



**DETERMINANT FACTORS CAUSING THE DELAY OF CONSTRUCTION PROJECT:
THE CASE OF ADEY ABEBA NATIONAL STADIUM CONSTRUCTION PROJECT**

BY:

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STATEMENT OF DECLARATION

I, Nigussie Yitayew, hereby declare that this research represents my own work which has been done for a partial fulfilment of the requirements for the Degree of Master of Arts (aka MA) at Addis Ababa University, School of Commerce and has not been previously included in a thesis or dissertation submitted to this or any other institution for a degree, diploma or other qualifications.

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STATEMENT OF APPROVAL

This is to certify that, Nigussie Yitayew has carried out this research project on the topic of “Determinant Factors Causing the Delay of Construction Project: The Case of Adey Abeba Stadium Construction Project” under my supervision. This work is original in nature and is sufficient for submission for the partial fulfilment for the Degree of Master of Arts in Project Management.

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STATEMENT OF CERTIFICATION

This is to certify that the project work prepared by Nigussie Yitayew entiteled “Determinant Factors Causing the Delay of Construction Project: The Case of Adey Abeba Stadium Construction Project” in Partial Fulfilment for the Requirements of the Master of Arts in Project Management complies with the regulation of the university and meets the accepted standards with regards to orginality and quality.

Advisor----- Signature----- Date-----

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ABBREVIATIONS

AANS	Adey Abeba National Stadium
AAWSA	Addis Ababa Water & Sewerage Authority
CCEC	China State Construction Engineering Corporation
CPM	Critical Path Method
EPA	Environmental Protection Agency
FCY	Foreign Currency Exchange
FDRE	the Federal Democratic Republic of Ethiopia
FIFA	Federation Internationale de Football Association
GLM	General Linear Model
IAAF	International Association of Athletics Federation
SPSS	Statistical Package for the Social Studies

GENERAL PROVISIONS

Client	Means FDRE Ministry of Culture & Sports
Consultant	Means MH Consultants PLC.
Contractor	Means China State Construction Engineering Corporation
Researcher	Means Nigussie Yitayew
Stakeholders	Means the Client, the Contractor & the Consultant

ABSTRACT

The Adey Abeba National stadium was one mega project in Ethiopia which the public was anticipating to see its completion on time. The project was launched in 2016 and planned to be completed in two separate phases at a total cost of 8 billion birr. The project's first phase was completed in 2018 but, its second phase which was launched in 2020 is yet at 11% completion consuming 120% of the time schedule. This study was conducted to reveal the determinant factors that caused the delay of the project. A descriptive research design was followed to quantitatively find the causes and rank them as per their importance. Data were gathered both from primary and secondary sources through a questionnaire survey and documents scanning. In the survey stratified 33 respondents were participated representing three major stakeholders: the client, the contractor and the consultant. The study used the Relative Importance Index (RII) for ranking the causes of the delay of the project. The survey findings revealed that the top ten factors that caused the project's delay are: (1) Shortage of foreign currency, (2) The COVID-19 pandemic, (3) Escalated inflation, (4) Dynamic foreign currency exchange, (5) War at the time of the construction of project, (6) delay in materials delivery, (7) political instability within the country, (8) Unavailability of utilities, (9) Complexity of project design and (10) Improper project planning and scheduling. Furthermore, a correlation test have been made to find whether there is a significant agreement among the stakeholders and the overall respondents in ranking the causes of the delay. The study suggested that the stakeholders of the project in general and the government and its policymakers in particular, must devise mechanisms (policies) that bring a multi-alternative foreign currency source and curve the ever-increasing inflation. Development of the decision-making capacities of the various authorities is also another essential factor.

Key Words: Delay, Delay factor, Client, Contractor, Consultant, AANS construction project.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The completion of a construction project within a specified time is one of the major objectives in project management. The failure to accomplish the objective of most construction projects, will eventually, lead to contractor and client's displeasure. Such projects are regularly confronted with delays and cost overruns that pose countless problems to their implementations (Ika, 2012).

Ideally, projects are expected to run recurrently without delays. Yet, construction delay is one of the major challenges faced by the global construction industry. Till date the industry has come across a number of major projects that failed to meet up with the projects deadlines as a result of not coping with delay in construction projects (Aibinu & Jagboro, 2002). These delays in construction projects downshifts economic activities, diminishes employment opportunities and can discourage foreign investments. This implies that a delayed project will always have undesirable consequences on the contract's final outcome (Neary, 2009).

Generally, delays in construction projects were seen to be caused by project mismanagement that could have been avoided if an efficient way to analyze the related consequence put in place (Ika, 2012). Researches have also suggested that challenges associated with delay in different projects, particularly in construction projects, can be reduced drastically by a vicarious implementation of project management concepts. Hence, a vital factor that has contributed to this challenge was the absence of project management practices in tackling these delays. However, findings from prior work has shown that in spite of adopting the various project management practices, construction project in most countries, particularly in the low and middle income countries, were still faced with the challenge of project delay (Africa & Sachs, 2016).

Construction delays did not just affect the construction industry alone, but the whole economy of the concerned countries. The most dominant factors regarding these delays were apparently resided on the client and contractors of the projects. Failure by clients to finance the projects and failure by contractors to comply with project schedules appeared very frequently in construction

project delay studies (Meena & Suresh, 2018, Borhan Ghasemzadech, 2014, Le-Hoai, L et al, 2008).

Construction project delay has rather been the characteristic feature of the industry in Ethiopia. A study by Abdo Abatemam conducted in 2006 revealed that the actual completion time of construction projects in Ethiopia ranges from 110% to a staggering 467% of the initial contract time of the projects. In his study 52 public and private building projects were analyzed and the actual completion time of the projects averages out to be 190% of the initial contract time of the projects. The problem was being more severe on public projects.

The trend didn't look to show any significant improvement in a study conducted by Habtemariam Tesfaye, ten years later, in 2016. About 35% of the construction projects under Habtemariam's study claimed to be completed with 200% to 300% extension time of the original contract time. Yet, again a 2020 study on Addis Ababa 40/60 housing projects registers an average of 150%-time delay (MollayeTekle, 2020).

Poor project management system and financing problems were mentioned by various researchers as the most important causes of these construction projects delays in Ethiopia (Abdurezak M. and Neway S., 2019, Werku K. and K. Jha, 2016). Inflation rate was also mentioned in such researches as the other dominant contributing factor to the problem. Even though inflation rate has been taken in to consideration in the contract agreements of the projects, when the projects get delayed beyond the schedule the effect of inflation went beyond what was considered in the contract agreements. A delayed supply of construction materials, especially in imported materials, also contributed a considerable effect for construction project delays in Ethiopia (Abdo, 2006).

The country's mega projects were also not immune to the problem. The country's largest mega project, The Great Ethiopian Renaissance Dam, is a representative example in this regard. The dam was initially supposed to be completed in 2018 yet, five years later in 2023 the construction is just at 90% completion.

One of the mega projects of the country was the long-awaited Adey Abeba National Stadium Construction Project. When the project was launched in 2016 the aim was to enable the country host international competitions. The stadium was to be built on 67 hectares of land in the capital

Addis Ababa with a capacity of 62, 000 seats covered by a distinctive dome with dynamic steel structure. The design of the stadium was given a lot of appreciation by experts of the field. The project also included car parking structures, basketball field, swimming pool and other sport facilities so as to fulfil FIFA & IAAF requirements. The project was planned to be completed in two construction phases at a cost of 8 billion birr. When the client, FDRE Ministry of Culture and Sports, and the giant Chinese contractor, CSCEC, signed a contract agreement in Jan 2016 the project was said to be completed in two phases. The first phase of the project was completed in late 2018 at a cost of 2.47 billion birr. Despite the fact that the second and final phase of the construction has been launched in May 2020, the contractor has increased its price adjustment by a third of the initial agreed budget of 5.57 billion birr. The contractor raised the rate of inflation, the COVID-19 pandemic and so on caused the delay and the total cost of the project. The client on the other hand, while admitting the inflation rate, did not accept the reasons raised by the contractor. Rather the client did complain the contractor for delaying the project deliberately in order to boost the cost of the project beyond what was on the contract agreement (The Reporter, Jan 2023).

In February 2022 the Ethiopian prime minister has visited the stadium physically and the government later established a new committee comprising ministers of finance, housing & urban infrastructures, culture & sports to come to a new deal with the contractor and complete the project within a short period of time. Following that the Chinese embassy in Addis Ababa has been hosting a successive meeting for discussion and negotiation between the two parties. However, the parties couldn't agree on the price adjustment and hence the client terminated its contract with the contractor while the project was at 11% completion (Ministry of Culture and Sports report, February 2020 and September 2021).

Currently, the client is preparing to accept a new tender. Yet, apart from the “blame game” between the client and the contractor, the actual reason for the delay of the project remained unknown so far.

Thus, the major aim of this study is to investigate the determinant factors that affected the even completion of the Adey Abeba National Stadium construction project. Particularly to identify the main causes of delay during construction phase by ranking the delay causes attributed to each stakeholder mainly to client, contractor and consultant involved in the project. Finally to state the

top ten delay causes of this construction project according to the client, consultant, and contractor and the combined views.

1.2. Statement of the Problem

Mega projects are by nature resource intensive. For a country like Ethiopia the resource that a single mega project requires could have a considerable effect on the total economy of the country. When they have been completed efficiently, the contribution of such projects to the growth of the country is immense and versatile. While they were under construction mega projects create thousands of job opportunities to citizens and serve as a practical knowledge transfer means and when completed the projects generate a long lasting and significant income to the economy.

In the past decades Ethiopia seemed very much engaged in constructing mega projects. Those completed and currently operational mega projects are serving as the back bone of the country's growing economy. The country's major hydropower plants, mega factories, express & rail ways are good examples in this regard (Meaza Alemayhu, 2015).

Despite the ambitions of the country and anticipation of its people the completion of mega projects within a specified time was still a big challenge the country has been facing. Mega projects were usually completed taking a time much extended than what they have been planned to be completed on. This extension of time would have various impacts. Primarily the delay has drained the country's struggling economy, as an extended constructions demands an extended cost. This have kept the projects to stay being a consumer of the economy at the time that the projects were supposed to be a generator in the economy. The delay of mega projects, on the other hand, has negatively affected the hope of the people who were anticipating to see the fruits of the projects. Delayed projects has also opened another door for public properties looting and corruption (Werku Koshe, K. N. Jha., 2016).

The causes for the delay of mega projects was seldom investigated by researchers in Ethiopia. Few researchers have tried to see the case focusing on some specific mega projects. For example, a study conducted by Molaye Takele (2020) on one of the most delayed construction projects in Ethiopia; the Addis Ababa 40/60 housing project 20 major causes of delay were identified based on a Relative Importance Index from a list of 70 possible causes of delay presented to client, contractors and consultants participants. The findings of his research indicated that delivery of

materials by the client, difficulties in financing projects by contactors, improper contractor selection, slow decision making by the client and obsolete technology used by contractors were some of the most dominant delay factors.

In another research Abdurezak M. and Neway S. (2019) have studied on the main causes of delay in public building construction projects in Addis Ababa Administration and listed 42 factors arranged in five categories and presented to three parties' the client, contractor and consultant. Their survey findings revealed the top ten factors that cause construction delays in the public building construction projects in Addis Ababa were: (1) Difficulty in project financing (poor financial system); (2) Poor Project management system;(3) Delay in issuance of designs and working drawings; (4) Shortage of availability of imported construction materials and goods on market; (5) Design errors and complexity of designs;(6)Delay in progress payments for completed works; (7) Late start & resource mobilization to site; (8) Financing problems; (9) Inaccurate Site investigation Report;(10) Price Inflation.

The construction of Adey Abeba National Stadium Construction Project was one of the delayed mega projects of the country. Though the moment it should have been completed and serving various sport activities in the country, the project is only at 11% of its second phase construction. It have also been reported that the remaining phase requires three times the initial construction cost to bring the project in to completion. The client and the contractor did not coincide in their opinion on the decisive factors that caused the delay of the project (Ministry of Culture and Sports report, September 2021).

Considering the few local researchers proposed determinant cause factors and others, in this study shortage of FCY, dynamism of the FCY exchange rate, COVID 19, war at the time of the construction of the project, political instability, escalated inflation etc. were some of the researcher's added cause factors not referred by previous researchers. Here the researcher needed to show the influence of such added factors for the delay of this particular project.

Additive to the earlier facts: The client and the contractor did not coincide on the decisive factors that caused the delay of the project and the researcher could also not find any study conducted on this case specific project construction delay factors.

Such a situation has called for an independent, free of conflict of interest, researcher to reveal the actual cause/s for the delay of the project. Hence, all this issues motivates the researcher to study on the problem and throw some fine stones on the ground.

1.3. Research Questions

The basic questions raised and tried to be answered in this study are:

1. What are the major determinant factors that caused the delay of the Adey Abeba National Stadium Construction Project?
2. What is the level/rank of each factor in the total delay of the project?
3. Whom shall take the responsibility regarding to the delay of the project: the client, the contractor or the consultant?

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of the study is to determine the major factors for the delay of the Adey Ababa National Stadium Construction Project.

1.4.2. Specific Objectives

- To investigate the level /rank of influence that each delay factor has on the total delay time of the project.
- To assess the responsibility of each stakeholder mainly to client, contractor and consultant involved in the project with regards to the delay of the project.
- To suggest recommendations to the evolving stakeholders.

1.5. Significance of the Study

The client of the project is preparing a new tender, following the termination with the existing contractor. But, unless the actual reasons that caused the delay and there by overprice of the project are discovered, it would be difficult what to change or improve by the stakeholders of the project in order to avoid a similar situation occur with the new contractor, as well. In this regard the study can contribute a share in delivering a research based information about the major

factors that caused the delay of the project and whom should take care in order to not repeat the same problem.

Project delay is a common problem on other construction projects of the country as well. In this regard the study could help the stakeholders of those similar other construction projects to evaluate their respective problems in light of the results of the study.

The study could also be used as a benchmark for other researchers who want to conduct further studies.

1.6. Scope of the Study

The stakeholders of such a mega project are expected to be numerous. However, within the limited time allocated for the study & limited authority the researcher have, it was difficult to address the entire stakeholders altogether. As a result the study was conducted based on the opinions of three decisive stakeholders of the project: the client, the contractor & the consultant.

The project was planned to be completed in two phases. The first phase of the project has been nearly completed with only 1% of the work remaining. For a technical reason, the remaining job of the first phase, which was about finishing the truck & the field, couldn't be completed until the second phase reaches above 80% completion. In this study only the second phase of the project, which took 3 years and reached only 11% completion, was studied.

Relative Importance Index method was applied to analyze the data. This method, by its nature, doesn't reveal the exact amount of time that each cause contributed in the total delay time of the project. In this regard the study is limited to ranking of the causes of the delay by comparing their contribution with one another.

Generally, the study has both geographical and conceptual scope. Geographically, this study is limited to Adey Abeba National Stadium construction project which is situated in Addis Ababa. Conceptually, this study focuses on the determinant factors causing the delay of this construction project.

1.7. Limitations of the Study

By the time the survey of this study was conducted the client of the project had already terminated its contract agreement with the contractor. Following this the contractor has already relocated the majority of its workers to different other projects of it or in some cases terminated their contract. This fact together with the unwillingness the contractor showed to provide the contact addresses of those workers, tracking and finding all of the workers was impossible within the specified time the study was supposed to be completed. As a result the study was conducted based on limited respondents which are currently working on the project and some other who were working on the project very recently were included in the survey.

Due to the nature of the project the contractor hired experts on a contractual agreement depending on the type of work the project reaches. For instance, when the project was at the beginning stage, it hired foundation engineers and when the project reached building the roof it terminated the contracts of the former engineers and hired structural engineers, so and so on. In this regard the study would have been more satisfactory if the researcher was able to get a chance to reach to as many experts as he needed from each stage of work of the project. Those experts of the contractor which are included in the survey may not have an original knowledge of how/what has been going on during the construction stages of the project before they were hired.

1.8. Organization of the Study

The study is organized in five separate chapters. The first chapter presents the background of the study, statement of the problem, the research question, the objective, significance, scope and limitations of the study.

The second chapter presents those literatures reviewed and found important in designing the study. Under this chapter the definitions and theories that are widely accepted by those previous researchers when dealing with such similar researches were presented. The summaries of the works of some selected researchers are also included under this chapter.

In the third chapter the methodology used in this study together with the sampling method & sample size are included.

The fourth chapter presents the analysis, result and discussion of the study. The last chapter discusses about conclusion, recommendation and suggestions raised by the researcher.

Also in the final pages of the paper a copy of the questionnaire used in the survey and a list of referenced documents are included.

CHAPTER TWO

REVIEW OF LITERATURES

2.1. Introduction

While doing this study the researcher has tried to review as many related literatures as possible. In the first section of this chapter those literatures that were reviewed and used to define the key-terms of the study have been explained. In this regard ‘delay factor’ which is one important key-term in this study has been explained from the points of views of credible researchers. Following that, various ways of classifying delay factors have been observed based on the classification mechanism that previous researchers used while doing similar research. The purpose of showing these classification mechanisms was related to the fact that this study also intended to classify delay factors to meet its specific objectives.

Later in this chapter short summaries of the works of other researchers with a similar research question have been observed. Here the works of both international and local researchers are included. The summary included the methodology the researchers followed in their ‘construction project delay studies’ and the results they achieved.

2.2. A Delay and Delay Factor

In construction, delay could be defined as the time overrun either beyond completion date specified in a contract or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule. The delay in the project has an adverse effect on project success in terms of time, cost and quality (Meena. & K. Suresh, 2015). Hence by definition a delay factor in construction is any factor that has a potential to cause a construction delay.

Sanders and Eagle (2001) define delay as an event that causes extended time to complete all or part of a project. Delay in construction is a global phenomenon (Sambasivan and Soon, 2007) affecting not only construction industry but also the overall economy of the country as well (Faradi and El-Sayegh, 2006). Delay involves multiple complex issues all of which are invariably of critical importance to the parties to construction contract. These issues concern

entitlement to recover cost of delay or the necessity to extend the project with the consequential entitlement to recovery costs for adjustment to the contract schedules. Questions arise as to the causes of delay and the assigning of fault often evolves in to disputes and litigation (Bolton, 1990). Braimah (2008) stated that delayed completion of any project is generally caused by the actions or inactions of the project parties including the contractors, consultants, owner or other (example the act of God).

2.3. Types of Delays

Trauner, Theodore J (2009) in his book of “Construction delays: documenting causes, winning claims, and recovering costs” briefly explains types of construction delays and the necessity of having a knowledge of these delay types to delay analysts. According to him before any discussion of delay analysis can begin, a clear understanding of the general types of delays is necessary. There are four basic ways to categorize delays:

- Critical or noncritical
- Excusable or non-excusable
- Compensable or non-compensable
- Concurrent

2.3.1. Critical Versus Noncritical Delays

In any analysis of delays to a Project, the primary focus is on delays that affect the progress of the entire Project (the Project end date or milestone date) or that are critical to the Project completion. However, many delays occur that do not delay the Project completion date or a milestone date. Delays that affect the Project completion, or in some cases a milestone date, are considered critical delays, and delays that do not affect the Project completion, or a milestone date, are noncritical delays. Determining which activities truly control the Project completion date depends on the following:

- I. The Project itself
- II. The Contractor’s plan and schedule (particularly the critical path)
- III. The requirements of the Contract for sequence and phasing
- IV. The physical constraints of the Project

2.3.2. Excusable Versus Non-Excusable Delays

2.3.2.1. Excusable Delays

All delays are either excusable or non-excusable. An excusable delay, in general, is a delay that is due to an unforeseeable event beyond the Contractor's or the Subcontractor's control. Normally, based on common general provisions in public agency specifications, delays resulting from the following events would be considered excusable:

1. General labor strikes
2. Fires
3. Flood
4. Acts of God
5. Owner-directed changes
6. Errors and omissions in the plans and specifications
7. Differing site conditions or concealed conditions
8. Unusually severe weather
9. Intervention by outside agencies (such as the EPA)
10. Lack of action by government bodies, such as building inspection

These conditions may be reasonably unforeseeable and not within the Contractor's control. Before the analyst concludes that a delay is excusable based solely on the preceding definitions, he or she must refer to the construction Contract documents. Decisions concerning delays must be made within the context of the specific Contract. The Contract should clearly define the factors that are considered valid delays to the Project that justify time extensions to the Contract completion date. For example, some contracts may not allow for any time extensions caused by weather conditions, regardless of how unusual, unexpected, or severe.

2.3.2.2. Non-Excusable Delays

Non-excusable delays are events that are within the Contractor's control or that are foreseeable.

These are some examples of non-excusable delays:

1. late performance of Subcontractors
2. Untimely performance by suppliers

3. Faulty workmanship by the Contractor or Subcontractors
4. A Project-specific labor strike caused by either the Contractor's unwillingness to meet with labor representatives or by unfair labor practices.

Again, the Contract is the controlling document that determines if a delay would be considered non-excusable. For example, some contracts consider supplier delays excusable if the Contractor can prove that the materials were requisitioned or ordered in a timely manner, but the material could not be delivered due to circumstances beyond the control of the Contractor. Other contracts may not allow such delays. The Owner and the Designer or drafter of the Contract specifications must be sure the Contract documents are clear and unambiguous. Similarly, before signing the Contract, the Contractor should fully understand what the Contract defines as excusable and non-excusable delays.

2.3.3. Compensable versus Non-Compensable Delays

A compensable delay is a delay where the Contractor is entitled to a time extension and to additional compensation. Relating back to the excusable and non-excusable delays, only excusable delays can be compensable. A non-compensable delay means that although an excusable delay may have occurred, the Contractor is not entitled to any added compensation resulting from the excusable delay. Thus, the question of whether a delay is compensable must be answered. Additionally, a non-excusable delay warrants neither additional compensation nor a time extension. Whether or not a delay is compensable depends primarily on the terms of the Contract. In most cases, a Contract specifically notes the kinds of delays that are non-compensable, for which the Contractor does not receive any additional money but may be allowed a time extension.

2.3.4. Concurrent Delays

The concept of concurrent delay has become a very common presentation as part of some analyses of construction delays. The concurrency argument is not just from the standpoint of determining the Project's critical delays but from the stand- point of assigning responsibility for damages associated with delays to the critical path. Owners will often cite concurrent delays by the Contractor as a reason for issuing a time extension without additional compensation. Contractors will often cite concurrent delays by the Owner as a reason why liquidated damages

should not be assessed for its delays. Unfortunately, few Contract specifications include a definition of “concurrent delay” and how concurrent delays affect a contractor’s entitlement to additional compensation for time extensions or responsibility for liquidated damages. To complicate matters further, there is a lack of understanding in the industry concerning the concept of concurrent delay. However, simply stated, concurrent delays are separate delays to the critical path that occur at the same time.

2.4. Construction Project Delay Factors and Their Classification

Construction project delay factors are those causes that result in a delay of a construction project. There are various factors that contribute to delays in construction projects. These range from factors inherent in the technology and its management, to those resulting from the physical, social, and financial environment. Method of classifying these factors depends basically on the objectives of the analysts in their study. The analyst classifies these factors in a way that he/she thinks will reveal the findings of his/her study in a better way of explanation (BorhanGhasemzadeh, 2014). For the purpose of this study the method of classification that Assaf and Hejji (Assaf and Hejji, 2005) was used with some customization to match the objective of the research.

As per Assaf and Hejji construction project delay factors can be classified based on the cause groups of the delay factors. Assaf and Hejji has classified delay factors in to nine cause groups/ categories. Some of them are outlined here below.

1. Causes of delay by client

No.	Causes of Delay
1	Delay to furnish and deliver the site to the contractor
2	Delay in progress payment
3	Change orders by owner during construction
4	Poor communication and coordination by owner and other parties
5	Slowness in decision making process by owner

2. Causes of delay by public authorities

No.	Causes of Delay
1	Inflation
2	Obtaining permits from government
3	Changes in government regulations and laws

3. Causes of delay by contractor

No.	Causes of Delay
1	Incompetence project team
2	Difficulties in financing project
3	Delays in subcontractors work
4	Poor site management and supervision
5	Mistakes during construction and make rework due to specific errors
6	Unavailability of professional construction management
7	Delay in site mobilization
8	Ineffective planning and scheduling of project

4. Causes of delay by consultant

No.	Causes of Delay
1	Delay in approving major changes in the scope of work
2	Late in reviewing and approving design documents
3	Conflicts between consultant and design engineer
4	Inadequate experience of consultant
5	Misunderstanding of owner's requirements by design engineer
6	Delays in producing design documents
7	Complexity of project design

5. Contractual relationship delays

No.	Causes of Delay
1	Short and unrealistic contract duration
2	Legal disputes between various parties
3	Inaccuracy in cost estimates
4	Excessive contracts and subcontracts
5	Mistakes and discrepancies in contract documents
6	Controlling sub-contractors by general contractors in execution of works
7	Project delivery method used

6. External causes of delays

No.	Causes of Delay
1	Delay in material delivery
2	Changes in material types and specifications during construction
3	Problems with neighbors
4	Unforeseen climate conditions
5	Effect of social and cultural factors
6	Waiting for test sample approval

2.5. Overview of Construction Project Delay Studies

2.5.1. International Studies

Meena & Suresh studied the trend of delays in Indian construction projects. 35 construction projects were surveyed in the study. 31 respondents that are taking part in those 35 construction projects were asked to rate 67 delay factors that were categorized under 9 groups (project team, owner, contractor, consultant, architect, material, labor, equipment and external party related). The researchers deployed the relative importance index to identify major causes of delay. The

findings of the research showed that lack of funds to finance the projects to completion, labor shortage, material shortage, lack of effective communication, lack of supervision and frequent design changes to be the major causes of delays in Indian construction project under the study (Meena & Suresh, 2018).

Borhan Ghasemzadech also investigated top causes of delays in Iranian construction projects. The study was conducted based on the responses of 32 experts that were actively involving in Iranian construction projects. The researcher used mean and standard variation of each individual delay factors to assess overall ranking. The researcher categorized a total of 36 delay factors in six major groups: client, contractor, consultant, public authorities, contractual relationship and external parties related factors. The study claims client related factors followed by contractor related factors takes the highest contribution for construction delays in Iranian construction projects (BorhanGhasemzadech, 2014).

In (2000) Al-Momani conducted a quantitative analysis of construction delays by examining the records of 130 public building projects constructed in Jordan during the period of 1990-1997. The researcher presented regression models of the relationship between actual and planned project duration for different types of building facilities. The analysis also included the reported frequencies of time extensions for the different causes of delays. The researcher concluded that the main causes of delay in construction projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions, and increase in quantities (Al-Momani, 2000).

Le-Hoai, L et al, in (2008) studied problems related to delays and cost overruns in Vietnam large construction projects and they identified that the cause for construction delays and cost overruns in overall context are poor site management and supervision, poor project management assistance, financial difficulties of owner, financial difficulties of contractor and design changes are the five most frequent, severe and important causes (Le-Hoai, L et al, 2008).

Assaf, S. A. and S. Al-Hejji in (2006) conducted a time performance survey of different types of construction projects in Eastern Province of Saudi Arabia to determine the causes of delay and their importance according to each project participant (owner, consultant, and contractor). It was concluded that 70% of projects experience time overrun. The survey was conducted with 23 contractors, 19 consultant and 15 owners. They identified seventy-three (73) causes of delay and

grouped them into nine classes during the research. The most common cause of delay identified by all three parties was “change of order”. The overall results are stated that the factor related to labor, contractor, project owner and consultant are in the highest rank (Assaf, S. A. and S. Al-Hejji, 2006).

2.5.2. Construction Projects Delay Studies: Ethiopia

One of the most delayed construction projects in Ethiopia; the Addis Ababa 40/60 housing project was studied by MolyeTakele and EndaleMamuye in separate studies. The former let 99 respondents representing client, contractors and consultants participate in his survey. In his study 20 major causes of delay were identified based on a Relative Importance Index from a list of 70 possible causes of delay. The findings of his research indicated that delivery of materials by the client, difficulties in financing projects by contactors, improper contractor selection, slow decision making by the client and obsolete technology used by contractors were some of the most dominant delay factors. The researcher added that for the top 20 delay factors a number of another root causes were identified for their occurrence. The cumulative effects of those varieties of causes for the incidence of major delay factors contributed a great role on the project timely completion failure and the project is delayed by more than 150%. From the investigated major causes of delay, client sourced and contractor sourced delay factors were the major bottlenecks of progress. The researcher also implied the impacts of the delay of the projects. According to Mollaye, cost-overrun, time-overrun, increased unemployment rate, client loses time value of money, the government mistrusted by the people and reduce the quality of construction were some of the most severe effects of delay (MolyeTakele, 2020).

The later, Endale Mamuye, let 80 respondents participate representing client, consultant and contractor firms and identified ten major causes of delay from a list of 45 common causes of delay based on a Relative Importance Index. Those ten major causes of delay were late material supply, financial difficulties faced by contactors, problems related to utilities supply, equipment unavailability, delayed payments by contractors, poor site management, ineffective planning, late design review and approval and slow decision-making processes (Endale Mamuye, 2016).

Abdurezak Mohammed and Neway Seifu (2019) carried out a research on Causes of Delay in Public Building Construction Projects: A Case of Addis Abeba Administration, Ethiopia and revealed the top ten factors that cause construction delays in the public building construction projects in Addis Ababa. These are: difficulty in project financing, poor project management system, delay in issuance of designs and working drawings, shortage of availability of imported construction materials and goods on market, design errors and complexity of designs, delay in progress payments for completed works, late start and resource mobilization to site, financing problems, inaccurate site investigation report and price inflation (Abdurezak Mohammed and NewaySeifu, 2019).

Abdo (2006) conducted a research on delays in public building construction projects and their consequences in Ethiopia. 52 public building projects constructed by local contractors in the years between 1995 and 2005 were surveyed in the study. In the study a questionnaire survey was used to collect data on delays, and 62 responses from contractors, consultants, public owners and construction professionals were analyzed using mean score method. The researcher grouped 80 causes of delay into six categories which included design related, management related, construction related, finance related, code related, and force majeure related causes of delay. Of these groups of delay causes, design related causes of delay were to be the most frequent ones followed by management related delay causes. The study also lists 10 critical causes of delay in public building construction projects in Ethiopia which included scarcity of material in the market, late material supply, delayed payments to contractors, unrealistic performance schedule, change in subsurface conditions, client's finance shortage, adverse weather condition, less emphasis to planning, material and labor price escalation, and variations (Abdo, 2006).

Robel Assefa also conducted a delay analysis on Addis Ababa Light Railway Transit construction project. In his study 20 respondents were asked to fill questioners and of which only 14 were able to complete filling the questioner. The study concludes that financial problem, managerial problems and local subcontractors' limited skill to have the highest contribution in the project delay (Robel Assefa, 2015).

2.6. Research Gap

Public and Private construction projects are the major investment Phenomenon in Ethiopia which are growing year to year. However, few studies were conducted whether they have been finalized as per the contract agreement or not. Construction project delay is a very critical factor in Ethiopia which consumes enormous resources. The factors of construction delay are many and differs from project to project as per the researches obtained internationally and a few from Ethiopians. The case of AANS Construction Project is also prone to such an issue as to the researcher's knowledge. The researcher could not find any study conducted on this case specific project construction delay factors. As it is stated on the problem statement the researcher added some new cause factors which were not referred before to see the level of influence of such added factors on the delay of the AANS construction project. Taking the above facts in to consideration, the intention of the research is to throw some fine stones on the ground.

2.7. Conceptual Framework

The conceptual framework the study adopts in carrying out the study was the Assaf and Hejji concepts. As per Assaf and Hejji construction project delay factors can be classified based on the cause groups of the delay factors. The conceptual framework Assaf and Hejji used in their study is outlined in a concise figure hereunder in figure 2. 1.

For the purpose of this study the factors were rather regrouped into six groups, based on the responsible stakeholder the factor belongs to. These are:

1. Client related factors
2. Contractor related factors
3. Consultant related factors
4. Project team related factors
5. Public authorities related factors and
6. External parties related factors

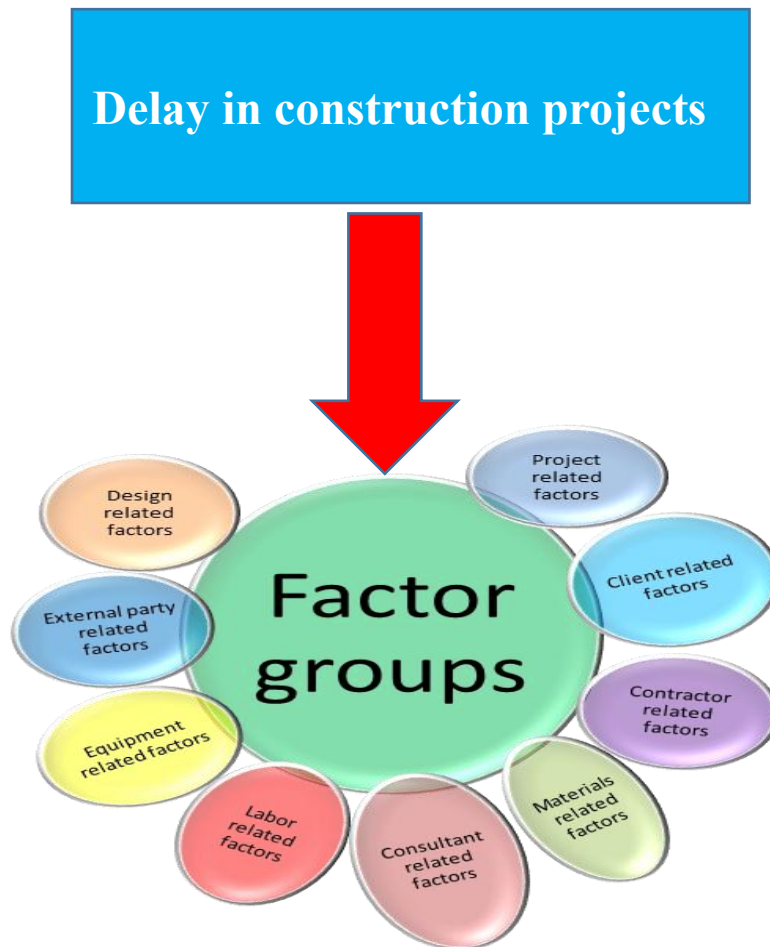


Figure 2.1: An adopted model conceptual framework

CHAPTER THREE

METHODOLOGY

In this chapter the research design, applicable sampling method, data collecting method, and data analysis techniques and interpretation of the research have been briefed.

3.1. Research Design

A descriptive research design was applied in this study. Descriptive research design is defined as a type of research project that aims to obtain information to systematically describe an object, situation, or population. Clearly, it helps to answer questions about what, when, where, and how about of a research problem, rather than why? This method comprehends the use of different kind of research method to investigate the variables in question. In this design the researcher does not control any variables he only takes an account of what has accused or happening (Mohd R. et al, 2022).

3.2. Research Approach

A quantitative research enables a researcher to establish the characteristics of individual, situation or group by analyzing a data generated from samples of a population (Leedy. et al. 2005). As explained by Leedy *et al.* a quantitative approach involves the generation of data in quantitative form which could be subjected to accurate quantitative analysis in a proper and rigorous manner and in the form of a data base from which to realize characteristics or relationships.

The objective of this study was identifying the delay factors and their relative Weight/ Importance on the total delay time of AANS construction project. The approach to meet the objective of the study was by analyzing a data collected in a questionnaire survey. Hence, a pure quantitative method of study was applied to meet the objective of the study.

3.3. Population and Sampling

The population of interest for a study is comprised of the individuals, groups, organizations, or other entities one seeks to understand and to whom or to which the study results may be

generalized or transferred and is the principal group about which the research is concerned. Populations create boundaries for the scope of a study and provide environmental and context cues for the reader. Such boundaries place natural delimitations upon the research to afford the researcher the proper focus so as not to present a one-size-fits-all set of results. The definition of boundaries also allows the researcher to clearly identify subpopulations, such as the target population, sampling frame, and sample, and to ensure alignment between these groups within the research (Casteel& Nancy, 2021).

The population of this study was determined to be those workers of the three stakeholders whose job has a close tie with the construction of the AANS construction project. Hence, those workers of the stakeholders who are/were working on or attending the works on the project were targeted as the population of the survey. Accordingly, 47 workers that are/were working at or monitoring the construction of the project at the project site or from head offices were identified. The contribution of the client, the contractor and the consultant in the population were 14, 20 and 13 respectively.

The framing of the population was done depending on a list of workers found from the Human Resource departments of the stakeholders.

Then again, a stratified sampling method was applied to divide the population in to three main participant stakeholders; the client, contractor and consultant and to determine the sample respondents from each group of the survey.

Stratified sampling is where the population is divided into strata (or subgroups) and a random sample is taken from each subgroup. A subgroup is a natural set of items. Subgroups might be based on company size, gender or occupation (to name but a few). Stratified sampling is often used where there is a great deal of variation within a population. Its purpose is to ensure that every stratum is adequately represented (Hamed Taherdoost, 2016).

The purpose of using a stratified sampling technique was to include an even number of respondents representing each three stakeholders. This is because the analysis technique used in this study (the RII) demands the presence of an equal number of representatives from each stakeholder in order to avoid a biased result and to diminish the conflict interest or blame game on the delay of this particular project.

3.4. Sample Size

The sample size was determined by considering the stakeholder with the least number of representative in the population, the consultant in this case. Hence, through a stratified sampling method a total of 39 respondents were selected from the population of 47 experts, each stakeholder (the client, the contractor & the consultant) represented by 13 experts in the sample. To check whether the sample was within the acceptable error magnitude or not the researcher tested it by using (Yamane, 1967) sample size determination equation.

According to a sample sizing equation developed by (Yamane, 1967):

$$n = \frac{N}{1 + N * e^2} \text{ equation (eq). 3.1}$$

Where

N=Population size

n=sample size

e=acceptable magnitude of error

As per (Yamane, 1967) sample size determination equation, a sample size of 39 from a population of 47 has given a 93.4% confidence level which is 1.6% less than the 95% confidence level recommended by Yamane. In order to enhance the confidence level to be to 95%, three additional respondents would have needed to be added. The first option was to add two representatives from the contractor and one from the client, since all the consultant has only 13 representatives. But adding these respondents, three more representatives, will result in a disproportional number of representatives in the sample and that would start to affect the RII used in the analysis technique and the analysis would be prone to bias from the beginning. The second option was to include one more representative of the consultant that didn't qualify to be included in the population of the study. And this also compromises on the data quality. Therefore, the researcher has decided to stay at 93.4% confidence level and avoid a biased analysis or a compromised data quality.

3.5. Data Collection Technique

Both primary and secondary sources of data were used in the study. The primary data was collected in a questionnaire survey presented to the samples of the survey. Only this primary data was used in the quantitative analysis of the study. The secondary data were collected by scanning documents found at the head offices of the stakeholders and reports of other sources (governmental organizations reports, newsletters, magazines and websites). This secondary data were used to enhance the data quality of the survey as explained in 3.5.2 hereunder.

The technique used to collect data was a questionnaire survey. However, it wouldn't be fair to accept the scaling of the respondents of the survey as is, as respondents may be prone to conflict of interest between telling the truth and defending the stakeholder they belong to. In order to mitigate this problem the researcher tried to make a document scanning available at the head offices of the stakeholders and discussed his knowledge of the documents he scanned with each respondents of the survey prior they began filling the questioner. This, in the researcher's opinion, has helped respondents of the survey to stay honest while they were filling the questioner.

3.5.1. Questionnaire

The questionnaire design was done by adapting model questionnaires that well accepted researchers, including those from Ethiopian and foreign researchers covered under the literature review section and used in their construction delay analysis studies. The questionnaire has two sections. The first section deals about the personal profile of a respondent and the second section contains a list of potential delay factors that the respondents were expected to scale the degree to which each delay factor has affected the delay of the project. The 5-point Likert scale was used for scaling of the listed delay factors.

N.B: The questionnaire format is attached in Appendix A of this paper.

3.5.2. Document Scanning

Scanning of documents available at the head offices of the stakeholders in relation to the project was done in the course of this study. Despite the lack of willingness in the stakeholders' side to show/share such documents, the researcher tried to scan some important documents such as

contract agreement, payment certificates, approval certificates, feasibility study of the project and so on to enhance the quality of data collected during the survey. The researcher used his knowledge of these documents in discussions with the respondents prior they start filling the questionnaire. In the researcher's opinion, this had a positive influence on the respondents of the survey with regards to staying honest while filling the questionnaires.

3.6. Data Analysis Technique

The analysis in this study was conducted in such a way as to disclose the facts the objective of the study intended to show. Generally the analysis dealt with measuring the Weight/Importance of a list of potential delay factors. The Relative Importance Index (RII) method of measuring delay factors was consistently used throughout the analysis. Both SPSS and Microsoft Excel were employed to analyze the data collected through the questioner survey. Interpretation of the calculated RII value was done based on the 5-point Likert scale method.

The Cronbach's Alpha method of checking reliability of data was used to test the reliability of the data collected through the questionnaire survey. In order to observe how much agreement there is among the stakeholders on the rankings of the delay factors, the Spearman's correlation coefficient method of measuring strength of relationships was applied in the study. Both the Cronbach's alpha and the Spearman's correlation coefficient was calculated using SPSS.

The techniques of the Cronbach's alpha, the Relative Importance Index (RII) and the spearman's correlation coefficient methods are discussed here below in relation to how they were applied in the context of this study.

3.6.1. The Cronbach's Alpha

The Cronbach's alpha is a measurement used to assess the reliability of data by measuring the internal consistency of the data (Cronbach, 1951). In this study the Cronbach's alpha was used to measure how consistent the answers of respondents belonging to the same stakeholder and over all across stakeholders are in scaling each delay factor. The data collected through the survey in this study was checked if it qualifies the minimum 0.7 alpha before a further analysis was done.

Alpha is calculated using the following formula:

$$\alpha = K / (K - 1) [1 - (\sum \sigma_k^2 / \sigma_{\text{total}}^2)] \text{ eq. 3.2}$$

Where:

- K is the number of items
- $\sum \sigma_k^2$ is the sum of the k item score variances, and
- σ_{total}^2 is the variance of scores on the total measurement

3.6.2. Relative Importance Index (RII)

This technique has been used extensively in similar types of Surveys and was recognized as an excellent approach for aggregating the scores of the variables rated on an ordinal scale by respondents (Werku & Jah, 2016). Relative Importance Index (RII) is determined by the following mostly used empirical formula.

$$RII = \frac{\sum W}{AN} \text{ eq. 3.3}$$

Where:

- W is the weighting given to each indicator by the respondents (ranging from 1- 5),
- A is the highest weight (i.e., 5 in this case), and
- N is the total number of respondents.

The RII value is $0 < RII < 1$. The values of relative importance index can be interpreted as in table 2.7 (Akadiri, 2011).

RII value	Importance level	
From 0.8 to 1	High	(H)
From 0.6 to 0.8	High-Medium	(H-M)
From 0.4 to 0.6	Medium	(M)
From 0.2 to 0.4	Medium-Low	(M-L)
From 0 to 0.2	Low	(L)

Table 3.1: RII value interpretation

In this study respondents of the study were given a list of potential delay factors that were assumed to contribute for project’s delay and asked to scale the contribution of each delay factor in a 1 to 5 scale range. Here in this study, a 5-point Likert scale was used to scale the contribution of each delay factor on the total delay of the project. Where:

- | | |
|--------------------|---------------|
| 1 denotes Very Low | 4 “ High |
| 2 “ Low | 5 “ Very High |
| 3 “ Medium | |

Then the gathered data through the questionnaires was analyzed using relative importance index (RII) equation to determine the value of RII of each delay factor. Then again a 5-point Likert scale was used to interpret the value gained from the RII analysis as in table 3.7, above.

3.6.3. Spearman’s Correlation Coefficient

Spearman’s correlation coefficient is a statistical measure of the strength of a monotonic relationship between paired data. This coefficient provides a measure of agreement between respondents within a survey on a scale of zero to one (spearman, 1951). The spearman’s correlation coefficient is calculated using the following equation:

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n} \text{ eq. 3.4}$$

Where:

- r_s = Spearman rank correlation coefficient
- d = Difference in ranking between two parties

- n = The number of variables

The spearman's correlation coefficient is by design constrained as follows

$$-1 \leq r_s \leq 1$$

And its interpretation is that the closer the absolute value of r_s to 1 the stronger the monotonic relationship. Correlation is an effect size and so we can verbally describe the strength of the correlation using the following guide for the absolute value of r_s :

Coefficient value	Strength of Relationship
0.00 - 0.19	“very weak”
0.20 - 0.39	“weak”
0.40 - 0.59	“moderate”
0.60 - 0.79	“strong”
.80-1.0	“very strong”

Table 3.2: The spearman rank correlation coefficient value vs Strength of Relationship

In this study after respondents were regrouped according to the stakeholder they represent, the RII value given by representatives of each stakeholder for each delay factor was compared with one another in a one-tailed spearman's correlation on SPSS.

3.7. Ethical Considerations

The researcher assured that the stakeholders (client, consultant and contractor) and the respondents were clear about the essence and objective of the research. Being in mind the awareness created and the main purpose of the research work (only for academics), the stakeholders and respondents were free of any confusion on the matter. They have also been given an assurance for the confidentiality of their response. With this knowledge the respondents provided their agreement to be the participants of the research undertaking.

CHAPTER FOUR

ANALYSIS AND RESULTS DISCUSSION

4.1. Introduction

In this chapter the data collected from the questionnaire survey was analyzed in a way to answer the objectives of the study. SPSS and Microsoft excel were used to analyze the data. The analysis consists three major sections. The first section deals with the profiles of respondents and the reliability of data. The second section deals with on rankings of delay factors by regrouping the total data in different classifications. In the beginning the data was classified based on respondents' employers i.e. stakeholders (client, contractor or consultant). In the process how each stakeholder ranks those 43 delay factors based on their Weight/Importance on the project's delay has been presented. In addition, the total data were shown to reveal the rankings of those 43 delay factors in the combined data. The relative importance index (RII) method of ranking for the project delay contributing factors together with the 5-point Likert scale was consistently used throughout the second section analysis. The final section of the analysis part has tried to describe the strength of relationship between the three stakeholders and the overall combined in ranking the delay factors. Here in the final section the spearman's correlation coefficient together with RII method & the 5-point Likert scale were used to measure strength of relationship.

In each stage of the analysis the 43 delay factors were grouped under the following six major groups. Relative Importance Index for each delay factor has been calculated considering the answers of all respondents' main participant parties and in combined. The result from the RII has been used to show the degree of Importance each factor has on the total delay time of the project. As it was mentioned already in the second chapter the 43 delay factors were categorized into six groups. These are:

- I. Client related delay factors
- II. Contractor related delay factors
- III. Consultant related delay factors
- IV. Project team related delay factors

V. Public authorities’ related delay factors

VI. External parties related delay factors

These were the cause groups of the delay factors. In other words these were the categories to which the delay factors belong to. The purpose of classifying the delay factors based on their cause group was to associate the cause group’s responsibility to the delay of this construction project. The analysis described the ranking of each delay factor based and the cause groups.

4.2. Reliability Check for Stakeholders and Overall

Data found from the questionnaire were checked for reliability using the Cronbach’s correlation coefficient (Alpha) method. The Cronbach’s alpha here measures the consistency of respondents answer within a given stakeholder and in combined (overall).

Cronbach's Alpha for Client	Cronbach's Alpha for Contractor	Cronbach's Alpha for Consultant	Cronbach's Alpha Overall
.981	.980	.982	.989

Table 4.1: Cronbach’s Alpha Values

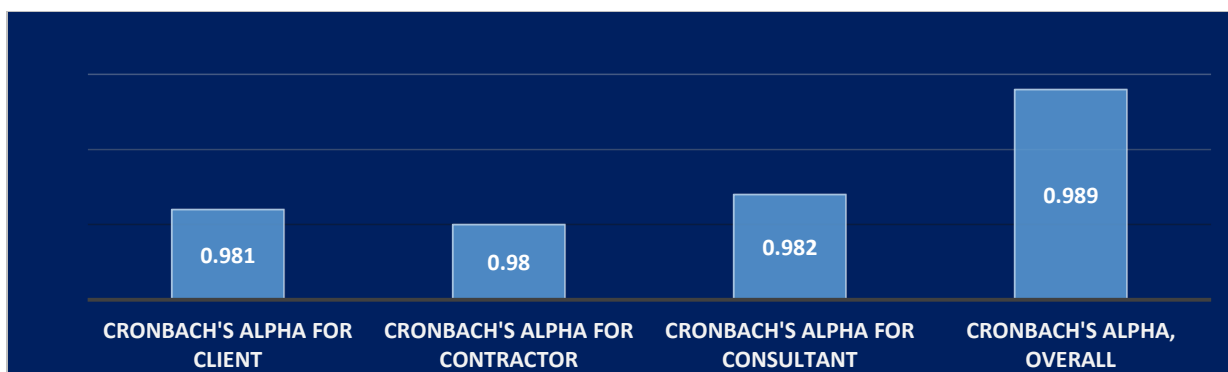


Chart 4.1: Cronbach’s alpha values

Table 4.1 showed the SPSS result of the Cronbach’s alpha calculated for each stakeholder and the overall sample. Accordingly the Cronbach’s alpha of the data found from the client, contractor and the consultant were found to be 0.981, 0.98 and 0.982 respectively. And the alpha of the overall data was 0.989. The alphas of all the three stakeholders and the overall sample has already passed the minimum criteria of 0.7 alpha value. Hence in terms of reliability the data collected could be considered as reliable and were convenient for further analysis.

4.3. Response Rate

A total of 39 questionnaires were distributed to potential respondents. Of which 5 questionnaires were not returned. Hence response rate was:

$$\begin{aligned} RR &= 34/39 * 100\% \\ &= 87.17\% \end{aligned}$$

Those 34 questionnaires were properly answered no invalid questionnaire were found. But, since the method of analysis used in the study requires an equal number of respondents from each stakeholder, the left over one questionnaire was randomly abandoned in order to even out the number of respondents from each stakeholder.

4.4. Respondent’s Profile

The demography of the respondents participated in the questionnaire survey of the study has been shown in table 4.2 below.

Organization	No. of Respondents	Educational Background		Work Experience			
		Bachelor’s Degree	Masters’ Degree	0 – 5 yrs	5 – 10 yrs	10 – 15 yrs	>15 yrs
Client	11	8	3	6 (54.54%)	4 (36.36%)	1 (9%)	
Contractor	11	7	4	6 (54.54%)	5 (45.46%)		
consultant	11	6	5	6 (54.54%)	3 (27.27%)	2 (18.18%)	
Total	33	21	12	18 (54.54%)	12 (36.36%)	3 (9%)	

Table 4.2: Demography of Respondents

Normally all of the respondents had a minimum of a bachelor's degree and were in different positions of work. From the total 33 respondents 21 had a bachelor's degree and the rest 12 had a master's degree. Respondents taking an educational background of this level were assumed to have a better judging capacity in scaling the causes of the delay and, help us in enhancing the data quality of the survey.

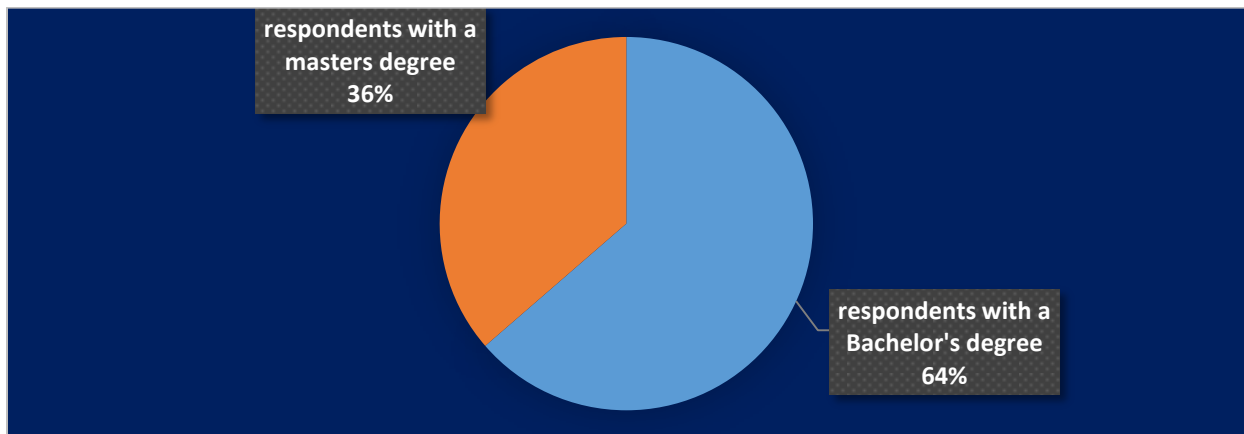


Chart 4. 2: Education Level of Respondents

In terms of work experience of the respondents had the following character. As per table 4.2 the work experience of 6 respondents each from client, contractor and consultant was less than 5 years, which marked a total of 18(54.54%) out of 33 respondents having 0 to 5 years of work experience. Likewise the number of respondents having a work experience of 5 to 10 years from client, contractor and consultant are 4(36.36%), 5(45.46%), and 3(27.27%), which totals to 12 (36.36%) respondents. On the other hand 3 (19%) respondents 1(9%) from client and 2(18.18%) consultant had work experiences between 10 to 15 years.

The collected data has showed that, respondents of the survey were having a working experience of a considerable number of years. Although it was hard to have a say on those 18 respondents with a working experience of less than five years (as zero year of experience is a possible case), the rest 15 had more than 5 years' experience in the field that could enable them to make a good judgment on the case under study.

4.5. Rankings of Delay Factors by Client’s Respondents

The respondents representing the client had rating delay factors using five-point Likert scale, which was processed, via RII method of analysis on SPSS and MS Excel has been presented in table 4.3 below. The respondents RII results found from each delay factor were ranked by using MS Excel from 1 to 43. As per the client’s respondents the top ten factors that have determined the projects’ progress in to completion were the following.

Delay Factor	RII	Rank	Factor Groups
Shortage of foreign currency	1	1	Public Auth. Related
Escalated Inflation	0.964	2	Public Auth. Related
The COVID-19 pandemic	0.945	3	Ext/ parties Related
Dynamic foreign currency exchange rate	0.909	4	Public Auth. Related
War at the time of the construction of the project	0.691	5	Public related
Problems with neighborhoods	0.673	6	Ext/ parties Related
Political instability within the country	0.655	7	Public Auth. Related
Legal disputes between various parties	0.655	8	Ext/ parties Related
Delay in material delivery	0.618	9	Ext/ parties Related
Poor cash flow management by the contractor	0.545	10	Contractor Related

Table 4.3. Ranking of Delay Factors by Client’s Respondents

Table 4.3 Showed that, as per the clients response, Shortage of foreign currency(1), Escalated Inflation (0.964), The COVID-19 pandemic(0.945) and Dynamic foreign currency exchange rate (0.909) have a very high contribution to the project’s delay registering 1 – 0.8 RII values. War at the time of the construction of the project (0.691), Problems with neighborhoods (0.673),

political instability within the country (0.655), Legal disputes between various parties (0.655) and Delay in material delivery (0.618) contributed a higher share on the projects delay.

As seen in table 4.6 in terms of the cause group of delay factor the client claims public authority related factors (0.630) contributed the highest share followed by external party related factors (0.493). According to the client, client related delay factors (0.241) have the least contribution after the contractor related (0.33) and the consultant related (0.286) delay factors.

4.6. Ranking of Delay Factors by the Contractor

With the same manner, respondents representing the Contractor were given 43 delay factors to rate via five-point Likert scale. The data was processed using RII method of analysis on SPSS and MS Excel. The respondents RII results found from each delay factor were ranked by using MS Excel from 1 to 43. As per the contractor’s respondents the top ten factors that determine the projects’ progress in to completion were the following.

Delay factor	RII	Rank	Factor groups
Dynamic foreign currency exchange rate	1	1	Public Auth. Related
Shortage of foreign currency	0.982	2	Public Auth. Related
The COVID-19 pandemic	0.982	3	Ext/Parties Related
Escalated Inflation	0.945	4	Public Auth. Related
War at the time of the construction of the project	0.654	5	Public Auth. Related
Difficulty in obtaining permits from public authorities	0.636	6	Public Authorities Related
Political instability within the country	0.636	7	Public Auth. Related
Slow decision making process by client	0.6	8	Client Related
Inaccuracy in project cost estimation	0.582	9	Project Team Related
Delay in material delivery	0.527	10	Ext/Parties Related

Table 4.4: Ranking of Delay Factors by the Contractor

From table 4.4 it can be observed that the contractor respondents’ listed Dynamic foreign currency exchange rate (1), Shortage of foreign currency (0.982), The COVID-19 pandemic

(0.982) and Escalated Inflation (0.945) as having a very high contribution on the projects delay. War at the time of the construction of the project (0.654), Difficulty in obtaining permits from public authorities (0.636), Political instability within the country (0.636), slow decision making process by client (0.6), and Inaccuracy in project cost estimation (0.582) were listed as the next higher contributors of the delay.

Table 4.6 depicts that in terms of the cause groups of the delay factors the contractor claims public authority related delay factors (0.714) to have the highest contribution while client related delay factors (0.513) contributed the next higher. As per the contractor, the contribution of contractor related delay factors (0.257) was the least preceded by consultant related delay factors (0.265).

4.7. Ranking of delay factors by the consultant

The respondents representing the consultant has also been provided the same 43 delay factors to scale via a five-point Likert scale. The scaling was processed using RII method of analysis on SPSS and MS Excel. The respondents RII results found from each delay factor were ranked by using MS Excel from 1 to 43. As per the consultant's respondents the top ten factors that affect the project from progressing in to completion were the following.

Delay factor	RII	Rank	Factor Groups
The COVID-19 pandemic	0.877	1	Ext/Parties Related
Dynamic foreign currency exchange rate	0.8	2	Public Auth. Related
Escalated Inflation	0.8	3	Public Auth. Related
Shortage of foreign currency	0.76	4	Public Auth. Related
War at the time of the construction of the project	0.512	5	Public Auth. Related
Unavailability of utilities (road, water, electric supply, etc.) at the site	0.471	6	Ext/ Parties Related
Delay in material delivery	0.444	7	Ext/Parties Related
Complexity of project design	0.421	8	Project Team Related
Improper project planning and scheduling	0.41	9	Project Team Related
Political instability within the country	0.398	10	Public Auth. Related

Table 4.5: Ranking of Delay Factors by the Consultant

From table 4.5 it can be perceived that the consultant respondents' gave COVID-19 pandemic (0.88) the highest stake on the delay of the project followed by Dynamic foreign currency exchange rate (0.8), Escalated Inflation (0.8) and Shortage of foreign currency (0.76). Unlike the rest two stakeholders, political instability within the country (0.4) has only a low contribution here. The consultant rather claims War at the time of the construction of the project (0.512), Unavailability of utilities (road, water, electric supply, etc.) at the site (0.471) and Delay in material delivery (0.444) have some considerable effect on the projects delay.

From table 4.6 it can be shown that in terms of the cause groups of the delay factors here again the consultant also claims public authority related delay factors with an RII of 0.641 have the highest contribution on the projects delay followed by project team related delay factors (0.425). According to the consultant, the contractor through the aggregate contractor related delay factors (0.330) perceived as least contributor, even lesser than the client related delay factors (0.427).

4.8. Ranking of Delay Factors by All Stakeholders (Combined)

The scaling of all the combined 33 respondents representing: the client, contractor and consultant have been also processed accordingly using RII method of analysis on SPSS and MS Excel. The respondents RII results found from each delay factor were ranked by using MS Excel from 1 to 43. As per the combined respondents the top ten factors that affect the project from progressing in to completion were depicted in table 4.6 last column.

Table 4.6 Shows that the ranking of delay factors for the combined stakeholders puts shortage of foreign currency (0.982), the COVID-19 pandemic (0.97), escalated inflation (0.964) & Dynamic foreign currency exchange rate (0.958) at the forefront contributing factors for the delay of the project. As per the 5-point Likert scale the above four delay factors with an RII of between 0.8 and 1 fall under the very high contributing factors group.

In the combined ranking 14 delay factors were found to fall under high contributing delay factors. War at the time of the project (0.6), delay in materials delivery (0.582), political instability within the country (0.558) and Unavailability of utilities (road, water, electric supply, etc.) at the site (0.521) have an RII value above 0.5. Improper project planning and scheduling (0.497), Complexity of project design (0.491), Inaccuracy in project cost estimation (0.497), Slow decision making process by client (0.473), Legal disputes between various parties (0.473),

Changes in material types and specifications during construction (0.473), Delay in progress payment by client (0.430), Fraud practices by contractor (0.424), Problems with neighborhoods (0.424) and Short and unrealistic contract duration (0.418) with an RII value of above 0.4 which is fall under a moderate contributing factors group.

The combined ranking also indicated that inappropriate construction method (0.224), poor site management & supervision (0.242) and Malpractice/unethical practices by consultant (0.224) to be the last three contributing factors of the total 43 delay factors presented.

In terms of the cause groups of the delay factors the combined ranking rates Public authority related, external party related, project team related, client related, contractor related and consultant related delay factors from 1 to 6 levels.

From table 4.6 and chart 4.3 it can be observed that of the top 10 contributing factors ranked by the combined stakeholders public authority related delay factors were the first contributors for the project's delay (5 delay factors) with an average RII of 0.812 and external related delay factors and project team related delay factors contributed 2nd & 3rd delay factors with an average RII of 0.655 & 0.497 respectively.

DELAY FACTORS	CLIENT		CONTRACTOR		CONSULTANT		OVERALL	
	RII	RANK	RII	RANK	RII	RANK	RII	RANK
CLIENT'S RELATED DELAY FACTORS	0.241	6	0.513	2	0.427	3	0.315	4
Delay in progress payment by client	.273	28	.509	13	.509	14	.430	15
Change of orders by client during construction	.200	43	.436	18	.255	37	.297	29
Poor communication and coordination by client and other parties	.236	40	.509	13	.382	23	.376	21
Slow decision making process by client	.255	33	.600	8	.564	12	.473	12
PUBLIC AUTHORITY'S RELATED DELAY FACTORS	0.630	1	0.714	1	0.655	1	0.641	1
Escalated Inflation	.964	2	.945	4	.982	2	.964	3
Shortage of foreign currency	1.000	1	.982	3	.964	4	.982	1
Difficulty in obtaining permits from public authorities	.236	39	.636	7	.418	18	.364	22
Changes in government regulations and laws	.291	23	.400	21	.236	41	.309	26
Political instability within the country	.655	8	.636	6	.582	10	.558	7
War at the time of the construction of the project	.691	5	.655	5	.655	5	.600	5
Inefficient bureaucracy at customs offices	.291	22	.455	17	.436	16	.394	19
Dynamic foreign currency exchange rate	.909	4	1.000	2	.964	3	.958	4
PROJECT TEAM'S RELATED	0.376	3	0.445	3	0.454	2	0.425	3
Poor Project delivery method	.345	20	.509	11	.236	40	.364	23
Improper project planning and scheduling	.436	15	.473	15	.582	9	.497	9
Short and unrealistic contract duration	.382	18	.455	16	.418	17	.418	18
Inaccuracy in project cost estimation	.327	21	.582	9	.564	11	.491	11
Complexity of project design	.491	13	.418	20	.582	8	.497	10
Incompetent project team	.273	27	.236	38	.345	28	.285	32
CONTRACTOR'S RELATED	0.330	4	0.257	6	0.330	5	0.304	5
Rework for Mistakes in construction	.236	38	.309	27	.364	26	.303	27
Difficulties in financing project by contractor	.236	37	.200	43	.345	27	.261	36
Inappropriate construction methods	.255	32	.236	37	.236	39	.242	41
Poor site management and supervision	.218	42	.218	42	.255	36	.224	42
Obsolete technology used by contractor	.236	36	.309	26	.255	35	.267	35

Delays in sub-contractors work	.418	16	.291	29	.255	34	.321	25
Fraud practices by contractor	.491	12	.255	33	.527	13	.424	16
Poor cash flow management by the contractor	.545	11	.236	36	.400	20	.394	20
CONSULTANT'S RELATED	0.286	5	0.265	5	0.291	6	0.281	6
Inadequate consultant experience	.255	31	.255	32	.382	22	.297	30
Delay in approving shop drawings and sample materials by consultant	.382	17	.255	31	.255	33	.297	24
Poor contract management by consultant	.236	35	.327	25	.255	32	.273	31
Weak supervision by consultant	.273	26	.236	35	.255	31	.255	37
Delay in approving payment certificate by consultant	.364	19	.345	24	.382	21	.364	24
Technically incapable consultant staff	.273	25	.218	41	.273	30	.255	38
Malpractice (unethical practices) by consultant	.218	41	.218	40	.236	38	.224	43
EXTERNAL PARTIES RELATED	0.493	2	0.416	4	0.449	4	0.453	2
Legal disputes between various parties	.655	7	.364	23	.400	19	.473	13
Mistakes and discrepancies in contract documents	.273	24	.273	30	.364	25	.303	28
Delay in material delivery	.618	9	.527	11	.600	7	.582	6
Changes in material types and specifications during construction	.545	10	.418	19	.455	15	.473	14
Problems with neighborhoods	.673	6	.382	22	.218	43	.424	17
Unforeseen climate conditions	.236	34	.236	34	.273	29	.248	40
Inefficient labor	.255	30	.218	39	.364	24	.279	33
Unavailability of utilities (road, water, electric supply, etc.) at the site	.473	14	.473	14	.618	6	.521	8
Unrelated public authorities interference in the process	.255	29	.291	28	.218	42	.255	39
The COVID-19 pandemic	.945	3	.982	1	.982	1	.970	2

Table 4.6: Ranking of Delay Factors by All Stakeholders (Combined)

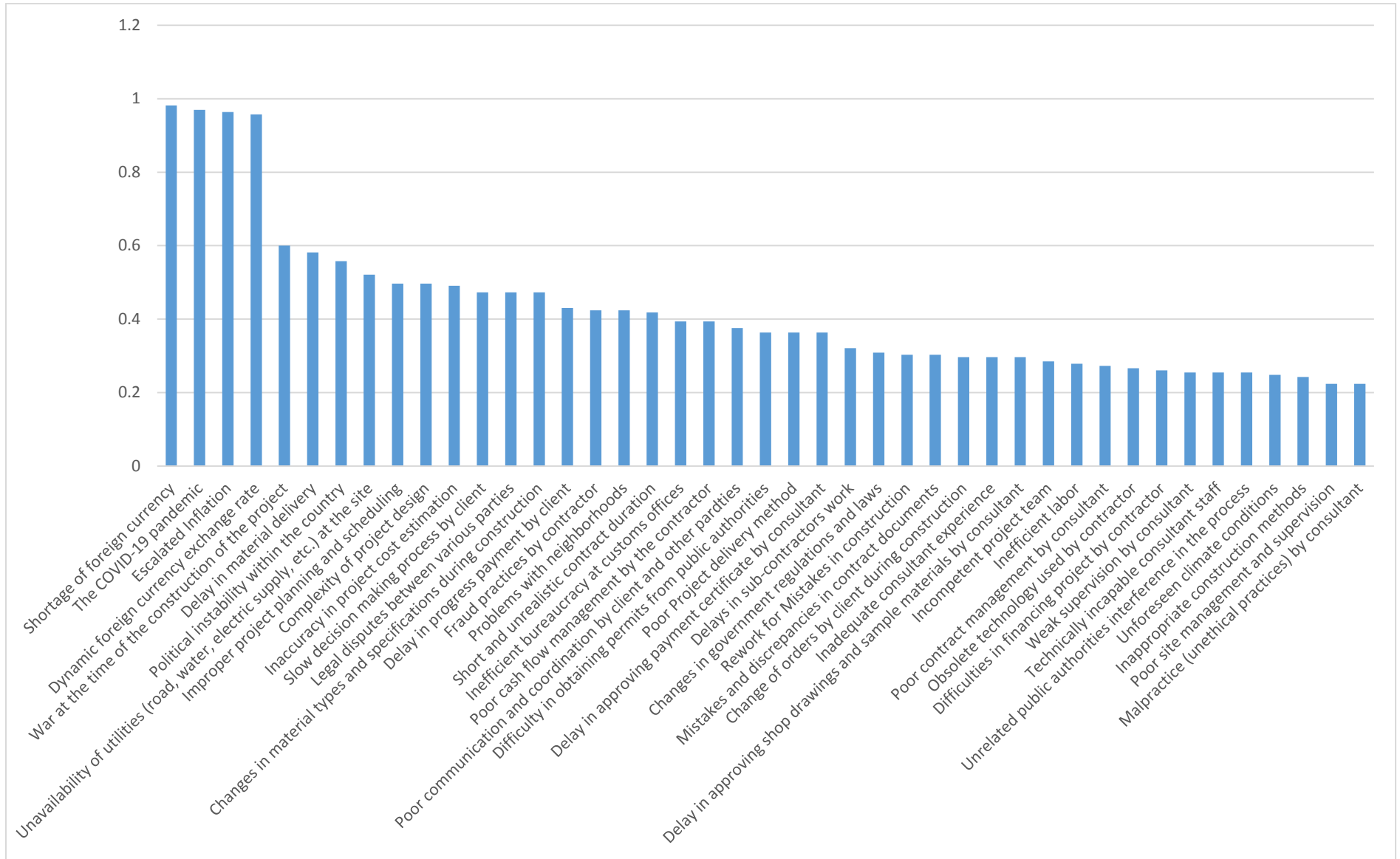


Chart 4.3: Delay factors in their order of ranks

4.9. Implications of the Result of the Three Stakeholders' and the Combined Response

The researcher has deducted that the respondents result obtained from the client, contractor, consultant and the overall, which was processed through RII method using a 5 point Likert Scale rating, have depicted similar results.

This implies that the respondents from all parties were inclined to choose the new factors added in this study as the most determinant cause factors for the project's delay. Hence, factor such as foreign currency related, war, and political instability and so on were not the major factors for project delay in other countries since these factors were not mentioned in any of the researchers findings referred in the study. For example (Assaf, S. A. and S. Al-Hejji, 2006) explained "change order" as a main factor for Saudi Arabia projects and they stated that the factor related to labor, contractor, project owner and consultant are in the highest rank, whereas Meena & Suresh (2018) deducted that lack of funds to finance the projects to completion, labor shortage, material shortage, lack of effective communication, lack of supervision and frequent design changes to be the major causes of delays in Indian construction project. Abdurezak Mohammed and Neway Seifu (2019) and other Ethiopian researchers could not also state these factors as the major cause for the delay of the public projects in Ethiopia.

The secondary data reports obtained from the Ministry of Culture and Sports (February 2020 and September 2021 reports) also indicated that the foreign currency factor was the determinant cause for the AANS construction project termination.

Regarding the cause groups the public authorities' related factors have gained more weight to the AANS construction project delay in all group of respondents. In most researches this study has referred client related factors were the major cause group factors. Only the contractor respondents rate the client related factor groups as the 2nd contributors for the delay of the project. The implication of the respondents result might give us some clue that the responsiveness, due consideration for the upcoming events and decision making capacities of those respective public authorities were at stake and in problem.

4.10. Measuring Correlations among Stakeholders’ and Combined Delay Factors Ranking

The strength of agreement among the stakeholders on the ranking of the delay factors was measured using the Spearman’s correlation coefficient (r_s). The correlation between the stakeholders have been done on a bilateral basis (two at a time) on SPSS. The interpretation of the results was based on table 3.2 of the methodology section.

The of spearman’s correlation coefficient found for the client vs. contractor relationship strength is $r_s= 0.562$ and that of client vs. consultant & contractor vs. consultant are 0.624 and 0.703 respectively. In reference to table 3.2 the results show that client Vs consultant and Contractor Vs Consultant had strong relationship in delay factor ranking, whereas, the strength of relationship between the client and the contractor in the ranking the delay factors were found to be moderate.

Finally the overall (combined) ranking coefficient of correlation has been investigated with the respect to the client, contractor and consultant. The value lies above 0.8 this shows that all the respondents in each stakeholder has been very strongly correlated to the overall ranking.

No.	Correlation between	r_s value	Strength of relationship
1	Client Vs contractor	0.562	Moderate
2	Client Vs Consultant	0.624	Strong
3	Contractor Vs Consultant	0.703	Strong
4	Client Vs Combined	0.825	Very Strong
5	Contractor Vs Combined	0.864	Very Strong
6	Consultant Vs Combined	0.865	Very Strong

Table 4. 7: Correlation between Stakeholders in Delay Factors’ Ranking

CHAPTER FIVE

CONCLUSSION AND RECOMMENDATION

5.1. Summary

The Adey Ababa National Stadium construction project was launched in 2016 and planned to be completed in two separate phases at a total cost of 8 billion birr. The project's first phase was completed in 2018 however, its second phase, which was launched in 2020, is yet at 11% completion consuming 120% of the time schedule. No researcher so far has tried to deal with the determinant factors causing of the project for delay.

The client of the project is preparing a new tender, following the termination with the existing contractor. But, unless the actual reasons that caused the delay and there by overprice of the project have been discovered, it would be difficult what to change or improve by the stakeholders of the project in order to avoid a similar situation occurrence with the new contractor as well. This study was conducted with an objective to find out the determinant causes for the delay of AANS construction project.

In construction, delay could be defined as the time overrun either beyond completion date specified in a contract or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule. And construction project delay factors are those causes that result in a delay of a construction project. There are various factors that contribute to delays in construction projects. These range from factors inherent in the technology and its management, to those resulting from the physical, social, and financial environment. Method of classifying these factors depends basically on the objectives of the analysts in their study. For the purpose of this study the method of classification that (Assaf and Hejji, 2005) used was applied with some customization to match the objective of the research. Accordingly, in this study delay factors were classified into six groups. These are: Client related, Contractor related, Consultant related, Project team related, and Public authorities' related, and external parties related delay factors.

A descriptive research design was applied in this study. In order to meet the objective of the study data has been collected in a questionnaire survey. A pure quantitative method of study was

applied to analyze the 43 potential delay factors which were selected, modeling similar researches conducted by previous well accepted researchers, to be distribute for 39 respondents representing the three major stakeholders of the project: the client, the contractor & the consultant. Respondents determined by stratified sampling method were asked to scale the variables using a 5-point Likert Scale. The response rate of the survey was 87%. The profiles of the respondents was also analyzed in terms of their education level & their work experience.

Reliability check was done for the collected data by applying the Cronbach's alpha method to discern internal consistency. Alpha's registering above 0.9 taken as reliable.

At each stakeholder level and in combined, Relative Importance Index (RII) have been used to measure the relative contribution of each delay factor. The combined RII results show that Shortage of Foreign Currency, Escalated Inflation, The COVID-19 Pandemic and Dynamic FCY Exchange Rate were the highest contributing factors for the project delay. Subsequent to those four delay factors war at the time of the construction of the project, delay in materials delivery, political instability within the country and Unavailability of utilities (road, water, electric supply, etc.) at the site depicts a high contribution in the delay of the project. In the combined data analysis Public authority related, external party related, project team related, client related, contractor related and consultant related delay factors ranks from 1 to 6 order, respectively as a delay contributing group of the project.

The strength of agreement between the stakeholders on the ranking of the delay factors was measured using the Spearman's correlation coefficient (r_s). The result showed that the delay factor ranking relationship client Vs consultant & contractor Vs consultant was strong in the ranking of the delay factors. However, the strength of relationship client Vs contractor in ranking the delay factors was moderate. The combined rankings visa viz the three stakeholders was very strong.

5.2. Conclusion

The results of the survey indicated foreign currency related factors, the COVID-19 pandemic and the civil war occurred in Ethiopia in the past two and more years were the most important factors that delayed the project. During the COVID-19 pandemic experts the contractor was in need of were unable to move from China to Ethiopia due to the lock down and travel bans enacted by

governments of the two countries. Importing and transporting the required building materials to the projects site was also a difficult task to the contractor subsequent to the lock lockdown. As such it deters the contractor from doing its job as per its schedule. These had caused a lot to the delay of the project's construction. Similarly, the civil war that was going on in Northern Ethiopia and most importantly near the import export corridor of Ethiopia in the Afar region gaze threat to the contractor from importing its high value import materials, afraid of the volatility of the situation. Thus, the contractor had to wait until the situation could settle and risks are avoided. This created another lag behind schedule for the contractor.

Those two problems, COVID 19 and War in the Northern Region, did not just only create their share as a delay factor but they also open doors for other untouchable factors. Yet again, the pandemic and the war left a surge of inflation and shortage of foreign currency in Ethiopian government side. In addition, the foreign currency to birr exchange rate was growing up in some unprecedented scale in the past years in Ethiopia. The cumulative effects of these series of events made the client unable to make advance and progressive payments on time. This was specially observed on those payments that were supposed to be paid in US Dollars. Failure by clients to make progressive payments on time was mentioned in previous public projects delay studies as one important cause of projects delay. This study has also concluded that delay in progress payment by the client was more differently severe and case specific to this project. Because, unlike in the case of other public projects, the client in this study did not fail to make progressive payments in Birr, the problem that particularly faced was a shortage of FCY (US dollars).

In general, top ten causes were found that count the projects delay. These are: (1) Shortage of foreign currency, (2) the COVID-19 pandemic, (3) Escalated inflation, (4) Dynamic FCY exchange rate, (5) War at the time of the construction of the project, (6) Delay in materials delivery, (6) political instability within the country, (7) Unavailability of utilities, (8) Improper project planning and scheduling, (9) Complexity of project design and (10) Inaccuracy in project cost estimation.

The study showed that of the top ten causes of the delay the first seven causes were essentially Public authorities and external related causes. The stakeholders neither can control such delay factors nor could they be prepared for them. Hence in terms of their cause group public authority

related and external parties' related factors were found to be the highest contributors of the causes of the delay.

Similar to other construction delay studies conducted by previous researchers in Ethiopia, in this study also stakeholders (the three parties) of the project were observed to blame one another for causes of delays. Previous studies showed that client, contractor and consultant ranked their respective contribution on projects delays to be the least. In a study conducted by Abdurezak M. and Neway S. (2019) the client ranked contractor and consultant related causes as number 1 and 2 for the causes of delay, while client related causes were ranked at number 4. With the same manner the contractor ranked client, consultant and contractor related causes number 1, 2 and 4 respectively (Abdurezak M. and Neway S., 2019). A similar phenomenon was also observed in a study conducted by Werku K. and K. N. Jha (2016). The similarity has been appeared in this study as well. This was specially observed between the client and the contractor of the project. In comparison with the three parties all claims themselves as the least contributing groups.

Difficulties in financing projects by contractors was repeatedly raised as the other important cause of delay in public construction project in Ethiopia (Abdurezak M. and Neway S., 2019), EndaleMamuye, 2016, Werku K. and K. N. Jha, 2016). This problem was not observed on the contractor under this study. In fact the contractor, in the first phase of the project, was not paid any of its dollar based payment for more than two years however, it handles the situation and complete the first phase.

5.3. Recommendations

In this study shortage of foreign currency and the ever-growing foreign currencies exchange rate was observed to be two most important causes to the delay of the project. This will not remain to be a problem exclusive to this project alone. Projects, specifically mega projects, launched in Ethiopia two and more years ago and are still underway would obviously face a similar fate to that of the one assessed in this study. And this is never a good news for a country that heavily relied on building mega projects as a phenomenal way to escape out of the cycle of poverty. Policy makers of the country must be able to draft new policies that could encourage foreign direct investment in the country as it is one largest source of the country's foreign currency resources. Together with that innovations that could enable to substitute import goods with

locally produced ones, shall be given more emphasis by the government in order to increase the FCY reserves of the country.

The other factor contributing a mediocre share on the delay of a project constructed hundreds of miles away from the war zone was the last civil war in the northern Ethiopia. This factor clearly shows that every place in Ethiopia is vulnerable unless every place in Ethiopia is safe. Apart from the countless social crisis that wars in Ethiopia create, they significantly affect the country's economy. First of all wars deplete the country's FCY reserves through armaments purchase, then it hits foreign direct investment activities hard, as no investor would want to come/stay in an unsafe land. In this regard Ethiopians, most importantly Ethiopian political powers, must be able to internalize the devastating effects the country faced in the aftermaths of every war in its history. There must be created a common and governing principle among political powers as to never consider war as a mechanism to solve disagreements. As long as war is the trend to settle disagreements projects like AANS will come in to break.

The contribution of the client in the delayed AANS construction project was perhaps understated by respondents of this study's survey. The client had a major problem in making a timely decision. During the survey the researcher was able to see that the contractor had already ceased the construction a year ago. It was waiting all of this time just not to breach a contract. In addition the contractor also knew that the price of the project was rising every time and it would ask a price adjustment accordingly to continue the work when the client became ready. Hence, the growing exchange rate and inflation was not much of a problem to the contractor as long as it stayed free of accountability. But, for the client every delay means an extra cost. So, the failure to make a decision earlier by the client was a bold fault. The client of the project must be able to recognize this problem very well and be able to enhance its decision making capacity quickly. Otherwise, there has been still another chance for the same problem to happen again with the new coming contractor as well.

5.4. Suggestions for Further Research

This study used a quantitative analysis method to rank delay factors on the basis of their weight on the total delay of the project. Though this method suffice for ranking the factors, it didn't tell the exact amount of time each factor had contributed. The study, for instance, ranked the COVID-19 pandemic as the 2nd highest contributor. But, the exact amount of time the project was delayed by as a result of the pandemic is unknown. On the other hand there is always a chance in a construction project delay analysis that two or more delay factors occur at the same time. The so called concurrent delay. In addition to these, since the factors have association with responsibilities of the stakeholders, the respondents might have encountered a conflict of interest during the survey.

Considering the above probable scenarios and reasoning, this study calls for a necessity of other diagnostic study to assess the exact & actual contribution of each delay factor on the total delay time of the project. This requires analyzing of all the necessary documents residing at the offices of each stakeholder. By doing so, one can be able to register every delay and the factor which caused the project for delay. Such a method will avoid those possible limitations of this study raised above, hence, all these issues might need doing other researches.

Also because of time and resource constraints, in this study impact of the delay of the project was not studied. The impact of the delay of such a mega project is expected to be large and versatile. In this regard a future research on the impact of the projects delay could reveal the size of the effects of delayed mega projects in Ethiopia could bring in terms of social and economic structures of the country.

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40. ባህልና ስፖርት ሚኒስቴር። (መስከረም 2014)። የብሄራዊ ስታዲየም ፕሮጀክት ግንባታን አስመልክት የቀረበ መግለጫና ጥቅል ሪፖርት። የምዕራፍ አንድና ሁለት የተጠቃለለ ማብራሪያ በኢ.ፌ.ዲ.ሪ ስፖርት ኮሚሽን። አዲስ አበባ፣ ኢትዮጵያ።

APPENDIX A

QUESTIONNAIRE FORMAT



Addis Ababa University

School Of Commerce

A questionnaire prepared to be filled by respondents from the stakeholders of Adey Ababa International Stadium construction Project

Dear respondent,

The aim of this survey is to identify the potential causes of delay associated with the delay of the Adey Ababa National Stadium Construction Project. Your genuine answers are very crucial in my study. The information obtained from the survey will be used only for academic purposes and the basic privacies of respondents to this survey won't be disclosed by any means. Understanding the fact I kindly ask you to completely fill this questionnaire with your careful and genuine answers.

Thank you in advance!

NigussieYitayew

Phone No.: 0911142658

Email: nigusyit@gmail.com

Section I: Respondents Profile

Please answer the following questions by ticking in the space provided.

1. In which one of the following organization are you working currently?

Client Consultant Contractor .

2. What is your level of educational?

Diploma BSc. MSc. PhD

3. What is your current position in your organization?

Project manager Supervisor Architect
Engineer contract administrator project coordinator
Quality control Other

4. What is your year of work experience in the field you are working in now?

< 5 5 –10 10 –15 > 15

Section II: Ranking potential Delay factors

The following factors are expected to have a contribution for the delay of Adey Ababa International Stadium Construction Project. Based on your Observation, please rate the degree of contribution of each factor.

<u>Scale</u>	
1	= Very Low
2	= L o w
3	= Medium
4	= H i g h
5	= Very High

No.	Delay Factor	Scale				
		1	2	3	4	5
1	Delay in progress payment by client					
2	Change of orders by client during construction					
3	Poor communication and coordination by client and other parties					
4	Slow decision making process by client					
5	Escalated Inflation					
6	Shortage of foreign currency					
7	Difficulty in obtaining permits from public authorities					
8	Changes in government regulations and laws					
9	Political instability within the country					
10	War at the time of the construction of the project					
11	Inefficient bureaucracy at customs offices					
12	Poor Project delivery method					
13	Improper project planning and scheduling					
14	Short and unrealistic contract duration					
15	Inaccuracy in project cost estimation					
16	Complexity of project design					
17	Incompetent project team					

Determinant Factors Causing The Delay of Construction Project: The Case of Adey Abeba National Stadium Construction Project

18	Rework for Mistakes in construction
19	Difficulties in financing project by contractor
20	Inadequate contractor experience
21	Inappropriate construction methods
22	Poor site management and supervision
23	Obsolete technology used by contractor
24	Delays in sub-contractors work
25	Fraud practices by contractor
26	Poor cash flow management by the contractor
27	Inadequate consultant experience
28	Delay in approving shop drawings and sample materials by consultant
29	Poor contract management by consultant
30	Weak supervision by consultant
31	Delay in approving payment certificate by consultant
32	Technically incapable consultant staff
33	Malpractice (unethical practices) by consultant
34	Legal disputes between various parties
35	Mistakes and discrepancies in contract documents
36	Delay in material delivery
37	Changes in material types and specifications during construction
38	Problems with neighborhoods
39	Unforeseen climate conditions
40	Inefficient labor
41	Unavailability of utilities (road, water, electric supply, etc.) at the site
42	Unrelated public authorities interference in the process
43	The COVID-19 pandemic