



THE CAUSE OF CONSTRUCTION PROJECT DELAY AND ITS IMPACT ON PROJECT  
COST: THE CASE OF ELMI OLINDO CONTRACTORS PLC

BY

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A THESIS

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ADDIS ABABA UNIVERSITY  
FACULTY OF BUSINESS AND ECONOMICS  
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GRADUATE STUDIES  
MA IN PROJECT MANAGEMENT

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## **DECLARATION**

I, the undersigned, declare that this thesis entitled “The cause of construction project delay and its impact on project cost: the case of elmi olindo contractors plc” is my own work, has not been submitted for a MA degree in any universities and all references used for the thesis has been duly acknowledged.

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### **Abbreviations and Acronyms**

EOC: Elmi Olindo Constructor plc

GDP: Growth Domestic Product

MoWUD: Ministry of Works and Urban Development

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*Abstract:*

*Construction project delays are occurring in every phase of a construction project and are common problems in construction projects in Ethiopia. Moreover, it is well known that the delays in construction projects are the major causes of project failure. If the delay is not identified and the corrective project management decision is not taken in time, a project may incur extra cost and extension of project time, which gives rise to dissatisfaction to all the parties involved. Nowadays, it's becoming a major obstruction for their development for developing countries like Ethiopia. This research first identified 24 key factors causing delay in EOC, and then evaluated by using the data collected in a survey of managers, site engineers, office engineers, and logistics engineers. Judgmental sampling techniques are used to select the respondents. The findings show that the main critical factors that cause construction delays in EOC are: escalation of the materials price, political instability in the country, poor project closeout practice, variation work order, change in drawing and unexpected subsoil conditions and recalled that it has a direct impact on the overall project. This paper finally came up with solutions towards reducing /minimize the causes of delays and its impact on project cost on construction projects in EOC.*

*Keywords: Construction Delay, Delay Causes, Top-Ten Delay Factors*

## CHAPTER ONE

### INTRODUCTION

Construction delays can be defined as the late completion of work compared to the planned schedule or contract schedule. Construction delays can be minimized only when their causes are identified. The word “delay” defined as something happening at a later time than planned, expected, specified in a contract or beyond the date that the parties agreed upon the delivery of a project. Construction delay can be defined as the slowing down of work without stopping construction entirely and that can lead to time overrun either beyond the contract date or beyond the date that the parties have agreed upon for the delivery of the project (Lo, Fong and Tung, 2006)

Delay in the delivery of work contracts still appear as a recurring issue in engineering projects, which often occur from design to completion, whether in public or private works, in developing or developed countries. The consequences are disputes and litigation between the parties, cost escalation, loss of profit, poor service quality, arbitrage, overrun of the deadline defined for executing the works or closing the project (Dolage; Pathmarajah, 2015). It is further observed that the delays in construction projects is a fact observed globally or on a large scale, affecting not only the industry itself, but the economy of nations in general; thus, negatively impacting the success of the project due to changes in the original execution schedule and the previously established costs, quality criteria and management of safety conditions (Chauhan; Shah; Rao, 2008).

Delay in construction works poses a strong financial and social impact on all the stakeholders in the project. However, it is more intense and common in developing countries, which usually overrun project costs and have budget problems and shortage of resources (Mohammed, 2018;).

Delay occurs in every construction project and the significant of these delays varies considerably from project to project. Many researchers have studied the causes of project delays in public construction industry.

A construction project is commonly acknowledged as successful, when it is completed on schedule and within the agreed budget, with the highest quality and in the safest manner, in accordance with the specifications and to stakeholders’ satisfaction. Functionality, profitability to contractors, absence of claims and court proceeding and “fitness for purpose” for occupiers have also been

used as measures of project success. For any public or private construction firms, upgrading the project performance can be taken as one of their main objectives. This can be achieved by reducing cost, finishing projects on schedule and increasing quality.

The construction industry is very large, complex, and requires huge capital investments. Delay in the completion of a construction project is one of the biggest problems facing by the construction industry and can be a major problem for construction's project participant leading to costly disputes and adverse relationships amongst project participants.

### 1.1. Background of the study

Current practice of the construction industry shows that most of construction projects are not completed on the scheduled time, budgeted cost and desired quality. The main reason behind is that construction projects are unique in nature, time consuming, cost demanding and they are full of uncertainties. As a result, claims and disputes become common phenomena especially on large civil engineering contracts. However, it became very difficult to complete a project in a stipulated time and cost given in the initial contract document. Time and cost overruns are the common phenomenon in almost all construction projects. Number of unexpected problems and changes from original design arise during construction phase, leading to time and cost overruns.

Frequent causes of time and cost overruns such as inappropriate choice of site, changes in design, delayed approval of payments, excessive change orders and absence of site staff are investigated to be faults of consultants.

Delayed payments to the contractor, additional work order, shortening of contract periods, finance and payment arrangements and client-initiated variations are found to be causes for which the project owners are responsible.

Causes for which the contractors are responsible include setting of unrealistic time schedule, shortage of materials on site, failure to update schedules on time, poor qualification of staffs and communication with consultants.

Time and cost overruns in this context are found to be extremely significant and serious problem in EOC, and also in other construction companies in Ethiopia compared to other countries. Most

of the projects exceed their completion time and cost higher than their allocated contract time and budget.

## 1.2. Statement of the problem

A lot of research efforts have been made to study the causes of construction project delay in different countries. Kalidindi (2016) showed that owner interference, inadequate contractor experience, financing and payments, labor productivity, slow decision making, improper planning, and sub-contractors are among ten top most important factors causing delay in Jordan; Maura et al. (2007) discovered that design errors, client liability, project specification and direct change order by the client are the major factors that cause the time and cost overrun in Portuguese; Abdul-Rahman et al. (2006) conducted a study on delay mitigation in the Malaysian construction industry; they proved that a financial problem is confirmed by the survey as the main causes of delay.

The project managers need to understand the causes or factors result in project delay and its impact on cost. Therefore, the link between causes and effects of delay needs to be established. The study was based on a questionnaire survey among persons drawn to managers, site engineers, office engineers and logistic engineers who are involved in the implementation of the projects in the study.

In addition to this, the researcher observed such vulnerable problems in EOC and the causes of this construction project delay which can leads to project cost overrun which has to be addressed properly. In this paper, the main causes of construction project delays and its impact on project cost in the case of EOC have been determined. From this the researcher has categorized major causes such as due to countries current situation, company management system, customer and/or owner, consultant and design team and external factors.

## 1.3. Objectives of the study

### 1.3.1. General Objectives

The main objective of this research is to determine the causes of construction project delay and its impact on project cost in the case of EOC.

### 1.3.2. Specific objectives

This study is undertaken with the following three specific objectives.

1. To identify the major causes of construction project delay and its impact on project cost in EOC.
2. To assess the existing situation associated with construction projects delay and the impact on cost in EOC
3. To examine recommendation about minimizing or avoiding construction delay, and hence to reduce its consequential effects on project cost in EOC.

### 1.4. Research Questions

1. What are the major causes of construction project delay and its impact on project cost in EOC?
2. What is the existing situation associated with construction projects delay and the impact on cost in EOC?
3. What is the recommendation about minimizing or avoiding construction delay, and hence to reduce its consequential effects on project cost in EOC?

### 1.5. Significance of the study

The primary objectives of this research are to optimize cost and time by reducing construction project delay. Some of the significance of this study can be summarized as follows: -

- ✓ To minimize or avoid additional cost and time in EOC projects.
- ✓ To identify the impact of delay on projects and give recommendation for the so identified problems.
- ✓ To create awareness for some construction project contractors about the cause of delay and its impact on cost.
- ✓ It is able to provide solution to the cause of construction project delay, to fulfil the gaps of knowledge and create healthy working environment.
- ✓ It is reference as further study for other researchers.

#### 1.6. Scope of the study and limitation

The scope of this research is concerned on the conceptual and practical review of construction project delay and its impact on project cost in EOC. When construction projects are performed, time and cost overruns arise by different stakeholders. Some of these includes; local communities, government bodies, consultants, client, suppliers, etc.

This research, as a result, takes this context into consideration to develop the preventive and resolution methods to come up with a researchable problem and its methodology together with identifying information sources for the research.

The limitation of this study is that, it is conducted only on construction projects that are carried out by EOC which is found in different parts of Ethiopia. However, the established principle of formulation could be applied for similar construction companies.

#### 1.7. Organization of the study

The research is logically organized into five (5) chapters and references. Chapter one deals with the introduction, which talks about the general idea and relevance of the study. It defines the background, statement of the problem, the objectives, the scope and limitation as well as the organization of the thesis. Chapter two comprises of literature review, and quotes the various related works done in this area of study. Chapter three attempts to describe in detail the methodology of the project followed in this research study. Chapter four contains data presentation, analysis of the information gathered through the data survey, summary of findings and interpretation. Chapter five provides conclusions and recommendations of the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1. Theoretical Review

##### 2.1.1. Overview

The Construction industry has a great influence on the economy of all countries. It is one of the parts that provide vital factors for the development of any economy. According to World Bank, the share of construction industry in developing countries is approximately between 6-9% of the GDP. (Unit, South Asia Sustainable Development, 2007). In Ethiopia its percentage of GDP amounts to 3%, considerably lower than the sub-Saharan average of 6%, MoWUD (2006).

The construction industry is an important part of the economy and has a considerable impact on the efficiency and output of other industries. It is not possible having extensive investment in manufacturing, agriculture or service sectors without construction of infrastructure facilities in place. One of the main objectives and policies of any public or private sectors dealing with the execution of projects is to upgrade project performance through minimization of costs, completion of projects within their assigned budget and time limits and improve quality. Completing projects within the time is an indicator of an efficient construction industry, Chan and Kumaraswamy (1997).

Ismael (1996), reported time overrun is endemic to construction projects in Ethiopia. He expressed the range of delays in percentage and he said he has examined 13 projects in Ethiopia and obtained the delays encountered in most of the project's range between 100% and 460% of the original contract time. Projects delay is the major cause of claims of time extension and associated cost overrun.

In Ethiopia, the present state of the construction industry falls short of meeting domestic and international quality standards and the performance demand expected from the sector, MoWUD (2006).

### 2.1.2. Definitions of time and cost overruns

#### a) Time overruns

- Choudhry (2004) and Chan (2001), defined time overrun as the difference between the actual completion time and the estimated completion time. It is measured in number of days. Construction project time overrun can be defined as an extension of time beyond the contractual time agreed during the tender, Al- Gahtani and Mohan (2007).
- According to Kaming et. al. (1997) and Trigunarsyah (2004), time overrun is the extension of time beyond planned completion dates usually traceable to contractors.
- Elinwa and Joshua (2001), defined it as the time lapse between the agreed estimation or completion date and the actual date of completion.
- Bramble and Callahan (1987), describe time overrun as the time during which some part of construction project is completed beyond the project completion date or not performed as planned due to an unanticipated circumstance.
- Dolage and Rathnamali (1992) defined time overrun as the non-completion of the project within the original or stipulated or agreed contract period.
- Lo, Fung & Tung (2006) and Assaf & Al-Hejji (2006), mentioned that time overrun is either beyond the contract date or beyond the date that the parties have agreed upon for the delivery of the project.

#### b) Cost overrun

- Cost overrun is defined as excess of actual cost over budget. Cost overrun is also sometimes called "cost escalation," "cost increase," or "budget overrun", Zhu et. al (2004).
- Cost overrun is defined as the change in contract amount divided by the original contract award amount This calculation can be converted to a percentage for ease of comparison, Jackson (1990).
- Choudhry (2004), defined the cost overrun as the difference between the original cost estimate of project and actual construction cost on completion of works of construction project.
- Cost overrun occurs when the final cost of the project exceeds the initial estimate or budget, Yehen Rosenfield (2002).

- The amount by which actual costs exceed the baseline or approved costs, Widman (2002).
- final project cost and the original contract amount, Hinze and Selstead (1991). The difference between the original cost and the actual cost when the project is completed, Avotts (1983). Actually, Avotts (1983), used the word cost growth instead of cost overrun.

### 2.1.3. Types of Delays in Construction Projects

Construction Projects delays are classified or categorized into four basic ways:

- a) Critical or non-critical delays
- b) Excusable or non-excusable delays
- c) Concurrent delays
- d) Compensable or non-compensable delays

There is also a need to understand the assimilation between the categories before determining the impact of delays on the project.

- One must determine whether the delay is critical or non-critical.
- Additionally, all delays are either excusable or non-excusable.
- Both excusable and non-excusable delays can be defined as either concurrent or non-concurrent.
- Delays can be further broken down into compensable or non-compensable delays.

Economic historian Robert E. Wright argues that construction delays are caused by bid gaming, change order artistry, asymmetric information, and post contractual market power. Until those fundamental issues are confronted and resolved, many custom construction projects will continue to come in over budget, past due, or below contract specifications. The types of delays further described in brief as below;

a) Critical or non-critical Delays

A delay that is responsible for extending project duration is a **critical delay**. Few results are mentioned below:

- Extended Field Overhead
- Unabsorbed home office overhead
- Liquidated Damage
- Idle labor & equipment cost
- Labor & Material Cost Escalation and many more

A delay that is not the cause of extended project duration is a non-critical delay; however, it will have an effect in terms of activities getting completed late than scheduled completion. These activities will also affect project cost estimates as reiterated below;

- Idle labor & equipment cost
- Labor & Material Cost Escalation and many more.

b) Excusable & non-excusable Delay

A delay where the contractor is entitled for extension of time or compensation or both, under the terms & conditions of contract is excusable delay. In this case, contractor does not have any control on the activity getting delayed. The causes may be;

1. Force Measure Clause
2. Natural Calamities
3. Political/Social Unrest
4. Terrorist Attacks
5. Delay from Client (Approvals, Decisions, etc.), etc.

A delay where the contractor is fully responsible for the activities getting delayed and resulted in extending project duration (responsible for critical delays) are non-excusable delays. In this case,

the contractor has to bear the risk of cost consequences including the liability to pay damages for itself but possibly for the other parties as well. The causes may be:

- Delayed Mobilization
- Delayed Procurement
- Delayed submission of important documents
- Planning & Scheduling
- Critical events that were not highlighted to client on right time, etc.

#### c) Concurrent Delays in Construction Projects

A situation where more than one delay event occurs at the same time affecting multiple activities simultaneously/independently affecting the completion is a concurrent delay. However, not all those events enable the contractor to be entitled for extension of time & cost claim. Importantly, it is the causes of delay rather the delay themselves, that must overlap.

#### d) Compensable or non-compensable Delays in in Construction Projects

Scenario where contractor is liable for Time Extension & Cost compensation is compensable delays. All compensable delays fall under excusable delays-Whereas, if the contractor is solely at fault for a delay event, it is termed as non-compensable delay. However, non-compensable may fall under critical, non-critical, excusable or non-excusable; depending upon the situation it has created and conditions of contract.

## 2.2. Empirical Review

### 2.2.1. Causes of time and cost overruns

#### a) Time overruns

In the construction industry, the aim of project control is to ensure the projects to finish on time, within budget and achieving other project objectives. It is a complex task undertaken by project managers in practice, which involves constantly measuring progress, evaluating plans and taking corrective actions when required, Kerzner (2003). During the last few decades, numerous project

control methods, such as Gantt Bar Chart, Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM), have been developed, Nicholas (2001) and Lester (2000).

A variety of software packages have become available to support the application of these project control methods; for example, Microsoft Project, Primavera and etc. Despite the wide use of these methods and software packages in practice, many construction projects still suffer time overrun. In recent years, there have been numerous studies on the identification of influencing factors of project time overrun worldwide.

Faridi & El-Sayegh (2006: PP1172), studied project delays in the United Arab Emirates and found that the three main causes of project delays were preparation and approval of drawings, inadequate early planning of the project and slowness of owner's decision-making processes.

Al-Momani (2000), examined 130 public projects in Jordan and concluded that the main causes of delays include changes initiated by designers, client requirement, weather, site conditions, late deliveries, economic conditions and etc. Yogeswaran et. al. (1998), scrutinized 67 civil engineering projects in Hong Kong and suggested that at least 15-20% time overrun was due to inclement weather. Walker (1995: PP269), surveyed Australian project representatives and found that the most important factors that affect time delays are the ability of the organization to manage risk, planning capabilities and effective resource coordination.

Mansfield et. al. (1994), carried out a questionnaire survey amongst 50 contractor, consultant and client organizations in Nigeria and found out that the most important variables causing construction delays are poor contract management, financing and payment of completed works, changes in site conditions, shortage of materials, imported materials and plant items, design changes, subcontractors and nominated suppliers. Kaming et. al. (1997), identified factors influencing construction time overrun on high rise building projects in Indonesia through a questionnaire survey administered on 31 project managers.

Design changes, poor labor productivity, inadequate planning, material shortages, inaccuracy of material estimate, skilled labor shortage and etc. were identified for time overrun. Kumaraswamy and Chan (1998), conducted a more extensive study in Hong Kong using 400 questionnaires after which follow up interviews were held. The study revealed the top causes of construction delays

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from the contractors' point of view are delays in design information, long waiting time for approval of drawings, poor site management and supervision, mistakes and discrepancies in design documents, etc.

#### b) Cost overrun

Angelo and Reina (2002), stated that cost overrun is a major problem in both developed and developing countries. Several studies of major projects show that cost overrun is common phenomenon. The causes of cost overrun in construction projects are varied, some are not only hard to predict but also difficult to manage.

In developing countries, the lack of proper phasing of construction projects can contribute to the economy to become 'overheated'. This leads to shortage of construction materials as the demand will exceed the supply, this in turn leads to a climb in the cost of construction materials; this inevitably gives rise to project cost overrun with consequential effects on inflation and a decline on efficient activity in the construction industry, Mansfield, Ugwuand Doran (1994).

During extensive studies on construction project performance in European countries, Morris & Hough (1987), as well as Flyvbjerg, Bruzelius & Rothengatter (2003), found that fluctuations in material cost and additional work contributed most to cost overrun. While the top variables causing only cost overrun were revealed as price fluctuation, inaccurate estimates, delays, additional work, materials cost increased by inflation, inaccurate quantity take off, lack of experience of project location, lack of experience of project type and etc. While all the above studies, to various extents, helped with the better understanding of the problems associated with cost overrun in construction projects, previous research has attempted discover reasons for the disparity between the tender sum and the final account.

According to User's Guide (2005), the following are the factors that change the cost of the construction projects through time; poor project management, design changes, unexpected ground conditions, inflation, shortages of materials, change in exchange rates, inappropriate contractors, funding problems and force majeure.

According to Robert F. Cox (2007), project owners identified five reasons for project cost overrun; these reasons were, incomplete drawings, poor pre planning process, escalating cost of materials, lack of timely decisions and excessive change orders.

S. Shanmugapriya, Dr. K. Subramanian (2013), who found reasons for cost overrun were high transportation cost, change in material specification, escalation of material price, frequent breakdown of construction plants and equipment and rework.

T. Subramani, P S Sruthi M. Kavitha (2014), who found slow decision making, poor schedule management, increase in material/machine/ prices, poor contract management, poor design/ delay in providing design/, rework due to wrong work, problems in land acquisition, wrong estimation/ estimation method/, and long period between design and time of bidding/tendering/ are the major causes of cost overrun.

#### 2.2.2. Responsible parties for causes of time and cost overruns

Alaghbari, Kadir, Salim & Ernawati (2007: PP199- 200), used four categories for analysis, namely contractor, consultant, owner and external. As far as causes related to contractor actions are concerned, financial problems, shortage of materials and poor site management were ranked among the top three. Owner causes included delayed payments, slow decision making and contract scope changes.

Ahmed et. al. (2003) and Theodore (2009), identified the following factors causing delays in construction projects. They have categorized the factors that cause delays in the four categories, those are due to; Contractor's responsibility.

The factors that are related to contractor's responsibility are; poor site management, financial problems, coordination and communication problems with others, poor qualification of the technical staffs, shortage of materials on site, construction mistakes and defective work, poor skills and experience of labor, shortage of site labor, low productivity of labor, conflicts in sub-contractor's schedule in execution of project and delays in site mobilization.

The factors that are related to consultant's responsibility are, absence of site staff, lack /inadequate/ of experience, delay in approving major changes in the scope of work and mistakes and discrepancies in design documents.

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The factors that are related to owner's responsibility are; delay to furnish and deliver the site, lack of working knowledge, change orders during construction (replacement and addition of new work to the project and change in specifications.), financial problems (delayed payments, financial difficulties and economic problems), slowness in decision making process and poor communication and coordination.

The factors that are related to external are; delay in obtaining permits from municipality, lack of labor, materials, equipment and tools in the market, weather conditions, poor site conditions (location, ground and etc.), poor economic conditions (currency, inflation rate, LC and etc.), changes in laws and regulations, high transportation cost and delay in providing services from utilities (such as water, electricity and etc.).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Research design**

Research design is a blue-print of the study. It typically includes how data is to be collected, what instruments will be use, how the instrument will use and the intended means for analyze data collect.

Kumar, (1999), considers research as a process of collecting, analyzing and interpreting information to provide solutions to questions. For the purpose of this research, it is defined as a practical investigation or exploration to find out new facts or assemble old facts by scientific ways for the purpose of developing existing theory or its applications for real problems.

The key task in research is to design research process so that the information obtained permits the assessment of their impact. The basic research design selected is an Explanatory research methodology using both primary and secondary data. It is Explanatory because the research looks for causes and reasons and provides evidence to support or refute an explanation or prediction. It is conducted to discover and report some relationships among different aspects of the phenomenon under study. In our case, it's to identify the causes of construction project delay and its effect on project cost.

#### **3.2. Sample and sampling techniques**

The research uses a non-probability technique called Purposive or judgmental sampling. Purposive or judgmental sampling is a strategy in which particular settings persons or events are selected deliberately in order to provide important information that cannot be obtained from other choices It is where the researcher includes cases or participants in the sample because they believe that they warrant inclusion and simple random sampling method because of each and all respondents have equal chance of being select (Maxwell, 1996).

The sample size is determined by the following formula which is taken from static's subjects as the following by using 90% level of confidence. (Kotari, 2004)

$$n = \frac{Z^2 pqN}{E^2 (N-1) + Z^2 pq}$$

Were

n = sample size

Z = from table of using confidence level

P = probability to be selected

q = probability not be selected

N = total population

E= error of level confidence

$$n = \frac{(1.64)^2 (0.5 \times 0.5) 98}{(0.1)^2 (98-1) + 1.64^2 (0.5 \times 0.5)} = \frac{65.8952}{1.6424} = 40$$

- The sample unit is taken from EOC.
- The target population is 98 in number (EOC permanent professional employees who are directly involved on the project i.e., managers, site engineers, office engineers and logistic engineers), as of May, 2022.
- The sample size is determined based on “sample size calculator”, and it is needed to be 40 in number, which are 12 managers, 24 site engineers, 2 office engineers and 2 logistic engineers.
- I have selected these number of respondents based on the number of professional present in EOC. The basic instrument used in this sampling is judgmental sampling techniques for the selected professionals of EOC.

### 3.3. Data source

Data would be collected from both primary and secondary sources: The primary data are questionnaire and personal observation and secondary sources is written document. In addition, information would be collected from the review of literature.

### 3.4. Data collection instrument

The information flow plays a vital role in facilitating the research process. There are approaches of data collection namely; questionnaire (primary data collection), desk study (secondary data collection) and personal observation. In this research both questionnaire and desk study are used. The literature survey is used to limit question that have been raised in the research.

The questionnaire is structured purposely to address the respondents to respond on construction project delay and its impact on project cost to fulfill this research.

Moreover, the questionnaire includes the following areas; General information (profile and experience in construction) of the respondents. In general, the data collected has been used to identify the root causes of delay and its impact on cost in construction projects, assess the impacts and forward solutions which will be applied by the EOC.

### 3.5. Data collection procedures

First, the researcher would communicate EOC and discussed the purpose of the research by showing the written letter from Addis Ababa University. Then the researcher would be clarified the objective of the research, and asked whether the respondents are willing to fill the questioners or not. Then after the researcher would be prepared open ended questionnaires in English languages. Before the questionnaire would be distributed, some relevant information had given for respondent to help them known and understand each item of the questionnaire. The researcher distributed the questionnaires to the respondents, and give enough time to fill the questionnaires.

Overall, the following procedures are conducted and followed throughout the research writing.

- The research is developed, after background study

- Questionnaire are developed and distributed
- Questionnaire responses are collected from respondents
- The collected data are analyzed, discussed and findings are taken out

### 3.6. Ethical consideration

The researcher follows ethical consideration to conduct this study and take full of responsibility of guarantees and confidentiality of participants' information based on the ethics of research.

### 3.7. Data analyzing methods

After the data is gathered the information would be grouped in tabulate and interpreted in form of frequency, percentage and mode. It would be analysis by table and chart. Here both quantitative and qualitative data analysis procedures would be used. Finally possible conclusion, recommendations would follow.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### 4.1 Preliminary Remarks

This chapter outlines the Data Analysis and reports on significant findings. It illustrates the findings on both quantitative and qualitative research carried out according to the research methodologies in chapter three. The Data Analysis considers the data collected from both sources – primary and secondary data sources. The Secondary data source, i.e., literature review is already illustrated in chapter two. This secondary research data is referred in conjunction with the primary sources of data collected to report the research findings. The data gathered is interpreted, cross tabulated in terms of number and percent (%) and analyzed in order to meet the research objectives.

#### 4.2 General information of respondents'

This part mainly designed to provide general information about the respondents in terms of gender, relevant work experience, job status and distribution and return of the questionnaire.

##### 4.2.1. Respondents' gender

Table 4.1. Summary of respondents' gender from the questionnaire survey

Gender	Occurrence in number	Rate of occurrence in percent (%)
Male	33	82.5
Female	7	17.5
Total	40	100

Table 4.1. Summary of respondents' gender from the questionnaire survey are 17.5% Female and 82.5% Male.

#### 4.2.2. Respondents' job status

Table 4.2. Summary of respondents' job status from the questionnaire survey

Categories'	Occurrence in number	Rate of occurrence in percent (%)
Managers	12	30
Site Engineers	24	60
Office Engineers	2	5
Logistic engineers	2	5
Total	40	100

Table 4.2. shows that 12 (30%) of respondents were managers, 24 (60%) were Site Engineers, 2(5%) were Office Engineers and 2(5%) were Logistic engineers.

#### 4.2.3. Respondents' work experience

Table 4.3. Summary of respondents' work experience from the questionnaire survey

Experience (years)	Occurrence	Rate of occurrence (%)
0- 5	19	47.5
6-10	12	30
11-15	7	17.5
Above 16	2	5
Total	40	100

Table 4.3. shows that 47.5 % (19) of the respondents have experience up to 5 years, 30 % (12) of the respondent's experience is between 5 to 10 years, 17.5 % (7) of respondents have experience from 10 to 15 years and 5 % (2) are with service year of above 15 years.

#### 4.2.4. Respondents' educational qualification

Table 4.4. Summary of respondents' educational qualification from the questionnaire survey

Education background	Occurrence	Rate of occurrence (%)
Diploma	1	2.5
1 <sup>st</sup> degree	33	82.5
2 <sup>nd</sup> degree	6	15
Total	40	100

Table 4.4 shows that 2.5 % (1) of the respondents have diploma, 82.5 % (33) of the respondents' qualification is 1st degree and 15 % (6) of respondents have educational background of 2nd degree.

#### 4.2.5. Summary of questionnaire responses

Table 4.5. Summary of questionnaire responses from the questionnaire survey

Categories'	Occurrence	Rate of occurrence (%)
Managers	12	100
Site Engineers	24	100
Office Engineers	2	100
Logistic engineers	2	100
Total	40	100

Table 4.4. shows the general response rate for respondents are 100 % and the total number of respondents for the four categories was 40 out of 40 respondents. The response rate of managers is 100 % (12 out of 12 respondents), Site Engineers 100 % (24 out of 24 respondents, 100 % (2 out of 2 respondents) for both Office Engineers and logistic engineers.

### 4.3. Analysis and interpretation of data

In this section, all the data are collected, analyzed and interpreted as follows

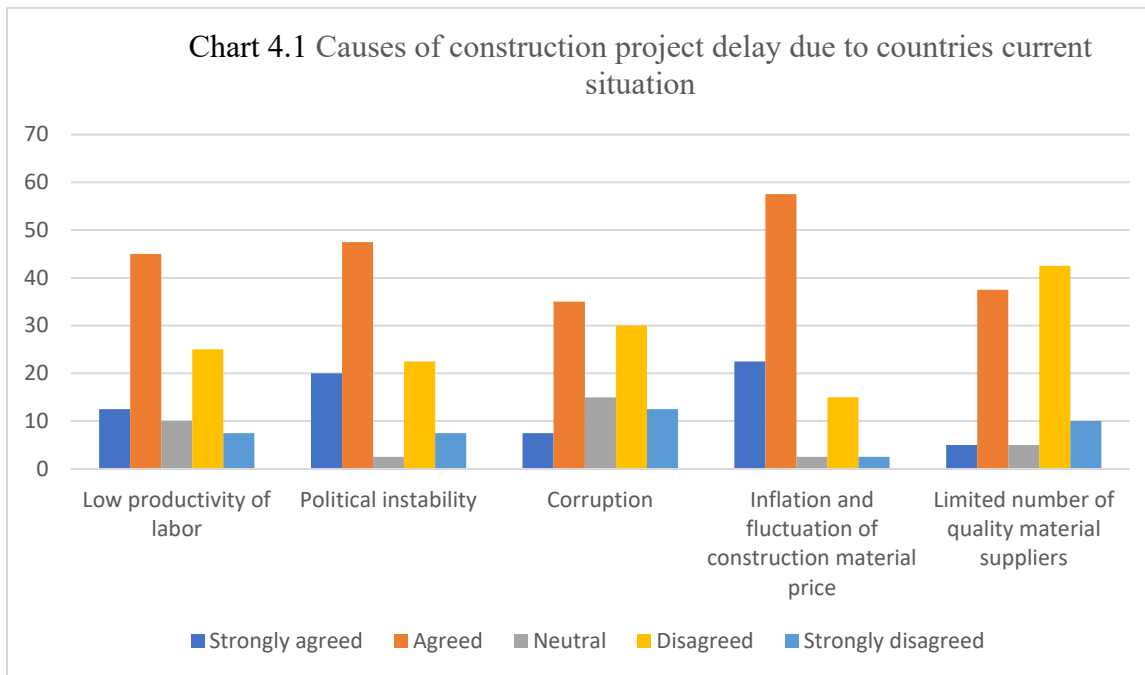
- All the data from the questionnaire are counted on the bases of frequency of occurrence (F).
- Add the responses to know the total number of responses (N)
- Calculate the percentage (%) of the frequency of occurrence from the total response
- Calculate the mode (M) to identify frequently occurred responses.
- Draw the table and chart to illustrate the findings

#### 4.3.1. Causes of construction project delay due to countries current situation

Table 4.5. Causes of construction project delay due to countries current situation

No	Item	N	1		2		3		4		5		M
			F	%	F	%	F	%	F	%	F	%	
1	Low productivity of labor	40	5	12.5	18	45	4	10	10	25	3	7.5	2
2	Political instability	40	8	20	19	47.5	1	2.5	9	22.5	3	7.5	2
3	Corruption	40	3	7.5	14	35	6	15	12	30	5	12.5	2
4	Inflation and fluctuation of construction material price	40	9	22.5	23	57.5	1	2.5	6	15	1	2.5	2
5	Limited number of quality material suppliers	40	2	5	15	37.5	2	5	17	42.5	4	10	4

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



**Source: Field Survey, 2022**

Table 4.5 shows the possible causes of construction project delay in EOC due to countries current situation. From the analysis, it is shown that low productivity of labor has a mode of 2. It means that, 45% of the respondents agreed on low productivity of labor in the country can cause construction project delay in the construction industry especially in EOC. The mode for causes of construction project delay due to political instability of the country is 2. 47.5% of the respondents agreed on the existence and highly effect of political instability in the country on the construction industry and it can be considered as one of the causes of construction project delay in EOC.

35% of the respondents agreed, mode =2, that high level of corruption within the government and construction industry in Ethiopia can be considered as one of the main causes of construction project delay. This can be said to be the cause of construction delay in EOC because when the government is corrupt, it will reflect in the selection of contractors for selfish interest. On the other hand, inflation and fluctuation of construction material price plays a vital role on delay of construction project. The mode for construction project delay due to inflation and fluctuation of construction material price in the country is 2. It means that 57.5% of the respondents agreed that inflation and fluctuation of construction material price are the root causes of construction project delay in EOC. The mode for respondents' response on delay of construction project due to limited

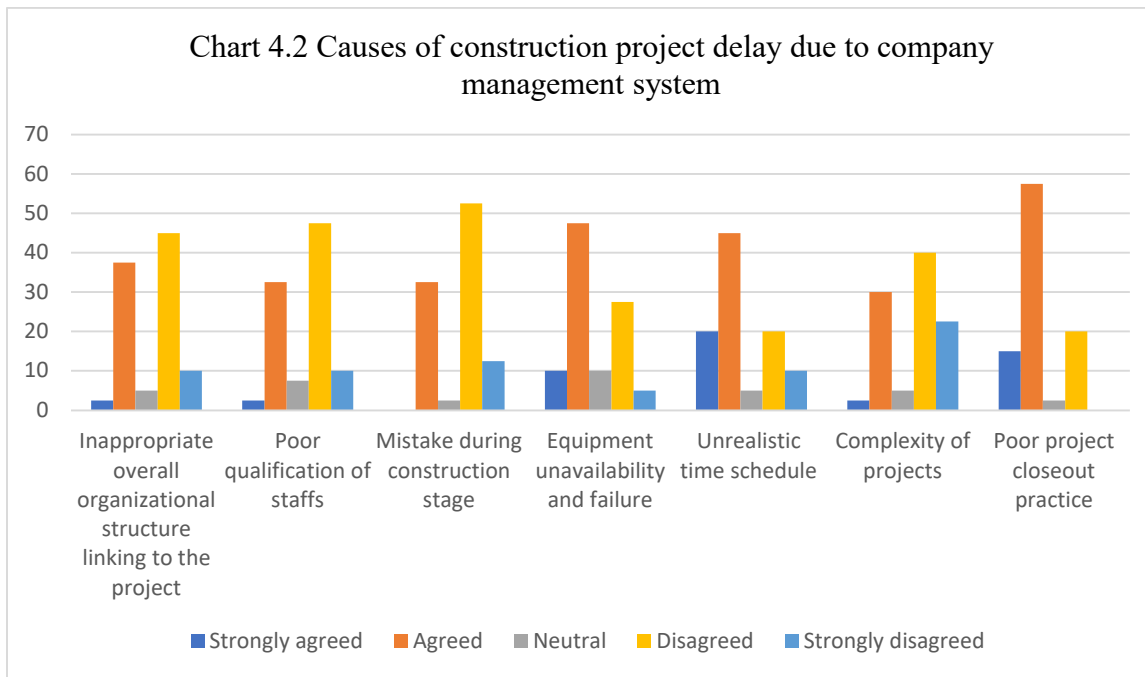
number of quality material suppliers is 4, 37.5% are agreed and 42.5% are disagreed. It shows that there are quality suppliers that are incorporated in to the market.

#### 4.3.2. Causes of construction project delay due to company management system

Table 4. 6. Causes of construction project delay due to company management system

No	Item	N	1		2		3		4		5		M
			F	%	F	%			F	%	F	%	
1	Inappropriate overall organizational structure linking to the project	40	1	2.5	15	37.5	2	5	18	45	4	10	4
2	Poor qualification of staffs	40	1	2.5	13	32.5	3	7.5	19	47.5	4	10	4
3	Mistake during construction stage	40	0	0	13	32.5	1	2.5	21	52.5	5	12.5	4
4	Equipment unavailability and failure	40	4	10	19	47.5	4	10	11	27.5	2	5	2
5	Unrealistic time schedule	40	8	20	18	45	2	5	8	20	4	10	2
6	Complexity of projects	40	1	2.5	12	30	2	5	16	40	9	22.5	4
7	Poor project closeout practice	40	6	15	23	57.5	1	2.5	8	20	2	5	2

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



**Source: Field Survey, 2022**

In most of the construction company in Ethiopia, it's common to have inappropriate overall organizational structure which links to the project. But in this survey, the mode for one of the listed items for causes of construction project due to company management system is inappropriate overall organizational structure linking to the project is 4. Which implies that 45% of the respondents disagreed and they believe that EOC has an appropriate overall organizational structure linking to the project. In addition to this, as indicated on item no 2, 47.5% of the respondents disagreed on poor qualification of staffs. It implies that, EOC have enough qualified professional staffs to handle the projects at hand. In relation to this, EOC has no major issue regarding mistake during construction stage. It is proved on item no 3 that, 52.5% of the respondents disagreed on EOC has mistaken during construction stage with mode of 4.

The analysis shows, 47.5% respondents agreed on equipment unavailability and failure are one of the root causes of construction project delay. Even though EOC has machineries which are required for the construction, some of the machineries are not working as per their daily requirements.

The mode for unrealistic time schedule and poor project closeout practice in EOC are 2 for both cases. It shows that 45% the respondent's response are agreed on the existence of unrealistic time schedule in EOC. It's become a usual trend to put unrealistic time schedule especially at the tendering stage to get the contract awarded. On the other side, project closeout practice in Ethiopia is so weak and most of the time conflicts arises. In our case, 57.5% of the respondents agreed that EOC are not good in its project closeout practice but not experience conflict.

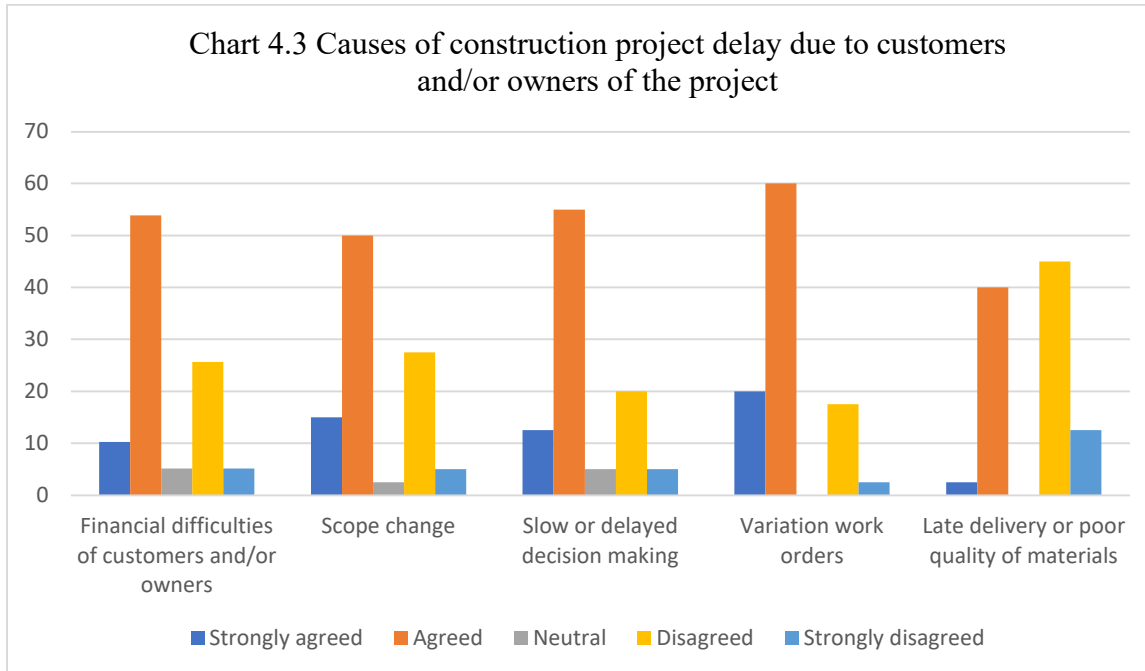
The other possible causes of construction project delay in Ethiopia construction industry are the complexity of the project. From the above analysis, its observed that the mode for construction project delay in EOC is 4 (disagreed). 40% of the respondents are disagreed and this shows that EOC has an experience on doing a huge and complex project before. This is because EOC is one of the experienced construction companies in Ethiopia and has well experienced professionals in mega projects.

#### 4.3.3. Causes of construction project delay due to customers and/or owners of the project

Table 4.7. Causes of construction project delay due to customers and/or owners of the project

No	Item	N	1		2		3		4		5		M
			F	%	F	%			F	%	F	%	
1	Financial difficulties of customers and/or owners	39	4	10.2	21	53.8	2	5.1	1	25.6	2	5.13	2
			6		5		3	0	4				
2	Scope change	40	6	15	20	50	1	2.5	1	27.5	2	5	2
								1					
3	Slow or delayed decision making	39	5	12.5	22	55	2	5	8	20	2	5	2
4	Variation work orders	40	8	20	24	60	0	0	7	17.5	1	2.5	2
5	Late delivery or poor quality of materials	40	1	2.5	16	40	0	0	1	45	5	12.5	4
								8					

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



**Source: Field Survey, 2022**

According to the above table, the mode for construction project delay due to financial difficulties of customer and/or owners is 2. It shows that 53.85% of the respondents agreed that if customers and/or owners of the project faced a financial problem, the impact will be reflected on the project and it leads to projects to be delay. The other factor that causes construction project delay due to customers and/or owners of the project is the scope change. In the above table, the mode for scope change is 2 and it shows that 50% of the respondents agreed on scope change can causes construction project delay in EOC.

The mode for slow or delayed decision making on any request is 2. It means, 55% of the respondent agreed that slow or delayed decision making by customers and/or owners of the project causes construction project to delay. Decision has to be fast in construction project so that each activity can be undergone on its scheduled time and budget. On the other hand, customers and/or owners of the project are ordering additional work items which is not included on the contract

document and they may need it after or before the completion of main contract. From the above table, the mean for construction project delay due to customers and/or owners of the project is 2. It implies that 60% of the respondents agreed that variation work orders by customers and/or owners of the project is one of the causes for construction project delay in EOC.

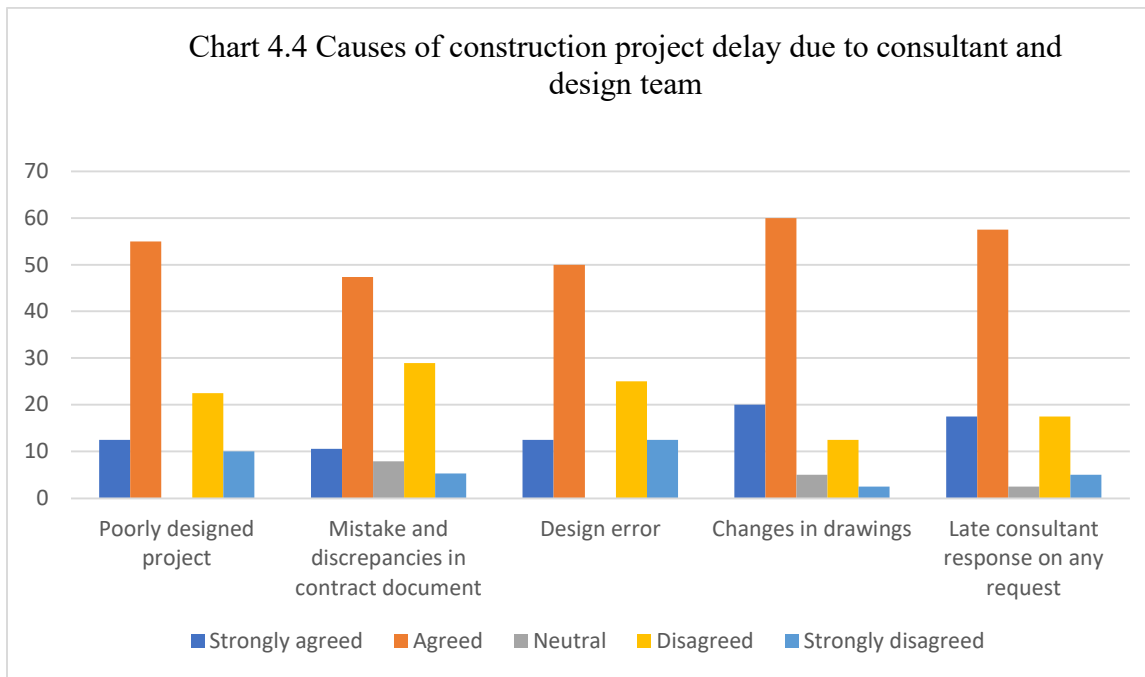
The other reason for delays of construction project is late delivery or poor quality of materials by customers and/or owners of the project. In our case, the mode from the above table for late delivery or poor quality of materials by customers and/or owners of the project is 4. It shows that most of the respondents (45%) are disagreed by considering EOC. EOC imports most of the construction materials that needs special quality

#### 4.3.4. Causes of construction project delay due to consultant and design team.

Table 4.8. Causes of construction project delay due to consultant and design team

No.	Item	N	1		2		3		4		5		M
			F	%	F	%			F	%	F	%	
1	Poorly designed project	40	5	12.5	22	55	0	0	9	22.5	4	10	2
2	Mistake and discrepancies in contract document	38	4	10.5	18	47.3	3	7.8	11	28.9	2	5.26	2
				3		7		9		5			
3	Design error	40	5	12.5	20	50	0	0	10	25	5	12.5	2
4	Changes in drawings	40	8	20	24	60	2	5	5	12.5	1	2.5	2
5	Late consultant response on any request	40	7	17.5	23	57.5	1	2.5	7	17.5	2	5	2

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



**Source: Field Survey, 2022**

According to the above table, the mode for poorly designed projects is 2. It means that, 55% of respondents agreed that poorly designed projects are one of the main causes for construction project delay in EOC. The consultant and design team of any company should have to be qualified enough and submit any requested document on time. This problem becomes common in Ethiopia and EOC are doing some of the drawings by itself in order to minimize the delay that comes by waiting the consultant and design team.

On item no 2 (mistake and discrepancies in contract document), out of the 40 respondents only 38 responses are collected. The mode for causes of construction delay due to mistake and discrepancies in contract document by consultant and design team is 2. It shows that 47.37% of the respondents agreed that mistake and discrepancies in contract document by consultant and design team is experienced in EOC. Now a days, mistake and discrepancies in contract document becomes common phenomenon in Ethiopian construction industry.

Design error and change in drawing are the key factors for completing a project with in the scheduled time and budget. In the table above, the mode for both design error and change in

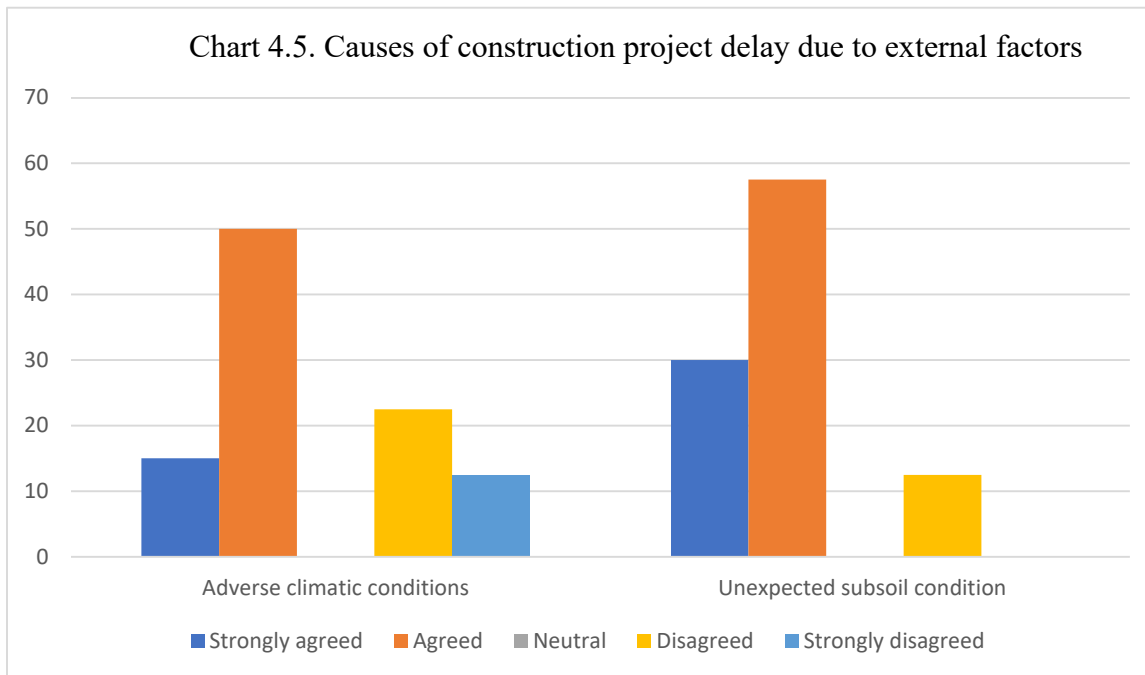
drawing are 2 for both cases. It shows that 50% of the respondents agreed that, design error in construction project affect has an effect on the project delivery date. To the same effect, 60% of the respondent agreed on drawing change can lead to a significant project delay. In order to minimize delay that arises due to design error and drawing change, the design team should have to sorted out before the project is carried out. The table shows that the mode for late consultant response on any request is 2. It means that 57.5% of the respondents are agreed that late consultant response on any request can cause a delay on a construction project. Its effect is visible for a project that has to be completed within a short period of time.

#### 4.3.5. Causes of construction project delay due to external factors

Table 4.9. Causes of construction project delay due to external factors

No.	Item	N	1		2		3		4		5		M
			F	%	F	%			F	%	F	%	
1	Adverse climatic conditions	40	6	15	20	50	0	0	9	22.5	5	12.5	2
2	Unexpected subsoil condition	40	12	30	23	57.5	0	0	5	12.5	0	0	2

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



Source: Field Survey, 2022

According to the survey results, the mode for adverse climatic conditions is 2. It implies that 50% of the respondents agreed that adverse climatic conditions have an effect on construction project and causes delay on the project. Similarly, unexpected subsoil condition has a mode of 2 in which 57.5% of the respondents are agreed that it is one of the major external factors that causes construction project delay and failures in Construction Industry.

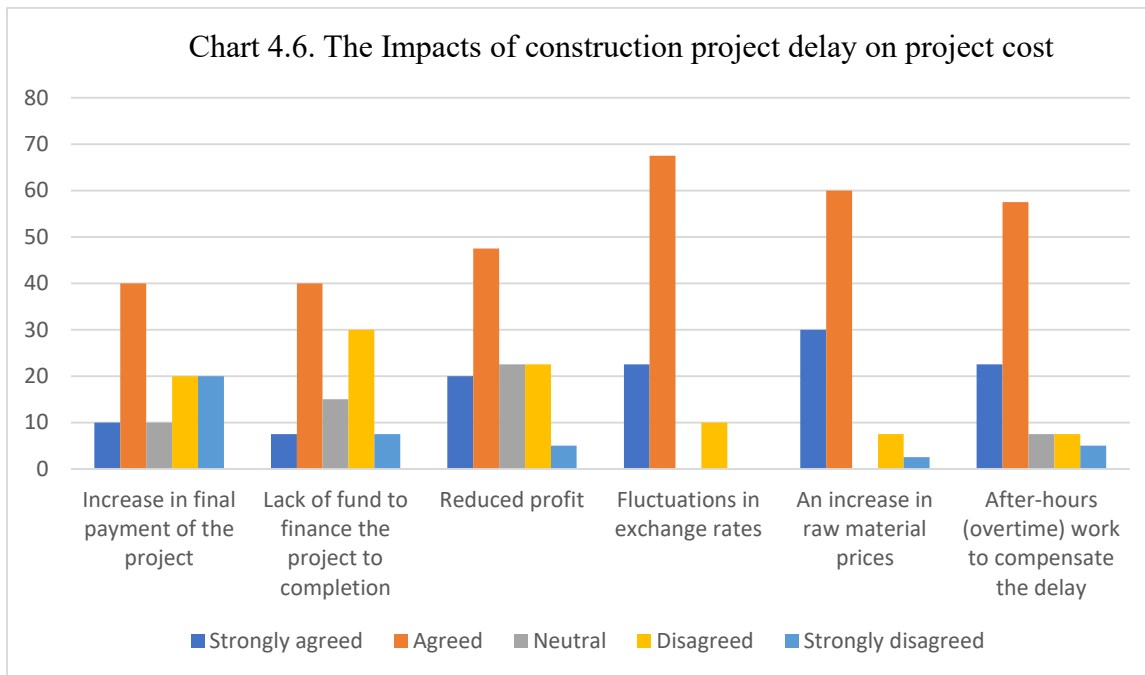
#### 4.3.6. Impacts of construction project delay on project cost

Table 4.10. The Impacts of construction project delay on project cost

No	Item	N	1		2		3		4		5		M
			F	%	F	%	F	%	F	%	F	%	
1	Increase in final payment of the project	40	4	10	16	40	4	10	8	20	8	20	2

2	Lack of fund to finance the project to completion	40	3	7.5	16	40	6	15	12	30	3	7.5	2
3	Reduced profit	40	8	20	19	47.5	2	5	9	22.5	2	5	2
4	Penalty due to the late completion of work	40	6	15	9	22.5	4	10	17	42.5	4	10	4
5	Fluctuations in exchange rates	40	9	22.5	27	67.5	0	0	4	10	0	0	2
6	An increase in raw material prices	40	12	30	24	60	0	0	3	7.5	1	2.5	2
7	After-hours (overtime) work to compensate the delay	40	9	22.5	23	57.5	3	7.5	3	7.5	2	5	2

Note: F- Frequency of occurrence, M-Mode, N-Number of responses; Response measurements, 1-strongly agree, 2-Agree, 3-Neutral, 4- Disagree and 5-Strongly disagree.



**Source: Field Survey, 2022**

The mode for increase in final payment of the project is 2. It implies that 40% of the respondents are agreed that construction project delay has an effect on final payment of the project. It's to mean that the final cost includes the budgeted amount plus any cost that are induced due to project delay. It can be related to item no 2 of the above table. It has a mode of 2 and 40% of the respondents agreed on lack of fund to finance the project to completion. Any delay in a project needs extra cost and it may cause lack of fund to finance the project to completion. In item no 3, the mode of reduced profit due to construction project delay is 2. It shows that the 47.5% of the respondents agreed that any delay in construction project can leads to reduce the profit that the contractor should have been gained.

On item no 7, the mode for after-hours (overtime) work to compensate the delay is 2. It shows that 57.5% of the respondents agreed that construction project delay can leads to after-hours (overtime) work to compensate the delay. Here it is clear that project delay can be the cause for after-hours (overtime) work to compensate the delay Another impact of project delay on project cost is penalty due to the late completion of work. As we see on the table above, the mode for penalty due

to the late completion of work is 4. It implies that 42.5% of the respondents disagreed on penalty due to the late completion of work in the case of EOC.

Item no 5 and 6 shows that the impact of construction project delay in relation to fluctuations in exchange rates and an increase in raw material prices respectively. The mode for item no 5 is 2 and it show that 67.5% of the respondents agreed that if construction project delayed the project can be affected in fluctuations in exchange rates. On the hand, when a project is delayed, a project can be challenged by an increase in raw material prices. It is shown in item no 6 that the mode of an increase in raw material prices is 2 and it implies that 60% of the respondents are agreed on delayed project can be challenged by increase in raw material prices.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATION

#### 5.1. Conclusion

The analysis of the survey revealed the high degree of agreement among the respondents; delay has a significant impact on construction cost. As a result, the top most important causes of delay in the EOC sequentially ranked escalation of the materials price, political instability in the country, poor project closeout practice, variation work order, change in drawing and unexpected subsoil conditions and ineffective project planning and scheduling.

Based on the results of the analysis of observations and respondents' responses of the questionnaire, the following conclusions are drawn.

1. The first major question of the statement problem was to identify causes of project delay and its impact on project cost in EOC. After analysis, main causes of construction project delay due to countries current situation (57.5% of the respondents agreed) in EOC are inflation and fluctuation of construction material price. It's the root causes of construction project delay.
2. The analysis and result indicated that, one of the reasons that EOC construction project delayed due to its weak project closeout practice (57.5% of the respondents agreed).
3. One of the specific objectives was to identify the existing situation associated with construction projects delay and the impact on cost in EOC. There are many effects of time and cost overruns to stakeholders in the construction industry. there are some causes of construction delay that leads to cost overrun but it is not experienced in EOC. For example, late delivery or poor quality of materials is not an issue for EOC. This is because, EOC are importing quality materials for their projects and the analysis results indicated that 45% of the respondents agreed on this.
4. The third major question of the problem statement was to forward the resolution methods and recommendation about minimizing or avoiding construction delay, and hence to reduce its consequential effects on project cost in EOC. And hence, during analysis results indicated that 57.5% of the respondents are agreed that late consultant response on any request. It implies that

EOC has to develop a strong relation with the consultants so that the communication becomes easy.

5. Out of the listed causes of project delay; fluctuations in exchange rates, an increase in raw material prices and after-hours (overtime) work to compensate the delay have a greater impact on project cost (67.5%, 60% and 57.5% respectively).

## 5.2 Recommendation

The following points are suggested to EOC in order to control, minimize and avoid project delay and its impact on project cost.

1. EOC ought to assign competent and complete administrative and technical staff as soon as project is awarded to make arrangements to achieve completion within contract time, cost and with the required quality.
2. EOC is advised to use planning and scheduling, which are continuing processes during construction and match with the resources and time to develop the work and to avoid project delay and its impact on cost.
3. EOC has to be aware about best construction materials procurement competition, so it is advised to purchase the construction materials at the beginning of work. It is also better to have time schedule for material delivery process to the site in order to avoid shortage or lack of materials.
5. EOC is advised to setup realistic time schedule and preventive and periodic maintenance of plants and equipment.
6. EOC had better to monitor the quality of activities continuously and to set the required quality system in the different activities of the project so as to avoid any mistakes that may lead to rework of activities.
7. EOC need to have appropriate construction method and increase productivity to control or to avoid the greatest rate of project delay and its impact on cost of construction projects.

### 5.3. Directions for further research

This research studies the causes of construction project delay and its impact on project cost in EOC. From the study it is clear that there is much scope for further research in the following areas:

Poor planning and administration of the construction projects might lead to several adverse effects on the project duration. Construction delays and duration issues are frequently responsible for transforming productive ventures into failures. These delays can be reduced or prevented by appropriate pre-project planning and effective project management, since they are critical success aspects for completing the construction project.

Construction manager's primary duties include planning construction projects and overseeing their progress in a well-timed and cost-effective manner. They are responsible for the budget, organization, implementation, and schedule of the projects. These skills are honed through immense exposure that requires technical experiences in managing construction projects.

It is almost impossible to predict the occurrence of natural disasters, which could, among other things, impact construction projects. Delays associated with such events can be avoided by incorporating certain precautionary measures in the preparation stage. It is necessary to create a proper plan and schedule to conduct construction activities in extreme field conditions. Since most construction projects are infrastructures, it is recommended that the government and contractors must consider and schedule what project activities are appropriate during such conditions

A significant number of contract modifications (even some unforeseen work) can be avoided during the pre-construction phase (planning and design stage) of a project's life cycle. In the public sector, it may not be possible to have a contractor do a construct ability review prior to award due to restrictions on bid work. Procedures to reduce design error and omissions are being conducted, such as a formal review process of plans and specifications, pre-bid conferences, and quality management programs during design.

Productivity remains a fascinating and dominant matter in the construction area. It assures cost savings and the practical use of resources. Without adequate and efficient human resources, it is not feasible to proceed with a construction project. Hence, there is a need to ensure that laborers' best input for achieving the project goals.

Shortage and delay in materials supply are argued to be one of the most important factors that lead to delay in construction project delivery globally. The most important cause of the shortage of materials relates to the origin or availability of construction materials. On the other hand, the most influential cause of delay in material supply was found to be poor materials procurement and the inventory management system, which has other underlying reasons such as late identification of the type of materials needed. However, this is deemed avoidable. The impact of late payment translates to a delay in the progress of the project. It will affect the schedule and budget of the work. Thus, clients should search for co-investors for support on financial assurance. Working closely with the stakeholders as a team in the project is recommended to respond to problems easily expected in contract payment procedures.

## REFERENCES

- Werku Koshe & Jha, K. N. (2016). Investigating Causes of Construction Delay in Ethiopian Construction Industries, *Journal of Civil, Construction and Environmental Engineering*, 1(1), 18-29.
- Shewaferahru T. (2016). Cause and effects of delay on educational building projects, case study in Addis Ababa University, school of civil and environmental engineering.
- Srdic A. & Selih J. (2015). Delays in construction project: cause and mitigation, 1283-1389.
- Ashraf S. & Ghanim A. (2016). Causes and effect of delay in public construction project in Jordan. *American Journal of Engineering research (AJER)*, 5(5), 87-94.
- Eshetu Zenebe, Prof. Emer T. Quezon, Alemu Mosisa (2016). Contract claim Analysis on Building Construction Project in Addis Ababa: A case study at Yeka Sub City', *International Journal of Science and Engineering Research*, Volume7, Issue 7, July- 2016.
- Merid Taye (2016). Assessments of Time and Cost Overruns in construction projects: in case study at Defense Construction Enterprise in Ethiopia' IGNOU-SMU, School of Management studies.
- Ministry Finance and Economic Development of Ethiopia (2017/18), annual budget report.
- Owolabi et. al. (2014) 'Causes and effects of delay on project construction delivery time', *International Journal of Education and Research*. Vol. 2 No.4 April 2014.
- Dinakar A. (2014). Delay analysis in construction project. *International journal of emerging technology and advanced engineering*. 4(5), 2250-2459.
- Divya R. & Ramya S., (2015). Causes, effects and minimization of delays in construction projects, national conference on research advances in communication, computation, electrical science and structures 335-340.
- T. Subramani, P. S. Sruthi & M. Kavitha (2014). Causes of cost overrun in construction, *IOSR journal of engineering (IOSRJEN)*, 06(04), page 01-07.

S. Shanmugapriya (2013). Investigation of Significant Factors Influencing Time and Cost Overruns in Indian Construction Projects, *International Journal of emerging*.

Olawale, Y. A., & Sun, M. (2010). Cost and time control of construction projects: inhibiting factors and mitigating measures in practice. *Construction Management and Economics*, 28(5), 509–526.

Kong sik wei (2010). Causes, effects and methods of minimizing Delay in construction projects. *Journal of Management in Engineering*, 312-332.

Kang sik wei (2010). Causes, effects and methods of minimizing Delays in construction projects. *Journal Of Management in Engineering*, 312-332.

Fugar, F D K & Agyakwah-Baah, A B (2010). Delays in building construction projects in Ghana, *Australasian Journal of Construction Economics and Building*, p.103-116.

Shebob, A, Dawood, N & Xu, Q (2011). Analyzing construction delay factors: A case study of building construction project in Libya, *Journal of Association of Researchers in Construction Management*, p.1005-1012.

Alaghbari, W.M.A., Kadir, M.R.A., Salim, A. & Ernawati, (2007). The significant factors causing delay of building construction projects in Malaysia. *Engineering Construction and Architectural Management*, 14(2), pp. 192-206.

Assaf S. and AL-Hejji S. (2006). Causes of delay in large construction projects,

Fetene Nega, F. (2008). Causes and Effects of Cost Overrun on Public Building Construction Projects.

Faridi, A.S. & El-Sayegh, S.M. (2006). Significant factors causing delay in the UAE construction industry. *Construction Management and Economics*, 24(11), pp. 1167-1176.

Lo. T. Y., Fung, I. W. H., Tung, K. C. F. (2006) Construction Delays in Hong Kong Civil Engineering Projects. *Journal of Construction Engineering and Management*, Vol. 132, No. 6, 636-649.

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Ministry of Work and Urban Development (MoWUD). (2006). Urban development policy. Addis Ababa  
Nicholas, J. (2001) Project Management for Business and Technology. Prentice Hall, New Jersey.

Sambasivan, M. & Soon, Y.W. (2007). Causes and effects of delays in Malaysian construction industry. International Journal of Project Management, 25(5), pp. 517-526.

T. Subramani, P. S. Sruthi, M. Kavitha (2014). Causes of cost overrun in construction, IOSR Journal of Engineering (IOSRJEN), 06(04), pp.01-07.

## APPENDICES

### QUESTIONNAIRE

#### **Causes of construction project delay and its impact on project cost: The case of Elmi Olindo contractors plc.**

Researcher name: Tedla Tiruneh ([tedla492@gmail.com](mailto:tedla492@gmail.com))

Advisor name: Berhanu Denu (PhD)

Dear Respondent,

I am an MA student in Project Management at Addis Ababa university, school of Commerce. As part of partial fulfilment requirements for MA, I am conducting a small piece of research on “Causes of construction project delay and its impact on project cost: The case of Elmi Olindo contractors plc”.

I would like to invite you to take part in this research. Taking part will involve completing the consent form below and the attached questionnaire, which will take no more than 15 minutes of your time. The answer you provide will be kept confidential; only aggregate data will be presented in the written report and therefore, your anonymity is guaranteed, individual questionnaires will be kept only until the research work has been moderated and seen by an external examiner and will then be destroyed.

If you have any questions not answered in this introduction to the research, please contact me using the details above. If you have read this information and are willing to participate in this research, please indicate your informed consent using the form below.

#### **participant consent please tick**

1. I confirm that I have read and understood the information about the above study. I have had the opportunity to consider the Information, ask questions and had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without legal right being affected.

3. I agree to take part in the study.

### Section A: Demographic Data

**Instruction:** Please tick  appropriately

- 1) Gender: a) Female  b) Male
- 2) Age Range: a) 18 – 24  b) 25 – 34  c) 35 – 44  d) 45 – 54  e) 55 +
- 3) Nationality: a) Ethiopian  b) Foreigner
- 4) Job Description: a) Project Manager  b) Site Engineer  c) Office Engineer  d) Logistics Engineer
- 5) Years of experience in Construction Industry?
  - a) 0 – 5  b) 6 – 10  c) 11 – 15  d) 16 +
- 6) Educational Background.
  - a) Diploma  b) Degree  c) Master’s degree  d) PHD
- 7) Have you managed a Construction Project before?
  - a) Yes  b) No

**Section B:** The causes of construction project delay: The case of Elmi Olindo contractor’s plc.

Below is the list of questions, kindly tick  the most suitable option as it applies to you.

#### a) Related to countries current condition

No	Related to countries current condition	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Low availability and productivity of labor					
2	Political instability					
3	Corruption					

4	Inflation and fluctuation of construction material price					
5	Limited number of quality material suppliers					

**b) Related to the company management system**

No	Related to the company management system	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Inappropriate overall organizational structure linking to the project					
2	Poor qualification of staffs					
3	Mistake during construction stage					
4	Equipment unavailability and failure					
5	Unrealistic time schedule					
6	Complexity of projects					
7	Poor project closeout practice					

**c) Related to the customers and/or owners of the project**

No	Related to the customers and/or owners of the project	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Financial difficulties of customers and/or owners					

2	Scope change					
3	Slow or delayed decision making					
4	Variation work orders					
5	Late delivery or poor quality of materials					

**d) Related to Consultant and design team**

No	Related to Consultant and design team	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Poorly designed project					
2	Mistake and discrepancies in contract document					
3	Design error					
4	Changes in drawings					
5	Late consultant response on any request					

**e) Related to external factors**

No	Related to external factors	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Adverse climatic conditions					
2	Unexpected subsoil condition					

**Section C:** Impact of construction project delay on project cost: The case of Elmi Olindo contractor's plc.

Below is the list of questions, kindly tick [√] the most suitable option as it applies to you.

No	Impacts of delay on project cost	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
1	Increase in final payment of the project					
2	Lack of fund to finance the project to completion					
3	Reduced profit					
4	Penalty due to the late completion of work					
5	Fluctuations in exchange rates					
6	An increase in raw material prices					
7	After-hours (overtime) work to compensate the delay					