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(Summer Program)

Causes and Effects of Project Delay of Ambo-Woliso Federal road Project.

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As members of the examining board of the final B.Sc. open defense, we verify that we have read and evaluated the final BSc thesis/project prepared by **name of student** entitled **Causes and Effects of Project Delay of Ambo-Woliso Federal road Project**, and recommended for acceptance as a fulfillment of the requirement of **B.Sc. in Civil Engineering**.

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Abstract

The construction project is regarded successful when it is given over to the owner within the time, cost, and standards necessary while minimizing delays in public construction projects. Ambo-woliso road is one the public road project experiencing significant delays. This article evaluates the most prevalent delay issues encountered by Ethiopian government-funded construction projects, particularly those using Ambo-woliso road project, analyzes their impacts, and suggests a delay management system. The study applied qualitative as well as quantitative techniques to evaluate primary and secondary data. Per the entirety statistics, the top five most important and highly ranked factors are erroneous time estimates, force majeure, lowest bid, procurement policy, and volatile markets, as well as frequent design changes. Nearly every Ambo-woliso road project schedule overruns up to 300% of its contract duration. As a result, the government officials suffered from poor public relations and a high cost of supervision and contract administration. Conducting a thorough and accurate project feasibility study, awarding bids to experienced contractors, avoiding drawing discrepancies, preparing an accurate initial time and cost estimate, and strict schedule monitoring were discovered to be effective techniques for reducing delays in public construction projects.

Contents

Abstract.....	i
CHAPTER-ONE.....	1
INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	1
1.3 Research Question	2
1.4 Objectives of the Study.....	2
1.4.1 General Objective	2
1.4.2 Specific Objectives	2
1.5 Significance of the Study	2
CHAPTER TWO	4
LITERATURE REVIEW	4
2.1 Background of Construction Projects	4
2.2 Major causes of delays	4
CHAPTER THREE	7
METHODOLOGY OF THE STUDY	7
3.1 Description of the study Area	7
3.2. Research Methods	7
3.3. Ethical Considerations	8
CHAPTER FOUR.....	9
RESULTS AND DISCUSSIONS.....	9
4.1 The demographic distributions	9
4.2 Discussion on Factors of cause of delay	10
4.3 Effects of delays in construction projects	12
CHAPTER FIVE	Error! Bookmark not defined.
CONCLUSION AND RECOMMENDATION.....	Error! Bookmark not defined.
5.1 CONCLUSION.....	Error! Bookmark not defined.

CHAPTER-ONE

INTRODUCTION

1.1 Background of the Study

Time and cost overruns are two of the most serious issues confronting the construction sector in developing nations such as Ethiopia. The Ethiopian government is undertaking a variety of development projects, ranging from buildings to several mega structures such as the Great Renaissance Dam. Advanced technologies, new standards, multiparty engagement, and frequent owner-desired adjustments characterize modern construction projects. When combined with the inherent pitfalls and challenges in the physical, monetary, and economic contexts in which most projects are carried out, these circumstances have made completing projects on time and on the allocated funds a difficult task to accomplish, frequently leading to claims for cost compensation and/or time extensions, and it epitomizes additional costs due to late facility occupancy or other factors. Furthermore, it is a loss of revenue, a lack of productivity, and a reliance on current facilities for the client of the project. Construction delays, on the other hand, indicate higher costs, longer work duration, increased labor costs, higher material and equipment costs, and so on to the contractor. This eventually causes a delay in the project's completion [1].

1.2 Statement of the Problem

A delay can be described as a time overrun that extends beyond the completion date indicated in a contract or beyond the date specified by the parties for the completion of the project [2]. The delay might happen alongside other delays, and all of them may have an impact on the project's completion schedule [3]. Delays can lead to overruns in time and costs, disputes, court proceedings, poor quality, deliveries, and ultimate abandonment [4]. Construction project delays hurt investors' contractual rights by increasing combative relationships, distrust, litigation, arbitration, cash-flow issues, and a general sense of fear toward each other [5]. The delay was also defined as an "act event which extends the required time to perform or complete work under t contract and manifests itself as additional days of work" [6]. Local and international standards contain declarations about construction delays. A number of the standard documents that outline

each party's rights and obligations regarding construction delays are FIDIC, PPA, and the 1960 Ethiopian Civil Code [7–10]. The ambo-woliso road project get delay from the start up to now due to the cause of political disruption, payment delay, lack of raw materials and other factor. This delay of ambo-woliso road cause different problem on the society like they are cost additional money for transportation on unpaved road, dust problem, not easily access hospitals that lead death of the patient especially during day of birth, car accidents and the other impends the economy of the society. This research assessed factors that affecting the delay of public building construction projects ambo-woliso road in order to assist owners, consultants and contractors to overcome cost, time, and quality and leadership problem and to improve factors of their construction projects.

1.3 Research Question

- What were the major factors for delay of ambo-woliso road project?
- What were ranks of identified success factors in orders of their importance?
- What are the solution on the delay of ambo- woliso road project?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study is to identify the factor that affect cause of delay of Ambo-Woliso road, Oromia, Ethiopia

1.4.2 Specific Objectives

The Specific objectives of this research are:

- To identify delay factors for Ambo-Woliso road project
- To rank the identified delay factors in orders of their importance
- To identify the remedial solution of the problem

1.5 Significance of the Study

The aim of this research is to identifying the critical factors cause delay of Ambo- Woliso road project. The outcome of this research is helpful in real- time monitoring and restarting of ambo-woliso road project and decision making for timely minimization of losses. Moreover, would be helpful for the contractors to become attentive of the critical factors that needed to be given importance for the success of a project and to prepare competitive construction strategy. Project

controls are an area with a growing body of knowledge, this research makes an effort to contribute towards the body of knowledge with a particular emphasis on construction practices being currently implemented. Even though the research focuses on construction projects, the findings and the outcome could be relevant to practitioners in other industries with particular emphasis on the various stages involved in project controls. Moreover, the study is beneficial to project managers, consultants, personnel who may involve in such construction project by identifying which factors determine the delay of the Ambo- Woliso road project. Also, the results of the study will have great importance in assisting construction project companies to identify which delay factors are critical in Ambo- Woliso road. The findings of the study also help the policy makers, planners, researcher, as an input for further investigation.

1.6 Scope of the Study

The researcher used descriptive research design and quantitative research method and linear regression analysis. Questionnaire and document review was used for the study. Ambo- Woliso was considered for the study. The study was focused on Ambo- Woliso road projects which were under construction during data collection for the sake of getting relevant information.

CHAPTER TWO

LITERATURE REVIEW

2.1 Background of Construction Projects

The construction industry is an essential aspect of the economy and has a significant impact on the efficiency and production of other industries; large investment in other sectors is not possible without the necessary infrastructure in place [11]. The construction sector is becoming more dynamic as technology, money, and construction procedures become more uncertain. Construction projects are becoming increasingly complicated and challenging, and the construction project team is confronted with novel obstacles. Clients regard the timely completion of a construction project to be a major indicator of project success [12]. Alemayehu [13] defined delay as an occurrence that increases the time required to complete contract tasks. It frequently manifests as extra days of work or a delayed start of activity [14].

It is critical to analyze whether additional time extensions are necessary for critical activities because the type of delay has an impact on them. There are two types of excusable delays: those that are excusable with compensation and those that are not [2, 4, 10, 15]. A client, end-user, consultant, designer, owner, contractor, or supplier may cause a delay. Seife [16] indicates that the main reasons for time claims in Bahir Dar University projects include client fails to deliver the site to contractors, variations in work orders by the client and consultant, design issues, bad weather conditions, and a significant increase in the volume of work. A general overview of delay-causing factors in Ethiopian public construction projects is shown in Table 1.

Table 1. Factors contributing to Ethiopian public construction project delays.

2.2 Major causes of delays

In this research we investigate factors of delay of public projects, little of the cause of delay of public project are listed below;

- I. A poor project management strategy, late payments to contractors, delays in sharing information, and delays in funding
- II. Inadequate information exchange between government agencies, problems with right-of-way and site disposal, and significant changes to the design
- III. Delay in progress payment, severe weather, contractor's incapacity, land acquisition and resettlement, ineffective planning and scheduling, and scope revisions and additional work
- IV. Delays in providing materials on-site, ineffective site management, incomplete paperwork, delayed site transfer of ownership ineffective site management, and oversight

In the construction environment, the term “delay” often has a negative connotation for key players specific and the industry overall. According to the Journal of the Ethiopian Association of Civil Engineers [21], it implies claims, price hikes for a client, a reduction in profit/return, increasing expenses for operation and upkeep of infrastructure, loss of business opportunities, abandonment of the project and drop-in construction activities, bad reputation, and liability to secure financing for the project or secure it at a higher cost due to the major effects of time overrun discovered in construction projects. Claims, distrust, litigation, cost overruns, cash flow issues, and a negative hostile relationship among stakeholders are instances. Sambasivan and Soon [4] stated that the top six effects of delays reported in a study of the effects of construction delays on the project construction sector were cost run time overrun, disagreement, arbitration, lawsuit, and abandonment. Kemo [19] and Tilahun [12] stated that the following were the six most often seen repercussions of delay: time overrun, overrun of cost, conflicts, arbitration, lawsuit, and outright abandonment.

Aibinu and Jagboro [2] highlighted two approaches to reduce or, if possible, eliminate time overruns: acceleration of site activity and provision for contingencies. Tilahun [12] revealed that minimizing time delays and cost overruns would necessitate: ensuring an adequate and available source of finance until project completion; allocating sufficient time and money for the design phase; selecting a competent consultant and a reliable contractor to carry out the work; performing a preconstruction planning of project tasks and resource needs; hiring an independent supervising engineer to monitor the progress of the work; and ensuring timely completion. Alemayehu [13] recommended improving the construction project's situation by enforcing

liquidated damage clauses along with providing rewards for early completion; adopting an innovative approach to contract award procedures that give more weight to price and more weight to contractors' capabilities and previous performance; and adopting a novel approach to contracting, such as design-build and construction management (CM) types of contracts. Yifredew [6] stated that essential success element delays are caused by project managers' competency, time management, control system and duties, monitoring and feedback, and ongoing involvement in the project. Aibinu et al. [2, 11, 22] proposed that clear goals and project missions, support from upper management, a capable project manager, a qualified project team, sufficient resources, client/customer participation and consultation, effective communication, responsiveness to clients, proper monitoring, and comments are the factors to be considered in ensuring the successful completion of the project. According to Jagbor [23], the following are some strategies for reducing delays: competent project manager, ensuring an adequate and available source of finance, multidisciplinary/competent project team; availability of resources; commitment to projects, adopting a new approach to contract award procedures by giving less weight to prices and more weight to contractors' capabilities and past performance, adopting new contracting approaches such as design-build (D/B) and construction manager (CM), complete and accurate project feasibility study and site investigation, expedited site clearance, comprehensive contract documentation, frequent progress meetings, project management assistance, utilization of up-to-date technology, and use of experienced subcontractors and suppliers, complete and proper design at the right time, competent consultant/designer personnel, competent and capable client's representative, site management and supervision use of props, proper material procurement; developing human resources in the construction industry through proper training, allocation of sufficient time and money at the design phase, awarding bids to the right/experience consultant and contractor, perform a preconstruction planning of project tasks and resources needs, systematic control mechanism and effective strategic planning.

CHAPTER THREE

METHODOLOGY OF THE STUDY

This investigation intended to assess the primary variables responsible for delays in public construction projects in overland specifically woliso- Ambo road, and their impact on progress and on-time delivery and also propose approaches and techniques for reducing construction delays to overcome the problems.

3.1 Description of the study Area

Amb-Woliso road has a length of 112 km. It is located between 9°05' and 10°23'N latitude and 37°57' and 39°28'E longitude. The zone has 13 rural districts, one administrative town (Fitche), 18 towns, and 267 rural and 24 urban kebeles. Its altitude ranges from about less than 1000m to over 3540m. Its annual rainfall is from 600 - 2000mm. Fitche Town has total population of 12,500. The average minimum temperature is 10°C and the maximum temperature is 32°C(Wondrade et al., 2014). There is various public building that are constructed in Fitche Town every year. Currently there are three schools, three health post, four shallow well to serve 18750 people, one deep well to serve 20000 people.

3.2. Research Methods

In Ethiopia, public construction projects are rapidly expanding and the largest receiver of government funds under the government's development policy. It accounts for roughly 45% of the yearly government capital budget [24]. This study aims to identify the key reasons for the delay, their effects, and ways for mitigating them in Ethiopian public building projects, such as Ambo-woliso federal road project.

The types of analyses used in this research were primarily descriptive due to their ease of gathering people's opinions on a certain subject. This strategy is focused on gathering data and obtaining completely precise knowledge about the current state of phenomena, as well as concluding facts collected wherever possible [25]. However, before selecting a sample, the sampling unit must be identified. A sample unit can be a geographical unit such as a state,

district, hamlet, building unit, or social unit. As a result, the sample unit for this study was Ethiopian public building projects in general, and specifically the Ambo-Woliso road project. Purposive sampling was used in this study to collect the targeted respondents who are considered to have relevant information about the study's aims. Following that, data were gathered through document reviews, questionnaire surveys, and case studies. The questionnaire survey data were organized, coded, categorized, analyzed, and interpreted using the Statistical Package for Social Science (SPSS) V- 23 with Cronbach's alpha coefficient for reliability in equation (1) and the Relative Importance Index (RII) to determine the ranking of cause and effects of delay in the following equation:

$$RII = \sum_1^5 \frac{W}{Axn} \dots\dots\dots(3.1)$$

where w is the total weight given to each factor by the respondents, which ranges from 1 to 5, and is calculated by adding the various weightings given to a factor by the entire respondent, H is the highest ranking available (in this case, 5), and N is the total number of respondents who answered the question.

3.3. Ethical Considerations

This study adhered to the ethical criteria of research requirements. By keeping the information obtained private, the respondents' privacy and confidentiality were safeguarded. The fraud was avoided by alerting construction companies about the goal of the research and its ramifications for the respondents, and the actual names of the enterprises were replaced with fictitious company names.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 The demographic distributions

The demographic distributions of the 42 participants in this study are shown in Table 4.1. When the role of stakeholders in the project is assessed, it is seen that more than 40% of the participants are contractor. However, this is a consequence of the fact that the people in the contractor role are treating themselves as clients if they agree with a subcontractor. It can be said that this results from the lack of professional illiteracy in the small construction companies in Ambo-Woliso road project. It is also seen that the construction activities in Ambo-Woliso road project, which is an agricultural city, are predominantly on residential buildings. The evaluation of the causes and effects of delays is directly related to the experience of the project parties. Therefore, it is very important that approximately 26% of the participants have 0-10 years of experience. The lack of delays and the control of delays depend on the planning and scheduling. In the study, it was determined that 95% of the participants were scheduling for time management. However, only 30% of these participants use software for this. When the size of the projects on the local scale is taken into consideration, it is seen that the vast majority of the participants use MS Excel program for time management.

Table 4.1. Demographic results of the survey

<i>Age</i>	Frequency	Percentage
20-29	14	33.33
30-39	12	28.57
40-49	12	28.57
50 and above	4	9.53

<i>Role</i>	Frequency	Percentage
Client	7	16.67
Contractor	18	42.56
consultant	17	40.77

<i>Gender</i>	Frequency	Percentage
Male	39	92.86
Female	3	7.14

<i>Experience</i>	Frequency	Percentage
0-10	11	26.19
10-20	23	54.81

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More than 25	8	19.05
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<i>Education</i>	Frequency	Percentage
Undergraduate	7	16.67
Graduate	10	23.81
Master	13	30.95
Doctorate	2	4.76
Other	10	23.81

<i>Occupation</i>	Frequency	Percentage
Civil engineer	16	38.12
Architect	2	4.76
COTM	5	11.90
Surveyor	3	7.14
technician	8	19.04
other	8	19.04

4.2 Discussion on Factors of cause of delay

According to the results obtained within the study, the 10 most important factors causing delays in the construction projects in Ambo-Woliso road project are listed together with the name of groups of factors and RII value in Table 4.2. As the result of the rank basing on RII, the three most important reasons behind the delay are; (1) delay in obtaining permits from municipality (RII: 0.79), (2) change in government regulations and laws (RII: 0.78) and (3) difficulties in financing project (RII: 0.78). Financial related delays are the most common causes for the delay in developing countries has the same characteristic. This is also observed in Ambo-Woliso with its local scale. However, it is seen that the structure and dynamics of the construction industry are more dependent on local regulations in urban scale. This also overlaps the opinions of participants in face-to-face interviews and the notes in the last section of the questionnaire where participants are asked to express their own views and suggestions. In addition, the three least important reasons for delay are improving design documents (RII: 0.69), personal conflicts between labor's (RII: 0.52) and labors' strike (RII: 0.52). According to this, it is seen that material-equipment and labor-related delay causes have less importance than the others.

Groups of factors	Cause of delays	RII	Rank
External-related	Delay in obtaining permits from municipality	0.79	1
External-related	Change in government regulations and laws	0.78	1
Contractor-related	Difficulties in financing project	0.78	1
Client-related	Delay in approving design documents	0.69	3

Labour-related	Shortage of labours	0.53	4
Contractor-related	Inadequate experience of contractor	0.79	1
Labour-related	Unskilled and/or unqualified labours	0.52	3
Design-related	Inadequate experience of design office	0.69	2
Design-related	Unclear and inadequate details in drawings	0.4	7
Client-related	Slow decision making	0.4	7

Each individual cause's RII perceived by all participants were used to assess the general and overall rankings in order to give an overall picture of the causes of construction delays in Ambo-Wolisoroad project. These rankings also made it possible to cross compare the relative importance of the items as perceived by the three groups of participants (Table 3). In this context, the three most important groups of causes of delays are contractor-related (RII: 0.701), finance-related (RII: 0.697) and client-related (RII: 0.692) delays. However, some of the groups of delay causes can differ from each other according to project parties. The most parallel results with the general situation were obtained by the clients. In addition, there is a consensus on the causes for the three most important delays between the clients and the contractors, while close ranking is seen for other causes. Consultants, on the other hand, state that the most important delays are due to financial reasons. Material and equipment-related delays are also the least significant delays in which almost all parties have the same opinion.

<i>Group factors</i>	<i>Client</i>		<i>Consultant</i>		<i>Contractor</i>		<i>Overall</i>	
	<i>RII</i>	<i>Rank</i>	<i>RII</i>	<i>Rank</i>	<i>RII</i>	<i>Rank</i>	<i>RII</i>	<i>Rank</i>
Client-related	0.79	1	0.81	1	0.67	3	0.66	2
Contractor-related	0.78	1	0.63	2	0.61	4	0.66	2
design-related	0.79	1	0.60	5	0.69	3	0.67	2
external-related	0.62	3	0.60	5	0.71	2	0.61	3
financial-related	0.72	2	0.77	1	0.78	1	0.75	1
labor-related	0.59	5	0.42	6	0.73	2	0.59	3
equipment-related	0.68	3	0.63	3	0.67	3	0.67	2
management-related	0.77	2	0.61	4	0.77	1	0.73	1

4.3 Effects of delays in construction projects

Table 4.4 shows the effects of delays in construction projects in Ambo-Wolisoroad project. According to the literature, time overrun and cost overrun, which are delay effects in construction projects, are the most common global results in the construction sector worldwide. This situation is also the same in Turkey (Sarıkaya 2010). However, unlike the studies carried out nationwide, when the delay effects on the construction projects in the urban scale were examined, it can be seen that there are some differences. The maintenance of the business continuity of small and local construction companies depends on its reliability in the city. Therefore, delays in construction projects will cause the company to gain a bad reputation among the local people by reducing the confidence through the company. For this reason, the most important delay effect in the case study is obtained as the bad reputation and the reduction of reliability. The most significant effects after this effect are time overrun and cost overrun, respectively. When the opinions of the project parties are compared to the delay effects, it is seen that while the clients and the consultants have similar results, the contractors evaluate the situation differently.

4.3. Factors Causing Delay of Ambo-woliso road Projects

Construction delays are a commonly acknowledged truth and a prevalent issue in building projects. Delays in construction projects occur due to a variety of circumstances and causes. These causes are categorized into four-factor groups in this study: clients, consultants, contractors, and external associated variables. According to the questionnaire survey results, **Table 8**, the most important, highly ranked, and high level of importance consultant-related delay causes are inaccurate time estimates, frequent design changes, delay in performing testing and inspection, failure to give written instructions, late reviewing and approving design documents, preparing an incomplete or undetailed BOQ, and delay in approving a major change in the scope of work. Contractor-related delay factors include: contractor financial capacity, late material delivery, low-balling/low cost, work suspension on the engineer's order, and inadequate coordination and communication with other parties. Client-related delay causes include insufficient staff, slow decision-making, information delays, change orders, and change of mind during construction, while external delay causes include force majeure, lowest bid procurement policy, construction material market instability, poor economic conditions (currency, inflation

rate, LC, etc.), and construction material shortage. In addition, respondents suggested evaluating payment delays and the lengthy and bureaucratic payment processes as potential causes of project delays because the lowest bids may be from unqualified contractors. As a result, poor contractor performance will ensue, affecting the project timetable.

Table 8. Index of importance for the most essential factors in total outcomes.

No	Cause of delay	Relative Importance Index (RII)	Rank
1	Erroneous time estimate	0.852	2
2	Policy for the lowest bid procurement	0.745	3
3	Market volatility for building materials	0.813	2
4	Regular modifications to the design	0.845	2
5	Taking too long to examine and approve the design document	0.918	1
6	Financial capacity of the contractors	0.945	1
7	Information delays	0.713	3
8	Late delivery of materials	0.932	1
9	Poor coordination and communication with other parties	0.815	2
10	Work suspension based on the engineer's directive	0.724	3

The above table 4.10 shows that the main causes of the Ambo-road project's delay are the contractors' financial capability, the length of time it takes to review and approve the design document, and the delayed delivery of materials.

4.4. Delay Effect on DMU Construction Projects

The aim to complete a project on schedule, within budget, and to the best quality is shared by all contracting parties, including the owner, contractor, and consultants. Delays typically result in the loss of one or more forms for everyone. Time overruns, cost overruns, wastage and underutilization of resources, tying down of the client's capital due to non- completion of the

project, abandonment of the project, the dispute between parties, reduced profit or total loss, arbitration, and litigation and court cases were the nine effects of delay identified. Respondents were asked to score their agreement on the effect of delay by linking it to the delay it creates in this regard.

Table 4.1 results demonstrate that discontent by project owners and, as a result, end-users (bad public relations), is ranked first, followed by the high expense of supervision and contract administration for the project’s consultant. Loss of users’ benefit if it had been completed on time, loss of profit for non-completion to the contractor, material price escalation costs, pouring money unnecessarily into the project at hand at the expense of other new projects, extended site overhead and general overhead expenses, and liquidated damage expenses. The third through tenth grades were discovered to have the biggest impact on Ambo-woliso road project delays, with a high level of relevance. Every stage of a project’s life cycle requires time. When a contract is completed and a deadline is set, the effect of delay affects time and increases the final cost; more money must be paid. Delays will also result in personnel and resource waste and underutilization. These three consequences are intricately linked. According to the correlation between the causes and effects of delay, the phrase “time overrun” refers to late completion or late delivery from the period stipulated or agreed upon by all construction project stakeholders. The primary causes of time overruns are financial issues, late payments for completed and continuing work, change orders, ineffective planning and scheduling, bad site management, material supply delays, and so on.

Table 9. Effects of delay on construction projects.

No	Effects of delay	RII	Important level
1	The high cost of supervision and contract administration for the consultant	0.923	High
2	Delay in getting service by clients	0.63	Medium low
3	Loss of profit for non-completion to the contractor	0.954	High
4	Material price escalation costs	0.968	High
5	Extended site overhead and general overhead expenses	0.838	Medium

6	Expenses for liquidated damage	0.658	Medium low
7	Economic impact on the country	0.969	High
8	Termination	0.623	Medium low
9	Poor quality of work due to hurrying	0.846	Medium
10	Negative attitude towards the construction industry by the higher public authority and by society as a whole	0.871	Medium
11	Political impact	0.966	High

Cost overruns are the rising costs of labor, labor force, materials, equipment, and so on. The primary sources of cost overruns are modification orders, contract errors, changes in drawings, faulty cost estimation, and so on. Wastage and underutilization of resources related to idle labor, reduced worker and equipment productivity, and so on. Late procurement and material delivery, slow response and approval modification orders, insufficient material supply, changes in drawings, weather conditions, unforeseen site conditions, and other factors are the primary causes of resource underutilization. Disagreements between parties in a building project are referred to as disputes among parties. Slow or late payments for completed or ongoing work, poor communication and coordination, and client meddling are the primary reasons for disagreements. Litigation and court cases refer to legal proceedings in a court to solve problems, which might take a long time. The major causes of litigation and court disputes are late or nonpayment for completed work, increases in material pricing, and so on. Abandonment is halting all work or suspending the project for an extended period. The most common reasons for desertion are regulatory changes, financial and payment issues, natural calamities, and so on.

4.5. Mitigation Measures for Delay of DMU Construction Project

A construction project delay that is not effectively handled or managed will have a detrimental impact on the project, the parties participating in the project, and the construction industry as a whole. Handling delays covers how an extension of time for the delayed project is granted, beginning with notification of the delay, and the degree of enforcing liquidated damage clauses put into the contract agreement.

As shown in Table 4.12, some of the construction delays minimizing mechanisms in public construction projects include conducting feasibility studies before starting projects, selecting appropriate contractors for specific projects, ensuring all design/drawing and contract documents are clear and complete, accurately estimating the time and cost of the project, and ensuring the allocated budget is available before starting the project.

Table 10. Mitigation measures for delay of construction projects.

No	Method of resolving/minimizing delay	RII	Level
1	Awarding bids to the right/experienced consultant and contractor	0.932	High
2	Avoid the discrepancy in the drawings	0.855	Medium
3	Accurate initial time estimate	0.631	Medium low
4	Strong supervisions as per a schedule	0.843	Medium
5	Accurate initial cost estimate	0.985	High
6	Ensuring adequate and available sources of finance	0.943	High
7	Top management support	0.833	Medium
8	Paying the payment at the right time	0.941	High
9	Avoidance of unclear and incomplete contract documents	0.811	Medium
10	Frequent progress meeting	0.653	Medium low

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5. Conclusion

The following conclusions are drawn from literature reviews, questionnaire responses, and case studies in accordance with the study's purpose. An incorrect time estimate, many design changes, delays in testing and inspection, failure to provide written instructions, and late evaluation and approval of design papers were identified as the primary causes of the consultants' failure to perform their duties. Financial capacity, late material supply, law-balling, construction halt at the engineer's order, and insufficient coordination and communication with other parties were revealed to be the primary causes of delays on the contractor's side.

On the other hand, the client's obligation and force majeure were determined to be insufficient manpower, delayed decision-making, information delays, modification orders, and changes of mind throughout construction. External causes of delay for Ambo-Woliso road projects were identified as the lowest bid procurement policy, construction material market instability, adverse economic conditions, and a construction material scarcity. The sequence of delayed construction projects was found to include: dissatisfaction by project owners and, consequently, end users; high supervision and contract administration costs for the project's consultant; loss of the benefit that users would have received if the project had been completed on time; delay in client service; loss of profit for the contractor due to non-completion; excessive investment in the current project at the expense of other new projects; extended site overhead and general overhead expenses; and expenses for liquidated damage.

The study found that delays in project schedules generally hurt both the contractors and the client. In every project, the extent of harm varies from contract to contract and affects the client cumulatively.

6. Recommendation

The most important factor in Ambo-woliso road time overruns, according to the customer, contractor, and consultants, was "Change to design during construction." They concurred that the highest level of quality requirements, incomplete drawings and project information, contract modification, government obstruction, client-contractor working relationship, late payment, and project location were the most important factors contributing to time overruns caused by design changes during construction. The authors suggest requiring clients, contractors, and consultants to comply with the study's conclusions.

Reducing design modifications, improving design plans, and emphasizing project completion dates; effectively communicating through documentation, including drawings and requirements

High-quality designs and paperwork that are closely applied to the construction project are required, they must make all necessary decisions prior to the project's execution and refrain from making any further decisions after it is finished, integration between the client and the consultant, an early start to the design review, prompt response for design approval, the use of skilled and experienced designers, experience sharing, and other measures were suggested as solutions for the delayed design review and approval.

In Ethiopia, the main reasons, effects, and methods for mitigating delays in public construction projects have generally followed similar trends. Therefore, this study will help the government overcome it.