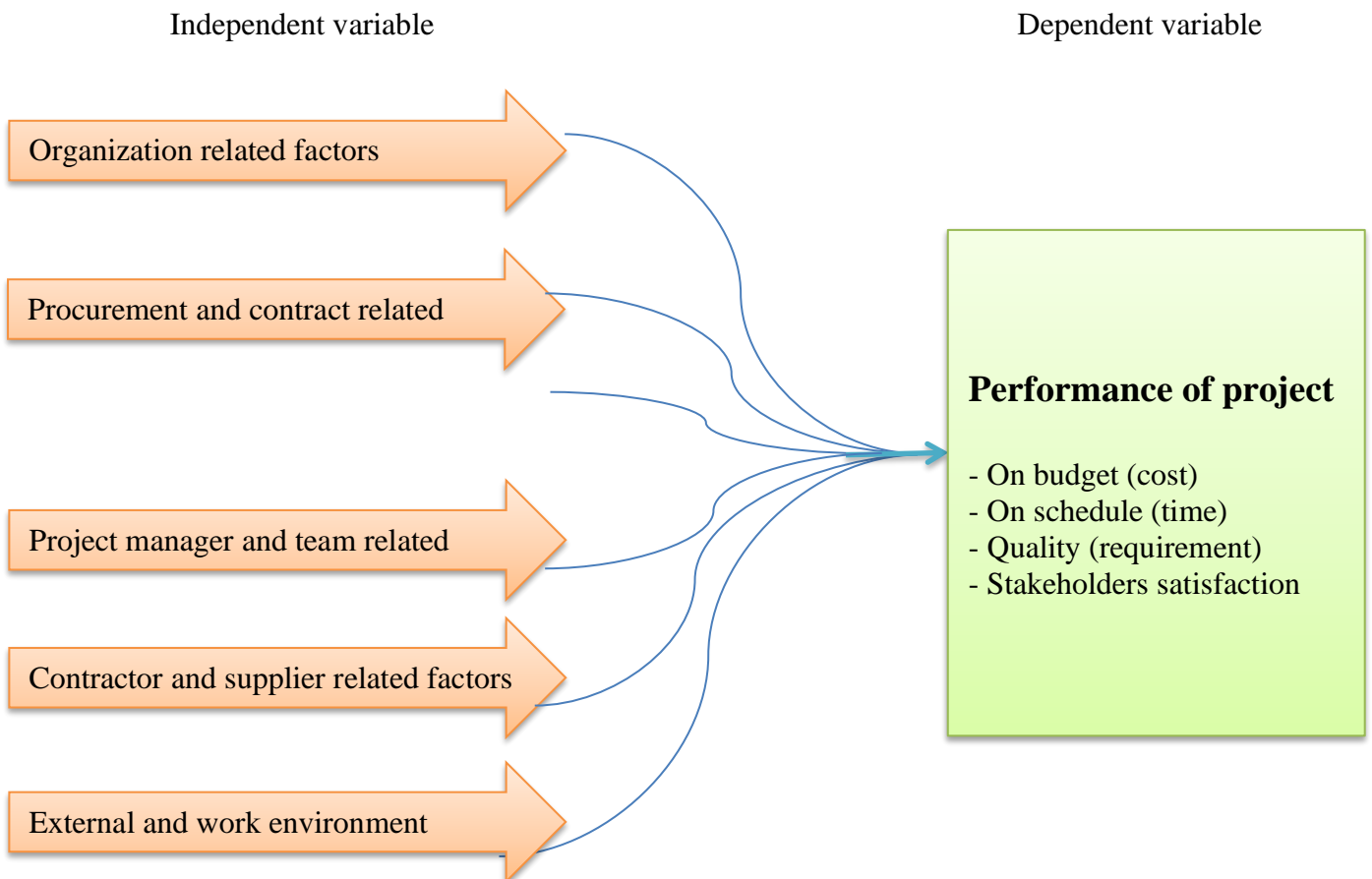
3.3 **Quality (Requirement)** Quality of Deliverables: The level of excellence and conformance to specified requirements of project deliverables, products, or services.

3.4 **Stakeholders Satisfaction** Stakeholder Engagement: The level of involvement, communication, and collaboration with relevant stakeholders throughout the project.

Stakeholder Expectations: The degree to which the project's outcomes meet the expectations and needs of key stakeholders.

The conceptual framework illustrates the relationships between independent variables (factors affecting project performance) and dependent variables (project performance metrics). By analyzing these relationships, project managers and organizations can identify critical factors that contribute to successful project outcomes and make informed decisions to enhance project performance.

**Figure 0-1 Conceptual framework**



**Source: Researcher's own development**

## **CHAPTER THREE**

### **3. RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Research approach**

The study mainly used a quantitative research approach to reach its main goal and test the hypotheses. This choice was made to make the research process straightforward and ensure accuracy in answering the planned research questions and hypotheses. The emphasis on quantitative methods meant collecting and analyzing data in a systematic way, focusing on numbers and measurable aspects. By not including qualitative parts, the study aimed to make its findings clearer and more statistically reliable, adding to a more focused and numbers-driven exploration of things and how they relate to each other.

#### **3.2 Research Design**

The research design, as defined by Kothari (2004), provides the essential framework for data collection, measurement, and analysis. For this study, descriptive and explanatory research designs were used. As described by Mugenda and Mugenda (2019), descriptive research is a methodology with the purpose of presenting and identifying the existing state of affairs. The primary objective is to investigate a specific event or situation occurring at a particular location and moment. Descriptive research emphasizes examining practices, conditions, frameworks, relationships, variations, perceptions, and continuous processes. In our case, the primary aim was to identify the factors that significantly influence the performance of public building construction projects. Explanatory design, aims at gaining an explanation of a specific circumstances or problem, generally in the form of causative relationships.

To achieve this objective, the study focused on establishing relationships between the relevant variables. For this purpose, Pearson correlation analysis was utilized. The advantage of correlation analysis is that it does not manipulate existing data; instead, it examines pre-existing associations between the variables of interest.

Furthermore, to gain a deeper understanding of the impact of independent variables on the performance of public construction projects, the study employed relative importance index analysis. This technique allowed us to determine the relative ranking of the factors based on Likert scale answers provided by the survey respondents. Through this method, we could effectively rank and assess significance of each factor influencing the project performance.

### **3.3.Target Population:**

The study targeted all stakeholders involved in on-going public building construction projects in Jimma Town. According to the 2023 report from the Jimma Town construction office, there were five such projects during the data collection period. From these, the G+5 administration building and the integrated land management building were randomly selected using a random sampling technique. The rationale behind choosing these two projects was their perceived similarity in terms of projects and stakeholders involved, making them representative of the larger population. The Jimma Town Infrastructure Development Office's 2023 report indicated a total of 79 individuals actively participating in the selected projects. Consequently, the sample size for this study encompassed the entire population, consisting of 79 respondents.

### **3.4. Sampling Techniques and Sample Size**

As the target population was less than 100, there was no need to use formulas such as Slovin's formula to determine the sample size. Therefore, the sample size for this study was the entire population, which consisted of 81 respondents. According to Leedy et. al. (2005), as cited by Olatunji (2010), researchers should endeavor to maximize the sample size. The following guidelines for selecting the sample size are suggested: survey the entire population for a population of less than 100 people or units, sample 50% of the population if the entire population is 500, for a population of about 1500 sample 20%, and beyond a population of 5000 and more, the population size is almost irrelevant and a sample size of 400 should be adequate.

### **3.5. Data Collection**

Efficiently addressing research inquiries necessitates a well-executed data collection process that involves acquiring information from participants. As pointed out by Mesly (2015), this data can be sourced from either primary or secondary sources. In this particular study, cross-sectional data was employed with the intention of providing a snapshot of the current scenario, utilizing primary data sources.

To obtain primary data, the researchers administered a questionnaire to individuals involved as stakeholders in the chosen building construction projects. This questionnaire followed an observational approach and comprised statements that required written responses and item selection through ticking.

The questionnaire, presented in Appendix I, was structured into two distinct sections. The first section aimed at gathering foundational information about the participants, while the second delved into various elements influencing project performance. These elements encompassed the institutional environment, matters related to procurement and contracts, dynamics of the project manager and team, aspects related to contractors, and external as well as on-site environmental factors influencing projects.

The questionnaire incorporated closed-ended queries for demographic details and Likert scale items for evaluating the factors. The utilization of the Likert scale, which enables respondents to express their degree of agreement on a scale ranging from 1 to 5 (spanning from "Not at all" to "Very great"), was a conscious choice to streamline data collection while enhancing its accuracy. Furthermore, employing the Likert scale eliminated the likelihood of respondents becoming disinterested due to the need for lengthy written responses, instead fostering their enthusiastic participation.

### **3.6. Methods of Data Analysis and Interpretations**

The data collected by various instruments were thoroughly checked and examined to ensure their correctness. Then the data is transferred into an appropriate format, coded, and entered into a computer. Key variables were cross-tabulated and analyzed by using the statistical tool SPSS computer program version 20. The results were presented in absolute figures and percentages, using tables, charts, and graphs.

The study employed descriptive tools to analyze quantitative data. Descriptive statistics were utilized to briefly summarize the data, offering an overview of the sample. This allowed for comparisons between diverse study samples, enabling the identification of sample characteristics that could impact conclusions (Thompson & Panacek, 2006). Frequency distributions, means, and standard deviations were utilized to describe respondents' responses for this purpose.

Further, the study adopted the relative importance index method (RII) to rank participants' perspectives on the degree of influence of factors affecting the performance of public construction projects in Jimma Town. This method plays a pivotal role in establishing the hierarchy of different factors within distinct groups. The ranking derived from RII facilitates a comparative analysis of the factors' relative significance as perceived by respondents. Utilizing

the five-point Likert scale data, the relative importance index for each factor was calculated based on the following formula:

$$RII = \frac{\sum_{i=1}^n W_i X_i}{AN} \text{-----eq (1)}$$

Where:

W= weight assigned by respondents;

X = frequency of each weight;

A = highest weight; and

N = number of respondents.

The range of RII value is from 0 to 1, and an element with a higher RII value is considered more important than others (Deepak et al., 2019)

To examine the relationships between ranked variables, the study employed Pearson correlation coefficient. This statistical measure estimates the direction and strength of links between ranked variables. It was chosen because the collected data was on an ordinal scale, with respondents indicating their levels of agreement. Furthermore, the study employed ordinal regression analysis to explore actual contribution each of selected explanatory variable to the cost performance of public construction projects.

### 3.7. Variable Definition and Measurement

#### Dependent Variable

- **Project Performance:** The outcome of the construction project, measured by the project's completion time, cost, quality, and satisfaction of stakeholders.
  - i. **On Budget (Cost) Cost Performance:** The degree to which the project's actual expenses align with the budgeted costs.
  - ii. **On Schedule (Time) Schedule Performance:** The extent to which the project adheres to its planned timeline.
  - iii. **Quality (Requirement) Quality of Deliverables:** The level to which the project outputs meet predefined quality standards.
  - iv. **Stakeholders Satisfaction Stakeholder Engagement:** The satisfaction and involvement of project stakeholders.

## **Independent Variable**

- i. **Organization-Related Factors:** Characteristics of the organization overseeing the project, including structure and resource management.
- ii. **Procurement and Contract-Related Factors:** Processes governing resource procurement and contract management.
- iii. **Project Manager and Team-Related Factors:** Competencies and interactions of the project manager and team members.
- iv. **Contractor and Supplier-Related Factors:** Performance of external entities such as contractors and suppliers.
- v. **External and Work Environment-Related Factors:** External influences and project-specific operational conditions.

## CHAPTER FOUR

### 4. RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter focuses on presenting, analyzing, discussing, and interpreting the results of the study. It provides a comprehensive analysis of the study's results, including the response rate, participant characteristics, explanatory results, and the findings from Spearman's correlation analysis.

#### 4.2 Response Rate

Section 4.1 of the study presents the response rate of the survey conducted. A total of 79 questionnaires were administered, out of which 61 were properly filled and returned, representing an overall successful response rate of 77%. The remaining 23% failed to fill the questionnaires properly, and some of them failed to return. According to Babbie (2004), response rates of 50% are acceptable to analyze and publish, 60% is good, and 70% is very good. Therefore, the achieved response rate of more than 70% implies that the response rate was very good. The response rate is presented in table 4.1

**Table 4.1: Response Rate**

Response	Frequency	Percent
Successful	61	77
Unsuccessful	18	23
Total	79	100

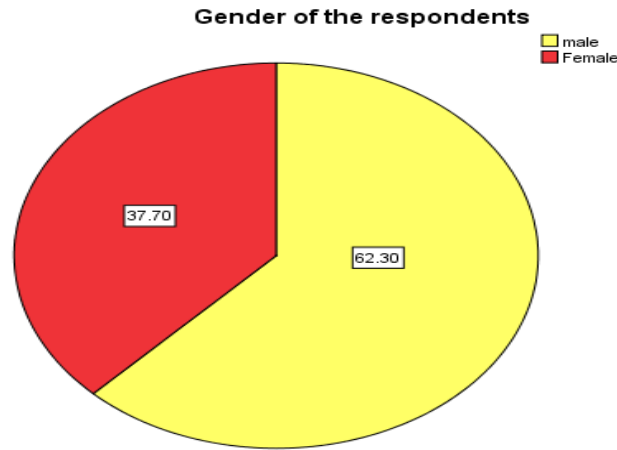
**Source: Survey, 2023**

#### 4.3 Sample Characteristics

The study was interested to examine the characteristics of the respondents who took part in the study. This section provides an overview of the sample features of the participants, including their gender, education level, working positions, and working experience. The demographic information allowed us to have a better understanding of the respondents and the topic.

##### 4.3.1 Gender

The findings of the study indicate that male respondents were the majority in the sample, accounting for 62.3% of the participants. On the other hand, female respondents represented only 37.7% of the sample, as shown in Figure 4.1.

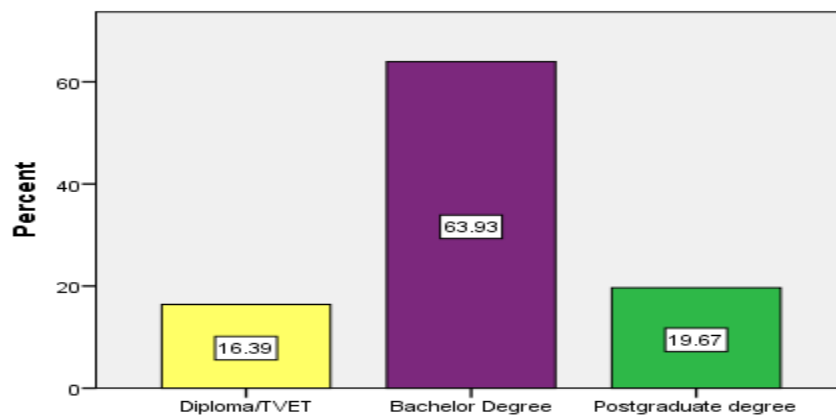


**Figure 4.1: Gender of Respondents**

The study's findings reveal a significant gender disparity in the sample, with male respondents comprising the majority. This aligns with the broader trend of male dominance in infrastructure-related engineering projects.

#### 4.3.2 Education Level

The study aimed to determine the educational background of the respondents. The findings showed that the majority of the respondents had bachelor degree certificates, accounting for 64% of the sample. Additionally, 16% of the respondents indicated that they held diploma certificates, while the remaining 6.4% indicated that they had reached above degree level.



**Figure 4.2 Educational level of the respondents**

### Figure 4.2: Educational level of the Respondents

The study's findings indicate that the majority of the respondents had degree certificates, with a smaller proportion holding diploma certificates or reaching above degree level.

### 4.3.3 Respondents' Position

In section 4.3.3 of the study, the positions of the respondents in the selected projects are presented. The study aimed to establish the positions of the respondents, and the findings showed that resident engineers were the most accessed respondents, accounting for 28% of the sample. This was followed by Counterpart engineer (20%), Supervisor (11.0%), Expert (10.0%), Forman (%10), Project manager, and consultant, which accounted for 6.5% of the sample. Figure 4.3 provides a visual representation of the distribution of respondent positions in the organization.

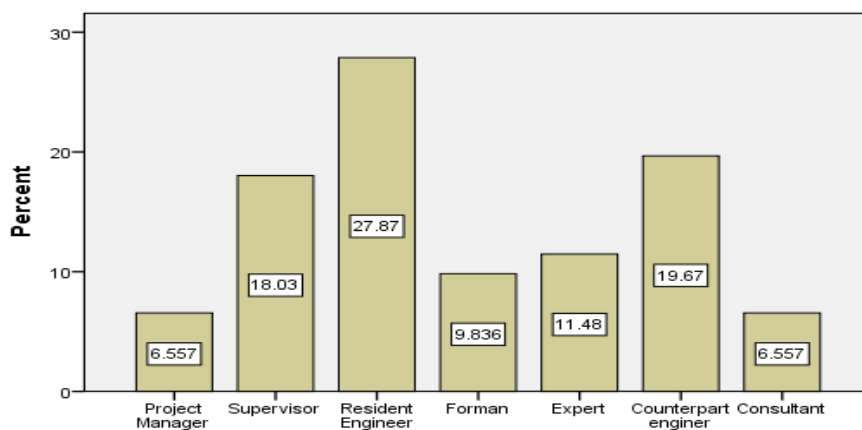


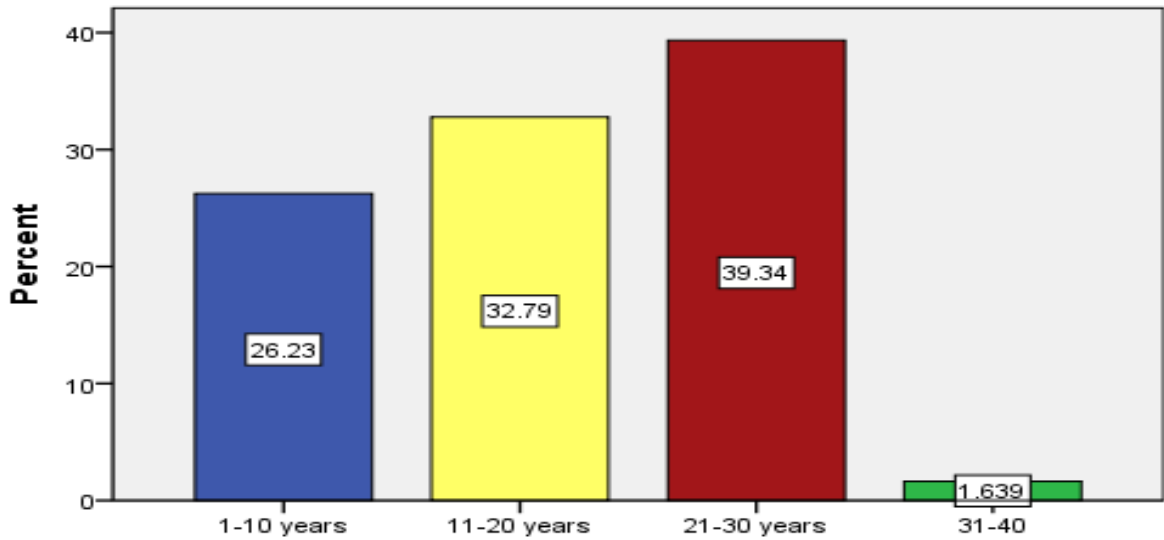
Figure 4.3 Job position of the respondents

### Figure 4.3 Job positions of the Respondents

This indicates that the randomly distributed questionnaire reached all of the respondent's position.

### 4.3.4 Working Experience

According to Figure 4.4, a significant number of participants in the study had more than a decade of experience in their current roles. Specifically, 39.34% had 21-30 years of experience, 32.79% had 11-20 years, and 26.23% had 1-10 years. The outcomes suggest that a substantial portion of respondents accumulated more than a decade of experience, thereby affirming the reliability of the study's findings.



**Figure 4.4 Respondents working experiences**

**Figure 4.4 Respondents Working Experiences**

**4.4. Influence of factors associated with organizations on the outcome of public construction projects.**

The study investigates the impact of organizational factors on the performance of public construction endeavors. A 5-point Likert scale was formulated to gauge respondents' perceptions of how organizational elements influence the effectiveness of their respective construction projects. Table 4.2 presents the statistical information regarding the mean score and standard deviation for a set of statements. The mean score for these statements was found to be 3.35, indicating the average value. The standard deviation, which measures the dispersion or variability of the scores, was calculated to be 0.617.

**Table 4.2: Descriptive Statistics for organizational-related factors**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
The project has an appropriate organizational structure that facilitates project success	61	2.9672	1.03227
The project has secured adequate funding/budget for completion.	61	3.2131	.96807
There is top management support and commitment to the projects	61	3.6721	.96127
<b>Overall mean</b>		<b>3.3552</b>	<b>.61725</b>

**Source: Survey, 2023**

This finding implies that organizational factors influenced the performance of public construction to a moderate extent. The finding also shows that participants perceived top management support and commitment as having the greatest impact on project success, followed by the adequacy of funding/budget. The organizational structure's impact was rated as moderate. These insights can help project managers and stakeholders focus on areas that are perceived as having a higher impact on construction project performance.

#### **4.5 Effect of Procurement and contract administration-related factors on the outcome of Public Construction Projects.**

The study assessed how procurement and contract administration influenced the performance of construction projects. To achieve this, a 5-point Likert scale was introduced, asking participants to specify the degree to which procurement and contract administration factors affected the outcomes of their projects. The combined average score for these statements equaled 3.92, accompanied by a standard deviation of 0.55. These results imply that procurement and contract administration factors played a great significant role in the projects. Respondents generally agreed on the importance of effective procurement and contract-related factors for project success as depicted in Table 4.3.

**Table 4.3 Descriptive Statistics Procurement & contract administration related factors**

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
There is the use of effective procurement and tendering methods.	61	3.3934	.97089
There is an effective contract formulation and contract administration.	61	4.1148	.89626
There is a sufficient supply of goods/ materials and services aligned with the project needs, schedules, and quality standards	61	4.4262	.78441
		3.92	.55

**Source: Survey, 2023**

Further, the respondents rated the effective contract formulation and administration as well as the sufficient supply of goods/materials and services as having significant positive impacts on the projects. The use of effective procurement and tendering methods was rated with a more moderate impact.

The mean score of 3.3934 on the uses of “effective procurement and tendering methods” suggests that respondents, on average, perceived the use of effective procurement and tendering methods to have a moderate impact on the projects. The standard deviation of 0.97089 indicates a notable variance in respondents' opinions. This variance suggests that some respondents might have perceived the impact as relatively slight, while others might have seen it as more significant.

The high mean score of 4.1148 for the statement “effective contract formulation and contract administration” indicates that respondents, on average, believed that effective contract formulation and administration had a considerable positive impact on the projects. The relatively lower standard deviation of 0.89626 suggests that there were more consensuses among respondents regarding the significant impact of this factor compared to the previous one.

The mean score of 4.4262 for the statement “sufficient supply of goods/materials and services aligned with project needs” reflects that respondents, on average, perceived having a sufficient supply of goods, materials, and services aligned with project needs to have a very significant impact on the project. The low standard deviation of 0.78441 indicates that there was a high level of agreement among respondents about the substantial impact of this factor on project success.

## 4.6 Effect of project manager and team-related factors on the outcome of public construction projects.

The study aimed to determine the impact of project manager and team-related factors on the outcomes of public construction projects in Jimma town. To assess this, a 5-point Likert scale was used, where respondents rated the extent to which these factors influenced the performance of their respective projects. The data presented in Table 4.4 shows that the average score for project manager and team-related factors was 3.71, with a standard deviation of 0.582.

**Table 4.4 Descriptive statistics for project manager and team-related factors**

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
The project managers have the necessary technical competence and experience.	61	4.4590	.59368
The project managers have managerial and leadership skills.	61	4.0492	.78371
The project managers are empowered with the authority to take decisions.	61	3.0492	1.16084
The project teams have a team spirit and commitment to the project's success.	61	2.7705	1.28314
The project team members are experienced and fully competent in their particular roles.	61	4.2295	.90173
		3.7115	.58255

**Source: Survey, 2023**

This finding denoted that, among project manager and team-related factors, the largest perceptions were associated with project managers' technical competence and experience, as well as the experience and competence of project team members. These were seen as crucial factors for successful project outcomes. On the other hand, the smallest perceptions were related to project teams' team spirit and commitment, and to some extent, the empowerment of project managers with decision-making authority.

The analysis of the findings shows that respondents generally recognized the importance of project managers' technical competence, managerial skills, and project team members' experience and competence as significant factors influencing project success. Empowering project managers with decision-making authority was perceived with a more moderate impact. The presence of team spirit and commitment within project teams was also seen as moderately important, but there was greater variability in opinions about its impact. These insights can

guide project managers in focusing their efforts on areas that are perceived to have the greatest impact on project success.

#### **4.7 Effect of contractor-related factors on the outcome of construction projects.**

The study aimed to determine the impact of contractor related factors on the outcomes of public construction projects in Jimma town. To assess this, a 5-point Likert scale was used, where respondents rated the extent to which these factors influenced the performance of their respective projects. The data presented in Table 4.5 shows that the average score for contractor-related factors was 4.23, with a standard deviation of 0.604.

**Table 4.5: Descriptive statistics for contractor-related factors**

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
The contractors have the necessary competence and commitment to the contract obligation.	61	4.2295	.82449
The contractors have cash flow/ financial capabilities to undertake the works effectively and consistently	61	4.3607	.68393
Effective site management, control and coordination are carried out by the contractors	61	4.1639	.68752
The contractors have adequate experience in these particular projects.	61	4.1967	.89106
		<b>4.2377</b>	<b>.60454</b>

**Source: Survey, 2023**

Participants showed agreement regarding the importance of contractor-related factors. The results further indicate that the largest perceptions were associated with contractors' cash flow/financial capabilities and their overall competence and commitment. These factors were considered highly influential for successful project outcomes. The smallest perceptions were related to effective site management, control, and coordination carried out by contractors, as well as contractors' adequate experience in the particular projects. Despite being rated slightly lower, these factors were still seen as important contributors to project success.

#### **4.8 Effect of external and work environment-related factors on the outcome of public construction projects.**

The study aimed to determine the impact of external and work environment-related factors on the outcomes of public construction projects in Jimma town. To assess this, a 5-point Likert scale was used, where respondents rated the extent to which these factors influenced the

performance of their respective projects. The data presented in Table 4.6 shows that the average score for external and work environment-related factors was 3.0295, with a standard deviation of 0.66617

**Table 4.6: Descriptive statistics for external and work environment-related factors**

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
The project is affected by site-related factors (e.g. access roads, ground conditions, challenging terrains, other unforeseen conditions, etc.).	61	3.3279	1.23452
The project is affected by political-related factors (e.g. political interference, political conflicts, vandalism, etc.).	61	2.8033	.98013
The project is affected by technical and technological-related factors (e.g. method of construction etc.).	61	2.6557	1.07835
The project is affected by physical environmental-related factors (e.g. unfavorable weather conditions, etc.)	61	2.8852	1.17045
The project is affected by economic-related factors (e.g. exchange rate, inflation, price escalation, etc.).	61	3.4754	1.10464

**Source: Survey, 2023**

The finding of the study as shown in table 4.6 revealed that respondents perceived economic-related factors as having the greatest impact on project success, indicating the significance of economic considerations in project outcomes. Technical and technological-related factors, political-related factors, physical environment-related factors, and site-related factors were perceived as having comparatively smaller impacts on project success. This insight can help project managers understand which factors are considered most influential by respondents and allocate resources and attention accordingly.

## 4.9 Performance of construction projects

The dependent variable for the study was project performance which was measured by four statements on the performance level according to project timeline; project cost, project quality, and stakeholder's satisfaction where respondents were asked to rate the performance of projects according to these parameters. Table 4.7 presented descriptive statistics for the performance of projects which show that the overall mean score was 3.5287 and a standard deviation of 0.54409

**Table 4.7: Descriptive statistics for project performance**

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
The project is progressing as per the schedule or within the planned timeline.	61	3.6066	.66530
The project cost is within the allocated budget or as per the planned budget.	61	3.1475	.94580
The project work meets the required quality standards.	61	3.7377	.70478
Overall, stakeholders are satisfied with the progress and outcomes of the project.	61	3.6230	.66242
		<b>3.5287</b>	<b>.54409</b>

**Source: Survey, 2023**

### **Project Progress and Timeliness:**

The mean score of 3.6066 suggests that respondents perceived the project's progress as moderately satisfactory concerning adherence to the schedule or planned timeline. The relatively low standard deviation of 0.66530 indicates a consistent agreement among respondents regarding the project's progress in relation to its timeline. This indicates that respondents' perceptions were well-aligned, and there existed a moderate level of satisfaction with project progress in terms of schedule adherence.

### **Project Cost Management:**

The mean score of 3.1475 indicates that respondents perceived the project's cost management as moderately satisfactory, yet with potential for enhancement. The relatively high standard deviation of 0.94580 suggests a broader range of opinions among respondents regarding the project's cost management. This variation implies that certain respondents might have

perceived the project's cost control more favorably than others, resulting in a less uniform perception compared to project progress.

### **Project Quality:**

The mean score of 3.7377 indicates that respondents perceived the project's work as moderately satisfactory in terms of meeting the required quality standards. The relatively low standard deviation of 0.70478 suggests a relatively consistent agreement among respondents regarding the project's quality. This implies that respondents shared a fairly aligned perception of the project's adherence to quality standards.

### **Stakeholder Satisfaction:**

The mean score of 3.6230 suggests that respondents perceived stakeholders' satisfaction with the progress and outcomes of the project as moderately satisfactory. The relatively low standard deviation of 0.66242 indicates a consistent agreement among respondents regarding stakeholders' satisfaction. This implies that respondents had a reasonably aligned perception of stakeholder satisfaction with project outcomes.

In summary, respondents perceived the project's progress and adherence to schedule as moderately satisfactory. Cost management was seen as somewhat satisfactory, quality standards were perceived as moderately satisfactory, and stakeholders' satisfaction was also seen as moderately satisfactory. While there was a relatively consistent agreement among respondents regarding project quality and stakeholder satisfaction, there was slightly more variability in opinions about project progress and cost management. These insights can help project managers understand how different aspects of project performance are perceived by respondents and where improvements might be needed.

## **4.10 Relative importance index**

In this study, the relative importance index method (RII) was used to rank the perspective of respondents on the factors of their degree of influence affecting the performance of public construction projects in Jimma town. The result presented in Table 4.8 below

**Table 4.8: Summary of relative importance index for all factors****Summary of Factors Affecting Construction Project Performance**

<b>Various factor statements</b>	<b>RII</b>	<b>Rank</b>
The project has an appropriate organizational structure that facilitates project success	0.55	16
The project has secured adequate funding/ budget for completion.	0.58	14
There is top management support and commitment to the projects	0.67	10
There is the use of effective procurement and tendering methods.	0.62	13
There is an effective contract formulation and contract administration.	0.76	8
There is a sufficient supply of goods/ materials and services aligned with the project needs, schedules, and quality standards	0.86	2
The project managers have the necessary technical competence and experience.	0.88	1
The project managers have managerial and leadership skills.	0.73	9
The project managers are empowered with the authority to take decisions.	0.58	15
The project teams have a team spirit and commitment to the project success.	0.53	17
The project team members are experienced and fully competent in their particular roles.	0.82	4
The contractors have the necessary competence and commitment to the contract obligation.	0.81	5
The contractors have cash flow/ financial capabilities to undertake the works effectively and consistently	0.84	3
Effective site management, control, and coordination are carried out by the contractors	0.77	7
The contractors have adequate experience in these particular projects.	0.79	6
The project is affected by site-related factors (e.g. access roads, ground conditions, challenging terrains, other unforeseen conditions, etc.).	0.62	12
The project is affected by political-related factors (e.g. political interference, political conflicts, vandalism, etc.).	0.50	19
The project is affected by technical and technological-related factors (e.g. method of construction, etc.).	0.47	20
The project is affected by physical environmental factors (e.g. unfavorable weather conditions, etc.).	0.52	18
The project is affected by economic-related factors (e.g. exchange rate, inflation, price escalation etc.).	0.65	11

**Source: Survey, 2023**

Drawing from the study's outcomes as shown in the table above, we can classify the elements influencing the performance of construction projects into three discrete groups determined by their Relative Importance Index (RII): High Importance, Medium Importance, and Low Importance.

**High Importance Factors:**

The project managers' technical competence and experience, highlighted by an RII of 0.88, emerge as the most crucial factor for ensuring successful project outcomes. Their proficiency in decision-making and problem-solving greatly influences project execution. Similarly, the contractors' ability to maintain a steady supply of goods, materials, and services, aligned with project requirements, schedules, and quality standards (RII: 0.86), along with their financial stability to consistently undertake tasks (RII: 0.84), play pivotal roles in maintaining project momentum and quality. The presence of experienced and competent team members (RII: 0.82) and contractors' commitment to contractual obligations (RII: 0.81) also fall within this high-importance category.

**Medium Importance Factors:**

Factors such as contractors' experience in specific projects (RII: 0.79) and their effective site management, control, and coordination (RII: 0.77) contribute significantly to ensuring efficient execution and adherence to quality standards. The formulation and administration of effective contracts (RII: 0.76) play a crucial role in clarifying project expectations and governance. Project managers' managerial and leadership skills (RII: 0.73) and top management support and commitment to projects (RII: 0.67) also contribute substantially to effective team management and decision-making.

**Low Importance Factors:**

Factors related to procurement methods (RII: 0.62) and site-related challenges (RII: 0.62) hold lower importance in comparison. The adequacy of project funding and budget completion (RII: 0.58) and project managers' authority in decision-making (RII: 0.58) also fall into this category. Additionally, external factors like economic influences (RII: 0.65), physical environmental challenges (RII: 0.52), and technical and technological issues (RII: 0.47) have comparatively lower impacts on project performance. Lastly, factors influenced by political dynamics (RII: 0.50) are perceived as having the least impact on construction project outcomes.

In conclusion, the factors categorized as high importance reflect critical pillars of project success, including the competence of project managers and contractors, availability of resources, and alignment with contractual obligations. The medium importance factors encompass aspects that enhance project efficiency and coordination. Conversely, low-importance factors encompass variables that contribute minimally to project performance, such as procurement methods, site challenges, and external influences. Understanding these

categories helps project stakeholders prioritize their efforts and resources for optimal project execution.

#### 4.11. Inferential statistics

In this section, the correlation analysis, Assumptions of ordinal regression analysis, and the result of ordinal regression analysis were discussed.

##### 4.11.1 Correlation Analysis

A correlation analysis was implemented to determine if there were any relationships between the independent variables and the dependent variable. To analyze data Pearson’s correlation analysis was used. Pearson correlation matrix is a technique used for testing the multi collinearity of explanatory variables. As noted by Gujarati (2004), correlation analysis was performed to show the direction and the strength of the relationship between the two or more variables. In the Pearson correlation matrix, the values of the correlation coefficient range between -1 and +1. A correlation coefficient of +1 indicates that the existence of perfect positive relation; while a correlation coefficient of -1 indicates as two or more variables have perfect negative relation. A correlation coefficient of 0, on the other hand, indicates that there is no linear relationship between two variables (Babulo and Hassen,2005). Besides, as noted by Brooks (2008), zero correlation among explanatory variables is not evident in any practical work.

**Table 4.9: Pearson Correlation Coefficient Results**

		Correlations					
		Org	procu	promgr	contra	External	perform
Org	Pearson Correlation	1	.419**	.316*	0.098	0.011	.506**
	Sig. (2-tailed)		0.001	0.013	0.453	0.936	0
Procu	Pearson Correlation	.419**	1	0.104	0.149	0.01	.276*
	Sig. (2-tailed)	0.001		0.426	0.252	0.939	0.031
Promgr	Pearson Correlation	.316*	0.104	1	.419**	.349**	.527**
	Sig. (2-tailed)	0.013	0.426		0.001	0.006	0
Contra	Pearson Correlation	0.098	0.149	.419**	1	.622**	.453**
	Sig. (2-tailed)	0.453	0.252	0.001		0	0
External	Pearson Correlation	0.011	0.01	.349**	.622**	1	0.104
	Sig. (2-tailed)	0.936	0.939	0.006	0		0.425

	Pearson						
Perform	Correlation	.506**	.276*	.527**	.453**	0.104	1
	Sig. (2-tailed)	0	0.031	0	0	0.425	

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

**Source: Survey, 2023**

Table4-9 shows the correlation matrix of the key variables in the study. The values indicate the strength and direction of the relationship between each pair of variables. Among the five independent variables, four were statistically significant at  $p < 0.05$ , indicating a significant relationship between the independent and dependent variables.

The results of the study showed project manager-related, organization-related, contractors-related, and procurement-related factors have a significant impact on the outcome of public construction projects in Jimma Town. The correlation matrix indicated that all independent variables were positively correlated with the performance of public construction projects.

#### **4.11.2 Assumptions of ordinal regressions Analysis**

Ordinal regressions can be used to address a variety of research questions. It can tell you how well a set of variables is able to predict a particular outcome (Pallant, 2005). In our case, the researcher is interested in exploring how well a set of subscales on various factors is able to predict the cost performance of public construction projects. Ordinal regressions provide us with information about the model as a whole, and the relative contribution of each of the variables that make up the model.

##### **Multi-co linearity Test**

Multi-co linearity test made to assess the existence of exact linear association among some or all explanatory variables in the regression model. Whenever independent variables are multi collinear, there is overlapping or sharing of predictive power. Consequently, the regression coefficients of the independent variables will be undetermined and their standard errors become immeasurable (Gujarati, 2004). The multi co linearity problem makes significant variables insignificant by increasing the p-value since the increased p-value decreases the statistical significant value. According to Gujarati (2004), the multi co linearity problem is solved by reducing highly correlated variables. Then, the result offers more significant variables than before. To test the existence of the multi co linearity problem, VIF (Variance Inflation Factor) is adopted. As a rule of thumb for Multi co linearity, the test of the model states a variable

whose values are larger than 10 or whose 1/VIF value is less than 0.1 indicates the possible problem of multi co linearity.

Accordingly, as highlighted in the below table, there is no value greater than 10, all values of the Variance Inflation Factors are less than 2.229 and all values of 1/VIF are greater than 0.449. This shows that the regression model in this study does not detect Multi co linearity problems and there is no multi co linearity.

**Table 4.10: Multi co linearity test result**

		Coefficients	
Model	Co linearity Statistics		
	Tolerance	VIF	
	Org	.738	1.354
	Procu	.801	1.248
1	Promgr	.726	1.377
	Contra	.552	1.812
	Exte	.593	1.686

a. Dependent Variable: project performance

**Source: Survey, 2023**

**Test of Parallel Lines:**

The "Test of Parallel Lines" assesses the assumption of proportional odds in the ordinal regression model. The null hypothesis posits that the location parameters (slope coefficients) are the same across all response categories.

**Table 4.11: Test of Parallel Lines:**

Test of Parallel Lines <sup>a</sup>				
Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	96.025			
General	82.519 <sup>b</sup>	13.505 <sup>c</sup>	15	.563

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

**Source: Survey, 2023**

The Test of Parallel Lines indicates that the assumption of parallel lines is not significantly violated in the ordinal regression model. The relaxation of this assumption in the general model does not provide a significantly better fit, suggesting that the proportional odds assumption holds reasonably well for the specified predictors and response categories in the analysis. It's essential to acknowledge the uncertainty regarding the test's validity due to the log-likelihood constraints in the last iteration of the general model.

### **4.11.3 Ordinal Regression Analysis result and discussion**

After checking the assumptions of ordinal regression models, ordinal regression analysis was performed to know how much of the variance in the dependent variable (cost performance) is explained by the model.

#### **1. Case Processing Summary:**

This table provides an overview of the distribution of the dependent variable, "cost performance." The majority of projects fall within the "Somewhat satisfactory" category.

This distribution provides a baseline understanding of the variation in the dependent variable.

**Table 4.12: Case Processing Summary:**

<b>Case Processing Summary</b>			
		<b>N</b>	<b>Marginal Percentage</b>
	Exceeded expectations / Outstanding	6	9.8%
cost performance	Good / Satisfactory	6	9.8%
	Moderately satisfactory	20	32.8%
	Somewhat satisfactory	28	45.9%
	Not at all satisfactory	1	1.6%
Valid		61	100.0%
Missing		0	
Total		61	

**Source: Survey, 2023**

## 2. Model Fitting Information:

This table presents information about the model's fit, including the likelihood ratio test.

**Table 4.13: Model Fitting Information**

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	152.092			
Final	96.025	56.067	5	.000

Link function: Logit.

**Source: Survey, 2023**

The -2 Log Likelihood test compares the final model to a model with only the intercept. A significant Chi-Square value ( $p < 0.05$ ) suggests that the final model fits the data better than the intercept-only model.

## 3. Goodness-of-Fit:

This table provides goodness-of-fit tests to assess how well the model fits the observed data.

**Table 4.14: Goodness-of-Fit**

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	169.188	231	.999
Deviance	96.025	231	1.000

Link function: Logit.

**Source: Survey, 2023**

The Pearson and Deviance tests assess the overall goodness of fit. A non-significant p-value suggests a good fit. The link function being "Logit" indicates the logistic regression nature of the ordinal model.

#### 4. Pseudo R-Square:

This table presents different pseudo R-squares to gauge the explanatory power of the model.

**Table 4.15: Pseudo R-Square**

<b>Pseudo R-Square</b>	
Cox and Snell	.601
Nagelkerke	.655
McFadden	.369

Link function: Logit.

**Source: Survey, 2023**

Pseudo R-squares help evaluate the proportion of variation explained by the model. Higher values indicate a better fit. The Nagelkerke value of 0.655 suggests a relatively good explanatory power. The Nagelkerke value of 0.655 which indicates that 65.5 percent of the variation in the cost performance of public construction projects could be accounted for by the combined effect of these five independent variables, project manager-related, organization related, contractor-related, external environment-related, procurement, and the other 35.5 percent remained unexplained.

#### 5. Parameter Estimates:

This table provides estimates for the thresholds and coefficients associated with predictor variables.

**Table 4.16: Parameter Estimates**

		<b>Parameter Estimates</b>						
		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[costp = 1.00]	8.926	3.591	6.180	1	.013	1.889	15.964
	[costp = 2.00]	10.542	3.660	8.297	1	.004	3.369	17.714
	[costp = 3.00]	13.561	3.906	12.055	1	.001	5.906	21.217
	[costp = 4.00]	19.629	4.377	20.114	1	.000	11.051	28.207
Location	Promanager	1.290	.625	4.268	1	.039	.066	2.515
	Contractor	1.307	.662	3.893	1	.048	.009	2.605
	Organiza	.274	.515	.284	1	.594	-.735	1.284
	Procurement	3.717	.802	21.479	1	.000	2.145	5.290
	External	-2.952	.928	10.125	1	.001	-4.771	-1.134

Link function: Logit.

**Source: Survey, 2023**

Project Manager-related factors exhibit a statistically significant influence on cost performance, as indicated by the Wald Chi-Square test with a p-value of 0.039. The interpretation suggests Project Manager-related factors, increases, the odds of achieving higher cost performance categories also increase significantly, with a factor of approximately 3.634. This underscores the importance of effective project management in enhancing cost performance in public construction projects.

Contractor-related factors similarly demonstrate a significant impact on cost performance, as evidenced by the Wald Chi-Square test with a p-value of 0.048. The interpretation emphasizes that an escalation in Contractor performance is associated with increased odds of achieving better cost performance by a factor of approximately 3.694. This underscores the pivotal role of contractors and related considerations in influencing the overall success of public construction projects in Jimma Town.

External Environment-related factors prove to be highly influential, supported by a highly significant Wald Chi-Square test with a p-value of 0.001. The interpretation indicates that an increase in management of external and supply related factor is linked to diminished odds of achieving better cost performance, with a factor of approximately 0.052. This highlights the need for astute management of external factors to mitigate potential negative impacts on cost performance.

Conversely, Organization-related factors do not show a statistically significant impact on cost performance, as reflected by a non-significant Wald Chi-Square test with a p-value of 0.594. This suggests that, in this specific context, organizational considerations may not play a statistically significant role in determining cost performance in public construction projects in Jimma Town.

The Procurement-related factors, including procurement strategy and contract management, exhibit a highly significant impact on cost performance, as indicated by a Wald Chi-Square test with a p-value of less than 0.001. The interpretation underscores that an increase in Procurement effectiveness is associated with substantially higher odds of achieving better cost performance, with a factor of approximately 41.160. This underscores the critical importance of strategic procurement practices in positively shaping the cost outcomes of public construction projects in Jimma Town.

## **CHAPTER FIVE**

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

This chapter provides a brief overview of the main things we learned in the study and the suggestions we are making based on those findings. We wanted to understand what makes public construction projects in Jimma Town, Oromia region, Ethiopia do well or not so well. We looked at a lot of data using both simple descriptions and more complex analyses. From what we found, we have come up with clear conclusions and ideas for what could be done to improve things.

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

The study on public construction project performance in Jimma Town yielded crucial insights into the factors influencing success. Notably, project managers' technical competence and experience emerged as paramount, with a Relative Importance Index (RII) of 0.88, underscoring their pivotal role in decision-making and problem-solving. Similarly, contractors' ability to ensure a steady supply of resources aligned with project needs (RII: 0.86) and financial stability (RII: 0.84) proved instrumental in maintaining project momentum and quality.

Medium-importance factors included contractors' experience in specific projects (RII: 0.79) and effective site management (RII: 0.77), emphasizing their substantial contributions to efficient execution and adherence to quality standards. Effective contract formulation and administration (RII: 0.76) and the support of top management (RII: 0.67) also significantly influenced project success.

Conversely, factors related to procurement methods and site challenges held lower importance, along with external influences like economic, environmental, and technical factors.

In terms of inferential results, ordinal regression analysis validated the significance of specific factors. Project Manager-related factors, Contractor-related factors, and External Environment-related factors demonstrated substantial impacts on cost performance. However, Organization-related factors did not exhibit statistical significance, emphasizing a contextual consideration.

## **5.2 Conclusions**

In this study, the investigation into the factors influencing the performance of public construction projects in Jimma Town provided valuable insights. The Relative Importance Index (RII) highlighted key factors classified into High, Medium, and Low importance categories. Notably, the technical competence and experience of project managers emerged as the most critical factor, emphasizing their significant influence on decision-making and problem-solving. Equally vital were contractors' abilities to ensure a consistent supply of resources and financial stability.

Medium-importance factors, such as contractors' project-specific experience and effective site management, played substantial roles in efficient execution and adherence to quality standards. Effective contract formulation, top management support, and other factors also significantly contributed to project success. Conversely, factors related to procurement methods, site challenges, and external influences like economic and political factors held lower importance in the context of project performance.

In the realm of inferential results, ordinal regression analysis confirmed the significance of specific factors. Project Manager-related, Contractor-related, and External Environment-related factors demonstrated substantial impacts on cost performance, while Organization-related factors did not exhibit statistical significance, highlighting the importance of a nuanced understanding of organizational contexts.

## **5.3 Recommendations**

Based on the discussion and findings from the search results, here are some possible recommendations for improving the performance of public construction projects:

1. Ensure that project managers have the necessary technical competence and experience to handle the complexities of construction projects., it's vital to prioritize hiring managers with a proven track record and providing continuous training and development. Regular evaluations, industry collaboration, and networking can further enhance their skills, ensuring successful project execution.
2. Ensure that there is a sufficient supply of goods/materials and services aligned with the project needs, schedules, and quality standards. Through a steady supply of goods, materials, and services in line with project needs, schedules, and quality standards by strengthening procurement processes and collaborating closely with suppliers.

3. Ensure that contractors have adequate cash flow and financial capabilities to undertake the works effectively and consistently. Guarantee contractors' operational effectiveness with sufficient cash flow and financial capabilities through consistent financial monitoring and strategic resource allocation.
4. Ensure that project team members are experienced and fully competent in their particular roles. Validate project team members' competency and experience in their respective roles by conducting thorough assessments and offering targeted training when needed.
5. Ensure that contractors have the necessary competence and commitment to the contract obligation. By making contractors' commitment to contract obligations by instituting clear expectations and regular performance reviews.
6. Ensure that contractors have adequate experience in similar projects. Secure contractors with relevant experience for similar projects to navigate complexities effectively and ensure successful project outcomes.
7. Ensure effective site management, control, and coordination are carried out by the contractors. Facilitate efficient site management, control, and coordination by assigning qualified contractors who adhere to project specifications and timelines.
8. Ensure effective contract formulation and administration. Effective contract formulation and administration through meticulous drafting, constant monitoring, and proactive issue resolution.
9. Ensure that project managers have managerial and leadership skills. Enhance project managers' leadership skills through tailored training programs and mentoring, enabling them to manage teams and projects adeptly.
10. Ensure top management support and commitment to the projects. Foster top management support and commitment by establishing open communication channels, aligning project goals with organizational objectives, and securing necessary resources.

## **Appendix I**

Business and Economics College  
Semi-structured Questionnaire

*Dear Respondents: I am post graduate (Master’s) student in the Department of project management and Finance at Jimma University. I am carrying out a study on the topic: “Factors Affecting the Performance of Public Construction Projects: A Study in Selected building construction Projects in Jimma Town, Ethiopia” The purpose of this questionnaire is only to collect relevant data to complete this research work. Therefore, you are, kindly requested to fill out the questionnaire in order to give the necessary information. Your response will be kept confidential and used only for academic purpose.*

<b>Part A: Give your Background Information in the space provided</b>		
Project Type: _____  Respondent Type _____ Age: _____ Gender: _____ Education level: _____	Job Position: _____ Working Experience: _____	

**SECTION B: Factors Affecting the cost, time, and quality performance of projects**

*Question 1: To what extent do the factors listed in the statements in the table below affect the Performance of your Projects?*

*Note: 1=Not at all    2= Slight    3=Moderate    4=Great    5=Very great*

<b>ii. Organization-related factors</b>						
	<b>Statements</b>	1	2	3	4	5
1	There is top management support and commitment to the projects.					
2	The project has secured adequate funding/ budget for completion.					
3	The project has an appropriate organizational structure that facilitates project success					
<b>iii. Procurement and contract-related factors</b>						
4	There is the use of effective procurement and tendering methods.					
5	There is an effective contract formulation and contract administration.					
6	There is a sufficient supply of goods/ materials and services aligned with the project needs, schedules, and quality standards					
<b>iv. Project manager and team-related factors</b>						
7	The project managers have the necessary technical competence and experience.					

8	The project managers have managerial and leadership skills.					
9	The project managers are empowered with the authority to take decisions.					
10	The project team members are experienced and fully competent in their particular roles.					
11	The project teams have a team spirit and commitment to the project's success.					

**v. Contractor-related factors**

12	The contractors have the necessary competence and commitment to the contract obligation.					
13	The contractors have adequate experience in these particular projects					
14	Effective site management, control, and coordination are carried out by the contractors					
15	The contractors have cash flow/ financial capabilities to undertake the work effectively and consistently.					

**vi. External and work environment factors**

16	The project is not affected by economic-related factors (e.g. exchange rate, inflation, price escalation, etc.).					
17	The projects are not affected by political related factors (e.g. political interference, political conflicts, vandalism, etc.).					
18	The projects are not affected by technical and technological related factors (e.g. method of construction etc.).					
19	The projects are not affected by physical environmental factors (e.g. harsh weather conditions, etc.).					
20	The projects are not affected by site-related factors (e.g. access roads, ground conditions, challenging terrains, other unforeseen conditions, etc.).					

**Performance Measures**

		Please tick (√) the appropriate answers to indicate your reactions to the following statements				
Statements		Not at all	Slight	Moderate	Great	Very great
		1	2	3	4	5
<b>Performance measures</b>						
1	The project is progressing as per the schedule or within the planned timeline.					
2	The project cost is within the allocated budget or as per the planned budget.					
3	The project work meets the required quality standards.					
4	Overall, stakeholders are satisfied with the progress and outcomes of the project.					

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