ST. MARY'S UNIVERSITY

School of Graduate Studies

Causes and consequence of delay in the construction project of Private Real Estate and Its effect on the project Implementation, the Case of Noah Real Estate

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July, 2023

Addis Ababa, Ethiopia

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A thesis submitted to St. Mary's University, School of Graduate Studies in Partial Fulfilment of the Requirements for the Award of the Degree of Master of Project Management

July, 2023

Addis Ababa, Ethiopia

CERTIFICATE OF APPROVAL

This is to certify that the thesis prepared by Hewan Teklu, entitled "Causes and consequence in the construction project of Private Real Estate & Its effect on the project Implementation, the Case of Noah Real Estate and submitted in partial fulfillment of the requirements for the Degree of Masters in Project Management with the regulations of the University and meets the accepted standards with respect to originality and quality.

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Yilkal Wassie (Asst. Prof.). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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July, 2023

ENDORSEMENT

This is to certify that the research entitled "Causes and consequence of delay in construction projects of private real estate in the case of Noah real estate, Figa site" has been the independent work done by Hewan Teklu (ID No. SGS/0311/2014A) under my supervision as a University research advisor and submitted to St. Mary's University, School of Graduate Studies, Project Management program in the partial fulfillment of the award of Master of Project Management.

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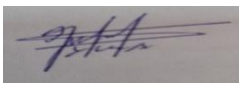
Signature: 

Date: July, 2023

ACKNOWLEDGMENT

First and for most thanks to Almighty GOD for his blessings, strength and knowledge he extended to me while carrying out this academic work.

I would like to express my sincere thanks to my advisor Yilkal Wassie (Asst. Prof.) who provided me his professional support to complete this paper.

I am also grateful to express my sincere thanks to Noah real estate project and management staff that provided me the necessary data to materialize this paper. Specially for the company project manager Mss Betelhem Alemu for her unreserved cooperativeness in doing data collection.

Finally, I must express my very profound gratitude to my Husband, Mesfin Wondafrash, my beloved babies (Leul & Edom) and my dearest sister Enaye, for their support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis.

Table of Contents

Abbreviations 3

ABSTRACT 4

CHAPTER ONE 5

INTRODUCTION 5

1.1 Background of the study 5

1.2 Statement of the problem 6

1.3 Project Research Question 7

1.4 Objectives of the study 7

1.4.1 General Objectives of the study 7

1.4.2 Specific objectives of the study 7

1.5 Significance of the study 8

1.6 Scope of the study 8

1.7 Limitation of the study 8

1.8 Organization of the study 8

CHAPTER TWO 9

REVIEW OF LITERATURE 9

Introduction 9

2.1 Concept and Definition 9

2.1.1 An overview of project and project management 9

2.1.2 Project performance 10

2.1.3 Definition of Project delay 10

2.1.4 Delay in Construction Industry 12

2.1.5 Types of delay 12

2.1.6 Cause of Delay in Construction 14

2.2 Theoretical Review 20

2.2.1 Effect of Delay in Construction 20

2.3 Empirical literature review 23

2.4 Research Gap 25

2.5 Conceptual Framework 26

CHAPTER THREE 27

RESEARCH DESIGN AND METHODOLOGY 27

3. Introduction 27

3.1 Description of the study organization 27

3.2 Research Design and Approach 27

3.3 Population of the Study 28

3.4 Sampling Technique and sample size determination 28
3.5 Tools for Data Collection 29
3.6 Data Analysis Method 29
3.7 Reliability and Validity 30
3.8 Ethical consideration 31
DATA PRESENTATION, ANALYSIS, AND INTERPRETATION 32
4. Introduction 32
4.1 Response rate 32
4.1.1 Respondents' profile 32
4.2 Descriptive Analysis 36
4.2.1 Owner related factors 36
4.2.2 Client related factors 38
4.2.3 Consultant related factors 39
4.2.4 Contractor related factors 40
4.2.5 External related factors 42
4.2.6 Effect of project implementation 44
4.3 Regression analysis 46
4.3.1 Classical linear Regression Model (CLRM) Assumptions 46
4.3.2 Correlation analysis 49
4.3.3 Analysis of Variance 52
4.3.4 Regression Result 53
CHAPTER FIVE 55
SUMMARY OF MAJOR FINDINGS, CONCLUSION, AND RECOMMENDATIONS 55
5. Introduction 55
5.1 Summary of major findings 55
5.2 Conclusion 57
5.3 Recommendations 58
Reference 59
Appendix 62

Abbreviations

EIA……Ethiopian Investment Agency

UN……United Nation

ABSTRACT

The purpose of this study was to assess the causes and consequence of delay in construction projects of private real estate and its effect on project implementation in the case of Noah real estate, Figa site. It is not known how and to what extent the construction of the project houses is not completed all agreed project budget and time. This research used both primary and secondary data and also involved quantitative research design. In light of these objectives, the study employed descriptive statistics. The target population of the study selected a sample of 92 individuals from 120 populations, the researcher was distributed structured survey questionnaires to clients, consultants, contractors, and those who are working in Noah real estate, Figa site project. The questionnaire had a list of delay causing factors of which the respondents were asked to rank each according to the 5 point Likert scale. Based on the research findings the following result were identified. late payment and order changes, inadequate planning and wrong budget estimation, improper planning and schedule, Inadequate experience and skills of contractors, bureaucracy and policy changes, inflation of material prices, material shortages, utility unavailability, and others. In addition, the top major effects of delay in the construction of real estates were time overrun, cost overrun, dispute, litigation, total abandonment and arbitration. The correlation analysis result indicated that client, contractor, consultant related causes of delay have a positive relationship with effect of delay in construction project. The findings suggested that Noah real estate should improve owners prioritize timely payments to contractors and minimize changes in project order clients should invest in comprehensive project contractors, prioritize investing in professional development and training to enhance their skills and knowledge, engage experienced professionals for budget estimation, and ensure sufficient resources are allocated, consultants should focus on meticulous project planning, including realistic scheduling and efficient resource allocation, stakeholders should to conduct thorough risk assessments, develop contingency plans, and establish robust supply chain management systems.

Keywords: Construction delay, the effect of delay, consultants, clients, contractors, and owner

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The construction industry plays a vital role in any developing country. This is mainly because developing countries are considerably dependent on the growth and development of their physical infrastructures and because the linkage of the construction industry to both economic and social sectors is very significant.

Ethiopia's construction sector is one of the most robust in Africa. Conditions are ripe for a surge in buildings across the country. The updating and building of new infrastructure links, residential developments, and so on are of considerable interest to the Ethiopian Government.

The construction industry has complexity in its nature because it contains many parties as clients, contractors, consultants, stakeholders, shareholders, and regulators (Kikwasi, 2012). Particularly in construction, there is a long history of project management and standard systems have been set up which have become comfortable but have not always produced the best value for the client (Fewings, 2005). Most construction projects usually suffer delays and surpass the outlined contract sum (World Bank, 2014). The result of such overrun can at the time lead to the abandonment of a project. Ideally, projects are supposed to run continuously without delays, and the responsibilities to keep this in check lie squarely with the project manager and other stakeholders who are linked directly with the projects (Oyewobi, et al. 2011). In the same view, ensuring that the project is delivered on time is one of the most significant needs of the clients in the construction industry (Latham, 1994). Moreover, the completion of projects within the estimated time is an indicator of how efficient the construction industry. (Nedo, 1988).

The housing problem in developing countries is increasing significantly. The main reason for this is urbanization. The impact of rapid population growth on housing development in a developing economy is usually a consequence of the push of the rural areas and the pull of the town. According to, A market insights report by ITE build and Interiors report, Ethiopia faces the challenge of not being able to supply sufficient new affordable housing and upgrade the existing stock to meet the demand required annually. As a result of the limited access to decent and affordable housing, informal settlements have increased in the main city. The housing deficit can perhaps be best exemplified by the capital. A 2013 UN report suggested that Addis Ababa needed at least 300,000 new homes to meet demand. However, with the city expanding at a rate of 3.8% per year, in terms of both wealth and population, more and more housing units are needed.

Sustained high urbanization and population rates derived from extra pressure on already failing and deteriorated urban infrastructure, services, and housing stock. In response to this challenge, private investors were attracted to the industry to build and provide different residential homes. Following this, timely delivery or transfer of a house is a big challenge and takes a longer period than the planned time. Construction delay in the private real estate industry is a major challenge.

Therefore, this study is focused on Noah real estate construction projects, which assessed the delay, causes and examines the effects on the project and provide recommendation on how can minimize the deliances factors based on the findings to improve project performance and completion of the projects at a reasonable cost and time.

1.2 Statement of the problem

Construction delay is considered as one of the most recurring problems in the construction industry and it often adversely affects the project's success in terms of time, cost, and quality. The effects of delay are costly to all parties concerned and very often it will result in disagreement, cost overrun, litigation, arbitration, total abandonment, and lack of trust in the society and project performance.

The housing problem is one of the key problems facing Addis Ababa; the housing stock is by far inadequate in quantity and quality to meet the need of the residents (UN HABITANT, 2010). The housing deficit is set to increase concurrently with the foreseen high population and urbanization growth. In reaction to this challenge, private investors are entering into the industry. According to EIA data, there are about 100 private real estate companies that are involved in the business. Although the number of private investors is increasing recently, the gap between demand and supply of completed residential house remain the same with all its negative images and complaints.

As the housing problem is one of the biggest social and political issues for any level of income group, most of the city’s residents live in the shelter with families due to homelessness and rent private houses even if they can afford to buy a house.

According to the study by Nesru Dusso, (2020). Construction projects have been increasingly growing in Ethiopia. However, few studies were conducted at the country and project levels that provide reliable evidence about the successes and challenges of the implementation. As per the researcher's awareness, there is no research conducted in the study area. The statistical abstract

document of GZFED (2009 E.C) showed that only 15% of the project were completed based on the agreed schedule. So, delays in construction projects are a critical and serious problem in Ethiopia.

For instance, initially, Noah real estate, Figa site project was launched to be constructed and hand overed within 3 years. However, it took five years to complete and hand over to the house owners. Due to this, people are forced into unnecessary extra costs and undesirable living conditions. This will lead to people's dissatisfaction with the real estate project implementation. Therefore, housing projects have an impact on personal, socioeconomic as well as political conditions. As a result, it is necessary to assess the actual causes of the housing construction delay and its effect on Noah real estate project implementation to minimize the delays and their corresponding costs and time. On top of that, this study will be very useful in providing information for the owner of the business for the improvement of project implementation.

1.3 Project Research Question

The research questions for the study are the following:

1. What are the main causes of delay related with the real estate owners, contractors, and clients?
2. What does the effects of delay on Noah real estate project implementation?

1.4 Objectives of the study

1.4.1 General Objectives of the study

This research aims to identify and assess the main causes of delay and its effect on construction projects of private real estate, specifically Noah real estate.

1.4.2 Specific objectives of the study

Deriving from the above research questions, the research has the following specific objectives.

- To identify the major cause of delays related with the real estate owners, contractors, and clients.
- To explain the effects of delay in the Noah real estate construction project implementation.

1.5 Significance of the study

The findings of this research improved our understanding of the factors that cause to implementation delays in the Noah real estate project. Noah Real Estate could be able to complete projects more competently and effectively in the coming future. This made it easier for the project to achieve its objective. Additionally, this research might offer a solution for related projects that are now being worked on around the country. It might also serve as a starting point for additional inquiry by other curious researchers. Apart from that, this study is anticipated to reduce the main reasons for delays to provide better strategies and methods for timely delivering construction projects.

1.6 Scope of the study

It is important to know that the findings of this research cannot be generalized due to its limited scope. The study is limited to cause and consequence of delay in construction project only at Noah rela estate. As far as the limitation is concerned many constraints can have an impact on the quality of the study. Most of the constraints will arise from the case of the targeted population or respondents are filled the questionnaires carelessly.

1.7 Limitation of the study

This research reviews some of the causes of delays in Noah real estate and the effects of these delays on project achievements. Therefore, the research did not cover the quality of the housing project. Again the study may also focus only on the causes and effects of delays by project parties owners, contractors, consultants and clients.

1.8 Organization of the study

The research paper is organized into five chapters. Accordingly: Chapter one deals with the background of the study, the statement of the problem, the research question, the objective of the study, the significance of the study, and the scope and limitation of the study. In chapter two both theoretical and empirical literature have been reviewed and the findings of some related studies conducted in the area are presented The third chapter was concerned with the methodology used for the study. In the fourth chapter presentation of data and interpretation will be presented. In the final fifth chapter summary of findings, conclusions, and recommendations are for future studies would have been addressed.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

Based on the research objectives identified in the earlier chapter, this chapter the previous studies and the research done in the field of project management by identifying the factors affecting delays in the construction industry and its effect on project implementation is summarized and reviewed.

2.1 Concept and Definition

2.1.1 An overview of project and project management

According to Kerzner (2009) the term project can be considered to be any series of activities and tasks that have a specific objective to be completed within certain specifications, have defined start and end dates, have funding limits (if applicable), consume human and nonhuman resources (i.e., money, people, equipment), are multifunctional (i.e., cut across several functional lines) Project, was also defined as collection of linked activities carried out in an organized manner with clearly defined start point and finish point, to achieve some specific results that satisfy the needs of an organization as derived from the organization's current business plans (Trevor L. 2007). This is what clearly entails a project; it's a unique undertaking, with defined beginning, ending and allocated resources, aiming to bring about change in an organization for the better result. Kerzner (2009) Successful project management can then be defined as having achieved the project objectives, within time, within cost, at the desired performance/technology level, wile utilizing the assigned resources effectively and efficiently, accepted by the customer if a project is defined in such a way, project management is then the application of knowledge skills, tools and skills techniques to project activities to meet project requirements. This is accomplished through the use of initiation, planning, execution, monitoring and controlling, and closure process (PMI, 2013). In the study of Westland j. (2006) Project Management was defined and briefly explained as the skills, tools and management processes required to undertake a project successfully. These skills, tools and processes are three components that are required to set up a project keep it on track and close it successfully. The roles of the three components are identified as follows Special knowledge, skills and experience are required to reduce the level of risk and increase the likelihood of success of a project. Tools are used by project management (PMs) to improve the chance of success. Examples are checklists, specific software, templates etc. Various processes and techniques are used to monitor and control time, cost, quality and scope of projects. Therefore Project manager should improve its skills, tools and processes in order to improve the

success rate of a project, these project management's skills, tools and processes are used to manage an every project, this is accomplished through the use of initiation, planning, execution, monitoring and controlling and closure process. On the other hand, Kerzner (2009) this Project management process as identified as the Guide, namely:-Project initiation, Project planning, Project execution, Project monitoring and control and Project closure.

These processes (the five life cycles) have been organized into ten knowledge areas; these are Project Integration Management, Project Scope Management, Project Time Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management (PMI, 2013). These ten knowledge areas are applicable to every project management and identified these ten knowledge areas that a project manager must be familiar with for a successful implementation of a project work (PMI, 2000). Project is typically of shorter duration and more risky than any business, so projects will be paying attention on the formation of a set of deliverables within agreed cost, time and quality parameters. The vital goal of a PMs is to recognize output and returns of strategic consequence, to achieve this a project is designed as a temporary flexible organization structure created to coordinate, direct and oversee the implementation of a set of related projects and activities in order to deliver output and returns related to the organization's strategic points. Project usually requires the dedication and active participation of more than one organization to achieve the desired output. A project delivers, or enables one or more profits i.e. measurable result from an output and perceived as an advantage by one or more stakeholders

2.1.2 Project performance

2.1.3 Definition of Project delay

A project Delay is an unplanned and unexpected deferment of a project because of some event or occurrence that impedes the project's commencement or continuation. It is the length of time that extends the project duration and causes a disruption in the delivery of project goals and objectives.

Project delays are often caused by circumstances that create barriers to the launch and further implementation of project activities. Rarely a delay can be caused by a request of the customer, sponsor, or other stakeholders to have enough authority on their project.

When project delays are unexpected, they are uncontrollable and have rather a negative impact on project activities and results. An unexpected delay extends the overall duration of project

activities and entails an increase in project costs. It generates time-associated cost effects that increase resource consumption and require more time for reaching project success.

To prevent the negative impact of project delays, it is reasonable to establish a delay allowance at the very beginning of a project. Delay allowance is the length of time included in the project schedule in advance to cover unpredictable contingencies and expected minor delays. It is a mechanism for increasing project safety by preventing activity disruptions and creating time buffers.

Ijariie-Issn, (2019), delay in government construction projects, especially in the road sector, has had a significant impact on economic activities in the country. Several road construction projects have littered the length and breadth of the country for which the government has commenced that have yet to be completed. Unfortunately, the timeline for these projects is unknown to the citizens of the country. This has led to an increased number of uncompleted road construction projects by the government and has further compounded the woes of Kurdistan Region's Citizens. The cost of a construction project is one of the most important factors in the construction industry. Due to many reasons, the total cost of a project can significantly vary from the initial estimated cost. The reasons could be changes in the scope of work, specifications, or any other contract documents. In the construction industry, variation orders are created when changes occur. It is an official document that states the changes made to the original agreement between the client and the contractor. When a variation order is created, it brings several negative effects to both the client and the contractor. The construction industry is the tool through which a society achieves its goals of urban and rural development. It is one of the sectors that provide important ingredients for the development of an economy. The construction industry tends to fluctuate with the general economy, and it has a quick response to changes in the economy.

According to Chitkara, the construction industry in many countries accounts for 9 % of the Gross Domestic Product (GDP). However, it is becoming more complex because of the sophistication of the construction process itself and the large number of parties involved in the construction process Delay has been defined severally by many researchers oftentimes with some bias towards the central theme of their research work. That notwithstanding, some definitions explain the concept of delays with precision. There are several definitions for a delay: To make something happen later than expected; to cause something to be performed later than planned; or to not act timely each of these definitions can be described as a delay to an activity of work in a schedule. On construction projects, as well as on projects where a schedule is being used to plan work, it is not uncommon for delays to occur.

2.1.4 Delay in Construction Industry

According to Assaf and Al-hejii (2006) delay refers to making something happen later than expected or not acting timely. In another study, Mohammed (2012) defined a delay in construction projects as the late in progress or actual completion of work compared to the baseline construction schedule or contract schedule.

Ab. Rahman (2018), delay in the construction industry is a worldwide phenomenon. Delay occurs in most construction projects, regardless of the project's complexity. In construction projects, delay can be defined as the extension of time in the completion of a project. In other words, the delay means failure to complete the project within the targeted time and budgeted cost as agreed in the contract. Construction delay is considered one of the most recurring problems in the construction industry and it often adversely affects project success in terms of time, cost, and quality. In most cases, the failure of the project is mainly related to the influence of consultants, contractors, and owners on project performance. The effects of delays are costly to all parties concerned and very often will result in disagreement, cost overrun, arbitration, litigation, total abandonment, and project infeasibility. Construction is a risky industry with uncertainties due to various external and internal factors that influence the construction process.

The definitions of delay provided above can generally be characterized as time extension, slowing down of a project, beyond the agreed project period, and late in progress over its anticipated timetable compared to the baseline.

2.1.5 Types of delay

Delays generally fall into four categories. Delay is considered a major cause of construction claims. The four types of delay namely: excusable, non-excusable, delay compensable & concurrent delays.

Excusable delays: Excusable delays are those not attributable to the contractor's actions or inactions, and typically include unforeseen events. It allows the contractor to obtain a time extension to complete the contract without being penalized. However, this type of delay normally does not entitle the contractor to any damages caused by the delay. The examples of excusable delays to a contractor's action are differing site conditions, design problems, changes to the work, inclement weather, and strikes. This type of clause sometimes called a "force majeure" clause,

lists excusable delays. As this list implies, when unanticipated outside 'forces delay the completion of the contractor's work, the delay is generally considered excusable.

Non-Excusable Delays: Examples of excusable delays to a contractor's action are differing site conditions, design problems, changes to the work, inclement weather, and strikes. This type of clause sometimes called a "force majeure" clause, lists excusable delays. As this list implies, when unanticipated outside 'forces delay the completion of the contractor's work, the delay is generally considered excusable. This type of delay presents no entitlement to a time extension or delay damages for the contractor if the delay can be proved to have affected the whole project. The owner however could be the liquidator of the damages. For instance, a non-excusable delay would be when a contractor fails to provide sufficient manpower to complete the job on time. The client can claim their loss if had in the contract agreement. The factor that contributes to the non-excusable delay: are the usual weather and as expected, delay caused by the subcontractor, the inefficiency of the contractor to manage the construction site, the finances of the contractor, the lack of labor, failure to manage their work according to the contract schedule, Always make mistake or fail to fulfill owner's specification

Compensable Delays: Basically, the compensable delay is when the contractor will receive payment due to the additional cost of delay and as well as the addition to a time extension for contract performance if there is any change in scope of work, late supply of owner materials or information, impeded site access, differing site conditions and failure to provide timely and review shop drawings. Furthermore, this type of delay is for which the innocent party is entitled to both a time extension and additional compensation for the resulting costs.

Concurrent Delay: Alkass said that concurrent delays refer to delay situations when two or more delays occur at the same time or overlap to some degree. For example, if an owner denies access to a project site for two weeks, and a severe storm prevents the contractor from working on the project for one of those two weeks as well, there will be a concurrent delay of one week. The contractor will be able to recover for delay damages for one week, as a severe storm is not a cause of delay that is compensable and would have prevented the contractor from performing even if the owner did not deny access to the site. However, if there are two concurrent causes of delay, one of which is a relevant event, and the other is not, then the contractor is entitled to an extension of time for the period of delay caused by the relevant event notwithstanding the concurrent effect of the other event.

2.1.6 Cause of Delay in Construction

A large number of delay factors may lead to project delays in construction projects, arising from different parties and resources. These delay factors are countless since each construction project has its characteristics and environment. Efforts have therefore been made by many researchers to identify the most significant factors of delay related to the owner, contractor, consultant, client, and other external factors in construction projects, which are discussed in the next section.

2.1.6.2 Factors related to the owner

The owner of the project is the party that owns, manages, and funds the project; the owner assigns either a firm or individual representing him to oversee the implementation of one phase or more of the phases of the project. Owner representatives take the responsibility of critical decision-making on the project and choose other parties such as consultants and contractors to implement the project. "The owner is responsible for setting the operational criteria for the completed Project, owner is also responsible for setting parameters on total cost, payment of costs, major milestones, and the project completion date.

One of the most crucial decisions that owners need to take at the beginning of the project is to determine the duration of the contract. Many owners prefer fast completion of work but thorough investigations should be conducted to decide the contract duration. Another major factor that delays the initialization of the project is the owner‟s failure to hand over the site to the contractor. Therefore, the personal involvement and quick decision-making on various matters by the owner in the initial phases of the project may accelerate the project‟s progress.

Kimmons & Loweree (1989) observed that “the working relationship between an owner and a contractor is one of the most crucial determinants of project success and this relationship also develops trust between the two parties”. The owner must participate in the construction project horizontally and vertically, but without interrupting the contractor‟s project plan. In addition, financial matters should also be taken into account, and the owner must ensure the on-time availability of funds; lack of financial stability may cause many problems, such as extensive delays due to labor strikes or material mismanagement Chan & Kumaraswamy (1997).

Odeh and Battaineh (2002), many owner-related delay factors have been identified are delay in furnishing and delivering the site to the contractor, unrealistic contract duration, delay in the settlement of contractor claims by the owner, suspension of work by the owner's organization,

delay in issuing of change orders by the owner, slow decision-making by the owner's organization, interference by the owner in the construction operations, uncooperative owner with the contractor complicating contract administration, delay in progress payments by the owner, the owner ‟s poor communication with the construction parties and government authorities, the owner ‟s failure to coordinate with government authorities during the planning, poor coordination by the owner with the various parties during construction, excessive bureaucracy in the owner's administration

2.1.6.3 Factors related to contractor

When a construction firm is involved in a big construction project, a contractor is generally appointed for carrying out the construction work. Contractor Related Delay Factors type was recognized as one of the groups of causes of schedule delays of construction projects. Some factors of contractor related delay in construction projects are discussed as follows. IRJET, (2016)

Ineffective project planning and scheduling

This delay factor consists of Project planning and scheduling which are not capable of performing efficiently or as expected. Inaccurate time and cost estimation of project may the most serious cause of delay. Construction estimating errors can be very expensive and embarrassing. Normally the contractor do not permit time for certain common problem constantly occur during the construction time such as missing deliveries of supplies, breakdown of equipment, accidents and emergencies and so on. Due to this problem the real time will run out from the planned time. So, the complete project might be facing the delay. Similarly, Mistaken in cost estimate contributes a lot of reason such as using improper units of mistakes in arithmetic. Sometime contractor because of wrong cost estimate, measurement for a second time for that specific work. Finally, due to re-measurement time some of the construction work will influence delay. Hence, the contractor should estimate all the problems in planning and scheduling which may occur during the execution of work and consider extra time to prevent delay.

Lack of experience of contractor

Abd Majid and McCaffer (1998) deliberate the factors of Lack of experience of the contractor as main causes of delays. Battaineh (2002) found the factors of Lack of experience of the contractor as main contributors to causes of delays. Long, et al. (2004) declared the factors of Lack of experience of contractor as key sources to causes of delays in construction project. In the construction trade, several of projects facing a problem of delay during the construction period. But at that time contractor could not able to resolve the problem instantaneously because of not

any experience. During the time in which the contractor discovering the technique to resolve the problem, certain works fully stopped because of this problem. The contractor should have sufficient working capital and higher efficient equipments for work and also capable in resolving problems on site. Before hiring the contractor for the project, background of the contractor should be checked.

Frequent change of subcontractors

When a construction firm is involved in a big construction project, a contractor is generally appointed for carrying out the construction work. The contractor, however, hardly does whole the work. The work that leftovers is implemented by subcontractors, who are under contract to the contractor, who is generally selected the prime contractor. Subcontractors may appoint their personal subcontractors to do portion of the work that they have contracted to carry out. Subcontractors sign agreements with the contractor that normally integrate the contract among the contractor and the owner. A subcontractor who unsuccessful in finish work on time or whose work is not satisfactory under the contract may be mandatory to pay compensations if the project is late because of these reasons. If the subcontractors changes in the course of the work by the contractors or subcontractor itself due to these problems. Then delay in the project occurs because the new subcontractor have no or say very little knowledge about that project and they start to understand the whole project from beginning which consume time and have chances of mistake. So that changing of subcontractor between the project task should be neglected and if it is necessary than contractor should be arranged regular meetings with the new subcontractor for providing full and correct knowledge of the project.

Obsolete technology

Structures are constructed from long ago in past but the difference is of technology as early structures were simple and just for the purpose of housing. With the time, innovatory modifications have seemed in construction also and it is all because of the technology that can be well-defined as real use of your knowledge. In the starting, houses were prepared from stones and mud, but in modern time, we build buildings using several kinds of materials such as stone, glass, concrete, timber, metals, etc.

Construction business contains a wide variety of constructions fit for all classes of people. Domestic construction, heavy or civil constructions, industrial construction, commercial construction are some examples that are now showing master pieces of construction technologies. For each of these needs different technical treatments. For domestic construction, simple

technological ways are generally chosen and commonly available materials are normally used. These are generally low cost projects and as well short-term. In commercial construction, the basic concern is infrastructure that is responsible for strength, workability and life of project. These are commonly launched by government organizations. These projects necessitate newest construction technologies, tools, and materials. Latest techniques of doing construction work are more effective than older techniques. Hence the use of old technique will slow down the speed of work in construction projects. For reducing such type of delay, latest technology equipment and materials should be preferred for work.

Inappropriate Construction Methods

Construction is the process of build structure to real property. So many individual activities perform in single construction project. Every activity have many different type of methods or techniques for executing the work. As efficiency codes have arisen into result in current years, new construction methods and technologies have developed. Construction Management sectors are on the cutting edge of the modern approaches of construction proposed to improve performance, efficiency and lessen construction waste. Sometimes contractor chooses the inadequate method for performing any task in construction which not right and not suited for that work. This may normally happen due to lack of experience or misunderstandings of contractors. In this situation, this factor contributes to cause of delay as well as loss of money. For reducing these delays, proper study of the project should be done by the contractor before selecting any method and check suitability of method for that particular work from old projects.

Rework due to errors

Rework is well-defined as work measures that have to be finished more than one time. A researcher described rework as the "unnecessary process of repeating a work activity that was wrongly carried out the first time". One more definition which highlights the essence of rework is "effort that is made to follow to the original requirements by correction at least one more time due to nonconformance with desires." Rework is not usually defined to contain missing possibility of work modifications and change orders carried by end owners, which are not essentially considered nonconformance. Rather alterations such as these instead stem from a desire to change due to financial plan limitations or other unrelated situations. In large complex surroundings that contains multiple stages of jobs, dealers and installers, and where lots of activities take place at the same time, the possibility for omissions, mistakes and poor management practices frequently cause neglect that can lead to failures in quality, which must then be reworked. Rework may

cause time overrun and cost overrun if it is done frequently. So it should be avoided during construction. For this every step of work should be check by inspector engineer.

2.1.6.4 Factors related to Consultant

The client may consult with other professionals who can assist him in organizing the entire construction project. These professionals are called consultants. The main duties and responsibilities of a consultant may be to design the infrastructure of the project, which includes architectural, mechanical, structural, and electrical designs. Some other responsibilities may include the preparation of project-related documents such as bills, drawings, specifications, and tender documents (Long et al, 2004). Furthermore, in some cases, consultants also conduct project planning, cost control and estimation, and quality control. In normal circumstances, consultant-related delays occur during the preparation of drawings, during the adoption of design drawings, while taking design approvals from contractors and clients, and when performing inspection procedures. There are many possible reasons behind these types of delays; prominent factors include inexperienced consultancy staff, poor qualifications, inadequate communication and coordination skills, and improper planning, Gunlana and Krit, (1996). Odeh & Battaineh (2002) believe that during the construction processes, the inquiries and inspections of the consultant may slow down the progress of the work. In response, the contractor may come up with solutions to the problems; however, these solutions may not satisfy the consultant and could result in the work having to be redone. Effective control and command over production on the construction site is a major element that contributes to the success of implementing the project; conversely, hindrances in performing these activities can have severe impacts on a construction project. The following points are consultant-related factors that can result in construction delays. Odeh and Battaineh, (2002) poor qualification of consultant engineers staff assigned to the project, delay in the preparation of drawings, delay in the approval of contractor submissions by the consultant, poor communication between the consultant engineer and other parties involved, poor planning and coordination by the consultant engineer with other parties involved, delays in performing inspection and testing by the consultant engineer, slow response from the consultant engineer to contractor inquiries, inadequate design specifications and poor contract management.

2.1.6.5 Factors related to Clients

There are many factors related to clients that affect the project delay.

Insufficient funding: Funds are not adequately released during relevant phases of project‟ execution, Milestones payments are not made on time due to organizational lapses or

bureaucracy; Inadequate cash flow leads to delays in delivery of materials and equipment to the site and delay in payment to contractors and consultants.

Impractical allocation of resources: Funds, manpower‟s, materials, and equipment are inadequate to complete the project because project owners or clients have not properly assessed whether they have the required resources to complete projects

Poor quality materials supply: Poor quality materials lead to poor quality workmanship, thus an unacceptable product. Most often, the project owners insist that corrections be made or that parts of work be completely scrapped and reworked.

Lack of adequate communication between the parties: Poor or inadequate communication between parties leads to misunderstanding and misrepresentation of facts. This could breed conflicts and consequently hinders the smooth progress of activities.

Major disputes & negotiations: Major disputes and negotiations between parties in the project impede the progress of work as aggrieved parties wait until grievances are resolved before they continue.

Wrong organizational structure linking to the project: Organizational structures affect project performance. Certain projects cannot be managed by certain types of organizational structures. For instance, it is difficult to execute quick-impact projects in a functional organizational structure because of the slow decision-making processes and bureaucracies associated with such a structure.

Unrealistic contract duration: This could be caused by the wrong packaging of the contract document, and unprofessional/inexperienced client‟s staff. Where the stated completion duration is impracticable, the responsibility lies on the stakeholders to review the initial expected completion time and make amendments where necessary.

Slow decision-making: Clients are the Project Owners. When they do not make decisions on time regarding project matters, they slow down activities at the project sites. Slow decision-making could be caused by an organization‟s internal bureaucracy or wrong channels of communication.

Wrong choice of Consultants & contractors: Clients select Consultants and Contractors as their vendors. If the selection process is faulty, unqualified vendors will be engaged. This could lead to faulty works and frequent rework and delay in project completion and cost overrun.

2.1.6.6 External factors

Some factors are outside the control of construction participants. For instance, the weather conditions in Libya in the summer are very hot, and the temperature normally exceeds 40 degrees Celsius. On the other hand, the weather conditions in the United Kingdom are worst in the winter season, when the temperature can typically fall to -5 or - 8. In such intense conditions, contractors may face many difficulties that normally result in either a slowdown of the construction process or, sometimes, a complete stoppage of work. These difficulties may include disruption to utility lines such as gas, electricity, or water. Ogunlana and Krit (1996) mentioned that social and cultural festivals and celebrations may also affect the time it takes labor to reach the job site, negatively affecting the productivity of the construction project and potentially resulting in minor delays. These external factors may also create clashes or disputes between the construction participants, which will further increase the product cost and duration Odeh and Battaineh, (2002). Unforeseen ground conditions, unexpected geological conditions, problems with neighbors, unusually severe weather, conflict, war, and public enemy, poor weather conditions on the job site, traffic control and restrictions on the job site, rises in the price of materials

2.2 Theoretical Review

2.2.1 Effect of Delay in Construction

A project might be affected by a variety of effects as a result of construction delays, including delayed completion, lost productivity, acceleration, consequential damages, increased cost, and contract termination. When projects are delayed, they either have its timeline accelerated or extended past the original completion date. Multiple studies have studied the issue of delay, and they determined that it is always negative.

The impact or consequences of delay in project completion is termed the effect of project delay. The effect of delay is a change or impact due to delay Sunjka and Jacob, (2013).

A study by Aibinu and Jagboro (2002) reveals six effects of delay on project delivery in the Nigerian

construction industry which are: time overrun, cost overrun, dispute, arbitration, total abandonment, and litigation.

Hamzah et al. (2011) disclose the same effects of delay in the Malaysian construction industry. Yahyaet al. (2013) identifies the effects of delays in the Pakistan construction industry as clash, claims, total desertion, and slowing down the growth of the construction sector. The desire to finish a project on time, under the planned budget, and with the highest quality is a common goal for all contracting parties, including the owner, contractor, and consultant. Delays usually result in losses of one form or another for everyone Murali, Sambasivan, and Yau, (2007).

The six effects of delay identified were: time overruns cost overrun, dispute, arbitration, litigation , and abandonment.

Fig. 2.1 Effects of delay in construction project

2.2.2 Effects of construction delays on project time overrun

Time overrun is one of the serious challenges construction projects face and it is the source of many problems in the construction industry. Delay in projects results in an increase in the financial cost of projects, wastage and underutilization of human resources and materials, disagreement among contracting parties, abandonment of projects, and poor quality in completed works pointed out that project delay leads to adverse consequences on the construction industry

and the economy at large. These include time overrun, increase in cost overrun, wastage and reduction in labor efficiency, tying down of clients' capital, the dispute between parties, profit loss, litigation or arbitration, unanticipated costs, demoralizing practitioners, slow development of the construction industry, environmental and safety issues, and public dissatisfaction. Above all, it impairs economic growth and devalues the efforts of innovators and experts in the construction industry. When the stipulated completion time is pushed forward, the project is said to have experienced a time overrun.

2.2.3 Effects of construction delays on project cost overrun

Cost is the common factor of any construction project. However, cost overrun is one of the most occurring risks in construction projects and the most severe in developing countries, where these overruns sometimes exceed 100% of the estimated budget (Memon, et al., 2010). Construction cost which is out of control adds investment pressure, increases construction cost, and affects investment decision-making. Hence, it is important to identify the factors that contribute to cost overrun to avoid and reduce the problems (Ali, & Kamaruzzaman, 2010). This part of the thesis focuses on theoretical approaches to examine the approaches and techniques as tools for public building construction. Additionally, related studies, a review of books, a thesis, standards, and relevant guidelines are reviewed. A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification. Project management is an organized commonsense approach that utilizes the appropriate client involvement to meet sponsor needs and deliver expected incremental business value. Projects arise out of unmet needs. Those needs might be to find a solution to a critical business problem that has evaded any prior attempts at finding a solution Wysocki, (2014).When a project is completed at a cost higher than what was budgeted, it is said to experience a budget overrun or cost overrun.

2.2.4 Effects of construction delays on project disputes:

Client-related factors, external factors, and contractual relationships that arise during a project. Delayed interim payments, owner interference, change requirements, improper management information system, etc. create disputes which in turn can lead to arbitration or litigation.

2.2.5 Effects of construction delays on project arbitration:

Client-related and contractual relationship-related factors which creates disputes lead to settlement by arbitration, which involves a third party settling issue out of court.

2.2.6 Effects of construction delays on project litigation:

Client-related, labor-related, contractual relationship-related factors and external factors lead to disputes which are not even solved by arbitration leading to litigation. Litigation is the last way to settle disputes.

2.2.7 Effects of construction delays on project total abandonment:

Sometimes client-related, contractual relationship-related, consultant, resource-related, etc., any cause which creates disputes and is unable to reach some result is abandoned.

2.3 Empirical literature review

Under this section, prior research conducted on the subject matter of this research will be assessed and reviewed to affirm the facts and issues raised here as related literature.

Ramya et al., (2015) studied the delay factors and their impact on project completion in the Malaysian construction industry. The study result indicated ten (10) most important causes of a delay from a list of twenty-eight (28) different causes. The ten most important causes of delay were (i) contractor ‘s improper planning (2) contractors' poor site management (3) incomplete (4) client ‘s inadequate financial resources and payments for complemented work (5) problems with subcontractors (6) shortage of material (7) labor supply (8) equipment availability and failure, (9) Lack of communication between parties and (10) mistake during the construction stage.

Prakash and Joseph (2014) identified eight categories as leading to construction delays, six factors that effects delays, and fifteen methods for mitigating construction delays in their analysis of the causes of delays in construction projects. Late revision and acceptance of design plans, delays in subcontractor operation, and inadequate contact and coordination change orders by the owner during construction were the top three most significant reasons that led to the causes of delays. Contractor-related delays were ranked as the most important cause of delays, followed by client-related delays, and consultant-related delays. The top three important ways of reducing construction delays have been identified: site control and monitoring, effective strategic planning, and consistent knowledge and contact channels.

A study of delay analysis in a construction project (Dinakar, 2014), classified delay-causing factors into seven major groups, these are owner contributed factors, contractor-contributed factors, consultant-contributed factors, material-contributed factors, equipment-contributed factors, labor-contributed factors, and external factors. The contribution of the Contractor in the delay of the construction project is more than the client and consultant side. External causes, on the other hand, have the least impact on building project delays. Improper communication

between the involved parties is found as the major problem while external reasons like lack of qualified labor, equipment, and material when needed come next in the row.

The study carried out by Sunjka and Jacob (2013) revealed that the ten (10) most common causes of project delays in the Niger Delta region in Nigeria include youth commotion, communal catastrophes, lack of proper planning, poor contract management, late identification and resolution of drawing and specification errors. Ibrahim (2006) worked on finding out the causes of delay in construction projects and their severity according to contractors and consultants and stated that cost, time, and quality have proven their importance as the main measures for construction project success.

Aedwin and Shibi (2015) identified causes of delay related to owners, consultants, contractors, Labour, Equipment, and external factors. Owner-related factors, according to their report, include (slow decision-making, delay in delivering the site, payment delays, incorrect preparation and scheduling, owner intervention, change of orders, interruption of operation, lack of communication, late decision making, conflicts among partners); Consultant (Inadequate experience, delay in approving drawings and samples, inadequate detailing and clarity in drawings, quality assurance control, mistakes & discrepancies in design documents); Contractor (delay in payment, delays in sub-contractor work, poor site management and supervision, rework due to errors, inexperience, poor qualification of staff, in effective planning, frequent change of subcontractor); Labour & Equipment (shortage of labour, low productivity level of labours, in-experienced work force, delay in material delivery, shortage of materials, shortage of equipment, equipment break down, low productivity & efficiency, poor operator skill, lack of communication); and External factors (change in government, poor soil conditions regulations, delay in obtaining permits, climatic factors, accidents during construction, delay in commissioning).

Srdić et al (2015) studied the causes of delay in the construction industry of Slovenia. They categorized the causes into 11 groups and conducted research. The results show that the causes of most delays can be attributed to legal issues, slow decisions of the owner or his representative, and design that lacks details important for the contractor. Many of the issues within these categories appear at the very beginning of the project and can be mitigated (partially or fully) by the owner; while their costs are far away from being excessive.

According to Ashraf and Ghanim (2016), the top ten factors causing delays for public sector projects in Jordan are: (1) inadequate management and supervision by the contractor, (2) client

changes of the design, (3) inadequate planning and control by the contractor, (4) using lowest bid that leads to low performance, (5) changes in the extent of the project, (6) errors in design and contract documents, (7) progress payments are not made in time by the client, (8) Rework due to mistakes during construction, (9) Changes in the original design and (10) Low-level productivity.

Many researchers have examined the main causes of construction delay in various types of construction projects. In Malaysia, Aftab H. M. (2014) in his study Contractor perspective on time overrun factors in Malaysian construction projects‟ concluded that the top ten most significant causative factors contributing to construction time overrun are frequent design changes; changes in the scope of the project; financial difficulties of the owner; delays in decisions making; unforeseen ground condition; delay in progress payment by the owner; shortage of site workers; mistakes and Errors in design; delay preparation and approval of drawings; and incompetent subcontractors. Another study by Aftab et al., (2011) on their study time overrun in construction projects from the perspective of Project Management Consultant (PMC)‘ in Malaysia: concluded that the major causes of time overrun by PMCs are cash flow, and financial difficulties faced by contractors; contractor's poor site management; inadequate contractor experience; shortage of site workers; ineffective planning and scheduling by contractors; escalation of material prices; the practice of assigning the contract to the lowest bidder; problems with subcontractors; and lack of communication among parties.

Muhammad, et al., (2017) in their study on Time Overrun in Public Sector Construction Projects in Pakistan as an example of a developing country: summarized their findings based on an average index of the topmost factors of time overrun in the form of non-excusable, non-compensable and compensable delay found on construction industry site as follows. NonExcusable Delay: (1) Delay in shop drawings and sample materials; (4) Suspension of work. Non-Compensable Delay: (1) Fire (2) Natural changes in environment; (3) Wind; (4) Snowfall. Compensable: (1) Poor site management and supervision by the contractor (2) Poor communication and coordination by a contractor with other parties; (3) Delays in subcontractor’s work; (4) Delays in sub-contractors work.

2.4 Research Gap

There are many studies about causes and consequence of delay in project implementation private real estate construction. However, there are few studies on causes and consequence of delay in developing countries such as Ethiopia specifically in Addis Ababa City Administration. Researchers investigated different factors that cause and consequence of delay in project

implementation in private real estate construction, from project initiation up to project close out. When considering delay in context of private real estate construction projects there are additional factors that cause and consequence of delay in real estate construction from different stakeholder perspective. This research tends to address this issue and add a fresh contribution to the scant literature that deals specifically with this question. The review of literature found few research studies related to the analysis of delay factors in the private real estate construction. However, it was also found that no studies to date have ranked the cause and consequence of delay in housing construction projects. In addition, there were few studies carried out in relation to stakeholders' contribution for delay in construction of private real estate. Hence conducting study on causes of delay in construction of private real estate from limited stakeholders' side will not give complete solution to the problem.

2.5 Conceptual Framework

A construction project is successful when the work of the construction project is done by proper planning and scheduling, under the budget and specified quality, under a specified time, and by the satisfaction of the stakeholders. Delay has become one of the major problems in the construction industry (Khattri, Agarwal, Gupta, & Pandey, 2016). Based on this, this section aims to summarize the idea about past literature and to bring out the contributions for this study area. Thus, this part starts with the idea generated and the contribution follows.

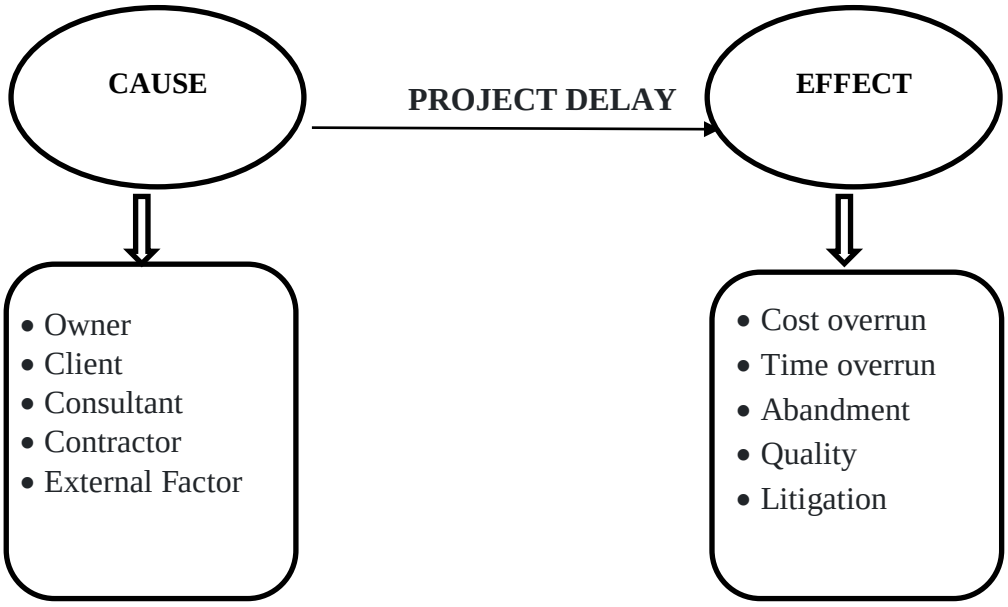


Fig. 2.2 Conceptual framework

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3. Introduction

This chapter discussed the methodology of the research topic about causes of delay and its effect on private real estate, specific to Noah real estate. Mainly the chapter consists of the following sections research design and approach followed by research population, sample size, data gathering procedures, sampling procedure, research instrument, data analysis, and the method conducted for the study.

3.1 Description of the study organization

Noah Real Estate PLC was established in 2013 G.C. and has since delivered 16 residential, 5 commercial, and 8 mixed-use mid to large-scale projects, with additional 10 projects under development at various sites in Addis Ababa. Within this 10 years of experience, Noah has constructed and is constructing a total of 29 projects.

Noah is a sister company of Great Abyssinia PLC, a renowned FMCG company with brands, such as Abyssinia Coffee, Prigat, Tulip, and Aby soda drinks with various flavors. In a recent prestigious deal, they are also partnered up with Nestlé in water bottling; a continuation of the Abyssinia Springs brand.

This study is focused only Figa site project. Under Figa site project there are two projects which are Noah Terrace and Noah Garden Apartment.

The parties were include in the survey is mainly engineers, managers, suppliers and accountants representing clients, consultants and contractors in Noah real estate project office. All the respondents were selected on the basis that they have experience in implementation of the projects. A questionnaire survey were distributed to the targeted respondent in order to identify the most important factors that cause delays and the common effect of delays.

Source: Company brochure

3.2 Research Design and Approach

The research design refers to the arrangement of collecting and analyzing data in a manner that aims to combine relevance to the research purpose with the economy in the procedure (Babbie,

2007). The purpose of this study is particularly be intended to identify and assess the causes and effects of construction project delay in private real estate, specifically Noah real estate. For this objective descriptive survey design is used and adapted to provide descriptions concerning the causes and effects of project delay.

A descriptive research design is a scientific method that involves observing and describing the behavior of a subject without influencing it in any way. In addition, a descriptive study attempts to describe a subject, often by creating a profile of a group of problems, people, or events, through collections of data and the tabulation of frequencies on research valuables and the research reveals who, what, when, where or how much (Serakan, 2010).

According to Dawson (2002) there are three types of research approaches, quantitative, qualitative, and mixed approach. The purpose of quantitative research is to gather, analyze and measure statistical data. To collect the relevant data the survey is structured into a Likert scale questionnaire. Based on this, the researcher used quantitative approaches for the survey.

3.3 Population of the Study

Hair, et al (2008) defined a targeted population as consisting of the complete group of elements (people or objects) that are identified in the investigation based on the objectives of the research. The targeted population in this study are clients, consultants, and owners of real estate which is a total of 120.

3.4 Sampling Technique and sample size determination

In this study owners, contractors, consultants, clients/house owners, and sites in Noah real estate, Figa site project construction are included. The basic idea of sampling is selecting some units, for example, people, and organizations from a population of interest so that by studying the sample, a researcher can conclude the entire population.

The researcher employed systematic sampling design for the study; the parties included in the survey are mainly site engineers, client/owner, consultants, and contractors at Noah real estate, Figa site project office. For the study, to determine the sample size, the researcher uses a formula. The sample size is determined by the statistical formula that was developed by Taro Yamane in 1967.

- Contractors – 24
- Consultant – 10
- Noah Management staff - 21
- Project office staff - 65

Total population **120**

$$n = \frac{N}{1 + N(e2)}$$

Where: n=number of sample size

N=Number of a total targeted population

e=error (at 95 % confidence interval)=0.0025

N=120

E=0.0025

n= ____120____

1+120(0.0025)

=1.3

=120 =92 **n=92**

1.3

3.5 Tools for Data Collection

Primary data had collected using a structured questionnaire and secondary data from literature reviews, Working papers from the Noah real estate project office, as well as quarterly and annual performance reports. Using a structured questionnaire set of surveys is distributed to the targeted respondent to identify the most important factors that cause delays and the common effect of delays. The survey questionnaires had distributed to the target group mainly engineers, managers, and accountants representing clients, consultants, and contractors in Noah real estate, Figa site project office site who are taking part in the project implementation.

3.6 Data Analysis Method

The purpose of the data analysis is to determine the relative importance of various factors that contribute to the causes and effects of construction delays. In this study, descriptive analysis is used, and the researcher analyzed it using the Statistical Package for Social Sciences (SPSS

version 27). Descriptive statistics is used to describe the variables in this study. Descriptive statistics is the use of mean, standard deviation, and percentage to achieve the study's objectives (Saunders, Lewis, & Thornhill, 2009). The collected data are entered into an SPSS worksheet and the information is generated from the application via statistical table presentation. The data are tabulated and cross-tabulated using the statistical package for social science (SPSS). Following that, the researcher interpreted the frequency tables and produce a summary of findings, conclusions, and recommendations.

3.7 Reliability and Validity

According to Kothari (2004), the validity of a test is the degree to which it can accurately and precisely reflect the results of a measurement technique. The extent to which the content aspect of the questionnaire instrument covers the topic being evaluated is another definition of the validity of the content. The accuracy of the data gathering tools was examined in light of the literature that was at hand.

The Cronbach alpha coefficient is the most common method used for assessing the reliability of a measurement scale (Hayes & Bob, 1998). Using SPSS software, which is frequently used, the reliability of the surveys is examined using the Cronbach's Alpha test coefficient. The degree of internal dependability, or how closely a set of items are related, is shown by the Cronbach's alpha coefficients. The range of Cronbach's alpha values was 0 to 1. Values above 0.70 are regarded as "rational" or appropriate in the majority of social science study environments. A greater value always suggests for the internal consistency of Cronbach's Alpha (Gliem and Gliem, 2003).

Variable	**No. items**	**Cronbach alpha**
Owner related	5	0.784
Client related	5	0.811
Consultancy related	5	0.728
Contractor related	5	0.844
External factor	5	0.697

Table 3.1 *Reliability test of the variable by Cronbach's Alpha*

Source: Own survey, June 2023

The variables included in the analysis were owner related, client related, consultancy related, contractor related, and external factor. Each variable consisted of a set of items. The owner related variable comprised five items and yielded a Cronbach's alpha of .784, indicating good internal consistency. Similarly, the client related variable had five items with a Cronbach's alpha of .811, suggesting a high level of internal consistency. The consultancy related variable also consisted of five items, and its Cronbach's alpha was .728, indicating reasonably good internal reliability. The contractor related variable, with five items, demonstrated a high level of internal consistency, as reflected by its Cronbach's alpha of .844. Lastly, the external factor variable appeared to have a single item, and its Cronbach's alpha was .697, indicating moderate internal consistency. These Cronbach's alpha values provide insights into the reliability and consistency of the measurements within each variable, contributing to the overall understanding of the study or survey results.

3.8 Ethical consideration

Ethical consideration was part of this study and documents which is reviewed by the organization remains confidential. During this study, respondents were free to respond with their own opinion from their experience and their personal information such as name and religion were not be mentioned the information which is used in this research for academic purposes.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4. Introduction

This chapter deals with the analysis, interpretation, and discussion of the data collected through the questionnaire. Responses for measures on the questionnaire are summarized and analyzed by using SPSS version 27 software

4.1 Response rate

According to, Berg (2004) stated that the response rate of 70 percent and above is credible for analysis.The study targeted a sample size of 92 respondents from which 86 were filled in and returned the questionnaires making a response rate of 93 percent. This rate implied that the response rate was acceptable to mark deductions for the study.

4.1.1 Respondents' profile

The study sought to find the demographic characteristics of the respondents. This included sex, age, and number of years the respondent, educational qualification, project stakeholders type, and job designation has analyzed.

Table 4.1. Demographic Characteristics of respondents

Item 1: Sex of Respondents				
		Frequency	Percent	Valid Percent
Valid	Female	32	37.2	37.2
	Male	54	62.8	62.8
	Total	86	100	100
Item 2: Age				
		Frequency	Percent	Valid Percent
Valid	Between 29-42	56	65.1	65.1
	Between 43-60	26	30.2	30.2
	Above 61	4	4.7	4.7
	Total	86	100	100
Item 3: Educational Qualification				
		Frequency	Percent	Valid Percent
Valid	Diploma	8	9.3	9.3
	Degree	36	41.9	41.9
	Masters and above	42	48.8	48.8
	Total	86	100	100
Item 4: Project stakeholders' type				
		Frequency	Percent	Valid Percent
Valid	Consultant	16	18.6	18.6
	Contructor	32	37.2	37.2
	Client	38	44.2	44.2
	Total	86	100	100
Item 5: Job designation				
		Frequency	Percent	Valid Percent
Valid	Resident engineer	8	9.3	9.3
	Project or construction manager	10	11.6	11.6
	Project engineer	12	14	14
	Site superintendent	16	18.6	18.6
	Other support staff	23	26.7	26.7
	Owner	17	19.8	19.8

	Total	86	100	100
Item 6: Year of work experience				
		Frequency	Percent	Valid Percent
Valid	1-3 years	8	9.3	9.3
	3-5 years	21	24.4	24.4
	Above 5 years	57	66.3	66.3
	Total	86	100	100

Source: Own survey, 2023

Item 1: Sex of respondents

Based on the data provided, 32 respondents were identified as female, which represents 37.2% of the total respondents. Additionally, 54 respondents are identified as male, accounting for 62.8% of the total respondents. The total number of respondents in the survey was 86.

Item 2: Age of respondents

The respondents' age distribution in the survey shows that the majority of participants fell within the age range of 29 to 42, accounting for 65.1% of the total respondents. This suggests that a significant portion of the survey population consisted of individuals in their late twenties to early forties. The next largest age group was between 43 and 60, comprising 30.2% of the respondents. This indicates that a considerable number of participants were in their middle-aged years. Lastly, respondents above the age of 61 represented a smaller portion, making up 4.7% of the total respondents. Overall, the survey captured a diverse range of age groups, providing insights from individuals across different stages of life.

Item 3: Educational qualification

The respondents' educational qualification distribution in the survey reveals a diverse range of educational backgrounds. Among the participants, 9.3% held a diploma as their highest educational qualification. This suggests that a small but notable portion of respondents had completed a diploma program. The majority of respondents, comprising 41.9%, held a degree as their highest educational qualification, indicating a significant proportion of individuals with undergraduate education. Furthermore, an even larger segment of the respondents, accounting for 48.8%, possessed a master's degree or higher. This indicates a substantial number of participants with advanced degrees, highlighting their higher level of education and expertise. The survey captured individuals with varying educational qualifications, providing insights from participants with different levels of educational attainment.

Item 4: Project stakeholders

The project stakeholders involved in the survey consisted of three main types: consultants, constructors, and clients. Consultants, who provided professional advice and expertise, made up 18.6% of the respondents. Their input and guidance played a crucial role in the project's planning and execution. Constructors, accounting for the largest portion at 37.2%, were actively involved in the physical construction activities. They were responsible for translating the project plans into tangible structures. The clients, representing 44.2% of the respondents, were the individuals or organizations for whom the project was being developed. Their perspective and requirements were essential in shaping the project's objectives and ensuring its alignment with their needs. The survey encompassed insights from each of these stakeholder groups, providing a comprehensive understanding of the project's dynamics and perspectives from various vantage points.

Item 5: Job Position

The respondents in the survey represented a diverse range of job designations within the construction project. Among the participants, 9.3% held the role of resident engineer, providing their expertise and guidance on site. Project or construction managers accounted for 11.6% of the respondents, responsible for overseeing the overall project execution and coordination. Project engineers, representing 14.0% of the respondents, played a vital role in managing specific aspects of the project's engineering and technical requirements. Site superintendents, comprising 18.6% of the respondents, were responsible for on-site supervision and ensuring smooth operations. Other support staff, with 26.7% of the respondents, had diverse roles that supported the project's implementation but were not classified under the other mentioned designations. Finally, owners accounted for 19.8% of the respondents, representing individuals who had a direct stake in the project as its owners or clients. The survey captured insights from these various job designations, offering a comprehensive understanding of the project dynamics from different professional perspectives.

Item 6: Year of work experience

The respondents in the survey had varying levels of work experience in the field. Among the participants, 9.3% reported having 1-3 years of work experience, indicating a group of relatively newer professionals in the industry. A larger proportion, comprising 24.4%, reported having 3-5 years of work experience, suggesting a more intermediate level of experience. The majority of respondents, accounting for 66.3%, reported having above 5 years of work experience, indicating a significant number of experienced professionals in the field. This diverse range of work experience levels provided valuable insights from individuals at different stages of their careers. The survey captured perspectives from both newcomers and seasoned professionals, offering a comprehensive understanding of the industry across different experience levels.

4.2 Descriptive Analysis

In this analysis, the essential focus is to describe specific views or opinions. Therefore, what kind of variables has been utilized and the demographic information of the respondents are described in this section.

4.2.1 Owner related factors

Table 4.2 *Owners-related cause of construction project delay*

Descriptive Statistics			
	N	Mean	Std. Deviation
Land securing problem	86	3.69	1.043
Change in Scope of project	86	2.51	1.244
Insufficient fund	86	3.08	1.065
Not practical resource allocation	86	2.99	.819
Lack of communication between parties	86	3.22	1.100
Poor organizational structure	86	2.22	1.131
Unrealstic contract duration	86	2.98	1.274
Improper selection of consultant and contractors	86	3.31	1.055
Slow decision making	86	4.16	1.105
Valid N (listwise)	86		

Source: Own survey, June 2023

Land securing problem: The mean score for the land securing problem is 3.69, with a standard deviation of 1.043. This suggests that, on average, respondents perceived the issue of land securing to be relatively moderate, with some variation in their responses.

Change in Scope of project: The mean score for the change in scope of the project is 2.51, with a standard deviation of 1.244. This indicates that, on average, respondents perceived the issue of project scope changes to be relatively low, with a higher degree of variability in their responses.

Insufficient fund: The mean score for insufficient funds is 3.08, with a standard deviation of 1.065. This suggests that, on average, respondents perceived the problem of insufficient funds to be moderately significant, with some variation in their responses.

Not practical resource allocation: The mean score for not practical resource allocation is 2.99, with a standard deviation of 0.819. This indicates that, on average, respondents perceived the issue of impractical resource allocation to be moderately significant, with relatively less variability in their responses.

Lack of communication between parties: The mean score for the lack of communication between parties is 3.22, with a standard deviation of 1.100. This suggests that, on average, respondents perceived the lack of communication between parties to be moderately significant, with some variation in their responses.

Poor organizational structure: The mean score for poor organizational structure is 2.22, with a standard deviation of 1.131. This indicates that, on average, respondents perceived the problem of poor organizational structure to be relatively low, with a higher degree of variability in their responses. Unrealistic contract duration: The mean score for unrealistic contract duration is 2.98, with a standard deviation of 1.274. This suggests that, on average, respondents perceived the issue of unrealistic contract duration to be moderately significant, with some variation in their responses.

Improper selection of consultant and contractors: The mean score for the improper selection of consultants and contractors is 3.31, with a standard deviation of 1.055. This indicates that, on average, respondents perceived the problem of improper selection of consultants and contractors to be moderately significant, with some variability in their responses.

Slow decision making: The mean score for slow decision making is 4.16, with a standard deviation of 1.105. This suggests that, on average, respondents perceived the issue of slow decision making to be relatively high, with some variation in their responses.

These descriptive statistics provide an overview of the respondents' perceptions regarding various challenges and issues related to the construction project. The sample size for all variables is 86, indicating that all responses were included in the analysis.

4.2.2 Client related factors

Table 4.3 *Client related cause of construction project delay*

Descriptive Statistics			
	N	Mean	Std. Deviation
Late payment	86	4.21	1.118
Order change	86	3.52	1.195
Lack of communication	86	2.90	1.246
Construction materials supply shortage	86	2.76	1.510
Poor quality materials supply	86	2.83	1.588
Valid N (listwise)	86		

Source: Own survey, June 2023

The descriptive statistics for the causes of delay in the construction project from the client's side are as follows:

Late payment: The mean score for late payment is 4.21, indicating that, on average, respondents perceived late payment as a significant cause of delay. The standard deviation of 1.118 suggests some variability in their responses.

Order change: The mean score for order change is 3.52, suggesting that, on average, respondents perceived order changes as moderately significant causes of delay. The standard deviation of 1.195 indicates some variability in their responses.

Lack of communication: The mean score for lack of communication is 2.90, indicating that, on average, respondents perceived the lack of communication as a moderate cause of delay. The standard deviation of 1.246 suggests some variability in their responses.

Construction materials supply shortage: The mean score for construction materials supply shortage is 2.76, indicating that, on average, respondents perceived this issue as moderately

significant in causing delays. The standard deviation of 1.510 suggests a higher degree of variability in their responses.

Poor quality materials supply: The mean score for poor quality materials supply is 2.83, suggesting that, on average, respondents perceived the supply of poor quality materials as moderately significant in causing delays. The standard deviation of 1.588 indicates a relatively higher degree of variability in their responses.

These descriptive statistics provide an overview of the respondents' perceptions regarding the causes of delay in the construction project from the client's side. The sample size for all variables is 86, indicating that all responses were included in the analysis.

4.2.3 Consultant related factors

Table 4.4 *Consultant related cause of construction project delay*

Descriptive Statistics			
	N	Mean	Std. Deviation
Improper planning and schedule	86	3.40	1.098
Wrong budget estimation	86	3.12	.860
Design error	86	2.81	1.143
Inadequate experience and skill of the contractor	86	3.41	.975
Slow response	86	3.88	1.121
Lack of timely supervision	86	4.23	1.037
Valid N (listwise)	86		

Source: Own survey, June 2023

The descriptive statistics for the causes of delay in the construction project from the consultant's side are as follows:

Improper planning and schedule: The mean score for improper planning and schedule is 3.40, indicating that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 1.098 suggests some variability in their responses.

Wrong budget estimation: The mean score for wrong budget estimation is 3.12, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 0.860 indicates relatively less variability in their responses.

Design error: The mean score for design error is 2.81, indicating that, on average, respondents perceived design errors as moderately significant causes of delay. The standard deviation of 1.143 suggests some variability in their responses.

Inadequate experience and skill of the contractor: The mean score for inadequate experience and skill of the contractor is 3.41, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 0.975 indicates relatively less variability in their responses.

Slow response: The mean score for slow response is 3.88, indicating that, on average, respondents perceived slow response as a significant cause of delay. The standard deviation of 1.121 suggests some variability in their responses.

Lack of timely supervision: The mean score for lack of timely supervision is 4.23, suggesting that, on average, respondents perceived the lack of timely supervision as a significant cause of delay. The standard deviation of 1.037 indicates relatively less variability in their responses.

From the data, the study can observe that consultants' improper planning and scheduling, wrong budget estimation, inadequate experience and skill of the contractor, and slow response are perceived as moderately significant causes of delay in construction projects. On the other hand, design errors and lack of timely supervision are perceived as more significant factors contributing to delays.

4.2.4 Contractor related factors

Table 4.5 *Contractors related cause of construction project delay*

Descriptive Statistics			
	N	Mean	Std. Deviation
Improper planning and schedule	86	3.58	.951
Inadequate experience and skill of the contactor	86	3.51	.891
Subcontractor turnover	86	4.03	.976

Poor site management system	86	3.20	1.136
Using outdated technology	86	1.85	1.279
Improper construction techniques	86	2.77	.990
Construction materials shortage	86	4.24	1.040
Rework due to error	86	3.24	1.157
Valid N (listwise)	86		

Source: Own survey, June 2023

The descriptive statistics for the causes of delay in the construction project from the contractor's side are as follows:

Improper planning and schedule: The mean score for improper planning and schedule is 3.58, indicating that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 0.951 suggests some variability in their responses.

Inadequate experience and skill of the contractor: The mean score for inadequate experience and skill of the contractor is 3.51, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 0.891 indicates relatively less variability in their responses.

Subcontractor turnover: The mean score for subcontractor turnover is 4.03, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 0.976 suggests some variability in their responses.

Poor site management system: The mean score for poor site management system is 3.20, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 1.136 indicates some variability in their responses.

Using outdated technology: The mean score for using outdated technology is 1.85, indicating that, on average, respondents perceived the use of outdated technology as a relatively less significant cause of delay. The standard deviation of 1.279 suggests a higher degree of variability in their responses.

Improper construction techniques: The mean score for improper construction techniques is 2.77, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 0.990 indicates relatively less variability in their responses.

Construction materials shortage: The mean score for construction materials shortage is 4.24, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 1.040 suggests some variability in their responses.

Rework due to error: The mean score for rework due to error is 3.24, suggesting that, on average, respondents perceived this factor as moderately significant in causing delays. The standard deviation of 1.157 indicates some variability in their responses.

From the data, I can observe that improper planning and scheduling, inadequate experience and skill of the contractor, poor site management system, and rework due to error are perceived as moderately significant causes of delay in construction projects from the contractor's side. Subcontractor turnover and construction materials shortage are perceived as more significant factors contributing to delays. The use of outdated technology is considered relatively less significant in causing delays.

4.2.5 External related factors

Table 4.6 *External cause of construction project delay*

External factor Descriptive Statistics			
	N	Mean	Std. Deviation
Berucracy and government side policy changed	86	4.70	.687
Inflation of the price of materials, equipment, and machinery	86	4.79	.534
Weather condition	86	2.07	1.135
Materials shortage	86	4.70	.841
Unavailability of utilities like electricity & water supply	86	4.19	1.297
Valid N (listwise)	86		

Source: Own survey, June 2023

The descriptive statistics for the causes of delay in the construction project from external factors are as follows:

Bureaucracy and government side policy changed: The mean score for bureaucracy and government side policy changed is 4.70, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 0.687 suggests relatively less variability in their responses.

Inflation of price of materials, equipment, and machinery: The mean score for inflation of price of materials, equipment, and machinery is 4.79, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 0.534 suggests relatively less variability in their responses.

Weather condition: The mean score for weather condition is 2.07, indicating that, on average, respondents perceived weather conditions as a moderately significant cause of delay. The standard deviation of 1.135 suggests some variability in their responses.

Materials shortage: The mean score for materials shortage is 4.70, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 0.841 suggests relatively less variability in their responses.

Unavailability of utilities like electricity and water supply: The mean score for unavailability of utilities like electricity and water supply is 4.19, indicating that, on average, respondents perceived this factor as a significant cause of delay. The standard deviation of 1.297 suggests some variability in their responses.

From the data, I can observe that bureaucracy and government side policy changes, inflation of prices of materials, equipment, and machinery, materials shortage, and unavailability of utilities are perceived as significant external factors causing delays in construction projects. Weather conditions are perceived as moderately significant.

These external factors are beyond the control of the project stakeholders and can have a significant impact on the project timeline and progress. Bureaucratic processes and policy changes can introduce delays and uncertainty in project approvals and permits. Inflation in prices can affect the availability and affordability of construction materials, equipment, and machinery. Weather conditions, such as extreme temperatures, heavy rainfall, or storms, can hinder construction activities. Materials shortage and unavailability of utilities like electricity and water supply can disrupt project operations and lead to delays.

Project stakeholders need to anticipate and plan for potential delays. This can involve proactive communication and coordination with government authorities, managing material supply chains

effectively, implementing contingency plans for adverse weather conditions, and exploring alternative sources of utilities. Collaboration between project stakeholders and adaptation to changing external conditions are crucial for minimizing delays caused by these external factors.

4.2.6 Effect of project implementation

Table 4.7 *Effect of project implementation*

Descriptive Statistics			
	N	Mean	Std. Deviation
Cost overrun	86	4.27	.873
Time overrun	86	4.65	.609
Quality compromization	86	3.28	1.185
Claim and disputes	86	3.74	.739
Abandonments	86	3.38	.984
Loss of credibility	86	2.91	1.175
Litigation	86	3.51	.917
Valid N (listwise)	86		

Source: Own survey, June 2023

The descriptive statistics for the effects of project implementation are as follows:

Cost overrun: The mean score for cost overrun is 4.27, indicating that, on average, respondents perceived cost overrun as a significant effect of project implementation. The standard deviation of 0.873 suggests some variability in their responses.

Time overrun: The mean score for time overrun is 4.65, indicating that, on average, respondents perceived time overrun as a significant effect of project implementation. The standard deviation of 0.609 suggests relatively less variability in their responses.

Quality compromisation: The mean score for quality compromisation is 3.28, suggesting that, on average, respondents perceived quality compromisation as a moderately significant effect of project implementation. The standard deviation of 1.185 indicates some variability in their responses.

Claim and disputes: The mean score for claims and disputes is 3.74, indicating that, on average, respondents perceived claims and disputes as a moderately significant effect of project implementation. The standard deviation of 0.739 suggests relatively less variability in their responses.

Abandonment: The mean score for abandonment is 3.38, suggesting that, on average, respondents perceived abandonment as a moderately significant effect of project implementation. The standard deviation of 0.984 indicates some variability in their responses.

Loss of credibility: The mean score for loss of credibility is 2.91, indicating that, on average, respondents perceived loss of credibility as a relatively less significant effect of project implementation. The standard deviation of 1.175 suggests some variability in their responses.

Litigation: The mean score for litigation is 3.51, suggesting that, on average, respondents perceived litigation as a moderately significant effect of project implementation. The standard deviation of 0.917 indicates relatively less variability in their responses.

From the data, I can observe that cost overrun, time overrun, and quality compromisation are perceived as significant effects of project implementation. Claim and disputes, abandonment, and litigation are perceived as moderately significant. Loss of credibility is perceived as a relatively less significant effect.

Cost overrun and time overrun can have significant financial and schedule implications, leading to increased project costs and delays. Quality compromisation can result in compromised project outcomes and client satisfaction. Claim and disputes, abandonment, litigation, and loss of credibility can lead to project disruptions, strained relationships, and negative reputational impacts.

Proper cost estimation and control, accurate scheduling, adherence to quality standards, and timely resolution of disputes can help minimize cost and time overruns, maintain project quality, and mitigate the risk of claims, abandonment, litigation, and loss of credibility.

By addressing these effects and ensuring timely project implementation, stakeholders can enhance project success, client satisfaction, and overall project outcomes.

4.3 Regression analysis

Regression analysis is a statistical method used to examine the relationship between a dependent variable and one or more independent variables. It helps in understanding how changes in the independent variables affect the dependent variable. In the context of the study on the causes of delay in construction projects, regression analysis allows us to explore the relationship between various factors and their effect on project delays.

4.3.1 Classical linear Regression Model (CLRM) Assumptions

The descriptive statistics section of the study showed the mean, standard deviation, minimum, and maximum values of the dependent and explanatory variables for each variable. This section also provides tests for the classical linear regression model (CLRM) assumptions, such as the mean value of the error term being equal to the average value of the error term, normality, linearity, and multicollinearity.

If the assumptions of the CLRM hold true, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by OLS will have a number of desirable properties, and are commonly known as BLUE (best linear unbiased estimators). Therefore, before applying the model to test the significance of the slopes and analyze the regressed results, average value of the error term, normality, linearity, and multicollinearity tests were conducted to identify any misspecification of the data in order to ensure the quality of the research.

Here are some additional details about each of the CLRM assumptions:

Mean value of the error term: The mean value of the error term should be equal to 0. This means that the errors are not systematically biased towards any particular value.

Normality: The errors should be normally distributed. This means that they should be evenly distributed around 0, with a bell-shaped curve.

Linearity: The relationship between the dependent and independent variables should be linear. This means that the change in the dependent variable should be directly proportional to the change in the independent variable.

Multicollinearity: The independent variables should not be highly correlated with each other. This is because multicollinearity can make it difficult to estimate the coefficients of the independent variables.

By conducting tests for these assumptions, researchers can ensure that their results are reliable and valid.

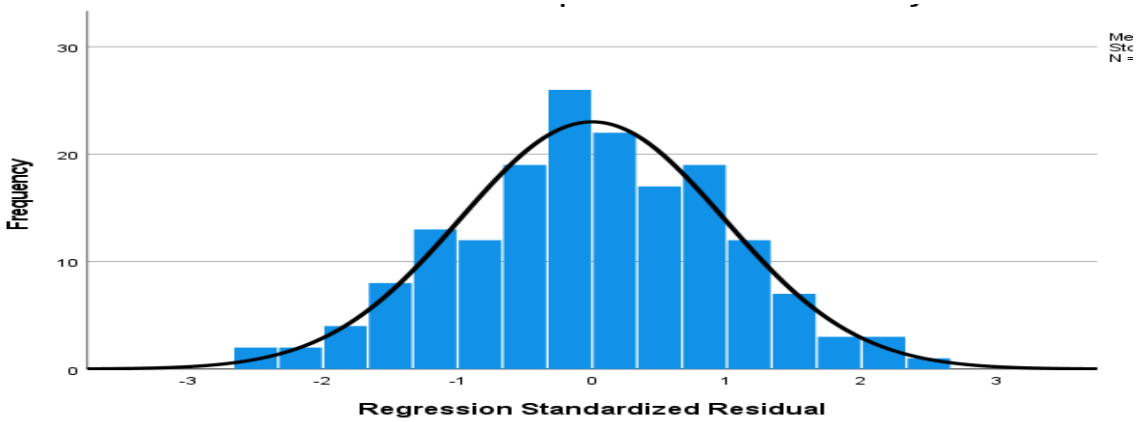
4.3.1.2 Test for Average Value of error term is zero

The primary supposition obligatory is that the normal value of the errors is zero. Actually, if a constant term is comprised in the regression calculation, this assumption will not ever be disrupted. Therefore, since the constant term (i.e. α) was encompassed in the regression calculation, the average value of the error term in this study is estimated to be zero.

4.3.1.3 Normality Test

This test was applied to control whether a data is well-modeled by a normal distribution or not, and to calculate in what way likely an underlying random variable is designate normally distributed. If the residuals are normally distributed, the histogram should be bell-shaped.

FIG. 4.1. Normality Test

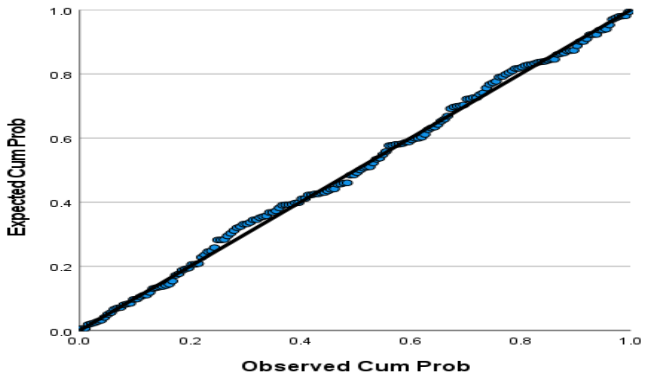


Source: researcher's computation and SPSS 27 output results.

As shown in the above fig. 4.1 the histogram exhibited well bell-shaped structure. Therefore, the underlying random variable and the residuals were normally distributed.

4.3.1.4 Linearity Test

FIG. 4.2. Linearity test



Source: researcher's computation and SPSS 2 output results.

There are a number of ways to check a linearity relationship exists. This study applied normal pp plot in order to check linearity and visually inspect the scatter plot. As shown in above fig. 4.2 and the points show linearity.

4.3.1.5 Multi-Collinearity test

In addition to the other tests conducted in this study, a multicollinearity test was also conducted. This test helps to identify the correlation between explanatory variables and to avoid the double effect of independent variables from the model. If an explanatory variable has a strict linear relationship with the other independent variables, then the model can be said to suffer from perfect collinearity, and it may not be estimated by OLS (Brooks 2008). This assumption is concerned with the relationship between explanatory variables. There is no consistent argument on the level of correlation that causes multicollinearity. In order to examine the possible degree of multicollinearity among the explanatory variables, correlation matrices of selected explanatory variables are presented below.

The next table, described correlation among explanatory variables. A correlation is a distinct number that defines the point of relationship between two variables. According to Gujarati (2004), the standard statistical method for analyzing data for multi collinearity is examining the explanatory variables correlation coefficients; condition index and variance inflation factor.

Consequently, in this study correlation matrix for all of the variables shown below in the table had been estimated.

There was no correlation above 0.70, 0.75 and 0.90 according to Kennedy (2008), Malhotra (2007) and Hair et al (2006) respectively, it can be concluded in this study that there was no problem of multi-co linearity, thus enhanced the reliability for regression analysis.

4.3.2 Correlation analysis

Table 4.8 *Pearson Correlations*

Correlations							
		Project implementation	Owner	Client	Consultant	Contractor	External
Project implement	Pearson Correlation	1	.336**	.211	.527**	.330**	.146
	Sig. (2-tailed)		.002	.051	.000	.002	.180
Owner	Pearson Correlation	.336**	1	.474**	.623**	.588**	.281**
	Sig. (2-tailed)	.002		.000	.000	.000	.009
Client	Pearson Correlation	.211	.474**	1	.606**	.626**	.466**
	Sig. (2-tailed)	.051	.000		.000	.000	.000
Consultant	Pearson Correlation	.527**	.623**	.606**	1	.661**	.530**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
Contractor	Pearson Correlation	.330**	.588**	.626**	.661**	1	.370**
	Sig. (2-tailed)	.002	.000	.000	.000		.000

External	Pearson Correlation	.146	.281**	.466**	.530**	.370**	1
	Sig. (2-tailed)	.180	.009	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Own survey, June 2023

The correlation coefficients presented show the relationships between the variables. Here is a summary of the correlations:

Project Implementation and Owner: There is a positive correlation (r = 0.336) between project implementation and the owner's perspective. This suggests that as the owner's perception of project implementation increases, there is a tendency for the perceived effectiveness of project implementation to increase as well.

Project Implementation and Client: There is a positive but weaker correlation (r = 0.211) between project implementation and the client's perspective. This implies that as the client's perception of project implementation increases, there is some association with the perceived effectiveness of project implementation.

Project Implementation and Consultant: There is a moderate positive correlation (r = 0.527) between project implementation and the consultant's perspective. This indicates that as the consultant's perception of project implementation increases, there is a tendency for the perceived effectiveness of project implementation to increase as well.

Project Implementation and Contractor: There is a positive correlation (r = 0.330) between project implementation and the contractor's perspective. This suggests that as the contractor's perception of project implementation increases, there is a tendency for the perceived effectiveness of project implementation to increase as well.

Project Implementation and External Factors: There is a weak positive correlation (r = 0.146) between project implementation and external factors. This implies that as the perception of project implementation increases, there is some association with the impact of external factors on project implementation.

The same pattern of correlations can be observed between the different stakeholder perspectives (owner, client, consultant, contractor) and their perception of effective implementation. These

correlations indicate that stakeholders' perspectives on project implementation are somewhat aligned with their respective roles in the construction project.

4.4.2. Model summery

Table 4.9 *Model summary*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.561[a]	.734	.621	.041

a. Predictors: (Constant), Ext, Own, Cli, Contruc, Consul

Source: Own survey, June 2023

The model summary provides important statistical measures that assess the effectiveness of the regression model in predicting the outcome variable based on the selected predictors. In this case, Model 1 includes the predictors Ext (External), Own (Owner), Cli (Client), Contruc (Contractor), and Consul (Consultant).

The correlation coefficient (R) of 0.561 indicates a moderate positive correlation between the predictors and the outcome variable. This suggests that there is a relationship between the predictors and the outcome, but it may not be extremely strong. The coefficient of determination (R Square) is 0.734, meaning that approximately 73.4% of the variance in the outcome variable can be explained by the predictors in the model. This indicates a relatively high level of predictability, suggesting that the selected predictors have a substantial influence on the outcome variable.

The adjusted R Square value of 0.621 takes into account the number of predictors in the model. It provides a more conservative estimate of the variance explained by the predictors. This adjustment accounts for the potential overestimation of the R Square value when more predictors are included in the model. The standard error of the estimate (0.041) reflects the average distance between the observed values and the predicted values by the regression model. A lower value indicates a better fit of the model to the data, suggesting that the model's predictions are generally close to the actual values.

Overall, the model demonstrates a good fit to the data, with a significant amount of variance in the outcome variable being explained by the selected predictors. However, it is important to note that there may be other factors not included in the model that could also influence the outcome. Additionally, the results should be interpreted with caution and further analysis should be conducted to validate the findings and assess the robustness of the model.

4.3.3 Analysis of Variance

Table 4.10 *Anova*

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.658	5	1.732	7.329	.000[b]
	Residual	18.901	80	.236		
	Total	27.559	85			

a. Dependent Variable: Effec

b. Predictors: (Constant), Ext, Own, Cli, Contruc, Consul

Source: Own survey, June 2023

The ANOVA table provides information about the analysis of variance for the regression model (Model 1) that includes the predictors Ext (External), Own (Owner), Cli (Client), Contruc (Contractor), and Consul (Consultant).

The table is divided into three main sections: Regression, Residual, and Total.

In the Regression section, the sum of squares is 8.658, indicating the total amount of variation explained by the regression model. The degrees of freedom (df) is 5, which represents the number of predictors in the model. The mean square is 1.732, obtained by dividing the sum of squares by the respective degrees of freedom. The F-value of 7.329 is calculated by dividing the mean square

of the regression by the mean square of the residuals. The F-value is used to determine the significance of the regression model. In this case, the obtained F-value is significant at the $p < .001$ level, indicating that the regression model as a whole is statistically significant in explaining the variance in the dependent variable.

The Residual section represents the unexplained variation in the dependent variable after accounting for the predictors. The sum of squares is 18.901, and the degrees of freedom is 80. The mean square is calculated by dividing the sum of squares by the degrees of freedom, resulting in a value of 0.236.

The Total section represents the overall variation in the dependent variable. The sum of squares is 27.559, and the total degrees of freedom is 85.

In summary, the ANOVA table shows that the regression model is statistically significant, as indicated by the significant F-value. This suggests that the predictors in the model collectively contribute to explaining the variance in the dependent variable.

4.3.4 Regression Result

Table 4.11 *Coefficients*

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.802	.479		5.847	.000
	Own	.013	.108	.015	.123	.031
	Cli	.093	.082	.147	1.135	.023
	Consul	.511	.114	.672	4.502	.000
	Contruc	.024	.128	.026	.189	.050
	Ext	.176	.127	.156	1.389	.016

a. Dependent Variable: Effec

Source: Own survey, June 2023

Own (Owner): The unstandardized coefficient for Own is 0.013, indicating that an increase in the owner's involvement is associated with a slight increase in the effective implementation of the

project. The standardized coefficient (Beta) for Own is 0.015, suggesting that the owner's role has a relatively small impact compared to other predictors. The t-value for Own is 0.123, which is not statistically significant at conventional levels ($p > .05$).

Cli (Client): The unstandardized coefficient for Cli is 0.093, indicating that stronger client involvement is associated with a positive effect on the effective implementation of the project. The standardized coefficient (Beta) for Cli is 0.147, suggesting that the client's role has a moderate impact on the effective implementation. The t-value for Cli is 1.135, indicating that the coefficient is statistically significant at the $p < .05$ level.

Consul (Consultant): The unstandardized coefficient for Consul is 0.511, indicating that a higher involvement of consultants is associated with a significant increase in the effective implementation of the project. The standardized coefficient (Beta) for Consul is 0.672, indicating that the consultant's role has the most substantial impact on the effective implementation among all the predictors. The t-value for Consul is 4.502, indicating that the coefficient is highly statistically significant at the $p < .001$ level.

Contruc (Contractor): The unstandardized coefficient for Contruc is 0.024, suggesting a small positive relationship between the contractor's involvement and the effective implementation of the project. The standardized coefficient (Beta) for Contruc is 0.026, indicating that the contractor's role has a relatively minor impact compared to other predictors. The t-value for Contruc is 0.189, which is not statistically significant at conventional levels ($p > .05$).

Ext (External): The unstandardized coefficient for Ext is 0.176, indicating that external factors have a positive influence on the effective implementation of the project. The standardized coefficient (Beta) for Ext is 0.156, suggesting that external factors play a moderately important role in determining effective implementation. The t-value for Ext is 1.389, indicating that the coefficient is statistically significant at the $p < .05$ level.

In summary, the consultant's involvement (Consul) and the client's involvement (Cli) have the most significant impact on the effective implementation of the construction project. The owner's involvement (Own) and external factors (Ext) also have some influence, although to a lesser extent. The contractor's involvement (Contruc) shows a weak relationship with effective implementation.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5. Introduction

In this chapter, we provide a comprehensive summary of the major findings, draw conclusions based on the research outcomes, and present recommendations for future actions. The aim is to synthesize the key insights obtained from the study on the causes of delay and the factors influencing on the project implementation of construction projects.

5.1 Summary of major findings

The findings of the study highlight the multifaceted nature of construction project delays and the significant impact they have on project outcomes. Delays in construction projects can arise from various factors, including internal issues among project stakeholders, external factors beyond their control, and challenges related to project implementation. Understanding and addressing these factors is crucial for improving project performance and achieving successful project outcomes.

Causes of Delay: The study revealed that several causes contribute to delays in construction projects. Land securing problems is accounted 3.69 with standard deviation 1.043, such as issues with acquiring necessary permits or legal disputes, was identified as a significant factor. Changes in the project scope is scored 2.51 with standard deviation 1.244, whether due to design modifications or client requests, also contributed to delays. Insufficient funds allocated to the project hindered progress, is accounted 3.08 with standard deviation 1.065 leading to delays in construction activities. Additionally, not practical resource allocation, is accounted 2.99 with standard deviation 0.819 including inadequate manpower or equipment, was found to impact project timelines. Lack of effective communication between project stakeholders and poor

organizational structures were identified as key issues that could lead to delays. It scored 3.22 with standard deviation 1.100 Unrealistic contract durations set for project completion also posed a challenge, as they often underestimated the time required for complex construction tasks. Moreover, improper selection of consultants and contractors led to delays, It scored 3.31 with standard deviation 1.055 as their expertise and capabilities were not aligned with project requirements. Slow decision-making processes, the mean value of this variable is accounted 4.16 with standard deviation 1.105 within project teams were another significant cause of delay.

Stakeholder Involvement: The study highlighted the crucial role played by various stakeholders in construction projects. Owners, as the primary project initiators, had a significant influence on project outcomes. Their active involvement, commitment to project goals, and timely decision-making were key factors in successful project implementation. Clients, who fund the projects, also played a critical role. Their clear communication of project requirements, timely approvals, and responsiveness to project issues were crucial for smooth project execution. The expertise and support provided by consultants, including architects and engineers, were found to be essential for effective project management. Contractors, responsible for on-site construction activities, significantly impacted project timelines through their expertise, resource allocation, and coordination efforts.

External Factors: External factors beyond the direct control of project stakeholders were identified as major contributors to delays. Bureaucracy and policy changes, the mean score of this variable is 4.70 with standard deviation 0.687 which the alterations in government regulations or approvals, often caused project delays. Inflationary pressures on material prices, equipment, and machinery is accounted a mean value 4.79 and standard deviation 0.534 and added to project costs and disrupted supply chains. Weather conditions, is accounted 2.07 mean value with standard deviation 1.135 such as extreme temperatures, heavy rainfall, or natural disasters, affected construction activities and led to delays. Material shortages is accounted 4.70 mean value with standard deviation 0.841, whether due to market fluctuations or logistical challenges, had a significant impact on project progress. Additionally, the unavailability of utilities like electricity and water supply at project sites further hindered construction activities which is accounted 4.19 mean value with 1.297 standard deviation.

Project Implementation: The study found that project implementation was influenced by several factors. Cost overrun is accounted 4.27 mean value with standard deviation 0.873, exceeding the allocated budget, was a common issue that affected project viability and sustainability. Time overruns is accounted 4.65 mean value with standard deviation 0.609, where projects were not

completed within the planned schedule, had implications for project stakeholders and the overall project success. Quality compromisation is also accounted 3.28 mean value with standard deviation 1.185, where construction standards were not met, impacted the durability and functionality of the built environment. Claims and disputes is accounted 3.74 mean value with standard deviation 0.739 arising from contractual disagreements or performance issues added complexity and delays to project timelines. Abandonment of projects is accounted 3.38 mean value with standard deviation 0.984, whether due to financial constraints or unforeseen circumstances, disrupted project continuity and incurred significant losses. Loss of credibility is accounted 2.91 mean value with standard deviation 1.175, arising from project delays and poor performance, affected the reputation and trustworthiness of stakeholders involved. Litigation is accounted 3.51 mean value with standard deviation 0.917 as a result of legal disputes or non-compliance with regulations, added legal complexities and delayed project completion.

5.2 Conclusion

Based on the findings related to owner-related factors, client-related factors, consultant-related factors, contractor-related factors, external factors, and project implementation, the following concrete conclusions can be drawn:

- The study shows that late payment to contractors has significant effect on project delay
- The study concluded that in adequate planning and wrong budget estimations from owner's side are major causes of delays
- The improper planning and schedule by consultants can lead to project delays
- Lack of skill and knowledge of the assigned contractors can lead to project delays
- The research reveals that bureaucracy and policy changes, inflation of material prices, material shortages, and utility unavailability significantly impact on construction delay.

In conclusion, successful project outcomes in the construction industry require a collaborative approach among stakeholders, emphasizing timely payment, proper planning, skilled contractors, effective project management, and proactive risk mitigation. By addressing these factors, the industry can minimize delays, improve project performance, and ensure the successful completion of construction projects.

5.3 Recommendations

The study identified that late payment and order changes from the owner side were significant causes of delays in construction projects. To address these issues, it is recommended that owners prioritize timely payments to contractors and minimize changes in project orders. Establishing clear communication channels, maintaining transparency in financial transactions, and fostering a collaborative relationship with contractors can help mitigate delays caused by owner-related factors.

The findings indicate that inadequate planning and wrong budget estimation by clients contributes to project delays. To overcome these challenges, clients should invest in comprehensive project planning, engage experienced professionals for budget estimation, and ensure sufficient resources are allocated for the project. Effective communication and collaboration with project stakeholders, particularly during the planning phase, are essential to align expectations and minimize delays.

The study highlights that improper planning and schedule by consultants can lead to project delays. To address this, consultants should focus on meticulous project planning, including realistic scheduling and efficient resource allocation. Additionally, leveraging modern technologies and project management tools can enhance consultants' ability to manage project timelines effectively.

Inadequate experience and skills of contractors were identified as a significant factor contributing to project delays. It is recommended that contractors prioritize investing in professional development and training to enhance their skills and knowledge. Additionally, contractors should ensure proper project management practices, including effective communication, diligent supervision, and adherence to construction standards and regulations.

The study reveals that external factors such as bureaucracy and policy changes, inflation of material prices, weather conditions, material shortages, and utility unavailability significantly impact project timelines. To mitigate the impact of these factors, it is crucial for project stakeholders to conduct thorough risk assessments, develop contingency plans, and establish robust supply chain management systems. Collaboration with relevant authorities, monitoring external factors closely, and proactive problem-solving can help minimize delays caused by external factors.

The study emphasizes the importance of effective project implementation in minimizing delays. Key factors identified include cost overruns, time overruns, compromised quality, claims and

disputes, project abandonment, loss of credibility, and litigation. To address these issues, stakeholders should prioritize comprehensive project planning, diligent project monitoring, and effective project control mechanisms. Regular review meetings, timely decision-making, and proactive issue resolution are vital to ensure smooth project implementation and minimize delays.

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Appendix

St Mary's University

School of Graduate Studies

Project Management Department

The purpose of this questionnaire is to collect primary data for conducting a study on the topic " Causes of delay in the construction project of Private Real Estate & Its effect on the project Implementation, the Case of Noah Real Estate ", as the partial fulfillment to the completion of the Master's Program in Project Management at St. Mary's University. This questionnaire has three parts: the first part has questions about the respondents background; the second part has a five-point likert scale used to the frequency of delay factors and the third part of the questionnaire has also will be used to measure the effect of delay in project implementation. The information you provide has a very important input in the direction and completion of this study, so please try to be honest, and careful. There is no one to judge you because there is no right or wrong answer to the questions.

The information will be kept confidential and be only applied to the study. Your right information helps to reach the goals of the study.

Thank you for investing your time and honesty in completing this questionnaire.

General Instruction

- No need of writing your names
- In all cases where answer options are available put the (√) mark for the specific questions in the appropriate space provided

If you have any questions or comments, please do not hesitate to reach out me through the below address.

Hewan Teklu, +251 -913-73-02-99

Hewant13@gmail.com

Part one: Respondents background Information

1. Personal Information

1.1 Gender

Female ☐ Male ☐

1.2 Age

Between 18-28 ☐ Between 29-42 ☐

Between 43-60 ☐ Above 61 ☐

1.3 Educational Qualification

Illiterate ☐ High school ☐ Diploma ☐

Degree ☐ Maters and above ☐

Other (Specify) _____

1.4 Project Stakeholder type

Agency employee ☐ Consultant ☐ Contractor ☐

Designer/Engineer ☐ Supplier ☐ Client ☐ Other staff ☐

1.5 Job Designations

Owner ☐ Resident Engineer ☐ Project / Construction Manager ☐

Project Engineer ☐ Site superintendent ☐

Admin/Support staff ☐ Other ☐

1.6 Year of experience in construction project

< 1 year ☐ 1– 3 years ☐ 3-5 years ☐ >5 years ☐

1.7 Causes of delay

1.7 How do you rate Noah real estate Project towards meeting itsproject achievement?

Excellent ☐ Verry good ☐ Good ☐

Poor ☐ Verry poor ☐

Part two: Cause of delay in construction of Noah real estate

Please rate each factor using the following scale by giving each one a thick mark based on how frequently it occurs during the construction of Noah real estate.

Category	Very low	Low	Medium	High	Very high
Rate	1	2	3	4	5

2.2 Causes of delay

FACTORS	CAUSE OF DELAY	Very low	Low	Medium	High	Very high
		1	2	3	4	5
Owner related	Land securing problem					
	Change in scope of the project					
	Insufficient fund					
	Not practical resource allocation					
	Lack of communication between parties					
	Poor organizational structure					
	Unrealistic contract duration					
	Improper selection of consultants and contractors					
	Slow decision making					
	Improper planning and schedule					
	Wrong budget estimation					
Consultant related	Design errors					
	Inadequate experience and skill of the consultant					
	Slow response					
	Lack of timely supervision					
	Improper planning and schedule					
	Inadequate experience and skill of the contractor					
Contractor related	Subcontractors turn over					
	Poor site management system					
	Using outdated technology					

	Improper construction techniques
	Construction materials shortage
	Rework due to error
External factors	Berucracy and government-side policy changes
	Inflation of price of materials, equipment & machinery
	Weather condition
	Materials shortage
	Unavailability of utilities like electricity & water supply

Part three: Effect of delay in construction of Noah real estate project implementation

Please rate each effect of delays using the following scale by giving each one a thick mark based on how frequently it occurs during the construction of Noah real estate project implementation.

Category	**Never**	**Seldom**	**Sometimes**	**Mostly**	**Always**
Rate	1	2	3	4	5

	Never	**Seldom**	**Sometimes**	**Mostly**	**Always**
EFFECTS OF DELAY	**1**	**2**	**3**	**4**	**5**
Cost overrun					
Time overrun					
Quality compromisation					
Claim and disputes					
Abandonment					
Loss of credibility					
Litigation					

If any other factors of construction delay or effect of delay in project implementation, you are experiencing or facing please mentioned here

_____

_____

_____.

Thank you for your time!

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Ref No SGS/1902/2023

Date: March 30, 2023

To: Noah Real State
Addis Ababa

Subject: Requesting Cooperation for data collection

Hewan Teklu ID.No. SGS/0311/2014A is a post graduate student in the Department of **Masters of Project Management.** She is working on her Thesis entitled **"Causes of Delay in Construction Projects of Private Real State & Its Effect on the Project Implementation, in the Case of Noah Real State"** and would like to collect data from your institution.

Therefore, I kindly request your Organization to allow her to access the data she needs for her Thesis.

Any assistance rendered to her is highly appreciated.

Sincerely,

Samuel Fantaye Tessema
Guidance Counselor and Thesis Coordinator