ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

SUPPORTED DISTANCE EDUCATION PROGRAM

EFFECTS OF MATERIAL PROCUREMENT PROCESSES ON THE TIMELY DELIVERY OF CONSTRUCTION PROJECT: THE CASE OF ADDIS ABABA CONDOMINIUM HOUSES.

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DECLARATION

I declare that this project work entitled, **effects of material procurement processes on the timely delivery of construction project: the case of Addis Ababa condominium houses** is my original work has not been presented for any other university and is not concurrently submitted in candidature of any other degree, and that all source of material used for the thesis have been duly acknowledged.

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STATEMENT OF CERTIFICATION

This is to certify that MESKEREM DEJENE HAILU has carried out this research project on the topic entitled "**effects of material procurement processes on the timely delivery of construction project: the case of Addis Ababa condominium houses' under my supervision** .This work is original in nature and is sufficient for submission for the partial fulfillment for the award of degree of masters of Art in Project management

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COLLAGE OF BUSINESS AND ECONOMICS

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GRADUATE PROGRAM IN PROJECT MANAGEMENT

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TABLE CONTENTS

DECLARATION i
STATEMENT OF CERTIFICATION ii
ACKNOWLEDGMENT iv
TABLE CONTENTS v
LIST OF FIGURES viii
LIST OF TABLE viii
LIST OF ABBREVIATION ix
ABSTRACT x
CHAPTER ONE: INTRODUCTION 1
1.1 Background of the study 1
1.2 Statement of the problem 2
1.3 Basic research questions 4
1.4 Objective of the study 4
1.4.1 General objective 4
1.4.2 Specific objective 4
1.5 Hypothesis of the study 4
1.6 Significance of the study 5
1.7 Delamination /scope of the study 6
1.8 Limitation of the study 6
1.9 Organization of the study 7
CHAPTER TWO: REVIEW OF RELATED LITERATURE 8
2.1 Introduction 8
2.2 Theoretical Literature 8
2.2.1 Material procurement processes in construction projects 8
2.2.2 Factors affecting procurement processes 9
2.2.3 Timely delivery of construction projects 10
2.2.4 Factors affecting the timely delivery of materials 10
2.2.5 Theories on Material procurement and project performance. 11
2.2.6 Procurement Procedures 12
2.2.7 Materials procurement practice in Construction Industry 12

2.2.8 Material Management Practices 13
2.2.8.1 Planning 13
2.2.8.2 Procurement 13
2.2.8.3 Logistics 13
2.2.9 Public Procurement Method in Ethiopia 14
2.2.10 Success Criteria Reflecting Project Performance 16
2.2.11 Procurement Related Success Factors' effect on project performance 18
2.3 Empirical Literature 19
2.3.1 Procurements in projects 20
2.3.2 Procurement management and a project's success 20
2.3.3 A Case studies related to construction performance projects in Addis Ababa. 21
2.3.4 Gap Identification 22
2.4 Concept framework 22
CHAPTER THREE: RESEARCH METHODOLOGY 24
3.1 Introduction 24
3.2 Research Approach 24
3.3 Research Design 25
3.4 Study Population, Sampling, and Sample Size 25
3.5 Sampling Techniques 25
3.6 Methods of Data Analysis 26
3.7 Regression Analysis 27
3.8 Validity Test 27
3.9 Reliability Test 27
3.10 Ethical Considerations and Ethical Clearance 28
CHAPTER FOUR –RESULT AND DISCUSSION / DATA 29
4.1 Introduction 29
4.2 Types of procurement used for the Bole Arabsa site condominium 29
4.3 General Information about the Respondents 29
4.4 Site Related Responses 32
4.5 Data Analysis 34
4.6 Descriptive Statistical Analysis 34

4.6.1 Mean and Standard Deviation for Material Purchasing Practices 34
4.6.2 Mean and Standard Deviation for Material Logistics Practices 34
4.7 Descriptive Statistical Analysis of Project Performance Related Questions 36
4.7.1 Mean and Standard Deviation for project performance effect on economic performance 36
4.7.2 Mean and Standard Deviation for project performance effect on time performance 36
4.7.3 Mean and Standard Deviation for project performance effect on quality performance 37
4.7.4 Mean and Standard Deviation for project performance effect on environmental performance 37
4.7.5 Mean and Standard Deviation for project performance effect on innovation performance 38
4.7.6 Mean and Standard Deviation for Material Stock & Waste control Practices 38
4.8Auto Correlation (Durbin Watson Test) 39
4.9 Multiple Regression Analysis result 39
4.9.1 Linearity Test 40
4.9.2 Homoscedasticity Test 40
4.10 Summary of the findings 41
4.11 Effect of Material Procurement Practice on Project Performance 42
CHAPTER FIVE-CONCLUSION AND RECOMMENDATION 46
5.1 Conclusion 46
5.2 Recommendation 47
References 48
APPENDIX 52

LIST OF FIGURES

Figure 1 concept framework 23
Figure 2 respondent survey blocks completed on a given time 32
Figure 3 respondent view personal opinion 33
Figure 4 Respondents view 33
Figure 5 A linearity test shows the associations between the dependent and independent variables. 40
Figure 6 A Homoscedasticity Test showing the equal variance of errors across all levels of the independent variables Source: Researcher survey on NOV 2023 41

LIST OF TABLE

Table 1 Procurement procedures relation to competition and cooperation 19
Table 2General information about the respondents 30
Table 3 Position of respondents 30
Table 4 Educational level of respondent 31
Table 5 Respondent profession 31
Table 6 Work Experience of respondents 31
Table 7 Mean and standard deviation for material purchasing practice 34
Table 8 Mean and standard deviation for material logistics practices 35
Table 9 Mean and standard deviation for material handling practices 35
Table 10 Mean and Standard Deviation for project performance effect on economic performance 36
Table 11 Mean and Standard Deviation for project performance effect on time performance 36
Table 12 Mean and Standard Deviation for project performance effect on quality performance 37
Table 13 Mean and Standard Deviation for project performance effect on environment performance 37
Table 14 Mean and Standard Deviation for project performance effect on innovation performance 38
Table 15 Mean and standard deviation for material stock & waste control 38
Table 16 Auto Correlation model summery 39
Table 17 Model summary of R value & R square value 43
Table 18 Regression analysis of ANOVA result 44
Table 19 Regression analysis Coefficient result 44

LIST OF ABBREVIATION

No		
1	A.A	Addis Ababa
2	AACGHDO	Addis Ababa City Government Housing Development Office
3	AACGHDPO	Addis Ababa City Government Housing Development Project Office
4	AAHCPO	Addis Ababa Housing Corporation Project Office
5	EBRD	European Bank for Reconstruction and Development
6	MPP	Material procurement practice
7	PP	Project performance
8	RDT	Resource dependency theory
9	RFP	Request for Proposal
10	RRI	Ranking and computation of relative importance index
11	S.d	Standard Deviation
12	SCM	Supply chain management

ABSTRACT

When a construction project is finished on schedule, within the allocated budget, and with the agreed-upon quality, in accordance with the specifications, and to the satisfaction of the stakeholders, it is often regarded as a success. The goal of the study is to examine how construction project performance (PP) in Addis Ababa (A.A) condominium homes is impacted by procurement procedures for building materials in the case of Bole Arabsa (B.A). The study is an explanatory research type based on its purpose and focused on a critical assessment of finding effect of construction material procurement on condominium construction project. The study included mixed types of qualitative and quantitative data, and those data were analyzed and interpreted with descriptive statistics and simple quantitative techniques. According to the analysis, the independent variables, including planning, purchasing, handling, logistics, stock, and waste control, have a significant impact on the dependent variable, as indicated by a strong relationship (regression coefficient of 93.6%). Though the adjusted R-square implies D.V is affected by 85.7% of the I.V. Also 76.3% of the time the project office uses a restricted bidding system for material procurement. Incorporating evidence from literature reviews, and a questionnaire survey, this study recommends that, to increase the PP economic, time, quality, environmental, and innovative performance of condominium house constructions in A.A, the AACAGHDO should give more attention to material procurement practices in order to have improved PP of future condominium house constructions. Secondly, the office should also give attention to creating an understanding of how material procurement planning has a significant role on condominium construction PP.

Keywords: Project performance, material procurement practice, condominium house construction, housing project office.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Construction industry is a significant sector that contributes significantly to the development of the country. A construction project is considered successful when completed within the given schedule, budget, and agreed quality, in compliance with specifications and stakeholder satisfaction (Assaf & Al-Hejji, 2006). Construction materials are one of the most significant cost components in any project and can account for 50% to 70% of total construction costs, depending on the project type (Gulghane & Khandve, 2015). The high cost of material handling is responsible for such significant costs, ranging from 30–80% of the total construction cost (Proverbs et al., 1999).

Factors that significantly affect project performance include materials shortage delays, unavailability of resources, low project leadership skills level, escalation of material prices, unavailability of highly experienced and qualified personnel, and poor quality of available equipment and raw materials (Enshassi et al., 2009). Ineffective material management can result in an inevitable loss for a construction project. According to Wanjogu et al. (2015), material management is the process of planning, executing and controlling the field and office events in construction. It involves the planning and control of necessary efforts to ensure the right quality and quantity of material and equipment is specified promptly, obtained at a reasonable cost, and available when needed.

According to Shehu et al. (2015), lack of proper material management in construction projects results in delays, cost overrun, construction waste and low productivity. Material management plays a crucial role in the construction industry by ensuring that the right quality and quantity of materials are appropriately selected, purchased, delivered, and handled on-site in a timely manner and at a reasonable cost. Gulghane & Khandve (2015) note that there is no proper system for procurement of construction materials, leading to countless project delays due to late delivery of materials. In many project plans, material delivery is shown as a single arrow, which indicates how significant material procurement is in controlling project cost and timely completion.

Despite the importance of material procurement, current practices in the construction industry face various challenges that negatively affect construction projects with regard to cost, quality

and time. Previous research did not explore the full extent to which Material Procurement practice affects construction project performance. Ethiopia's construction industry involves several parties, including owners, consultants, contractors, and small enterprises, making it complex. Efficient material management is crucial to ensuring timely construction, but issues such as delayed deliveries, inadequate storage, and poor on-site control can still result in delays. The government's affordable housing project in Addis Ababa faces challenges due to the interpretation and implementation of the project delivery method. Therefore, this research aims to evaluate the impact of material procurement processes on the timely delivery of mass housing projects in Addis Ababa.

1.2 Statement of the problem

The project work often depends on materials procured for the project. The delivery of these materials influences the scheduling of the project, and often some materials are needed earlier than normal procurement practices would deliver. The time overrun in construction projects has become one of the most common problems in the industry that causes a multitude of negative effects on the projects and its stakeholders.

In Ethiopia, most project works are being affected due to the lack of effective procurement process, which is the main cause of insufficient service delivery in all public sectors (Anteneh, 2015). According to Lu 2011, purchasing is a means of obtaining materials or services of the right quality in the right quantity from the right source and delivering them to the right place. But most organizations give less attention to the contribution of purchasing which is traditionally viewed as clerical stuff. Failures in recognizing the importance of purchasing activities are caused by an organization unable to integrate the purchasing function with its operational functions. In these cases, organizations are faced with the danger of output disruptions, loss of income, and negative effects on competitiveness (Giunipero, 2005). These major project constraints are interrelated and dependent on one another, so failure on one of those will affect the project as a whole.

According to AAHCPO at that time the project office was planning to construct 50,000 condominium houses every year. However, the project office up to August 2016 constructed and transferred only 179 thousands of condominium houses. This shows the project office is incapable of constructing the condominium houses according to the schedule. According to the

project office Planning and budget department, the project office is planning to construct the houses within 18 months but practically the project office was taking more than 36 months or more than 3 and 4 years. At Arabsa site construction took almost 5 years to complete and transfer the houses to residents due to several reasons.

An important factor that affects the performance of construction projects is the improper handling of materials during site activities. This an effort to analyze the Process analysis of material Procurement management by generating strategies to improve the procurement process in government projects. To avoid delays mainly the material planning to be carried out on time with the relevant material details material approval, material lead time, and material delivery and to be properly tracked. One or combination of Information and Communication Technology helps in effective management of materials at various stages of construction (Sarode & Bhangale, 2020).

Moreover, in developing country, many procurement activities still suffer from neglect, lack of proper direction, poor coordination, slow with a number of bureaucracy, lack of open competition and transparency, lack of accessibility, differing levels of corruption and not having a cadre of trained and qualified procurement officer, who are capable to conduct and manage the procurement process in a professional, timely and cost effective manner (Wanyonyi & Muturi, 2015). Procurement related success factors, from the design stage to performance evaluation, and a wide range of success criteria. This will make it possible to analyze if and how different factors & criteria interact and affect each other.

Therefore, to fill this gap, this study aims to investigate and identify how it can affect insufficient materials procurement if the materials are not delivered in the right quantity, at quality, at the right time and also from the right source. Even if the materials are delivered on time, it might not fulfill the quality requirements of materials according to contract documents or specifications. It also affects the project negatively such as time and cost overruns, low productivity, poor quality and inadequate customer satisfaction.

1.3 Basic research questions

- What procurement processes are used to procure materials in condominium house construction in Addis Ababa?
- What are the effects of material procurement on the on-time delivery of condominium houses?
- What kind of remedial will prevent future inconvenience in material procurement of condominium houses?

1.4 Objective of the study

1.4.1 General objective

The main objective of this research is to examine the impact of material procurement on the timely project delivery of construction works in Addis Ababa condominium houses.

1.4.2 Specific objective

In order to handle the research questions and realize general objective stated above, the study deals with the following specific objectives:

- To assess the existing process involved in material procurement for Addis Ababa in Bole Arabsa condominium house construction.
- To identify the effects gained and lost due to the material procurement practiced in the condominium housing project.

1.5 Hypothesis of the study

Based on the research objectives set above, the following hypotheses were formulated to be tested:

- H1- Bole Arabsa condominium house construction in Addis Ababa experiences delays and cost overruns as a result of the ineffective material procurement method currently in place.
- H2- On the whole, the condominium housing project in Addis Ababa is of a very high quality, both in terms of construction and visual appeal, due to the modern material procurement procedures.
- H3-Effective material procurement procedures can lower expenses, raise overall satisfaction among the homeowners, and enhance the quality of the condominium housing project.

The use of effective material procurement processes in condominium house construction in Addis Ababa significantly improves the timely delivery of condominium houses and the implementation of remedial measures can prevent future inconvenience in material procurement."

1.6 Significance of the study

While the above research seeks to provide contributions to the research area, the primary focus of the study is identification of effects of material procurement practice on construction project performance. The findings from this study will provide inputs for further research works such as an impact assessment of project delays, project in timely delivery and cost problems and mitigation techniques against delays and cost overruns. Moreover, the study identified that impact of overall procurement on completion time of the Addis Ababa condominium houses construction projects that can be used as a benchmark and reference to control the existing and future projects. Apart from this research being useful to the field professionals, it would be also valuable for the academic. The study will also serve as a source of references of what the past researchers have written on effects of overall procurement practice on construction projects performance in other places and Addis Ababa city.

Furthermore, it will also provide information for further researchers, additional verifications and consolidation of the findings here too. Here are some potential contributions that the research on the effects of material procurement processes on the timely delivery of construction projects in Addis Ababa, condominium houses may make:

Practice: Construction managers and contractors can use these research findings to optimize material procurement processes and reduce delays in project completion. This can lead to improved project delivery times, cost savings, and increased revenue, ultimately benefiting the construction industry.

Social significance: Construction of condominium houses in Addis Ababa is a crucial aspect of bridging the housing gap in the city, and timely delivery of these projects means more families can move in, leading to social improvement and better living conditions.

Policy: Policymakers can use the insights from the research to develop policies that promote effective procurement processes within Addis Ababa's condominium house construction sector.

For example, the research could inform policies that promote the use of specific procurement practices or the adoption of standardized procurement guidelines.

Academics: This research can contribute to the academic literature on procurement practices in the construction industry, specifically within the context of Addis Ababa. Academic researchers can build on the findings to further explore the topic and develop a deeper understanding of the issue at hand.

Research: The research can identify gaps in the literature and suggest areas for future research. This could lead to the development of new theories, models, or methodologies that can contribute to the advancement of knowledge in the field.

1.7 Delamination /scope of the study

The research focuses only on material procurement practice on construction projects performance in the case of Addis Ababa condominium houses constructed by the Addis Ababa city administration. Because, above ninety-nine percent of condominium houses construction projects are constructed by the city government

The study analysis bases its location in Ethiopia, Addis Ababa, Bole Arabesa Condominium. Because of there are so many condominiums in Addis Ababa that it is not convenient to review them all and the given time to conduct the research and the budget required to conduct the research in a country level is improbable .The research is also focused on the identification of effects of overall procurement practice on construction project performance works in Addis Ababa condominium houses.

1.8 Limitation of the study

A potential drawback of the research on the procedures used in Addis Ababa Bole Arabsa condominium house construction overall procurement and their effects on the project is the sample size and representativeness of the data. Depending on how the research was conducted, the researchers may have only gathered data from a small number of sites or stakeholders, which may not be generalizable to the entire population of Addis Ababa Bole Arabia condominium construction projects or may not reflect the views of all actors involved. Therefore, the findings and recommendations of the study should be interpreted with caution and verified through

additional research. Additionally, the study may have relied on self-reported data or biased sources, which could affect the accuracy and reliability of the results.

and recommendations of the study should be interpreted with caution and verified through additional research. Additionally, the study may have relied on self-reported data or biased sources, which could affect the accuracy and reliability of the results.

1.9 Organization of the study

The research was organized into five main chapters, which is summarized below. The first chapter discusses the general introduction part which introduces the background of the study, statement of the problem, objectives of the study, research question, and significance of the study, scope of the study and organization of the thesis. The literature review, Conceptual framework, Empirical and theoretical literatures will be reviewed in the second chapter. The third chapter will briefly present the study area, research approach, design and methodology, population and sample, data sources and types and the procedures used to collect and analyze them and also it contains the collected primary data from observation, interview and review of documents and secondary data will be analyzed. The Fourth chapter will answer research questions, objectives and provide systematic evidence for better enhancing, verifying results for the research main objective and include the result of data analysis. Finally, the last Fifth chapter concludes by summarizing the research recommendation and conclusion.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Introduction

In this chapter, the researcher will review relevant literature which is related to the title in the study area. The chapter includes concepts and ideas, practices of procurement and organizational performance. The conceptual framework of the research and empirical evidence are included.

2.2 Theoretical Literature

2.2.1 Material procurement processes in construction projects

The timely delivery of construction projects is a critical performance measure for many stakeholders involved in construction projects, including owners, contractors, and suppliers. Material procurement processes play a significant role in the timely delivery of construction projects. Several theoretical frameworks and models have been developed to study the impact of procurement processes on project delivery times.

The Transaction Cost Economics (TCE) theory is one such framework that has been used to study the impact of procurement processes on project delivery times. According to TCE, procurement decisions are influenced by transaction costs associated with the different procurement options available. The TCE theory suggests that the procurement method that minimizes transaction costs is the most appropriate. In the context of construction projects, the TCE theory suggests that procurement methods that involve closer collaboration and improved communication among stakeholders, such as the design-build method, can lead to more effective procurement processes and improve project delivery times (Tekleab et al., 2017).

The Resource-Based View (RBV) theory is another theoretical framework that has been used to study the impact of procurement processes on project delivery times. According to RBV, resources are a source of competitive advantage and contribute significantly to project success. Procurement processes are viewed as a critical resource that affects project delivery times. RBV suggests that procurement methods that improve the quality of procurement resources, such as procurement expertise, can lead to more effective procurement processes and improve project delivery times (Gebrezgi et al., 2019).

The Organizational Learning (OL) theory is another theoretical framework that has been used to study the impact of procurement processes on project delivery times. According to OL,

organizations learn from their experience and use this knowledge to improve their performance. In the context of procurement processes, OL suggests that organizations that learn from past experiences and continuously improve their procurement processes are likely to have better project delivery times. The OL theory stresses the need for organizations to build procurement expertise, promote communication and collaboration among stakeholders, and use performance metrics to evaluate and improve procurement processes (Seifu, 2018).

2.2.2 Factors affecting procurement processes

- **Contractor Selection:** The process of selecting contractors who are capable of delivering the required materials on time is important in ensuring timely delivery. Poor contractor selection can result in delays or materials not meeting project requirements.

- **Price:** Pricing is also an important consideration in procurement processes. Finding the best pricing that meets project requirements and timeframe is essential to keep the project within budget and on schedule.

- **Quality control**: Ensuring the quality of the material procured is important to keep the project on schedule. Poor quality materials can lead to rework or delays in the project timeline.

- **Lead Time**: Procurement lead time can impact delivery timeline of the project. Long lead times that are not sufficiently planned for can cause delays to the project schedule.

- **Availability:** The availability of materials can impact the timely delivery of construction projects. Materials that are difficult to source or that have long lead times can result in project delays.

- **Delivery Time**: Ensuring the timely delivery of materials to the construction site is critical to meeting project timelines.

- **Payment Terms:** Payment terms can also impact procurement processes. Negotiating suitable payment terms with suppliers is important in ensuring timely delivery.

- **Regulatory Requirements:** Compliance with regulatory requirements is also important in the procurement process. Non-compliance can lead to project delays and possible legal issues.

2.2.3 Timely delivery of construction projects

Timely delivery is the successful completion of a construction project within the planned or predetermined time limit is referred to as timely delivery of construction projects. In the construction industry, project delays unquestionably have a detrimental financial and reputational impact on clients, contractors, and other stakeholders. The timely delivery of construction projects is crucial for ensuring the effective and efficient use of resources as well as the achievement of project goals and objectives.

2.2.4 Factors affecting the timely delivery of materials

- **Procurement process:** Timely execution of construction projects depends on efficient procurement procedures. An ineffective procurement procedure may cause budget overruns, misunderstanding, and material unavailability, which could delay the project's completion.
- **Coordination between Procurement and Project team:** Coordination between the procurement team and the project team is critical in ensuring timely delivery. Lack of coordination can lead to delays in delivery or miscommunication on material specification that can impact the project timeline.
- **Communication:** Clear communication channels between procurement team and project team is crucial for timely delivery. Miscommunication or ambiguities in communication can result in misunderstandings, delivery delays, or materials not meeting project requirements.
- **Lead Time:** Procurement lead time can impact delivery timeline of the project. Long lead times that are not sufficiently planned for can cause delays to the project schedule.
- **Quality control:** Ensuring the quality of the material procured is important to keep the project on schedule. Poor quality materials can lead to rework or delays in the project timeline.

- **Change Management:** In situations where there are changes to the project scope or design, a good change management process is critical to minimize delays and keep the project on schedule.

- **External Factors:** External factors such as logistics, import requirements, fluctuation of material costs, and geopolitical instability can also impact the timely delivery of construction projects related to procurement.

2.2.5 Theories on Material procurement and project performance.

By using different theoretical frameworks, analysts can gain a multi-dimensional perspective of material procurement for the construction of Addis Ababa condominium houses and can identify specific areas where interventions would be most effective in improving timely delivery. The following list includes four theories drawn from various literary sources.

A. Agency theory

A conflict of interest between owners and managers led "Stephen Ross and Barry Mitnick to develop agency theory in 1973." When one party (the principal) delegated control and decision-making over particular tasks to another party (the agent), agency theory was relevant (Eisenhardt, 1989). The Agency theory ensures that tasks are assigned to accountable individuals who will make decisions affecting the project, making it particularly effective in planning during project implementation. It also emphasizes how project performance, the dependent variable, is impacted by activities like purchasing, storing, and transporting materials.

B. The Resource Dependency Theory

Gerald Salancik and Jeffrey Pfiffer developed Resource Dependency Theory in 1987. (Pfeffer & Davis-Blake, 1987) "The theory focuses on a set of power relationships based on the exchange of resources." It acknowledges that businesses frequently rely on one another because they lack some of the resources they might need to create value (Hunt & Morgan, 1996). This theory works especially well for moving and storing materials. Given that the material used in the process is extremely scarce, effective transportation and storage are required. To maintain their functional and operational requirements, organizations must manage their power-dependence relationships (Pfeffer & Salancik, 1978). RDT assumes that organizations frequently form coalitions to increase their influence and make decisions.

C. The Network theory

Network theory is a sociological theory that examines the relationships and interactions between different individuals or organizations within a network environment. It highlights the importance of partner-to-partner relationships on an organization's operations and recognizes the influence of network dynamics. (Halldorsson, Kotzab & Skjoett-Larsen, 2007) The theory emphasizes the notion of strong and weak ties and considers key triggers for inter-organizational connectedness that managers can use to develop a more realistic assessment of resources and their implications for resource acquisition and coordination. (Fayezi, Zutshi & O'Loughlin, 2010).

D. The Relational Exchange Theory

This theory centers on the idea of embeddedness, which suggests that cooperative parties act based on certain norms, as opposed to contractual obligations. (Kuchler, 2018) It emphasizes soft control mechanisms to attenuate opportunism. Larson (1992) predicts that trust-based relationships are less prone to partner opportunism. Trusting relationships assist in dedicating resources to developing and maintaining relationships, rather than managing transactional tensions or abnormal behaviors in the supply chain (Joshi & Stump, 1999).

2.2.6 Procurement Procedures

(Shaw, 2010) points out that the procurement process can be wrapped into three steps. These are

1) Planning and Specification of Goods or Services Required
2) Sourcing, Awarding and Supplier Management
3) Placing Orders and Contracting
4) Progressing /Expediting
5) Delivery and Return
6) Payment
7) Records of Procurement Documents

2.2.7 Materials procurement practice in Construction Industry

At the planning stage, it is necessary to forecast the company's sales and buy the various materials needed for production. The functions carried out by the materials procurement practice include purchasing, material procurement, transportation, storage, inventory control, quality control and inspection of materials, material handling, packaging, obsolete material disposal, and finished goods safety and care.

According to John (2013), the importance of material management to the entire production process cannot be overstated. Materials management activities actually begin before production even starts by providing the best materials needed for production and their supply at various production stages.

2.2.8 Material Management Practices

It involves the planning, procurement, handling, stock & waste control, and logistics surrounding materials on construction projects. A good materials management environment enables proper materials handling on construction sites. In order to better understand materials management, the following processes are discussed: planning, procurement, logistics, handling, stock & waste control.

2.2.8.1 Planning

The materials planning process involves establishing and maintaining records of every part used in each plant, in order to determine target inventory levels and delivery frequency required (Tanko et al., 2017). Effective management of these materials records is crucial for the smooth flow of materials at a site and helps to minimize problems of shortage or delay, such as materials being out of stock or undelivered.

2.2.8.2 Procurement

The objective of procurement in material management is to provide quality materials at the right time and place, and at an agreed budget. (Adeyinka et al., 2014) states that it is about organizing the purchasing of materials and issuing delivery schedules to supplier and following up, to make sure that suppliers deliver on time.

2.2.8.3 Logistics

This idea places a focus on movement and includes organizing, carrying out, and managing the movement and storage of all goods—from raw materials to finished goods—in order to satisfy customer needs (Ogunde et al., 2017). Construction-related raw materials frequently come in a variety of shapes and sizes, are heavy, and require careful handling during the supply chain. Increasing coordination and communication between project participants during the design and construction phases, especially in the materials flow control process, is the main goal of logistics in any construction project (Fleischmann et al., 2012).

2.2.9 Public Procurement Method in Ethiopia

The Federal Negarit Gazeta (2005, pp 2963) sates that except as otherwise provided in this Proclamation, the procuring entity shall use open bidding method as the preferred procedure of procurement. Even though it is common that each method has its own advantage and drawback, the Ethiopian government prefers the bidding method of purchasing especially; open bidding way to perceive the advantage gained by such method. On the other hand, in most public procurement guidelines and manuals, procurement methods are identified by different names for groups of procurement categories. According to (Lynch & Angel, 2013) public procurement methods are the procedures used by procuring entities to acquire goods, services and construction works. He classified Public procurement as competitive or noncompetitive. There is a preference for using competitive methods, given that they are likely to promote transparency, economy and efficiency, and limit favoritism. By referring UNCITRAL Model Law on Public Procurement, he further classified as open tendering, request for proposals, two-stage tendering, restricted tendering, request for quotations, and single-source procurement.

The Federal Democratic Republic of Ethiopia, Public Procurement and Property Administration Agency (2011, PP: 47) by quoting Proclamation Article 33: list the following methods of procurement. The following methods of procurement shall be used in public procurement:

a) Open Bidding (Tendering)

A purchasing procedure whereby potential suppliers are invited to make a firm and unequivocal offer of the price and terms on which they will supply specified goods or services, which, on acceptance, shall be the basis of a subsequent contract, is called a tender, as defined by Lysons and Farrington (2006). Alternatively, Lewis (2005, pp. 1) elaborates that a formal written offer to undertake work or provide services for a stated price is also called a tender. Lysons and Farrington (2006) further explain that prospective suppliers are invited to compete for a contract advertised in the press or on the internet, with the lowest tender generally being accepted, although the advertisers usually state that they are not bound to accept the lowest or any tender.

b) Two-Stage Tendering

According to The European Bank for Reconstruction and Development (EBRD, 2014), a two-stage tendering procedure shall be used when it is difficult to prepare complete technical specifications in advance. First, unpriced technical proposals based on a conceptual design or

performance specifications are invited, subject to technical as well as commercial clarifications and adjustments.

c) Restricted (Selective) Tendering

According to Odhiambo and Kamau (2008), restricted tendering is a method of obtaining bids through direct invitation rather than public advertisement. In this scenario, the procuring entity will contact suppliers directly to invite them to participate in the tendering without prior notice. Both national and international tenders can be restricted. In restricted national bidding, prequalified providers are directly invited to submit bids, as opposed to only prequalified international firms in open international bidding.

d) Request for Quotations

According to Lynch (2013), the benefits of the request for question procurement method include the procurement process taking an excessively short amount of time and a higher likelihood of receiving responses to the request for quotations. Requests for quotations, however, have the following drawbacks:

- It may be possible to repeatedly request quotes from a select and reduced number of businesses even though the goods, services, or works are available from a greater number.
- It limits competition because only a small number of suppliers are invited.
- It is vulnerable to abuse because requirements are split into smaller sizes in order to justify applying this method of procurement.

e) Direct purchase

According to Tacle (2014), the direct method is typically used when a single supplier or contractor is the only one providing the product. It may also be used in situations where there is an urgent need and delaying would pose serious risks to the procuring entity's performance; when continuing an already satisfactorily completed consulting service would be in the interests of economic efficiency; when "shopping" becomes necessary (as will be covered below); and when there are infrequent but extremely advantageous opportunities. This method's flaw is that it is both anti-competitive and discriminatory.

f) Request for Proposals

The Request for Proposal (RFP) is a two-envelope procurement method that can be used to obtain goods, services, or works, according to Lynch J. (2013, p. 8). It is employed when a particular procurement requirement requires suppliers, contractors, or service providers to propose a specific solution (methodology and work plan).

Technical and financial proposals must be submitted by organizations in separate envelopes. The technical proposal is assessed first, and then ranked using pre-established evaluation standards. Only the financial proposals of the organizations that receive a minimum qualifying mark (score), as specified in the RFP, on the technical evaluation are opened and assessed.

2.2.10 Success Criteria Reflecting Project Performance

Cost, time, and quality are the three project performance criteria that have historically drawn the attention of researchers and organizations (Dainty et al., 2003; Chan and Chan, 2004; Swan and Khalfan, 2007). However, in recent years, many studies have also taken into account other performance factors, such as health and safety, environmental performance, customer satisfaction, innovation, and customer satisfaction (Chan and Chan, 2004; Collins and Baccarini, 2004; Swan & Khalfan, 2007). Next, we'll briefly go over six criteria that can be used to determine whether a construction project is successful.

i. Economic performance

This has traditionally been seen as one of the most important areas – if the economy of the project is off, the project can seldom be seen as a success. Overall project cost, i.e. the overall cost that a project incurs from inception to completion, is of major interest as it shows the resource usage in economic terms. Another important aspect regards cost predictability, that is, whether the final overall cost is in line with the initial cost estimate (Swan & Khalfan, 2007).

ii. Time performance

Our globalized society's growing emphasis on time has had an impact on the construction sector in the form of compressed project timelines. The number of days, weeks, or months a project will take to complete is known as its duration. Project duration is frequently of the utmost importance because time can be a crucial concern for many clients. Overruns on the schedule,

however, might be an even bigger problem. The construction industry is frequently criticised for project delays (Chan & Kumaraswamy, 1997), (Odeh & Battaineh, 2002), (Faridi & El-Sayegh, 2006), and (Swan & Khalfan, 2007). Project completion in a predictable manner on time (within schedule) is an important indicator of project success. Schedule overruns, also known as time growth, are frequently very detrimental because they prevent the client from using the finished product as intended.

iii. Quality

If the project produces subpar quality, satisfactory time and cost performance are of little value. Customer satisfaction has gradually gained importance in the construction industry, and the concept of quality is closely related to it (Latham, 1994; Egan, 1998; P. J. Forsythe, 2007). A comparison between a customer's pre-purchase expectations and their post-purchase perceptions is a common way to define customer satisfaction. As a result, it concerns the client's ultimate perception of whether the result provided a satisfying or unsatisfactory experience (P. Forsythe, 2007).

iv. Environmental performance

Since the actors began to recognize that the construction industry is one of the major contributors to environmental problems in recent decades (Crawley & Aho, 1999; Tam, Tam, Shen, et al., 2006; Tam, Tam, Yiu, et al., 2006), environmental management in construction has grown into a critical issue. Both the activities carried out during the construction process and the materials and technical solutions incorporated in the finished product have an impact on the environment (Crawley & Aho, 1999).

v. Work environment

Having a safe and healthy work environment for those involved in the construction process is another important indicator of a successful project performance. Construction has a poor record in this area and is still today generally a dangerous workplace (Teo et al., 2005). However, this does not mean that a project can allow the work environment to continue to cause project participants to become ill or even die. Rather, it is the opposite. A construction project must not harm those involved if it can be helped. A failure to succeed with this may cause long-term problems as it reduces the legitimacy of those responsible.

vi. Innovation

Traditionally, the construction sector has been seen as a low-tech industry, with little innovation compared to other industries (Reichstein et al., 2005),(Harty, 2008). Actually, many of the problems outlined in the introduction can be seen as symptoms of a lack of new thinking and innovative action. in recent years, innovation in construction has received increasing interest in an explicit manner, both among practitioners and academics. Innovation thus seems to be a success criterion to be reckoned with. There are two aspects of innovation. First, product innovation implies innovation in the final construction, for instance in terms of innovative architecture or innovative features in other aspects of the building. Second, process innovation, is about novel ways to work with the actual construction phase. It can comprise new ways to organize the work, new construction methods, etc.

2.2.11 Procurement Related Success Factors' effect on project performance

According to Eriksson (2008) and Eriksson et al. (2008), they developed a systematic and comprehensive frame of reference regarding clients' procurement-related choices during all stages of the buying process. The study treated various procurement alternatives as independent variables that affect procurement related success factors, which in turn impact the governance form's focus on competition and cooperation.

Table 1 illustrates that choosing cooperative procurement procedures will establish a cooperative governance form, while selecting alternatives that emphasize competition will generate a governance form focused on competition. In contrast, competitive choices that balance competition and cooperation can result in a governance form that balances the two.

Table 1 Procurement procedures relation to competition and cooperation

Buying stage	**Procedures related to competition**	**Procedures related to coopetition**	**Procedures related to cooperation**
Design	By the contractor (or by the client)	Joint specification with one party responsible	Joint specification with shared responsibilities
Bid invitation	Open bid procedure (multiple bids)	Limited bid invitation (a few bids)	Direct negotiation with one bidder
Bid evaluation	High weight on price	Equal weight on price and soft parameters	High weight on soft parameters
Subcontractor selection	By the contractor (or by the client)	Joint selection with one party responsible	Joint selection with shared responsibilities
Compensation	Fixed price	Fixed price and shared profits	Including incentives (shared profits)
Performance Evaluation	By the client	Divided between client and contractor	By the contractor

2.3 Empirical Literature

This section presents an assessment of research papers related to procurement and purchasing practices, as well as factors that impact construction project performance. Previous studies on project performance have identified the effect of material procurement practices on project outcomes. It was found that project performance criteria are impacted by effective material procurement practices, which can lead to time optimization, cost-saving, quality maximization, productivity improvement, and waste minimization. Conversely, ineffective procurement processes can lead to negative effects such as time delays, cost overruns, degraded quality, reduced productivity, and excessive waste generation.

The aim of this paper is to identify the factors that affect material procurement practices and their impact on project performance. It was concluded that the availability and sufficiency of materials and equipment are critical for project success because they impact time, quality, productivity,

and performance. Appropriate material quality can also affect time, cost, and quality performance. The papers reviewed in this study aimed to identify gaps in procurement processes that hinder effectiveness and recommend solutions to improve procurement practices in the construction industry.

2.3.1 Procurements in projects

Companies are seriously exploring the potential of supply chain management (SCM) (Gunasekaran et al., 2008). The procurement process is an area of interest to organizations responsible for project delivery for better performance in product quality, cost, cycle time, and responsiveness (Sanderson & Cox, 2008).

The procurement process is composed of different stages (pre-acquisition phase, tender process and contract award, contract and supplier management), each one requiring a specific and careful design capable of guaranteeing the best possible results (Baldi et al., 2016)

Besides, the literature suggests that supplier performance should be monitored and controlled regularly so that any failures can be identified and corrected (Ng et al., 2002). The evaluation of the supplier's performance throughout the project's implementation is important to ensure the success of the project (Araujo et al., 2017).

Designing a supply chain and selecting suppliers to take considerable effort in any organization. The company needs to understand what is important for it in the selection of a particular supplier or, in other words, it needs to define the evaluation criteria (Zolghadri et al., 2011).

2.3.2 Procurement management and a project's success

deAraújo et al.,(2017) highlight the importance of suppliers in the success or failure of the project. The selection and evaluation of the performance of the supplier play an essential role in the development of the project.Several researchers have developed decision charts to investigate the criteria for the selection and success rate of suppliers in terms of time, cost and quality. Over the years, however, the selection process has become increasingly complex, mainly as a result of the continued proliferation of different procurement methods, the increasing technical complexity of projects (Agarchand & Laishram, 2017), and the need for greater value for money. Therefore, the classic criteria of time, cost and quality alone are considered very simplistic in the context of complex project environment and, so, decision frameworks need to be updated

(Naoum & Egbu, 2016). The current vision of a project's success is considered multidimensional (Carvalho & Rabechini Junior, 2015); (Shenhar & Dvir, 2007), and this comprehensive view should also be considered in a procurement management environment.

2.3.3 A Case studies related to construction performance projects in Addis Ababa.

I. Kuhil & Seifu's research paper, "Causes of Delay in Public Building Construction Projects: A Case of Addis Ababa Administration, Ethiopia," was published in the Asian Journal of Managerial Science in 2019. Time overruns are one of the most common problems in the construction industry, according to the article, and they have a significant negative effect on projects and the stakeholders involved. 42 events that caused delays in the construction of public buildings in Addis Ababa were identified and grouped into five major categories in the study. Based on information gathered from a questionnaire survey of three groups of respondents—clients, consultants, and control groups—the study evaluated and ranked the most significant and critical causes of public building construction delays.

II. "Causes of Condominium Houses Construction Project Delay in Addis Ababa: The Case of Bole Arabsa Site from Stakeholders' Perspectives" (Michael, 2017) is a research paper that was presented to the Department of Business and Management at Addis Ababa Science and Technology University in September 2017 by Michael Chala. The paper assesses the main causes of delay in condominium housing construction projects in Addis Ababa, using the case study of the Bole Arabsa Site. The study aims to provide insights into how stakeholders perceive the causes of project delays and how these issues can be addressed

The research recommends, (AAHCPO) should improve….

- the supply and delivery of construction materials,
- improve the design documents approval system,
- Improve the procurement system

2.3.4 Gap Identification

The gap shows that as per the researcher's awareness, there is no research which was conducted in the study thematic scope of Construction material procurement practice in condominium projects.

- From the empirical reviews, the identified gaps are
  - Most research conducted in the study area did not focus basically on material procurement practice, and
  - They do not measure the magnitude of material procurement effect on project performance.

2.4 Concept framework

The conceptual framework establishes the link between the construction procurement process and the performance of construction projects. A procurement plan outlines how your business will purchase the supplies it needs to manufacture its products and provide its services. To track the procurement process, its effects, and its efficacy, strategic procurement planning needs data and analytics. The process of purchasing materials includes both commodities and services.

The process of choosing, ordering, billing, paying for, and delivering the materials needed to construct a building is known as material procurement in the construction industry. Construction material management has a positive impact on project performance and has a higher possibility of lowering project costs

Material logistics is the movement and comprises of planning, execution, and follow up and storage of all materials from raw to finished ones to attain the expectation of clients. (Safs et al, 2014). Lack of standard or poor-quality control in material management contributes to an increase in construction costs. Handling and implementation stages are higher and it requires a material replacement. R.F. Aziz, (2013). Material handling is the process of moving, protecting, storing, and controlling materials throughout the construction process. It includes the steps taken when dealing with construction materials from when they are delivered to the construction site until when they are disposed of. Dey (2014) states that delays in material supply were a major

cause of the time overrun of the construction project. Thus, it would seem that materials delays are a major cause of delays in the project.

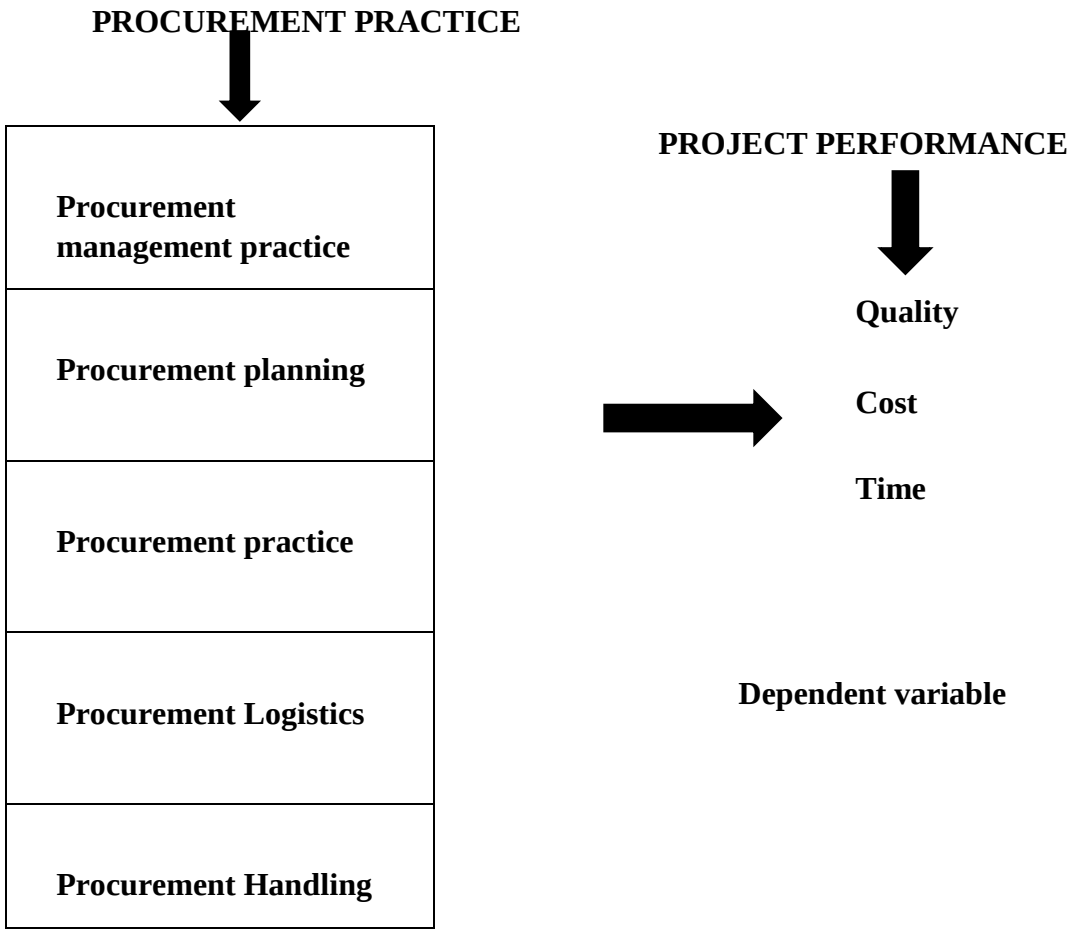

Figure 1 concept framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with research design and methodologies. It specifies the type of research, the process of how the study is designed, and the methods that are going to be used to carry out the research. Generally, it comprises research design, sampling techniques and sample size determination, data sources, data collection tools to be used, validity and reliability test, data analysis method, and ethical considerations. Research that is both qualitative and quantitative. The research will be conducted using various techniques. However, the overarching strategy is qualitative because qualitative methods emphasize the involvement of the participant's experiences and make an effort to comprehend the rationale behind specific behavior descriptions. Three systems of data collection questionnaires are used in the evaluation. The questionnaires that were used to gather both qualitative and numerical data

3.2 Research Approach

In this study investigating the effects of material procurement processes on the timely delivery of construction projects in the case of Addis Ababa condominium houses, a comprehensive literature review was conducted to gather information on existing research on the topic. Data was then collected using a combination of questionnaires, interviews, and surveys to gather information from relevant stakeholders such as construction companies, material suppliers, and project managers. The data collected were analyzed using appropriate statistical methods to identify patterns and relationships between the variables. The analysis revealed several key factors that influenced the timely delivery of construction projects, and based on these findings, recommendations were made for improving material procurement processes in construction projects.

3.3 Research Design

The general strategy for linking conceptual research issues to relevant and practicable empirical research is known as the research design. It is a query that offers precise guidance for research operations. Creswell (2014). Exploratory, descriptive, and explanatory are the three types of study designs. Developing hypotheses that can explain the recurrence of particular occurrences is a key component of exploratory research design, which is similar to exploration or detective work motivated by curiosity. A population, circumstance, or phenomenon is intended to be accurately and methodically described using a descriptive study design. Last but not least, to identify the variable that might be causing a specific behavior, i.e., whether there is a cause-and-effect link between variables, explanatory research must be done (Abhijeet Pratap, 2018).

This study used explanatory research because it helps to identify the relationship between independent and dependent variables; which aims to examine the relationship between project performance as the dependent variable and material management practices as independent variables. The findings of this study explained the relation of each independent variable with the dependent variable. Therefore, in this study explanatory research design was used.

3.4 Study Population, Sampling, and Sample Size

The study focuses on condominium houses which are located in Addis Ababa Bole Arabsa site. Since the condominium development program involves different stakeholders, Addis Ababa city HDP officials will be the primary exclusive sample of the research. Therefore, the main criteria for selecting this specific target sample group are related to the research scope spatial area which is the Arabsa condominium project. The second target sample will be construction contractors who are involved in the construction phase of the selected condominium house. The third target sample will be construction consultants who are involved in the consultation of the selected condominium house.

3.5 Sampling Techniques

In this study, probabilistic techniques, particularly simple random sampling, were applied. Both probabilistic and non-probabilistic sampling techniques exist. In probabilistic sampling, each unit in the population has a chance of being selected for the sample, and this probability can be precisely computed. The sampling technique can be straightforward random, systematic,

stratified, or multistage. Non-probabilistic sampling occurs when some population members have no possibility of selection or when the probability of their selection cannot be precisely calculated. Therefore, random sampling will be used in this study, which makes use of probabilistic methodologies. The sampling technique can be straightforward, random, systematic, stratified, or multistage. Non-probabilistic sampling occurs when some population members have no possibility of selection or when the probability of their selection cannot be precisely calculated. Therefore, random sampling will be used in this study, which makes use of probabilistic methodologies.

One such method is random sampling, which randomly chooses a sample of units from a population, usually to make it easier to generalize from the sample to the population.

3.6 Methods of Data Analysis

Instruments Data collection instrument is the tools used by researchers to actually collect data in the research process. Data collection plays a very crucial role in the statistical analysis. In research, there are different methods used to gather information, all of which fall into two categories, i.e. primary and secondary data (Douglas, 2015). The collected data will be analyzed using either SPSS or STATA tool according to the data acquired from the primary data to analyze both descriptive statistics and multiple linear regression analysis, as discussed hereunder to achieve the specific objectives of the study. Descriptive design was used to describe the analysis of the collected data while the explanatory design is concerned to test objectives and the research hypothesis, since one of the aims of this research is to find relationships between various causes and effects of procurement on on-time delivery of condominium houses. The major data used in the study was gathered from respondents, in particular the project manager, project coordinator, project office engineer, site engineer, survey engineer, and general foreman. The data was gathered via a self-administrative questionnaire. The English-language questionnaire. The analyzed data will be interpreted through charts, graphs, images, or tabular form and finally, the research report will be written as a publishing thesis format according to Addis Ababa University.

3.7 Regression Analysis

Regression analysis gives information on the relationship between a response (dependent) variable and one or more (predictor) independent variables to the extent that information is contained in the data. The goal of regression analysis is to express the response variable as a function of the predictor variables. (Lin et al., 2016).

One of the regression analysis techniques in this research used is multiple linear regression; it refers to a statistical technique that is used to predict the outcome of a variable based on the value of two or more variables. In this research, the variable predicted is known as the project performance, while the variables used to predict is know the value of the dependent variable are known as material procurement practice variables. Therefore, in this research, findings from the data analyzed are presented using tables, charts, and percentages.

3.8 Validity Test

The validity of research refers to how closely the scientific research method requirements were followed when generating research findings. It is considered a necessary requirement for all types of studies, as it determines the accuracy of the results. To ensure validity, the research instrument (questionnaire) must effectively measure the concepts being studied. One method to assess research validity is through a pilot test. In this particular study, 40 questionnaires were distributed to professionals at the Bole Arabsa project site. Out of the 40 questionnaires, 38 were completed, while 2 were not returned or completed. As a result, the pilot test questionnaires were not included in the data analysis

3.9 Reliability Test

The reliability refers to how consistently a method measures something. If the same result can be consistently achieved by using the same methods under the same circumstances, the measurement is considered reliable (Middleton, 2020). Reliability concerns the extent to which a measurement of a phenomenon provides stable and consist result. Reliability is also concerned with repeatability. To measure reliability Cronbach's alpha test conducted. The Cronbach Alpha is a measure of reliability social and organizational science. It is applied to determine how reliable the items in questionnaire. If the Cronbach alpha below 0.5, it indicate that the items are inappropriate; Cronbach alpha is greater 0.5 it is acceptable, (Taber, 2018). Therefore, the

research conducted the Cronbach's alpha reliability test through SPSS V25.To measure reliability, Cronbach's alpha test conducted. The reliability statistical analysis shows it is interpreted as consistent among the measurement items Alpha value 0.675 and 't' is greater than 0.50.

Therefore, the selected instrument can accurately measure the variables of the study.

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
0.675	0.770	9

Table 1 Reliability test

3.10 Ethical Considerations and Ethical Clearance

The report data, results, methods and procedures, and publication status are not fabricated, falsified, or misrepresented in this research paper. Additionally, the research avoided bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research. Careless errors and negligence were avoided carefully and critically to examine the researchers work and the work of your other researchers. Honor patents, copyrights, and other forms of intellectual property were given full recognition. The researcher did not use unpublished data, methods, or results without permission and gave credit where credit is due.

The researcher takes utmost caution while administering the interviews. Authorization will be obtained from the concerned office as well supporting letter from Addis Ababa University school of Commerce. The researcher approaches all participants to participate voluntarily in the data collection by collaborating in filling of the interview. Thus the respondents were free to share their views. This study is not undermining any other personnel or previous or future researches. The purpose of study is made clear and simple to be easily understood by the readers to avoid any ambiguity at any end.

CHAPTER FOUR –RESULT AND DISCUSSION / DATA

4.1 Introduction

The analysis of the respondent data collection is presented in this chapter. Utilizing the information gathered from the locations, the chapter aims to answer the research questions. Utilizing survey results, the findings of the study were addressed. The study makes an effort to reach its goals and respond to the research question.

4.2 Types of procurement used for the Bole Arabsa site condominium

		Frequency	Percent	Valid percent	Cumulative percent
Validity	**Bidding (tendering)**	5	13.2	13.2	18.4
	Direct Procurement	1	2.6	2.6	15.8
	Request for Quotations	3	7.9	7.9	23.7
	Restricted Bidding	29	76.3	76.3	100
	Total	38	100	100	

Table 2 types of procurement used on site

4.3 General Information about the Respondents

The demographic factors about the respondents (working position, gender, profession, experience, and educational background) were compiled and described in various figures and tables. The data gathered from respondents with various demographic traits in order to address the stated research objectives. The demographic data of the participants is included in the questionnaire's first section. Different figures and tables were used to summarize and describe

the demographic information about the respondents. These factors included employment status, gender, profession, years of experience, and educational background.

Table 2General information about the respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	14	36.8	36.8	36.8
	Male	24	63.2	63.2	100.0
	Total	38	100.0	100.0	

Source: Researcher Survey on NOV 2023

Table 3 shows that from 38 respondents 36.8% are female and 63.2% male

Table 3 Position of respondents

Position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Engineer/Architect	6	15.8	15.8	15.8
	Equipment Manager	4	10.5	10.5	26.3
	Procurement Chief:	7	18.4	18.4	44.7
	Project Manager	6	15.8	15.8	60.5
	stock control	1	2.6	2.6	63.2
	Supervisor	14	36.8	36.8	100.0
	Total	38	100.0	100.0	

Source: Researcher survey on NOV 2023

Table 4 shows that from 38 respondents 36.8% are supervisors to the construction of Bole Arabsa site condominium house, 18.4% are chief procurement officers in the procurement department office, 15.8% are project managers for the site, design, and construction of Bole Arabsa condominium site, 15.8% again are Engineers and Architects who are responsible for engineering or design related tasks,10.5% are equipment officers, and 2.6% are store control officers who control the store of construction materials.

Table 4 Educational level of respondent

Education Level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BSC	35	92.1	92.1	92.1
	MSc	3	7.9	7.9	100.0
	Total	38	100.0	100.0	

Source: Researcher survey on NOV 2023

Table 5 shows that educational qualifications of respondents 35 of them or 92.1% have a BSc Degree and 3 of them or 7.9% have MSC degree.

Table 5 Respondent profession

Educational Title					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Accounting and finance	1	2.6	2.6	2.6
	Engineering & related	22	57.9	57.9	60.5
	Management	13	34.2	34.2	94.7
	Project management	2	5.3	5.3	100.0
	Total	38	100.0	100.0	

Source: Researcher survey on NOV 2023

The respondent's profession is shown in Table 6 the highest construction of the respondents is engineering & related field (57.9%), secondly is other Management field (13%), third is Project management field (5.3%) and lastly accounting & finance (2.6%).

Table 6 Work Experience of respondents

Working Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	29	76.3	76.3	76.3
	6-10 years	9	23.7	23.7	100.0
	Total	38	100.0	100.0	

Source: Researcher survey on NOV 2023

Table 7 shows that 29 of them or 76.3% of the respondents have 0-5 years' experience, and 9 of them or 23.7% respondents have 6-10 years' experiences

4.4 Site Related Responses

The aim of investigating general information of Bole Arabsa condominium site related facts help to know the stance and depth of how much they know the site which will increase the confidence on the reliability of the gathered data and gives inputs to analyze based on the framework provided in the data gathering methodology. This section of the questionnaire has 4 basic general questions about Bole Arabsa condominium house pre and after construction statuses.

This section of the questionnaire has 4 basic general questions about Bole Arabsa condominium house pre and after construction statuses.

Blocks are completed on a given period of time within a given budget and scope

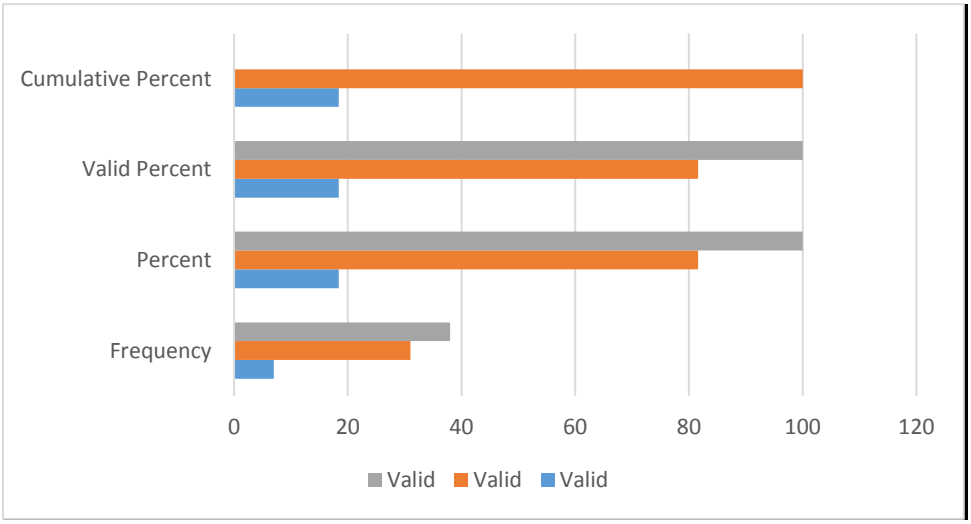

Figure 2 respondent survey blocks completed on a given time

Personal Opinion on procurement Pre - construction time related factor is affecting project performance

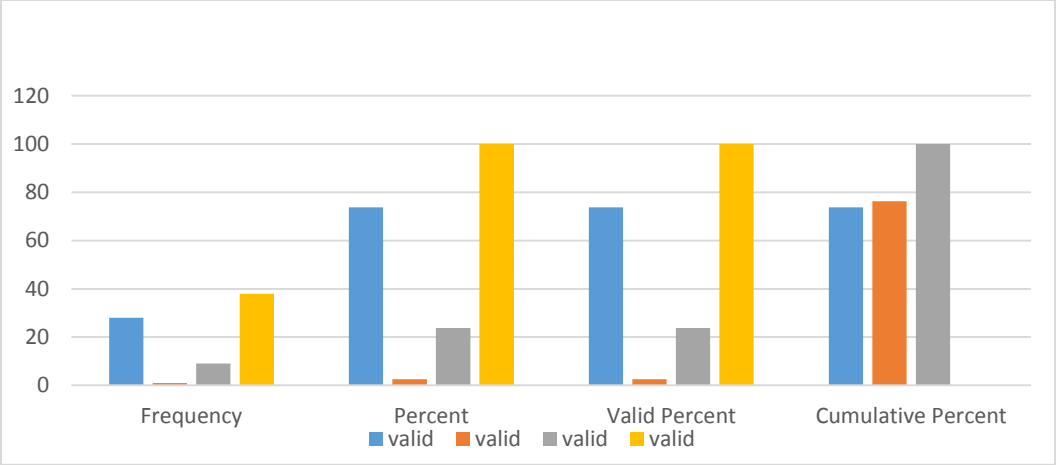

Figure 3 respondent view personal opinion

Personal Opinion on project office generally is well-staffed, experienced and capable of carrying out the procurement of construction materials

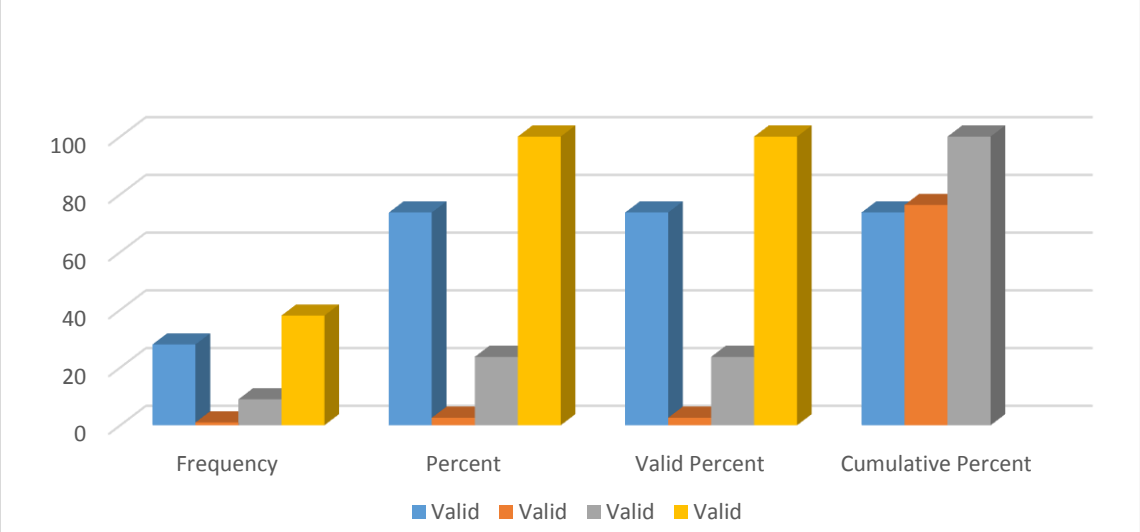

Figure 4 Respondents view

4.5 Data Analysis

A questionnaire with back ground of the respondents and 40 questions was developed to answer the research questions. The first part of questions focuses on back ground information about the respondents .The second part of the questionnaire comprises fifteen questions about the construction procurement material practices and the other part of questionnaire comprises questions about the project performance. The results obtained through different regression analysis and descriptive analyses are presented as follows

4.6 Descriptive Statistical Analysis

4.6.1 Mean and Standard Deviation for Material Purchasing Practices

In terms of material procurement Table 13 shows; project manager ensures the purchasing of materials follows the standard requirement; time and quality with mean value (1.79), and Procurement procedure have impact on the company material management with mean value (1.32).

Table 7 Mean and standard deviation for material purchasing practice

Description	N	Minimum	Maximum	Mean	Sd
The project manager ensures the purchasing of materials follows the standard requirement, time and quality.	38	1	4	1.79	0.577
The Procurement procedure have impact on the company material management	38	1	2	1.32	.471
Valid N (list wise)					

Source: Researcher survey on NOV 2023

4.6.2 Mean and Standard Deviation for Material Logistics Practices

Thirdly, Table 9 shows material logistic; coordination and communication between project participants during material flow process with the mean value (2.00), there is material supply delay due to material purchase before they required with mean value (1.68) and company determine material type and quantities from the detailed design with value (1.95).

Table 8 Mean and standard deviation for material logistics practices

	N	Minimum	Maximum	Mean	Std. Deviation
There is coordination and communication between project participants during material flow process	38	1	3	2.00	.232
There is material supply delay due to material purchase before they required	38	1	2	1.68	.471
The company determine material type and quantities from the detailed design.	38	1	4	1.95	.837
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023

Mean and Standard Deviation for Material Handling Practices

Table 9 Mean and standard deviation for material handling practices

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
There is appropriate handling of materials in the on site	38	1	4	3.13	0.991
Materials delivered to sites undamaged	38	2	5	3.34	0.994
There is material handling system in the company	38	2	5	3.08	0.941
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023

The last variable material handling table 4.5.4 shows that there is appropriate handling of materials in and on the site with mean value (3.13), Materials delivered to sites undamaged with mean value (3.34) and there is material handling system in the office with mean value (3.08).

4.7 Descriptive Statistical Analysis of Project Performance Related Questions

In this section of the questionnaire, project performance related questions were asked to investigate the effect of material procurement process on the overall project performance of the construction process on Bole Arabsa condominium house site. In order to gather information's, 16 questions were developed to answer the research questions.

4.7.1 Mean and Standard Deviation for project performance effect on economic performance

Table 10 Mean and Standard Deviation for project performance effect on economic performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
There is increase of construction cost due to poor quality control in material management.	38	1	2	1.76	0.431
There is extra expense cost on labor wage due to overstock material on site	38	1	3	1.71	0.515
There is timely delivery of materials by suppliers which reduces the rise of construction cost.	38	1	5	1.95	+1.012
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023.

From the above table 4.6.1 it shows the result of project performance; economical project performance shows; increase of construction cost due to poor quality control in material management with mean value (1.76), extra expense cost on labor wage due to overstock material on site with value (1.71) and timely delivery of materials by suppliers which reduces the rise of construction cost with mean value (1.95).

4.7.2 Mean and Standard Deviation for project performance effect on time performance

Table 11 Mean and Standard Deviation for project performance effect on time performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Materials arrive on time on site	38	2	5	4.26	.601
The project finished within the schedule due to available of materials	38	1	5	4.68	.842
There is problem on delay on project due to poor material management.	38	1	2	1.76	.431
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023.

Secondly, time project performance Table 13 shows ; Materials arrive on time on site with mean value (4.26), project finished within the schedule due to available of materials with mean value (4.68) and problem on delay on project due to poor material management with mean value (1.76).

4.7.3 Mean and Standard Deviation for project performance effect on quality performance

Table 12 Mean and Standard Deviation for project performance effect on quality performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
There is material wastage due to lack of coordination among the workers on construction site	38	1	3	1.76	0.490
There is waste generation due to inappropriate material storage	38	1	4	2.13	.578
There is inappropriate storage location which increases unproductive inputs due to workers longer time and effort to carry materials	38	1	2	1.71	.460
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023.

In Quality performance of a project Table 14 shows that; material wastage due to lack of coordination among the workers on construction site with mean value (1.76), waste generation due to inappropriate material storage with mean value (2.13), and inappropriate storage location which increases unproductive inputs due to workers longer time and effort to carry materials with mean value (1.71).

4.7.4 Mean and Standard Deviation for project performance effect on environmental performance

Table 13 Mean and Standard Deviation for project performance effect on environment performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
There is Efficient material management practice which minimize waste generation throughout entire construction process	38	1	5	3.76	1.125
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023.

In environmental performance of a project Table 15 shows; efficient material management practice which minimize waste generation throughout entire construction process has a mean value (1.76).

4.7.5 Mean and Standard Deviation for project performance effect on innovation performance

Table 14 Mean and Standard Deviation for project performance effect on innovation performance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Sd
There is availability of material which motivate workers to improve work productivity	38	1	5	3.16	1.175
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023.

Finally, in innovative performance of a project Table 16 shows; availability of material which motivate workers to improve work productivity has a mean value (1.76).

4.7.6 Mean and Standard Deviation for Material Stock & Waste control Practices

Table 15 Mean and standard deviation for material stock & waste control

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
There is appropriate storage location for stock near the site.	38	2	2.1	2.13	0.475
Materials available when required to construction site.	38	1	4	1.84	0.679
The company stock and waste control is good	38	1	4	3.34	1.146
Valid N (list wise)	38				

Source: Researcher survey on NOV 2023

Finally, in stock and waste control table 4.5.5 shows that; the control system with mean value (3.34), appropriate storage stock near the site. With mean value (1.89) and materials available when required to construction site with mean value (2.13).

Mean Value Range: *Strongly Agree 1 – 1.79, Agree 1.8 – 2.59,* ***Moderately 2.6 – 3.39****, Disagree 3.4 – 4.19, Strongly Disagree 4.2 - 5*

4.8Auto Correlation (Durbin Watson Test)

The idea that errors are independent of one another and that subjects are responding independently is known as autocorrelation or independence of error. In Stevens (2009). The Durbin-Watson statistic can be used to verify or refute the notion that our residuals are uncorrelated or independent. This number can range from 0 to 4. The Durbin-Watson value must be close to 2 in order for this assumption to hold (Field, 2006). A value that is problematic or alarming is one that is below 1 or above 3. We need to look at the model summary box shown below to verify this assumption.

Table 16 Auto Correlation model summery

Model Summery

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.213[a]	0.045	0.019	0.32967	1.902

a. Predictors: (Constant), MPP Independent Variable
b. Dependent Variable: PP Dependent Variable

Source: Researcher survey on NOV 2023.

4.9 Multiple Regression Analysis result

The regression model was applied to test how far the material procurement practices has an effect on project performance of the Bole Arabsa condominium houses. Coefficient of determination R is the measure of proportion of the variance of dependent variables about its mean about its mean that is explained by independent or dependent variables. It is conducted to investigate the effect of independent variables of planning, practice, procurement, logistics and handling, on the dependent variables of economy, time, quality, environment, and innovation. Then identify the relative significant influence; i.e., independent variables (material procurement practices) to dependent variables (project performance) in the AACGHDPO. Higher value of R represents greater explanatory power of the regression equation.

The basic assumption tests for the model must be carried out. This is a compulsory precondition in explaining the relationship between dependent and independent or explanatory variables. Four

major assumptions namely, Linearity Test, Homoscedasticity Test, Auto Correlation (Durbin Watson Test), and Normality Test checked and proved to meet reasonably well. Each test is explained below.

4.9.1 Linearity Test

The linearity of associations between the dependent and independent variables can be tested by looking at the P-P plot for the model. Figure 3 shows the closer the dots lie to the diagonal line, the closer to normal the residuals are distributed. As depicted in the below graph, the visual inspections of the P-P plot revealed that there exists linear relationship between the dependent and independent variables.

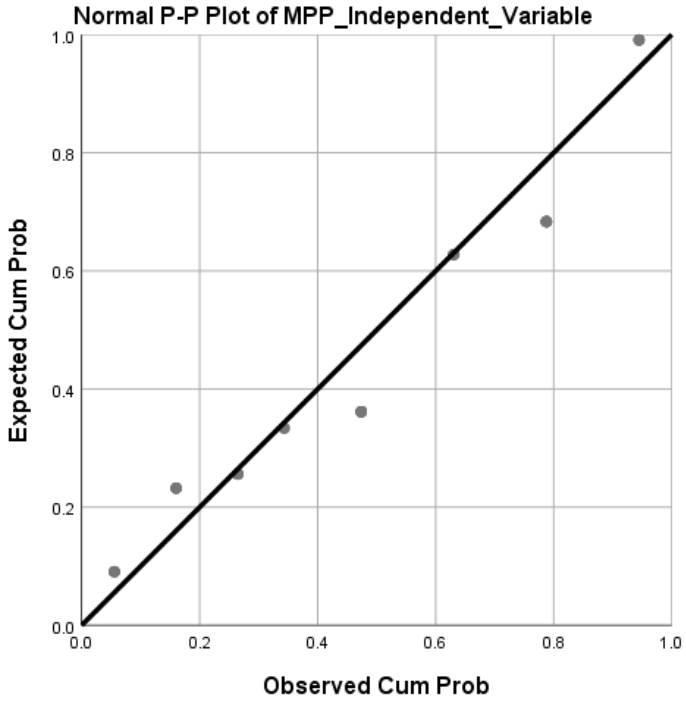

Figure 5 A linearity test shows the associations between the dependent and independent variables. Source: Researcher survey on NOV 2023

4.9.2 Homoscedasticity Test

The assumption of homoscedasticity refers to equal variance of errors across all levels of the independent variables (Osborne & Waters, 2002). This implies it requires even distribution of residual terms or homogeneity of error terms throughout the data. Homoscedasticity can be checked by visual examination of plot of the standardized residuals by the regression standardized predicated value (Osborne & Waters, 2002). If the error terms are distributed randomly with no certain pattern, the problem is not for analysis. The scatterplot in fig 4 shows that the standardized residuals in this research are distributed evenly which shows that no violation of homoscedasticity.

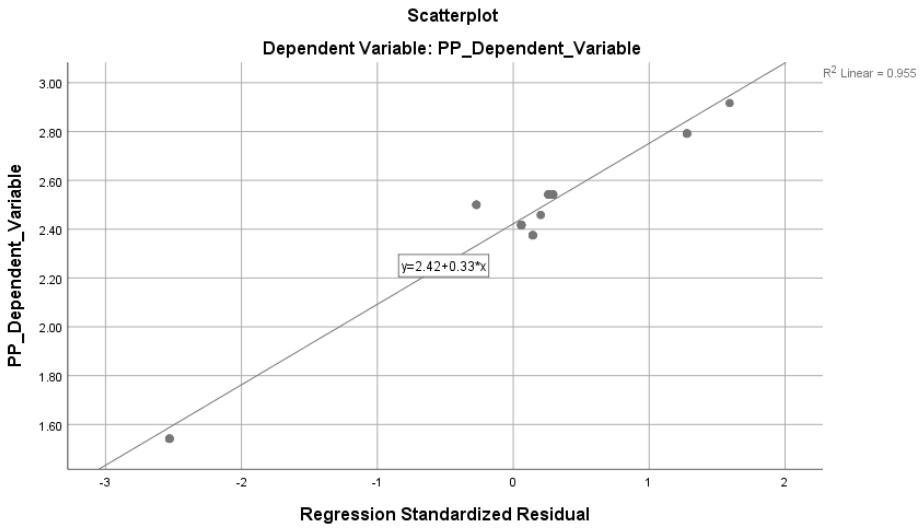

Figure 6 A Homoscedasticity Test showing the equal variance of errors across all levels of the independent variables Source: Researcher survey on NOV 2023

4.10 Summary of the findings

In this section the regression analysis result of in ***model summary***, **ANOVA** and ***Coefficients*** discussed.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.936[a]	0.876	0.857	0.12599
a. Predictors: (Constant), MPP Stock Waste Mgt, MPP_ Handling, MPP_ Logistics, MPP _Procurement, MPP_ Planning				
b. Dependent Variable: PP Dependent Variable				

- The regression analysis explains the extent to which the independent variables predict the effect of material management practice.

- **Test F** shows the role of the independent variables to explain the evolution of the dependent variable.

- The value of test F (45.234 >2.402) in the ANOVA table, the model reaches statistical significance (sig=.000, $p < 0.05$) shows **the regression mode is valid** and can be used to analyze the dependent between variables.

- The independent variables significantly explain the variance in dependent variable.

- Therefore, the regression model statistically significantly predicts the outcome variable (i.e., it is significant fit for the data).

- The value of beta which tells us that a certain improvement or problem on these variables will improve or decrease by the given values which is statistically significant

- Therefore, the above regression model showed that the beta coefficient of material planning is 0.076 that means a change in one unit in material procurement planning, the project performance changed unit of 0.076.

- The coefficient of material procurement is 0.954 that means a change in one unit of material procurement, the project performance changed unit of 0.954, whereas material logistics is 0.441, material handling is 0.199 and stock and waste control is -0.632.

4.11 Effect of Material Procurement Practice on Project Performance

In this section the regression analysis result of in model summary, ANOVA and Coefficients discussed. In model summary the information about how two variables related with one another. The model consists of the predictor variables which used to try predicting the outcome variable (Project Performance). In this case, we have five predictor variables in the model: Material Planning, Material Handling, Material Logistic, Material Procurement and Material Stock and Control. On the model summary section R interpreted as any regular correlation coefficient. But it instead telling you the relationship between variable and all of the predictor combined. Square on the other hand contains the value we are most interested in, this value indicates the proportion of variation in the outcome variable (Project Performance) that can be

explained by the model (i.e. Material Planning, Material Procurement, Material Logistic, Material Handling, and Material Stock and Waste).

The second part the result presented on ANOVA tells us whether or not the model (Material Planning, Material Handling, Material Logistic, Material Procurement and Material Stock and Control) is significant predictor of the outcome variable (Project Performance).

As the significance value is less than p=0.05, we can say that the regression model significantly predicts Project Performance. The last part is Coefficient tells us the extent to which the individual predictor variables contribute to the model. The sig column tells us whether the predictors significantly contributed to the model or not. The next beta coefficients for the model (the B values) tell us about the relationships between the outcome (Project Performance) and the five predictor variables (Material Planning, Material Handling, Material Logistic, Material Procurement and Material Stock and Control). As the predictor variables are positive, so are the relationships. Therefore, we are going to see the result of the findings one by one as follows below.

Table 17 Model summary of R value & R square value

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.936[a]	.876	.857	.12599

a. Predictors: (Constant), MPP Stock WasteMgt, MPP_ Handling, MPP_Logistics, MPP_Procurement, MPP_Planning
b. Dependent Variable: PP Dependent Variable

Source: Researcher survey on NOV 2023.

A regression coefficient of R=.936 or 93.6% shows that the independent factors and the dependent variable are related. The material procurement process accounts for 87.6% of the variation in project performance, according to the coefficient of determination R2 = 0.876. Other factors outside the scope of the model that can have an impact on the project's performance can account for the remaining 12.4%.

According to the table's corrected R-square, the independent variables (material management methods) had an 85.7% influence on the dependent variable (project performance). It demonstrates how the method used in the Bole Arabsa condominium construction project's

procurement of construction materials determines how well the project performs. The regression analysis clarifies how much the inverse.

Table 18 Regression analysis of ANOVA result

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.590	5	.718	45.234	.000[b]
	Residual	.508	32	.016		
	Total	4.098	37			
a. Dependent Variable: PP_Dependent_Variable b. Predictors: (Constant), MPP_Stock_WasteMgt, MPP_Handling, MPP_Logistics, MPP_Procurement, MPP_Planning						

Source: Researcher survey on NOV 2023.

The extent to which the independent variables forecast the impact of material management approach is shown by the regression analysis. Test F demonstrates how the independent variables are used to explain how the dependent variable has changed over time.

The model meets statistical significance (sig=.000, p 0.05), which indicates the regression mode is legitimate and may be used to examine the dependence between variables, according to the test F value in the ANOVA table of 45.234 > 2.402. The dependent variable's variance will be amply explained by the independent factors. As a result, the regression model significantly fits the data and statistically significantly predicts the outcome variable.

Table 19 Regression analysis Coefficient result

Coefficients[a]						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	.582	.202		2.877	.007
	MPP_Planning	.076	.253	.166	.302	.765
	MPP_Procurement	.954	.315	1.184	3.028	.005
	MPP_Logistics	.441	.206	.380	2.143	.040
	MPP_Handling	.199	.070	.272	2.822	.008
	MPP_Stock_Waste Mgt	-.632	.303	-1.477	-2.084	.045
a. Dependent Variable: PP Dependent Variable						

Source: Researcher survey on NOV 2023.

The above table 25 revealed the value of beta which tells us that a certain improvement or problem on these variables will improve or decrease by the given values which is statistically significant. Therefore, the above regression model showed that the beta coefficient of material planning is .076 that means a change in one unit in material procurement planning, the project performance changed unit of .076. The coefficient of material procurement is 0.954 that means a change in one unit of material procurement, the project performance changed unit of 0.954, whereas material logistics is 0.441, material handling is 0.199 and stock and waste control is -0.632.

Project Performance= 0.582+ 0.076 (planning) + 0.954(procurement) + 0.441(logistic) + 0.199(handling) – 0.632(stock & waste control) = 1.62.

This implies that when all the variables of the study were to be held constant, the performance of the condominium construction project would be at 0.582. A unit increase in material planning while other factors held constant would increase project performance by 0.076. A unit improvement in material procurement would decrease project performance by 0.954. A unit increase in material logistics would increase project performance by 0.441. A unit increase in material handling would increase project performance by 0.199 and finally a unit change in stock and waste would increase project performance by -0.6326. This is an indication of interdependence of the various variables directly influencing construction project performance.

Form the formula, an improvement of from the formula a single variable will positively influence the performance of other factors others except, material stock & waste control practice which the variable influences the performance negatively. Regression builds on the relationship between material planning, procurement, logistics, and handling; and it justifiable to argue that project success in AACGHDO construction projects are dependent on how theses project is aligned, except material stock and waste control.

In view of significance at 0.05 level, the study documents the significance of each individual variable. For material planning practice, the p-value was 0.765 which is greater than p-value and it is insignificant but the rest of the variables; material procurement with p-value 0.005, material logistics with p-value 0.04, material handling with p-value 0.008 and material stock & waste control with p-value 0.045 are significant.

CHAPTER FIVE-CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The study intended to investigate the effect of construction material management in Bole Arabsa condominium house. This study has goals, and in order to accomplish these goals, the hazards were first identified, and thorough literature analysis was conducted to learn more about the causes of inadequate procurement processes that other developing nations confront and how they affect project performance.

Second, a questionnaire was created based on the literature study, and the information gathered supported the key conclusions that follow. The assessment of existing processes involved in material procurement for Addis Ababa condominium house construction, and the identification of the effects gained and lost due to material procurement practiced in the condominium housing project was well executed.

This study has identified existing procurement processes in Addis Ababa condominium houses and their impact on timely delivery of materials by uncovering relationships, construction professionals can gain insight into possible causes of ineffective procurement processes that are unsuccessful for timely project delivery caused by procurement as perceived from the questionnaire. The major poor findings are…

- Miscommunication
- Lack of flexibility
- Completed with good quality
- Low usage of technology

The research findings provide valuable insights into improving material procurement and management practices to enhance the Addis Ababa condominium housing project's overall performance. Urgent action should be taken to address the identified issues, and necessary measures should be taken to improve future related project performance to meet the industry's expected standards.

Overall, the assessment of existing processes involved in material procurement for Addis Ababa condominium house construction, and the identification of the effects gained and lost due to

material procurement practiced in the condominium housing project was well executed besides the findings mentioned above . The research results will be useful in providing better insights into the optimal material management practices to be employed in the construction industry.

5.2 Recommendation

- Based on the conclusion, it is recommended that the budget that is required for material management procurement must be swiftly assigned. To improve project material procurement, the consulting party or Urban Development & Construction Department must be responsive to the timely preparation of payment certificates.
- The project management team should re-evaluate their material management practices, especially material stock and waste control, to ensure that materials are appropriately utilized, minimizing any waste and losses. The use of a more efficient material procurement system, such as an open bidding or request for proposal, can potentially enhance the quality of materials and reduce the costs, resulting in improved project performance.
- It is recommended for future work to add technological practice to improve effects of material procurement processes on the timely delivery of construction project.
- Store managers should have up to date their technical conceptual skills to be equipped in managing inventory control

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APPENDIX

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

Questionnaire

Effects of material procurement processes on the timely delivery of construction project:

The case of Addis Ababa condominium houses

Dear Respondent,

The purpose of this questionnaire is to obtain your professional opinion for Effects of material procurement processes on the timely delivery of construction project:

The case of Addis Ababa condominium houses**.** Your responses are extremely valuable to the outcome of the research, and I kindly ask for your cooperation in filling this questionnaire. Please note that the information provided in this questionnaire will be used for research purposes only. All specific respondent information will be kept confidential at all times.

Rest assured that data from one project will not be sold to another organization and will not be discussed with friends or family members without your consent.

Thank you for your valuable time and contribution to this study.

Best regards,

NB Please indicates your answer to all the questions by marking or by writing in the corresponding appropriate box. You can comment in the provided blank space if you have any different answer.

Section I: General Background Information about the Respondents

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

1. Gender

   Female: ☐ Male: ☐

2. Position

   Project Manager ☐ General Manager ☐ Engineer /Architect ☐

   Supervisor ☐ Equipment Manager ☐ Procurement Chief: ☐

   Other _____

3. Education Level

   Diploma:☐ BSC:☐ MSc: ☐ PhD:☐ Other: _____

4. Educational Title

   Project Management:☐ Management:☐ Supply & Chain Management:☐

   Engineering & Related:☐ Leadership:☐ Other: _____

5. Working Experience

   0-5 years: ☐ 15 years: ☐ 16-20 years: ☐ above 20: ☐

Section II: Bole Arabsa Condominium Site Related General Question

6. How many blocks are completed on a given period of time within a given budget and scope?

   ☐< 25 % ☐< 50 % ☐< 75% ☐< 100 %

7. What types of procurement method is used for the Bole Arabsa Site condominium?

   A. Bidding (tendering) ☐ B. Request for Quotations ☐ E. Request for Proposals ☐

   A. Restricted Bidding ☐ D. Direct Procurement ☐

8. The procurement Pre - construction time related factor is affecting project performance?					
9. The project office generally is well-staffed, experienced and capable of carrying out the procurement of construction materials?					

Section III: Material Procurement Related Questions

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
10. There is a material planning process before purchasing of construction materials.					
11. In order to maximize project efficiency at the project commencement phase, is there effective material planning?					
12. In the institute, is there overpayment and material orders?					
13. The project manager ensures the purchasing of materials follows the standard requirement, time and quality. 14. The Procurement procedure have impact on the company material management.					
15. There is coordination and communication between project participants during material flow process					
16. There is material supply delay due to material purchase before they required.					
17. The company determine material type and quantities from the detailed design.					
18. There is appropriate handling of materials in the on site					
19. Materials delivered to sites undamaged					
20. There is material handling system in the company					
21. The company stock and waste control is good					
22. There is appropriate storage location for stock near the site.					
23. Materials available when required to construction site.					

Section IV: Project Performance Related Questions

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
24. There is increase of construction cost due to poor quality control in material management?					
25. There is extra expense cost on labor wage due to overstock material on site					
26. There is timely delivery of materials by suppliers which reduces the rise of construction cost.					
27. Materials arrive on time on site					
28. The project finished within the schedule due to available of materials					
29. There is problem on delay on project due to poor material management.					
30. There is material wastage due to lack of coordination among the workers on construction site					
31. There is waste generation due to inappropriate material storage					
32. There is inappropriate storage location which increases unproductive inputs due to workers longer time and effort to carry materials					
33. There is availability of material which motivate workers to improve work productivity					
34. Effective waste management techniques are used throughout the whole construction process to reduce trash production?					
35. Do you rate the performance of the department in terms of right quality procurement?					
36. Do you rate the performance of the department in terms of right time procurement?					
37. Do you rate the performance of the department in terms of right price procurement?					
38. Do you rate the performance of the department in terms of right source procurement?					
39. Do you rate the performance of the department in terms of the right quantity procurements?					