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The cause of cost overrun on construction project; The case of International Rescue Committee, Ethiopia Country Program .

MA Thesis Research Proposal

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The cause of cost overrun on construction project success, The case of International Rescue Committee, Ethiopia Country Program .

A thesis submitted to the school of graduate studies St. Mary's University in partial fulfillment requirements for the degree of MA in Project Management

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I Shimelis Dagima declare that this thesis is my original work, and it is the result of my effort prepared under the advice of Maru Eshet (Ph.D.). The entire sources of material used for the study were duly acknowledged. This research has not been submitted for any degree in part or full in this university or any other higher institution, rather it is presented for the partial fulfillment of the degree of Master of Art in Project Management.

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ST.MARY'S UNIVERSITY SCHOOL OF GRADUTE STUDIES
FACULITY OF BUSINESS

The Cause of cost overrun on construction Project with the Case of the International Rescue Committee, Ethiopia Country Program

BY

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ACRONOMY

IRC; International Rescue Committee

BPRM; Bureau of Population, Refugee and Migration

ECHO : European Commission

EUTF: European Union Trust Fund

UNOCHA: United Nation

WFP: World Food Program

SPSS: Statistical Package for Social Science

IDP's: Internal displaced people

WASH: Water, sanitation, and Hugine

VIF: Variance inflation factor

ANOVA: Analysis of Variance

SD: Standard Devotion

OLS: Ordinary least squire

DW: Dubin Watson

Abstract

The study aims to identify the cause of cost overrun on donor funded construction project: A case study in International Rescue Committee. To achieve the "general and specific objectives" the study was look the cause of cost overrun in the concept of contractor related cause, Contract management process cause, client related cause, external related cause and level of compotator are the major cause for the occurrences of cost overrun. This study also used to explanatory/ descriptive research design and quantitative research approach were used and the primary sources of data were collected from 149 respondent who involved on construction project in International Rescue Committee . The sampling techniques used in this study were purposive sampling methods. However, the sample was selected from employees of the organization that has direct or indirect involvement on construction project at different field office. The regression analysis result showed that the five major cause of cost overrun namely, the cause of cost overrun in the concept of contractor related cause, Contract management process cause, client related cause, external related cause and level of compotator , explained 50.8%of the variance in the cause of cost overrun. This indicates that these five major cause areas are vital for project managers to focus on if they want to reduce the cost overrun. Finally, this study recommended that in donor funded construction project the concerned body shall be provide a good planning and scheduling are continuing process during construction and match with the resources and time to develop the work to avoid cost overrun. All the stakeholders shall revise the bid document such as technical specification during bill of quantities development and the design of the project in a good way.

Keywords: Cost Overrun, Contractor, External related cause, Procurement process management and level of compotator

Chapter One: Introduction

1.1 Background of the study

Cost overrun is a global phenomenon in the construction industry where very rarely projects are finished within the budgeted cost. In a global study on construction project performance, cost overrun is identifying the major problem where 9 of 10 projects faced the overrun in the range of 50 to 100%. The problem of cost overrun in the construction industry is a global phenomenon (Ameh et al, 2010).

Many factors are responsible for these cost overruns such as underestimation of costs to make the projects more viable, addition of scope during later stages of project planning and even during construction, changed conditions, etc. One of the most important contributing factors to the magnitude of cost overrun in large transportation projects are project delays. Furthermore, the length of project development phase from planning to construction seems to be a major factor in the extent of cost overrun (Touran and Lopez, 2006).

Construction industry is an important industry that plays a vital role in the socio-economic growth of a country. Economically, it contributes in significant improvement in the overall GDP of a country. It also improves the quality of life by providing the necessary infrastructure such as roads, hospitals, schools and other basic and enhanced facilities. Hence, it is fundamentally crucial to make construction projects completed successfully within time, budget and expected quality. However, being a complex, fragmented and schedule driven industry it always facing chronic problems such as low quality and productivity, cost overrun, time overrun, construction waste and others. Of these, cost overrun is a severe problem (Olawale and Sun , 2010) because it affects the overall development of any country.

The construction sector in Ethiopia contributed up to 12.5 % to the Gross Domestic Product (GDP) during 2014 with USD 6 billion, while in 2008 the sector accounted for 8.8% of the country's Gross Domestic Product or USD 1.9 billion. The growth rate of the Ethiopia construction sector was 17.6% in Q3 - 2015 according to Ethiopia National Bureau of Statistics (EBS). For this reason, it is considered vital for the economic development of the country. Moreover, the author also affirmed that construction activities have become a significant market because this industry procures products and material from other businesses in other sectors locally. Further, it is one of the most labor-intensive sectors and gives job opportunities to millions of citizens. The industry represents one of the most important sectors to the local economy.

According to (Idoko, 2008) many projects in developing countries encounter considerable time and cost overruns, fail to realize their intended benefit, or even are totally terminated and abandoned before or after their completion. In Ethiopia major construction projects have a history of delay and cost overruns. Construction project time overrun can be defined as an

extension of time beyond the contractual time agreed during the tender (Al-Najjar, 2008). Yehen Rosen field (2002) as it was cited in (Merid Taye, 2016) believes that cost overrun occurs when the final cost of the project exceeds the initial estimate or budget.

Current practice of the construction industry shows that it is a rare event that most construction projects were completed on the scheduled time, budgeted cost, and desired quality. As (Frimpong, 2003) describes a successful project was one that has accomplished its technical performance, maintained its schedule, and remained within budgetary costs. Therefore, project may not be regarded as a successful endeavor until it satisfies the cost, time and quality limitations apply to it. However, it is not uncommon to see a construction project failing to achieve its goal within the specified cost, time, and quality (Nega, 2008).

There are many risk factors causing cost overruns in the construction industry, therefore, the purpose of the study mainly focus to assess the effects of cost overruns on performance of donor-funded construction projects in IRC Ethiopia country program which is pursues to identify factors that responsible for project cost overrun, impact of the cost overrun and effect of cost overrun on the performance of donor-funded projects in IRC Ethiopia country program.

1.2 Statement of the problem

In Ethiopia, the present state of the construction industry fails short of meeting domestic and international quality standard and the performance demand expected from the sector (Ministry of Works and Urban Development (MoWUD), 2005/2006-2009/2010). Construction projects have problems with construction technique and management as well as limitation of funds and time. The critical problem is inability to complete the project on schedule, low quality work and cost overrun. In general, most construction project experience time overrun, and cost overrun during the execution period. An examination of the record of more than four thousand construction projects by Morris et al, (1998), showed that the project was rarely finished on time or within the allocated budget. Other researcher has also observed that cost overrun common in the construction industry worldwide. (Arditi, 1985).

Cost overruns could be dangerous to project success since it imply that, for maintaining project activities, a firm must spent funds intended for entirely other purposes to the project work. From the context of financial problems, unexpected expenses might provoke the growth of the organizational department. Hence, it was essential to understand the reasons why cost overruns occur and address them accordingly. There were many studies conducted on the factors that cause the project cost overrun in the construction sector at large, but the problem of cost overrun is still a chronic problem which affects project success, the stakeholders involved and the public at large. In this study the researcher selected the international nonprofit organization which is International Rescue Committee to assess the factors that cause project cost overrun that manage under donor funded project. Prior to selecting the organization, the researcher gathered information about projects undertaken by the organization to assess whether the projects are successful in terms of cost quality and time. From the monitoring report and contract reviewed

most of the project under construction constructed by different contractors in different field offices encountered cost overhead problems from the range of 21%-41%. The researcher believed that to minimize the problem of cost overrun, it is necessary to known the major cause of project cost overrun and prioritized the most important factors based on their frequency of occurrence and degree of severity to enable managers and stake holders better deal with the most severe factors to minimize the problem and dealing with all factors.

Most research works in the area mainly devoted to identifying the causes of cost overruns in public projects. As per the knowledge of this research , there were limited research include at studying the cause of cost overrun in construction projects supposed under funded by Donor in international nonprofit organization. Furthermore, most of existing studies stopped at the identification of the influencing factors from the literature but not progress onto finding additional organizational specific causes of project cost overruns that executed on the field offices.

Before this study, there was no study undertaken on cause of cost overrun on construction project in the case of IRC (International Rescue Committee) which was critical issue to discuss and way forward on the alternative solution or recommendation to the decision maker.

1.5 Objectives of the Research

1.5.1 General objective of the research:

The general objective of this study is to explore/assess the major causes of cost overrun in the construction project and evaluate their relative importance.

1.5.2 Specific objectives of the research:

This study will be undertaken with the following main/specific objectives.

1. Identifying the main causes of cost overrun from the perspective of contractor related cause for donor funded construction work project in IRC Ethiopia country program.
2. Investigating Contract management practice to the cause of cost overrun in donor funded construction work project in IRC Ethiopia country program.
3. Examining the client related cause of cost overrun for various types of donors funded construction work project in IRC Ethiopia country program.
4. Recognizing the external cause of cost overrun and Contractor related reason of cost overrun of donor funded construction work project in IRC Ethiopia country program.

5. Finding the level of compotators that majorly cause of cost overruns of donor funded construction work project in IRC Ethiopia country program.

1.5.3 Basic research questions

This study attempts to address the following basic research questions.

1. What are the client related cause on project cost overrun in construction sector in the case of International Rescue committee Ethiopia Program?
2. What are the major causes that influence cost overrun in contractor related issue in the case of International Rescue committee Ethiopia Program?
3. What are the relative level compotators in a major cause of cost overrun in the case of International Rescue committee Ethiopia Program?

4. What are the external challenges of International Rescue Committee with regards to causes of cost overruns?
5. What is the major cause of cost overruns in contract management process in the case of International Rescue committee Ethiopia Program?

1.6 Significance of the study:

In the current world, every organization faced different controllable and uncontrollable challenges, whether it is profit making organization or non-profit making organization. To adapt and cope up with uncontrollable situations organizations, Senor mangers, and all employees of the organization together shall set productive measures and at least attempt to minimize the effect of these situations on business activities.

According to Stephen P.Robbins(1996, p.419) an organization accounted for planning, coordination, controlling and doing things in manageable course of action to achieve its goal effectively and efficiently. Therefore, any organization whether small or large, profit or non-profit needs the assessment of its business feature, nature, strength, weakness, and function.

However, Construction projects were increasing time to time and the problem of cost overrun becomes a critical issue which needed an investigation. Undertaking this research was identify the major causes for the project cost overrun in construction projects undertaken by International Rescue Committee funded by donor. The study tried to investigate on factors which was most frequently occurred in the organization and the most severed factors which had a great impact on the organization cost monitoring. So, the findings of the study enable the organization to be prioritized on which factors to focus to minimize the effect of cost overrun. It also motivated other researchers to further study on how to minimize cost overrun problems based on the identified significant factors.

1.6 Scope of the study:

The study was conducted in IRC Ethiopia country program construction activity undergoing over the operation areas in Ethiopia to determine the main causes of cost overruns and its effect on construction projects. Therefore, only those construction projects located in different operation areas were considered for this research work.

There were many factors affecting cost overrun in the construction projects. For the purpose of identifying the major causes of cost overrun in construction projects, this research work would be limited to the following major groups: the major causes of cost overruns was confined to the main categories as follows: Contractor's site management related factors, Client related factors, Contract Management related factors, Human resource (workforce) related factors, Project management and contract administration related factors, Level of competitor, and external factors.

The data for this study was gathered through detail literature review, questionnaire survey, and interview from key professionals and the relative importance index will be used for analyzing the data collected from the respondents.

1.7 Limitations of the Study

It is an acceptance that there are limitations on this study as others including bounding itself on the construction sector specifically to building construction. Additionally, due to time and there are many criteria for project success the researcher used time, cost, quality, and stakeholder satisfaction as project success criteria.

1.8 Organization of the paper

The thesis is organized into five chapters that supposed to address on chapter one deals with introduces the background of the study, statement of the problem, research questions, objectives of the study, significance of the study, scope and limitation of the study and organization of the study, in chapter two literature review from professional journals, books, internet searches, etc. This chapter essentially provide in conceptual, theoretical, and empirical form of review and hence it has: the construction cost management, cost control, estimating cost, causes and magnitude of cost overrun in Ethiopia and , effects of cost overrun, and cost overrun in IRC, in chapter three discussed the research design and methodology followed to achieve the objectives

of the study, in chapter four the results of the data obtained from the questionnaire survey and desk study on donor funded construction projects; were presented and discussed accordingly and in final chapter five Summary, conclusions and recommendations forwarded based on the major findings of the study and discuss how the research objectives align with the findings

Chapter Two: Literature review

2.1 Theoretical Literature

The construction industry is complex in its nature because it comprises large numbers of parties as owners (clients). These are the contractors, consultants, stakeholders, and regulators. Despite this complexity, the industry plays a major role in the development and achievement of society's goals (Enshassi et al, 2009). It is one of the largest industries and contributes about 10% of the gross national product (GNP) in industrialized countries (Navon, 2005) . However, many local construction projects report poor performance due to many evidential project-specific causes. Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as; time, cost, quality, client satisfaction, client changes, business performance, health and safety. Time, cost and quality are, however, the 3 predominant performance evaluation dimensions. (Enshassi et al, 2009).

The most important performance problem in the construction industry is cost overruns. Cost overruns occur in every construction project and the magnitude of this cost overrun varies considerably from project to project. On the other hand, Cost performance is the most important indicator of project success (Olawale and Sun , 2010) . It represents not only the firm's profitability but also the productivity of organizations at any point during the construction processes. It can be seen in the project account and is always used to measure project performance. Generally, Construction industry has been facing poor cost performance which describes inability to complete project within budget (Abdul Rahman, et al. 2013). Therefore, it is essential to define the actual causes and effects to minimize and avoid cost overrun in any construction project. This chapter reviews literature concerning the major causes of cost overruns to recognize the related information to the regard of the mention issues.

Cost management in construction projects

In construction almost all clients are interested in obtaining fully functional facilities that are completed in time, cost, quality, and scope. A builder who can construct within the estimated time and budget, to the right standards and scope is an excellent builder (Otim, et al. 2008).

Cost management is the total process which ensures that the contract sum is within the client's approved budget or cost limit. It is the process of helping the design team to design cost rather than the QS costing a design. The basis of the design cost control using the cost-planning technique is the analysis of existing projects into functional elements to provide a means of comparison between projects planned with data from existing projects. A building element is defined as part of a building performing a function regardless of its specification. Elemental

analysis allows the comparison of the costs of the same element to be compared between two or more buildings. As the cost element under consideration is performing the same function, an objective assessment can be made as to why there may be differences in costs between the same elements in different buildings. There are four main reasons why differences in describing costs occurs are: - Differences in time (inflation), Quantitative differences, Qualitative differences and Differences in location. (Eldash, 2012)

2.1.1 Definition and Classification of cost

The (constructor.org, 2018)described that Major classification of construction projects costs are: Project direct costs and Project Indirect Costs

Total Project Cost = Project Direct Costs + Project Indirect Costs

i.   Direct Costs of Construction Project

The costs and expenses that are accountable directly on a facility, function or product are called as direct costs. In construction projects, the direct costs are the cost incurred on labor, material, equipment etc …,and all directly involved efforts or expenses for the cost object are direct costs. Direct costs are those for activities or services that benefit specific projects, for example salaries for project staff and materials required for a particular project (Wekipidia, 2018).
These costs for a construction project are developed as estimates by means of detailed analysis of the contract activities, construction method, the site conditions, and resources. Different direct costs in construction projects are material costs, labor costs, subcontractor costs, and equipment costs. (constructor.org, 2018)

ii.   Indirect Costs of Construction Project

The costs, unlike direct costs, are not directly accountable for a particular facility, product or function. Indirect costs can be either variable or fixed. Indirect costs are, but not necessarily, not directly attributable to a cost object. It should be financially infeasible to do so. Indirect costs are typically allocated to a cost object on some basis. In construction, all costs which are required for completion of the installation but are not directly attributable to the cost object are indirect, such as overhead. In manufacturing, costs not directly assignable to the end product or process are indirect. These may be costs for management, insurance, taxes, or maintenance, etc (Wekipidia, 2018). The (constructor.org, 2018) also describ as the main sections coming under indirect costs are personnel costs, security costs, and administration costs. These costs do not have a direct connection with the construction project. The indirect cost can be classified as:

a. Project Overhead Costs

In a construction project, the cost of some of the items cannot be directly allocated for a specific activity. Most of the site-related costs come under this section and are categorized as project overhead costs. Project overhead costs can either be fixed or time-related costs. Different costs coming under overhead costs are the costs of stores, safety facilities, workshops, offices, staffs, and parking facilities. All those plants that are required to support the working crews will come under this cost. (constructor.org, 2018)

The overhead cost is estimated by a detailed analysis of the site-related activities and their cost. Hence an accurate cost estimate is obtained. Most of the companies make use of forms and checklists developed by them to estimate these costs. The site's overhead costs account for 5 to 15% of the total project costs.

b. General Overhead Costs

The general overhead costs cannot be directly charged for a specific project. These form the costs that are used to support the overall activities of the company. The general overhead costs will include the cost of the design engineers, expenses of head-office, cost of directors and managers, schedulers, etc. The general overhead expense and cost are found reasonable through continuous monitoring of the company expenses. The general overhead costs account for 2 to 5 % of the contract direct costs. The amount of the general overhead that should be allocated to a specific project equal: (constructor.org, 2018).

2.1.2 Cost management

Cost management is concerned with the process of planning and controlling the budget of a project or business. It includes activities such as planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. Cost management covers the full life cycle of a project from the initial planning phase towards measuring the actual cost performance and project completion (Bouvrie, 2018). Different literatures stated that cost management has the following basic steps (Bouvrie, 2018; Buchner, 2015)

- Resource planning
- Cost estimating
- Cost budgeting
- Cost control

2.1.2.1 Resource planning

In the initial phase of a project the required resources to complete the project activities need to be defined. Work Breakdown Structures (WBS) and historical information of comparable projects can be used to define which physical resources are needed. You can think of the required time, material, labor, equipment, etc. Once the resource types and quantities are known the associated costs can be determined. (Bouvrie, 2018)

Project Resources and Controls Resource inputs at the project site which produce outputs in the form of work include men, materials, machinery, and money. The success of a project depends upon the performance of these input resources when controlling costs (Hendrickson, 1998). The clients should do everything possible to avoid unnecessary delays as it is one of the leading causes of cost escalation.

1.   **Materials**

One of the big problems on most building sites is the large amount of materials wastage due to varying circumstances (Butler, 1982). This problem requires a supervisor to constantly be on the lookout for the losses. According to Hendrickson (1998), wastage of materials can take place during the procurement process, storage, and utilization. Wastage during procurement can result from one or more of the following causes:

- buying materials of wrong specifications, buying more than the actual requirements to cater for unrealistic and unforeseen eventualities, untimely buying of short-life materials, improper and unnecessary handling of materials, and wastage in transportation.
- Wastage during storage can occur due to the following reasons: damages and breakages during handling, deterioration due to incorrect storage, incorrect maintenance and short-shelf life and losses due to fire, thefts/vandalism, and exposure to extreme climatic conditions.
- Other causes are lack of pre-work preparation and coordination, improper accounting and poor storekeeping, negligent and careless attitude of the supervisor, high rate of deterioration due to long storage at the place of work, and over-issues from the central stores and failures to return unused surplus materials to the stores.

According to (Chitkara, 2011) , some unavoidable wastage is inherent during utilization, but excessive wastage is of concern to the management as it affects the productivity adversely, with consequences of extra costs. Most problems relating to material wastage revolve around requisitioning and ordering, receipt and checking of deliveries from suppliers, offloading and handling, storing, and protecting, and issuing, distributing and use of materials.

2.   **Plant**

In construction, some tasks are labor intensive, some predominantly employ equipment, and some use a combination of both. While the actual work done and the associated labor is accounted by the supervisor concerned, the equipment and productivity control are undertaken to

determine its employment time, the output achieved, and its productivity at site (Hendrickson, 1998). The main purpose of the control is to minimize wastage in utilization so that the overall project cost is not affected (Chitkara, 2011) . (Alinaitwe, 2012) observed that industrializing construction would probably reduce the cost of construction by about 30%.

3.   Labor

Labor productivity achieved at the site for a given work provides a measure of the laborers' efficiency and effectiveness and the level of site organization. It shows the total time for which the laborer was employed at work, the time he was productive on work and the time he remained unproductive (Chitkara, 2011) Craftsmen use about 40% of available time on productive activities, and about 33% of the time on non-value adding activities (Alinaitwe, 2012) . Productive times are wasted for various reasons such as idle waiting, unnecessary travelling, late starting, early quitting, unscheduled breaks, and delays in the receipt of tolls, delays to receive materials and work instructions. Assessment of the level of industrialization in Uganda and the effect on productivity and other metrics were done by (Alinaitwe, 2012) and the results indicated that the cost of labor is the order of 30 to 40% of project costs. The metrics confirmed that labor is a significant factor in the cost of buildings and more efforts are required to industrialize the industry. According to (Chitkara, 2011) cost control process involves accounting of actual productivity, and comparing with the standard, analyzing the causes for variations taking remedial measures for improvement. Raina (1999) emphasizes the need for close supervision and good working relationship.

4.   Time-Cost Relationship

(Chitkara, 2011) said the relationship between time and cost is a very important aspect in the control of costs on site as any variation in time has automatic implication on cost. It is important to report and record all the works involving materials, plant, and labor on sites. This enables the contractor to be able to know the costs and expenses of the resources used on site and compare with the initial cost budget. Various report techniques used include daily or weekly and monthly recording, schedule control, site daily diary report and the project budget. (Otim, et al. 2008)

2.1.2.2 Cost estimating

An estimate can be defined as the calculated prediction of the amount of money required to undertake a specific amount of work in the year in which it was prepared. For the project manager to effectively plan and control a project, accurate estimating is essential. Accurate estimates of project costs provide an essential part of the proper basis for management decisions and control.

Several cost estimating methods can be applied to predict how much it will cost to perform the project activities. The choice for the estimation method depends on the level of information available. Analogous estimating using the actual cost of previous, similar

projects can serve as a basis for estimating the current project. Another option is to use parametric models in which the project characteristics are mathematically represented. Estimates can be refined when more information becomes available during the course of a project. Eventually this results in a detailed unit cost estimate with a high accuracy. The Remaining uncertainties in estimates that will likely result in additional cost can be covered by reserving cost (e.g. using escalation and contingencies). (Bouvrie, 2018)

The most obvious reason for producing cost estimates is to assist in pricing decisions, but that is by no means the whole history. Cost estimates are usually needed for all types of projects, including in-house projects without fixed prices. Timescale planning, pre-allocation of project resources, the establishment of budgets for funding, manpower and cost control, and the measurement of achievement against expected performance all demand the provision of sound estimates.

Ahuja (1994) cited by (Nega, 2008) , stated that estimating is the primary function of the construction industry; the accuracy of cost estimates starting from early phases of a project through the tender estimate can affect the success or failure of a construction project. He also stated that many failures of construction projects are due to the result of inaccurate estimates. A study conducted in United States of America on cost estimating problems associated with pioneer energy projects and process plants revealed that 74% of cost growth was caused by underestimation, that is, improper estimation (Merrow, 1988).

Cost is a major factor in most decisions regarding construction; as construction cost estimate is prepared before the actual construction of the project, much study and thought must be put into the primary and subsequent estimating phases as they form the future construction documents. Estimates made in the early phase of a project are particularly important because they affect the most basic decisions about a project: whether it will be undertaken at all; how large it will be; how elaborate, sophisticated and durable it will be.

Project stage	Concept development	Design	Advertisement	Bid/Award	Construction
Time Estimating function	Conceptual estimate	Design estimate	Pre-bid Estimate	Bid Analysis collusion detection	Cost Analysis
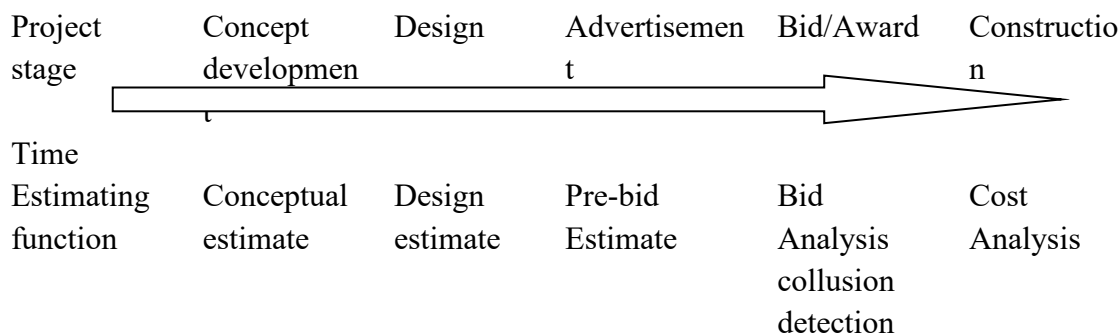
Figure 2. 1 Estimate Development in Relation to Project Development (Source: Jonathon, 2002)

As a project progresses from concept to final design more of the unknown factors can be eliminated from the estimate and numbers that reflect the design can be produced (Figure 2.2). Estimates at final design, prior to bid, are often referred to as the engineer's estimate, and are used to finalize project funding prior to bid solicitation and construction. Proper estimating and control of the project, especially at early design phase is crucial to the construction industry.
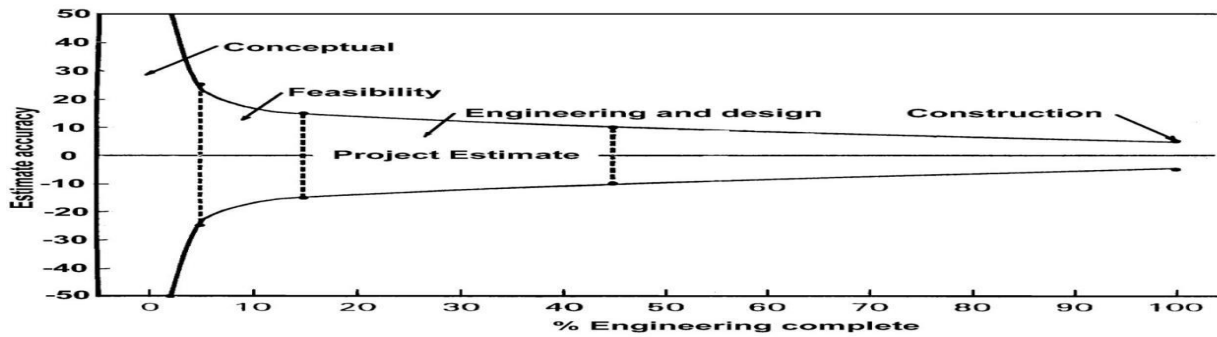
Figure 2. 3 Estimate Accuracy vs. Project Development phase (Source: Jonathon, 2002)

The cost estimate forms together with a project schedule the input for cost budgeting. The budget gives an overview of the periodic and total costs of the project. The cost estimates define the cost of each work package or activity, whereas the budget allocates the costs over the time when the cost will be incurred. A cost baseline is an approved time-phased budget that is used as a starting point to measure actual performance progress.

2.1.2.3 Cost budgeting

The cost estimate forms together with a project schedule the input for cost budgeting. The budget gives an overview of the periodic and total costs of the project. The cost estimates define the cost of each work package or activity, whereas the budget allocates the costs over the time when the cost will be incurred. A cost baseline is an approved time-phased budget that is used as a starting point to measure actual performance progress. (Bouvrie, 2018)

Cost budgeting involves allocating the overall cost estimates to individual work items in order to establish a cost baseline for measuring project performance. PMBOK7(1996)

2.1.2.4 Cost control

Cost control is a process where the cost of the construction project is managed through the best methods and techniques so that the contractor does not suffer losses when carrying out the activities of the project. One of the aims is to construct at the cheapest possible costs consistent with the project objectives (Otim, et al, 2008)

Cost control is concerned with measuring variances from the cost baseline and taking effective corrective action to achieve minimum costs. Procedures are applied to monitor expenditures and

performance against the progress of a project. All changes to the cost baseline need to be recorded and the expected final total costs are continuously forecasted. When actual cost information becomes available an important part of cost control is to explain what is causing the variance from the cost baseline. Based on this analysis, corrective action might be required to avoid cost overruns.

Dedicated cost control software tools can be valuable to define cost control procedures, track and approve changes and apply analysis. Furthermore, reporting can be enhanced and simplified which makes it easier to inform all stakeholders involved in the project.

Different literatures and researches show that Cost controlling techniques and mechanisms of construction projects in developing countries is not in good health. According to Otim, et al. (2008) Most project managers and contractors in Uganda find difficulty in controlling costs on their construction sites due to a number of problems which include poor project preparation, lapse in management and control, over budgeting, poor materials, labor shortages, increased cost of materials, delays in deliveries, wastage of materials, unexpected weather changes, loss of materials, insecurity and poor communication. This results into cost and time overruns, conflicts, and sometimes abandoning projects.

Cost control is concerned with: -
- Influencing the factors which create changes to the cost baseline to ensure that changes are beneficial,
- determining that the cost baseline has changed, and
- Managing the actual changes when and as they occur.

Cost control includes:
1. Monitoring cost performance to detect variances from plan.
2. Ensuring that all appropriate changes are recorded accurately in the cost baseline.
3. Preventing incorrect, inappropriate, or unauthorized changes from being included in the cost baseline.
4. Informing appropriate stakeholders of authorized changes. (USA P.M.I.,1996)

During the execution of a project, procedures for project control and record keeping become indispensable tools to managers and other participants in the construction process. According to Dharwadker (1985), cost control can be achieved by selecting the right man for the right job, the right equipment and tools for the right work and the right quality of materials, in the right quantity, from the right source, at the right price and delivered at the right time. Managers are expected to be well equipped to execute the project, with due consideration to the quality of work, yet within the estimated cost and limits.

2.2 Cost overrun.

Cost overrun is considered as one of the most considerable problems that hinder projects progress, since it reduces the contractor's profit leading to enormous losses and leaving the

project in massive troubles. Construction cost is one of the peak criteria of success of a project throughout its lifecycle and is of high concern to those who are involved in the construction industry. All projects, regardless of size, complexity is saddled by targets and uncertainty. Mostly in developing countries construction projects are characterized by overruns in cost. Cost overruns occur in every construction project and the magnitude varies significantly from project to project. Thus, what is Cost overrun mean?

Definitions**:**

- **Cost overrun** excess of actual cost over budget. Cost overrun is also sometimes called "cost escalation," "cost increase, or "budget overrun." Cost overrun is defined as the change in contract amount divided by the original contract award amount. This calculation can be converted to a percentage for ease of comparison. The difference between the actual cost and the initially projected cost. (G.V et al , 2016).

Cost overrun=Final contract amount $-Original contract amount$**Original contract amount**
- **Cost overrun:** the difference between the final actual cost of a construction project at completion and the contract amount, agreed by and between the owner and the contractor during signing of the contract. (Nega, 2008)
- **Cost overrun:** the increase of the final actual cost of a construction project (usually expressed as a percentage of original contract amount) at a completion

Over the original contract amount, agreed by and between the client (the project owner) and the contractor during the signing of the contract. (Wakjira,2011)Therefore: for this thesis Cost overrun is an excess amount of a project cost which is the actual cost deducted from the estimated cost.

2.3 Cost overrun around the world

The problem of cost overrun, especially in the construction industry, is a worldwide phenomenon, and its consequences are normally a source of argument among clients, consultants, and contractors on the issue of project cost variation. Project cost overruns create a significant financial risk to clients. In the study made by (Shambalid Ahady et al , 2017) stated that, In the past several decades, construction industries of many countries have faced the issue of cost overrun, though it is commonly acknowledged, the causes subject to more debate. The most important problem which led to the construction cost overrun in developing countries is fluctuations and increases in material price. Although all the factors are not like every project but most factors such as poor management, inaccurate material estimates and financial status of the contractor are common to the projects in the developing countries.

Moreover, on his research "A study of the causes of cost overrun in construction industry in Afghanistan": also identified the frequency of experience of cost overruns in the construction projects in Afghanistan and the survey result indicated that 6 out of 10 projects fall into this category. According to (Niazi and Painting, 2017). Due to various factors, cost overrun is often more of a challenge in developing countries where budget problems are just one factor in often poor project performance. In Afghanistan, construction cost overruns are the most substantial problem (facing all parties to a project; suppliers, subcontractors, main contractors, and clients).

Another study was conducted by (Shah, 2016) to identify an exploration of causes for delay and cost overrun in different three countries (Australia, Malaysia & Ghana). Although the main factors and magnitude varies among those countries, the researcher confirmed that there were a delay and cost overrun in each country

According to very comprehensive research done by (Bent Flyvbjerg, Mette Skamris Holm and Soren Buhl, 2002) in global construction, it was found that 9 out of 10 projects had cost overrun. The researcher investigated about the actual cost and the estimated cost in public work project. He has undergone various methods and found that the difference between actual cost and the estimated cost is due to technical factors, economic factors, psychological factors and political factors. From factors he concluded that in every infrastructure project, the actual cost will be higher than estimated cost. He added that the cost under estimation occur not only by error and mostly by strategic misrepresentation.

Due to various factors, cost overrun is often more of a challenge in developing countries where budget problems are just one factor in often poor project performance. (Niazi and Painting, 2017) studied about the Significant Factors Causing Cost Overruns in the Construction Industry in Afghanistan and found that: construction cost overruns are the most substantial problem which is facing all parties to a project; suppliers, subcontractors, main contractors and clients in Afghanistan.

The study about causes of cost overrun in construction which was studied on the case of Indian construction also discussed the contribution of construction industry for growth and economy of India and the other side of effects of cost overrun in this massive investment. The Indian construction industry is an integral part of country's economy and its growth and a conduit for a substantial part of India's development investment. The industry plays a pivotal role in developing the country's infrastructure, a pre-requisite for high levels of economic growth. Most construction projects experience cost overrun, and it put massive financial burden on the client or owner. (Subramani, et al. 2014)

2.4 Cost overrun and its magnitude in Ethiopia

Based on the construction type and scope, level of development, weather condition of the countries and other different factors the magnitude of cost overrun varies from one country to the other in extreme manner.

As an example: (Ibrahim Mahamid and Nabil Dmaidi, 2013)Stated that the average cost overrun in Palestine construction is between 10%- 30% of the project's estimated cost. Different researchers have specified different percentage for the magnitude of cost overrun in Ethiopia based on the study area. (Merid Taye, 2016) has studied to see the effect of Time and Cost Overruns on Ethiopian Construction Projects that are performed by Defense Construction Enterprise. They found that cost overrun ranges from a minimum of 1% to the maximum of 47% of the contract amount. Turkey, (2011) confirmed that from the desk study: the average cost overrun was found to be 26.95% of the contract amount, the actual cost overrun ranging from - 32.8% to 230.54%. The result of the questionnaire survey also strengthens this finding; it indicated that the perceived average cost overrun was found to be 34.18% of the contract amount found that in federal road construction projects. Another study was conducted by (Belachew, A.S., Mengesha, W.J. and Mohammed, M., 2017) to identify the causes of cost overrun in Federal Road Projects of Ethiopia. According to the research, the degree of cost overrun among selected project lengthened from 4.16% to 83.2%. the average magnitude of cost overrun was nearly 21.52% based on the three major construction parties (client, consultant, and contractor) and the principal factors that affect project cost performance were investigated. Lack of training, benefit realization and production supports were the primary reason for cost overrun at the execution processes of the projects as per clients' perception while lack of training, implementation process or bureaucrat and benefits realization were the primary reason for cost overrun at the execution processes as per contractors' perception. (Mustefa A. J., 2015) confirmed cost overrun problems of Addis Ababa Road projects by using Questionnaire survey and desk study: the researcher found that 100% of the road construction projects suffered both time and cost overrun. The rate of time overrun ranges from a minimum of 25% to the maximum of 264.38% of the contract amount and cost overrun ranges from a minimum of 4.11% to the maximum of135.06% of the contract amount.

For this topic, there is one good research in our country entitled: causes and effects of cost overrun on public building construction projects in Ethiopia, which is conducted by (Nega, 2008), he explained that, from the results it was found that 67 out of 70 public building construction projects suffered cost overrun. The rate of cost overrun ranges from a minimum of 0% to the maximum of 126% of the contract amount for individual projects. In this research it will be found that the rate of cost overrun decreases with the increase in contract amount.

The respondents identified 39 causes of cost overrun for Ethiopian case. The most important causes of cost overrun were found to be inflation or the increase in the cost of construction materials, poor planning and coordination, change orders due to enhancement required by clients, excess quantity during construction.

2.5 Empirical Literature

According to Changiz Ahbab, (2012),the existence of time and cost overrun problem in large construction projects in different countries was proved through an investigation on the selected

28 construction projects with the finance of some international banks. According to the investigation, existence of the causes for cost and time overruns in studied projects are as follows:

(a) Increase in quantities of work - additional work.

(b) Long period between time of bidding and contract award;

(c) Design and work permit changes during construction.

(d) Severe weather problems (hot, cold, snow, rain).

From the results "Rework and wastage of materials" and "Inflation" are two of the most important critical factors out of 47 factors that leading to cost overrun. Poor quality or mistakes in implementation means rework. Rework needs extra materials and money and leads to cost overrun. "Inflation" represents the second major cause for cost overrun according to the index analysis of the cost factor among the 46 factors. It is highly affecting different phases of the project, especially increasing actual total cost in the countries with positive rate of inflation.

According to Zinabu Tebeje Zewdu, Getachew Teka (2015), the contractors outlined the top five factors that cause cost overrun on construction projects are poor planning, fluctuation of price of materials, poor productivity, inflationary pressure, and project financing in descending order.

2.5.1 Main causes of cost overrun.

In the research made by (Ashebir et al, 2017) described that the main causes of cost overrun are material price fluctuation, cost underestimation, delay in supply of raw materials, inadequate review of contract documents, lack of coordination at the design phase and lack of cost planning during pre- and post- contract stage have the highest impacts on the performance of project costs from the client's, consultants' and contractors' perspective.

A study on causes of cost overrun in construction industry in Afghanistan (Shambalid Ahady et al , 2017) shows that, the top ten reasons of causes of cost overrun were found to be: Causes fall in the External related group which is "market inflation/deflation", Corruption, Shortage of supply of construction material required, Fluctuations in the cost of building materials and other materials, Falls in contractors related group which is "delay in subcontractor's work" , Management related factor that is "lack of pre-contract project ordination" which indicate that fast-track bidding process is not beneficial for the projects , Labor related factor which is a big need in Afghan construction industry that is "lack of skilled labor", Design related factor that is "improvements to standard drawings during construction stage" , Labor unrest" which leads to a low quality work and rework and "Inadequate & insufficient skill of labor" which is labor related group causing cost overrun.

On the other hand, another researcher (Niazi and Painting, 2017) also studied on Significant Factors Causing Cost Overruns in the Construction Industry in Afghanistan, They found of the key critical causes that potentially result in construction cost overruns in Afghanistan are corruption, delay in progress payment by owner, difficulties in financing project by contractors, security, change the order by the owner during construction and market inflation. (Frimpong,

2003) investigated 26 factors causing cost overruns in construction of Ghana groundwater projects and analyzed that the monthly payments difficulties were the most important cost overrun factor according to the contractors and consultants, while owners ranked poor contractor management as the most important factor. Despite some difference in the viewpoints among the three groups surveyed, there exists a high degree of agreement among the participants with respect to their ranking of the factors. Overall, ranking results indicated the main factors are monthly payment difficulties, poor technical performances, material procurement, poor contractor management and escalation of material prices.

Another study made by (Ibrahim Mahamid and Nabil Dmaidi, 2013) investigate the top five factors affecting cost overrun in building construction projects are: political situation, fluctuation of prices of materials, level of competitors, currency exchange, and economic instability.

In reviewing different literatures (S. Mulla et al , 2015) stated the following major factors:

- The most significant factor causing cost overruns due to client action is "additional work or changes to work".
- From a contractor's perspective, the most significant contributor to cost overruns is "time delays".
- The most significant factor for cost overruns is evident from external factors and that is "material price changes".
- Other common factors listed among contractors, consultants and clients were "poor estimates and material take-off" and "delay in payments".

In India, a study was conducted by (G.V et al , 2016) found that 10 significant factors result in cost overrun: Delay in preliminary handing over of project, wrong/inappropriate choice of site, inadequate project preparation, increment of material prices due to continuous closures, resources constraint, unpredictable weather conditions, fluctuations in the cost of building materials, equipment allocation problems, lack of cost reports planning/ monitoring during pre and post contract stages in the position, and design changes.

Research was carried out by (Shah, 2016) in different three countries indicated that the top three critical factors found in three different countries are:

S.N.	Australia	Malaysia	Ghana
1	Planning and scheduling deficiencies	Contractor's improper planning	Delay in payment certificates
2	Methods of construction	Contractor's poor site management	Underestimating of project cost

3	Effective ways of monitoring & feedback	Inadequate contractor experience	Underestimating the complexity of projects

top three critical factors (source: Kapur Shah, (2016)

(Olawale and Sun , 2010) identified 21 major factors causing cost overruns in UK. The major factors are design changes, incorrect evaluation of projects time and cost, risk and uncertainty related with projects, non- performance of subcontractors, conflict between project parties, fluctuation of rates, low skilled manpower, financing and payment, unstable interest rate, complexity of works, lack of proper training and experience of project manager, disagreement in contract documentation, lack of appropriate software, inflation of prices, contract and specification interpretation disagreement, dependency on imported materials, unpredictable weather condition, projects fraud and corruption, weak regulation and control and unstable government policies.

The research which has studied by (Almaktari et al , 2017) found that: political instability, Poor contract management, Low labor productivity, Delay in progress payments, Risk Management strategies, Poor site management and supervision, Staff training in the skill areas relevant to project, Contractors and Consultant tendering faults, Financing, and payment of completed projects Lack of materials and equipment are highly factors in Yemen.

(Mustefa, 2015) stated that in Addis Ababa Road projects the most important causes of cost overrun were found to be delay in construction, inadequate supply of raw materials and equipment by contractors, design changes, incomplete design at the time of tender.

2.5.2 Effects of Cost overrun.

Effects are the consequences that will be encountered when cost overruns occur on construction project. (Nega, 2008) stated that cost overruns have obvious effects for the key stakeholders, and on the construction industry in general. To the client, cost overrun implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs are passed on as higher rental or lease costs or prices. To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of

profit for non-completion, and defamation that could jeopardize his or her chances of winning further jobs, if at fault. To the industry as a whole, cost overruns could bring about project abandonment and a drop in building activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks.

The study of (Nega, 2008) further identified the following as the major effects of cost overruns: delays during construction, supplementary agreement, additional cost, budget short fall, adversarial relationship between participants of the project, loss of reputation to the consultant, the consultant will be viewed as incompetent by project owners, high cost of supervision and contract administration for consultants, delayed payments to contractors, the contractor will suffer from budget short fall of the client and poor quality workmanship. However, (Enshassi et al, 2009) identifies four effects of cost overruns as follows: company or firm liability to insolvency and liability of the companies or firms to bad debt, under-utilization of man-power resources, plants and equipment, increased project cost due to extension of time: longer project duration means that more resources will need to be allocated to the project, which then increases the project costs and project abandonment.

By reviewed different literatures M.J (2014) found the basic effects of cost overrun that are: extension of project, additional cost, budget short fall, adversarial relationship between participants of the project, delayed payments to contractors, poor quality workmanship and dissatisfaction by project owners and consequently by end users as the major effects of cost overruns. Furthermore, it was observed that time overrun, cost overrun, arbitration, litigation, disputes and total abandonment of projects were the effects of construction projects schedule overruns. Turkey (2013) indicated that the major effects identified in his research on Federal Road constructions are: reduction in planned increase of road network, Damaged professional, relations, Inability to secure project finance/securing it at higher costs, Loss of clients' confidence in consultants, for professionals -inability to deliver value to clients and Decreased rate of national growth.

Moreover, the most common effects of cost overrun identified by (Mustefa, 2015) are delay, supplementary agreement, adversarial relations among stakeholders, and budget shortfall of project owners.

Cost overruns in construction projects affect both stakeholders and business environment (Amoa-Abban and Allotey, 2014). These effects are not limited to the project level, but they can spread to the industry level. The effects of cost overrun in industrial level include; time overrun, disputes, arbitration, total abandonment and litigation (Kikwasi, 2012). According to Haseeb, et al. (2011), the effects of cost overrun can lead to slowing down the growth of the construction sector. The implication of these effects is to slow down other development sectors. Therefore, identifying the causes of cost overrun is the primary stage on mitigating the challenges.

Turkey (2011) listed the following main effects of construction cost overrun by summarizing different literatures:

- Loses of credibility to highway organization/bad reputation
- Loss of clients' confidence in consultants

- Added investment risks/Funding risk.
- For professionals -inability to deliver value to clients
- Discourages sponsors to invest in construction industry.
- Less returns on investment for client
- Delay in payment
- Loss of profit to the contractor
- Abandonment of future projects
- Drop-in construction activities.
- Inability to secure project finance/securing it at higher costs.
- Prevent planned increase in road network.
- Damage professional relations
- Suspension of work
- Dispute among parties
- Decreased rate of national growth

2.6 Research Hypothesis

The below research hypothesis draws up to answer the research questions whereby reframed at the conceptual framework. So that:

- **H₁: E**ffectiveness o**f** Contractor related causes had significant effect on the cost overrun.
- **H₂: P**roper Contract Management related causes brought significant effect on cost overrun.
- **H₃:** Examined Client related causes would have effect on cost overrun.
- **H₄:** Level of compotators in construction industry had effect on cost overrun.
- **H₅:** external related causes for cost overrun had tremendous effect on cost overrun.

2.7 Conceptual framework

This literature review has been conducted on identification of the causes leading to cost overrun and its consequential effects in depth. It has better contribution to develop conceptual and contextual basis for the research objectives. Accordingly, this chapter has presented some of the crucial findings in the existing theoretical and empirical literature on cost management construction projects.

Fetene (2008) survey showed that 67 out of 70 public building construction projects in Ethiopia suffered cost overrun. It was through questionnaire and desk study that the research was conducted and about 42 questionnaires were collected from the client, consultant, and contractor. And about 39 cost overrun factors were identified; the most important causes of cost overrun were inflation or increase in the cost of construction materials, poor planning, and coordination,

change order due to enhancement required by client, excess quantity during construction. The rate of cost overrun ranges from 0% to 126% of the contract amount for individual projects. Abubeker (2015) research showed that the cost overrun rate ranges from 4.11% to 135.06% of the contract amount. From 94 questionnaires 47 cost overrun factors were identified and the most important cause were delay in construction, inadequate supply of raw materials and equipment by contractors, design changes and incomplete design at the time of tender.

Therefore, the first part of this literature review introduces some theoretical concepts about the cost in general, definitions, and nature of cost management in construction projects. After having a clear and general idea about the cost, its classifications, management and control, identification and mitigation measures has been discussed in detail. The second part of the literature review has concentrated on identifying the main causes and its magnitude as well as the effects of cost overrun in construction projects in our country and all over the world. Through this review and desk study on some selected projects 47causes of cost overrun (Pdeveloped.st Overrun Variables) and different possible effects were identified and forms the bases on which the questionnaire will be developed

Indirect Variable   **Direct Variable**

Contractor related Cause.

Contract Management related cause

Client related cause

External related cause

Level of compotators

Cost Overrun
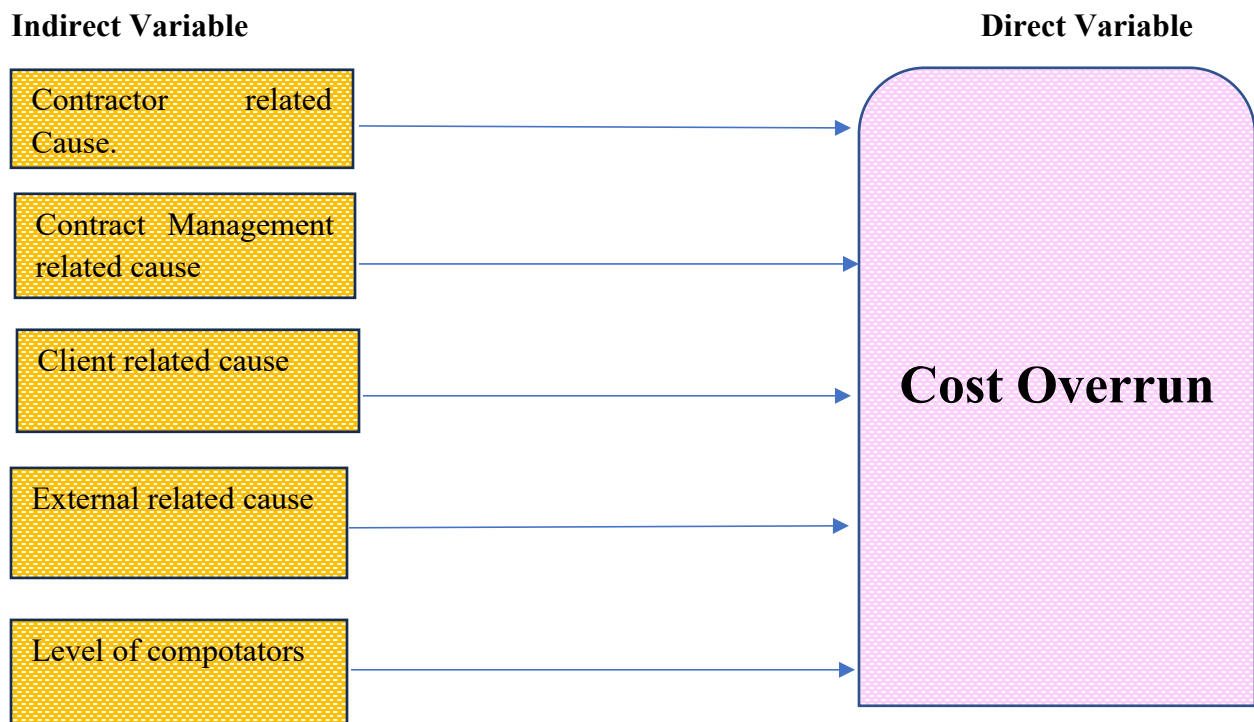
Figure 2. 4 Conceptual Framework

Chapter Three : Research Methodology

3.1 Introduction

The Study was conducted on different site of International Rescue Committee(IRC) Ethiopia Country Program construction project undergoing throughout the country . However, the country program secured fund from EUTF under the project title of "Promoting Inclusive Urban Development project" to be implemented in Assosa Town of Assosa Zone BGRS for three years project period and EUTF funded health project titled" Promoting stability and strengthen basic services delivery for host community, Refugee and other displaced population" in Gambella Zuria, Gog Woreda and Gambella Regional State for four years project through WASH activity by increase access to safe water supply to the people in Assosa urban and peri-urban settings in particularly Assosa General Hospital, Assosa Health Center, and Selga Alu Health center. This will be achieved by rehabilitation and expanding the Assosa town Water supply system and upgrading and maintaining the water supply pipeline and water supply facilities in the health facility like construction work of Borehole drilling, Generator hose construction, Mini Water quality Lab Construction, pressure line connection of new and existing borehole, Upgrading and replacement of Assosa town distribution pipes and fittings …etc.

In addition to WASH activity, IRC supports the three-health facility and Assosa Town health office through expanding infrastructure through construction of building and compound improvement for Assosa Hospital (Delivery Ward construction, expansion of the compound and road improvement within the compound). And under Promoting stability and strengthen basic services delivery for host community, Refugee and other displaced population" in Gambella Zuria, Gog Woreda and Gambella Regional State for four years project provide infrastructure improvement taking to consideration of disability persons by Construction of health center fence (600m2) & renovation of maternal and child health (MCH), communal latrine, residence blocks and other blocks at Bonga health center, Construction of walkways between blocks with shedding structure and re-enforced concrete construction of fence at Dozor Ulami health center, Construction of walkway including ramp and shed structure at Gambella town primary hospital, Construction work for renovation of waiting & card room, maternal and child health (MCH)

block and fence work by metal chain with reinforced concrete post at Puchalla health, Construction work for emergency block extension (isolation, pharmacy & triage) at Gambella town primary hospital and ..etc.

However, in order to carry out questionnaires and interviews the focused area for contractor and other stakeholder were only 7 Field Office but massive, which can transfer near future selected sites. In addition to Addis Abeba head office staff members; Gambella Field Office, Assosa Field Office and Jigjiga Field Office and Shire Field Office construction project sites are focusing area to select the participants and conduct the questionnaire and interviews.

3.2 Research Approach and Design

Research design is a master plan that specifying the methods and procedures for collecting and analyzing the needed information. It is a framework or the blueprint that plans the action for a research project. The selection of an appropriate research design involves several steps, beginning with identifying the problem, purpose of the study and in-depth literature review. According to McDaniel and Gate (1999), a research design is a plan for a study that provides specification of procedures to be followed by the researcher to achieve the research objectives. This study used an explanatory research type; the objective of this study is to explain factors to the project cost overrun and to give interpretation to the findings.

The data collection technique used in this research was quantitative approach which is a systematic empirical investigation of observable facts via statistical, mathematical, or computational techniques.

3.3 Data Source and date collection Methods

The quantitative data collected through a structured questionnaire that consists of both closed and open-ended questions, by in depth interview and desk study. The data was collect by using the "English" version of the questionnaire. Detailed information about different causes and effects of cost overrun as well as mitigation measurement of cost overrun collected through.

The study was evaluating the cause of cost overrun in construction projects in the case of International Rescue Committee. The research used both primary and secondary sources of data. Principally, self-administrative questioners proposed tools for primary data collection method. Additionally,   both qualitative and quantitative data were collected by interviews through unstructured interview with technical managers and operation managers over the area of construction activity held and observations during the execution period. The secondary data collected through reviewing of all the relevant   document which dealt with construction

management process desk review during the course of performance. The data collected by using the "English" version of the questionnaire. Detailed information about different causes and effects of cost overrun as well as mitigation measurement of cost overrun collected through the above-mentioned points.

3.4 Sample Size and Sampling Procedure

The total populations for this study were workers who have a direct contribution to International Rescue Committee donor funded construction projects those are project Managers, engineers, subcontractors, Forman and Project teams. The current total numbers of employees in the company are around 309 target population who use the laptop that they can fill the questioner in Micros Soft 365 Form in IRC Ethiopia country program(288), Client (15) and Contractor (6) where construction project are undergoing at Gambella Field Office, Jigjga Field Office, Assosa Field Office and Addis Abeba head office, the total employees who are working permanently in projects are about 100 and the remaining 188 staffs are support staff and others worker; the study focused on those who are permanently working on the construction project and the sampling size of the study were 100 but the questineer sent off through official working email for those 309 staff unfortunately 149 respondent filled out the questioner. Although the study population is small, it was difficult to conduct census study that most of the employees are working on sites outside Addis Ababa.

For the accessible primary data source, two types of sampling techniques are employed. These are stratified sampling technique and purposeful sampling techniques. Stratified sampling technique is used to gather data from the employees working in the organization and purposeful sampling techniques is used to gather information from the technical head and project managers.

The stratified sampling technique used since the researcher wants to give equal chance for all department of employees who have different response. The purposeful sampling technique uses to select the managers who can gives more relevant and general information about the cause of cost overrun on construction project success in International Rescue Committee Ethiopia country program.

3.5 Data Analysis and Data Presentation

This research categorized as explanatory and largely descriptive to examine the findings of the study. Since, the research tried to describe the current existence and extent of IRC Ethiopia construction project held under donor funded with the aim of identifying and explaining the causes and effects of cost overrun in the projects.

The research work has started with problem identification, which was done through unstructured literature review, formal and informal discussion with different individuals who have direct or indirect relation with the construction project. Beside the procedure for organizing, Summarizing, and describing the quantitative data about the sample of the study.

Discussions were made based on the analysis done on the gathered data to draw conclusions. and answering the question of the problem statement of the study. A conclusion will be produced from the analysis made in the research and recommendations are given for avoiding and/or administrating time and cost overruns. The research is a practical problem developed from the observation of construction projects and the research questions are oriented to investigate the cause of cost overruns and its effects and resolutions.

After collecting the raw data of questionnaire, the data entered into computer spreadsheet, SPSS program. Therefore, IBM Statistical Package for Social Sciences (SPSS) computer program version 27.0.0 is used to summarize and categorize the respondents view and Simple Linear Regression method used to rank the factors and effects of cost overruns separately for their importance and frequency of happening. The procedure that is used in analyzing the results aimed at establishing the relative importance of the various factors responsible for project delay and cost overruns. Therefore, the collected data analyzed using a Simple linear regression method. Linear regression finds the line of best fit line through the data by searching for the regression coefficient (B1) that minimizes the total error (e) of the model. The importance index is computed by the following formula:

$$y = \{ \beta_0\} + \{ \beta_1\{X\}\} + \{e\}$$

- **y** is the predicted value of the dependent variable (**y**) for any given value of the independent variable (**x**).
- β_0 is the **intercept**, the predicted value of **y** when the **x** is 0.
- β_1 is the regression coefficient – how much we expect **y** to change as **x** increases.
- **x** is the independent variable (the variable we expect is influencing **y**).
- **e** is the **error** of the estimate, or how much variation there is in our estimate of the regression coefficient.

3.11. Validity and Reliability

According to Saunder et al (2003), reliability refers to the degree to which data collection method will yield consistent findings, similar observations would be made, or conclusions

reached by other researchers or there is transparency in how sense was made from source. The purpose of reliability is to examine the level of non-error in measurement, which means to examine the consistency of measurement. Validity is defined as the extent to which data collection methods accurately measures what they were intended to measure Saunder, et. al, (2003). The researcher conducted a pre-test and make some revision on the structure of questionnaire before it distributed to the respondents. Therefore, the questionnaire as a measuring tool used in this study meets the requirement of content validity.

This study was adopted Cronbach's alpha test, or the reliability coefficient have been used to measure the internal consistency between the multiple measurements of a variable in a questionnaire. According to Hair et al. 2006 (p.137), this test is the most widely used to assess the consistency of the entire scale. Cronbach's alpha ranges in value from 0 to 1 and used to describe the reliability of factors extract from questionnaires. According to Gliem and Gliem (2003), the closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. The following rules of thumb indicated acceptable of Cronbach's alpha coefficient: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor and _ < .5 – Unacceptable" In this paper, the authors were applied Cronbach's alpha test to measure the internal consistency of questionnaires to test its reliability and the result is 0.668 as per the above rules of thumb Cronbach's alpha coefficient range is >.8 and the result is acceptable.

3.12. Ethical Considerations

The researcher was carrying out the research work in an ethical manner honestly and with integrity. Therefore, there were certain ethical protocols that should followed by the researcher. One was soliciting explicit consent from the respondents. This was ensured that their participation to the study is not out of their own volition. The researcher also ensures that the respondents was aware of the objectives of the research and their contribution to its completion. One other ethical measure exercised by researcher was treating the respondents with respect and courtesy (Leary, 2004). This was done so that the respondents were at ease and more likely to give honest responses to the questionnaire.

There were also ethical measures that was followed in the data analysis. To ensure the integrity of data, the researcher was checking the accuracy of encoding of the survey responses. This was carried out to ensure that the statistics generated from the study were truthful and verifiable (Leary, 2004).

Chapter Four

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the results of data analysis through SPSS from the distributed 306 questioners through Microsoft 365 online portal. 149 questioners were returned after completed all the relevant questions that mean the response rate of the questioner is 100%. The statistical data were entered into SPSS and analyzed by using descriptive statistical technique. The chapter begins by presenting the general background information of the respondents and then goes through the findings from questionnaire for the factors identified for the cause of cost overrun in donor funded project. The response of the respondents for the frequency of occurrence and the level of severity for the cost overrun factors identified was analyzed by computing frequency and severity index. Finally, the major cost overrun factors for the company under study were identified by computing their importance index.

4.2 Response Rate

The survey questionnaire is being prepared, filled in and administrated in the online platform by sending the link via emails from 30 May to 06 June 2023, interested participants being given enough time to fill in the questionnaire. A total of 306 online questionnaires were distributed to the respondents with close follow up and 149 respondents properly filled and returned the questionnaires in suitable form; and were used to do the analysis. This indicates that eighty four percent (94 %) response rate was attained; it meant many of the total targeted respondents were participated in the study.

4.3 Characteristics of respondents

This part of the data presentation summarized demographic profiles of the respondents, i.e. distribution of respondents in sex, age, and educational, marital status as well as their years of experience, the location of the respondent, type of organization with plotted project. In view of that, their responses are presented in the following table and followed by the implication of the responses.

The study was proofed that all the respondents were university graduated (well educated), worked or involved directly or indirectly with the project undergoing at International Rescue Committee. This shows that the researcher was not biased and collected the data considering all the respondents irrespective of their gender. It was believed that majority of the respondents could understand the subject under study that impacted cause of project cost overrun is on the cost overrun in construction project that executed under donor funded project. This show that the

study providentially included those employees who have extensive experience surveyed project get better picture the project executed in different areas of project site.

		Frequency	Percent
Organization	IRC	142	95.90
	Other	6	4.10
Type of organization	Client	15	10.07
	Contractor	8	5.37
	Other	126	84.56
	Total	149	100
Gender	Male	95	63.76
	Female	54	36.24
	Total	149	100
Respondent education level	Diploma	2	1.34
	BSC/BA	66	44.30
	MSC/MA	81	54.36
	Total	149	100
Respondent designation	Project Manager	25	16.78
	Site Engineer	3	2.01
	Head of Department	27	18.12
	Other	94	63.09
	Total	149	100
Relevant working experience in construction project (Years)	1-3 Yrs	40	26.85
	3-5 Yrs	25	16.78
	5-10 Yrs	46	30.87
	>10 Yrs	38	25.50
	Total	149	100
Office Location	Addis Abeba	107	71.81
	Other	42	28.19
	Total	149	100

Table 4. 1: Demographic profile of the respondents

Source: Survey result, 2023

Referencing the background information on the staffs at different level has been shown throughout the above table shows that, out of 149 the total of employee's and other

respondents ,142 (95.9 %) are International Rescue Committee and the remaining 6 (4.1%) number of the respondents are other. The result shows that most of the respondents are from the internal staff of the International Rescue Committee and the participation of external staff also involved on the survey process. According to the survey collected under the type of organization that the respondent operated the result showed that from the total number of respondents 149 employees, 15(10.07 %) are client, 8 (5.37%) contractor and the remaining 126 (84.56%) are IRC internal staff. On the other side from the total respondent's office location, most of them 107(71.81%) were at head office (Addis Abeba) and the remaining 42(28.19%) staff were operated in other place (in different field office). This implied that different stockholder was involved in filling out the survey and that supports the analysis to see in different aspect from different scope of views on cost overrun.

The above table displayed that, among 149 sampled respondents 54 (%) are females and 95 (%) of the sampled respondents are male. The results show that male project participants or actors could be controlling the engagement in implementation of the construction project that are funded by donor. This could be recognized to see further availed participation and employable in similar projects through various funds educational and financial support to women to empowering more women to engage in more on construction projects that are undergoing on donor funded.

The above table demonstrated that out of 149 sampled respondents' designation, 25 (16.78%) of the total respondent were Project Manager, 3 (2.01%) were also Site Engineer, 27(18.2%) respondents were head of department, the remaining 94 (63.09) sampled respondent were from other. This could be considered the study gathered information from well experienced people who acquired knowledge in projects.

The above table displays that, among 149 sampled respondents of their educational background, 1.34% had diploma, 44.3 % of the total respondents had first degree and 54.4% of them attended university postgraduate (masers degree) and this data shows that majority of the respondents were well educated and equipped with professionalism. Additionally, the respondent relevant work experience in construction project, 40(26.85%) respondents had experienced from 1-3 years, 25(16.78%) respondents had experience of 3-5 years, 46(30.87%) respondent had experience of 5-10years and the remaining 38(25.50%) had experience of >10 years . This implied that the Labor productivity is among the variables which affect project cost overrun. Educational background and work experience of employees can affect the reliability of the research data on the determination of factors which cause project cost overrun in that workers who had long year of work experience and better educational background may had a better knowledge on the topic under study.

Descriptive Statistics Analysis

A summary of the descriptive statistics is given here for ease of reference.

Descriptive Statistics

	Mean	Std. Deviation	N
Project cost overrun	3.8372	.75221	149
Responsible parties for causes of cost overruns (Contractor)	3.8931	.59549	148
Cause related to Contract Management Process	3.7894	.47222	149
Client-Related Cause	3.7239	.79949	149
External-related cause	3.8949	.80371	149
Level of competitor	3.6594	.79175	149

Table 4. 2 Descriptive Statistics

Source: Survey result, 2023

Notice that the standard deviations are large relative to their respective means for all variables. This would indicate a high variability among cause of cost overrun in construction project at IRC Ethiopia. However, whether the standard deviations are relatively large or not, will depend on the context of the application. Skill in interpreting the statistical analysis depends very much on the researcher's subject matter knowledge.

4.4 Inferential Analysis

This study used to two type of inferential analysis which are namely that correlation and multiple regression analysis.

4.4.1 CORRELATION INFERENTIAL ANALYSIS

The study uses scale typed questionnaire that is distributed to relevant respondents and responses of questionnaires encoded in to the SPSS 25 version. The study intends to measure the strength and the type of relationship among the independent variables, Responsible parties for causes of cost overruns (Contractor), Cause related with Contract Management Process, Client Related Cause, External related cause and Level of competitive to Plan cost overrun engagement significancy for correlation by referring to Schober, Boer & Schwarte (2018) a correlation coefficient lays between 0.40 and 0.69 is a moderate correlation.

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For clarifying the investigation to each factors that referred correlation matrix table it's observed that there is strong and statistically significant correlation between five cause of cost overrun in project funded by donor namely, Responsible parties for causes of cost overruns (Contractor), Cause related with Contract Management Process, Client Related Cause, External related cause and Level of competitive. As the correlation coefficient for each factors respectively identified as 0.000, 0.046, 0.000, 0.002 and 0.350 and in all cases at 1% significance level ($p < 0.01$).

		Project cost overrun	Responsible parties for causes of cost overruns (Contractor)	Cause related to Contract Management Process	Client-Related Cause	External-related cause	Level of competitor
Pearson Correlation	Project cost overrun	1.000					
	Responsible parties for causes of cost overruns (Contractor)	.322	1.000				
	Cause related to Contract Management Process	-.114	.013	1.000			
	Client-Related Cause	.594	.051	-.009	1.000		
	External-related cause	.469	.207	-.006	.384	1.000	
	Level of competitor	.418	.199	.046	.384	.317	1.000
Sig. (1-tailed)	Project cost overrun	.	.000	.083	.000	.000	.000
	Responsible parties for causes of cost overruns (Contractor)	.000	.	.439	.268	.006	.008
	Cause related to Contract Management Process	.083	.439	.	.457	.473	.288
	Client-Related Cause	.000	.268	.457	.	.000	.000
	External-related cause	.000	.006	.473	.000	.	.000
	Level of competitor	.000	.008	.288	.000	.000	.
N	Project cost overrun	148	148	148	148	148	148
	Responsible parties for causes of cost overruns (Contractor)	148	148	148	148	148	148
	Cause related to Contract Management Process	148	148	148	148	148	148
	Client-Related Cause	148	148	148	148	148	148
	External-related cause	148	148	148	148	148	148
	Level of competitor	148	148	148	148	148	148

Correlations

a. Dependent Variable: Project cost overrun

Table 4. 3 Correlation Inferential Analysis

Source: Survey result, 2023

The above correlation analysis was made to determine whether there is a positive correlation between independent variables and a dependent variable or not. Basing the above table one can

infer that there is a significant positive association between independent variables of contractor, contract management process, client related cause, External related cause and level of compotator.

MULTIPLE REGRESSION ANALYSIS

Multiple regression is a flexible method of data analysis that may be appropriate whenever a quantitative variable (the dependent or criterion variable) is to be explored in relationship to any other factors (expressed as independent or predictor variables). Relationships may be nonlinear, independent variables may be quantitative or qualitative, and one can examine the effects of a single variable or multiple variables with or without the effects of other variables considered (Stephanie, 2018). Adding additional explanatory variables to a simple linear regression model builds a multiple linear regression model. The process is identical within SPSS – including additional variables in the specification stages.

4.4.2.1 ASSUMPTIONS AND DIAGNOSTIC TEST

Attempts have been conducted to test normality, multicollinearity, autocorrelation, and test for average value of the error term are found in appendices part, next to the data collection instrument in this study. The assumption test was done based on theoretical and empirical multiple regression concepts and results found on Appendix next to data collection method. The test results show that the normality, Multicollinearity, autocorrelation, and test for average value of the error term were met the assumptions of regression analysis. It includes the data was normally distributed with no Multicollinearity and autocorrelation problems. This section contains diagnostic tests for testing the regression assumptions such as multi collinearity test, homoscedasticity, normality test, sampling adequacy, and normality tests for parameter stability.

Multicollinearity Test

Problem may arise when two or more predictor variables are correlated. The VIF detects multi collinearity by measuring the degree to which the variance has been inflated. A VIF greater than10 is thought to signal harmful multi collinearity as suggested by (Frost ,2017)

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Responsible parties for causes of cost overruns (Contractor)	.932	1.073
	Cause related to Contract Management Process	.997	1.003
	Client-Related Cause	.771	1.298
	External-related cause	.795	1.258
	Level of competitor	.795	1.258

Table 4. 4 Summary of Collinearity Statistics

The Variance inflation factor (VIF) was checked in all the analysis which is not a cause of concern according to(Stephanie ,2018) who indicated that a VIF greater than 10 is a cause of concern.

Normality Test

This study used the descriptive statistic of Kurtosis and Skewness statics calculation and demonstrates that the distribution was normal because Kurtosis and Skewness are in between -2 and +2, thus data is normally distributed and had a reasonable variance to use subsequent analysis. From the finding on the histogram test on normality, the study found that significance in both tests were less than 0.05 which is leads to the rejection of the null hypothesis that that data on all variables were not normally distributed this is an indication that data on the variables were normally distributed.
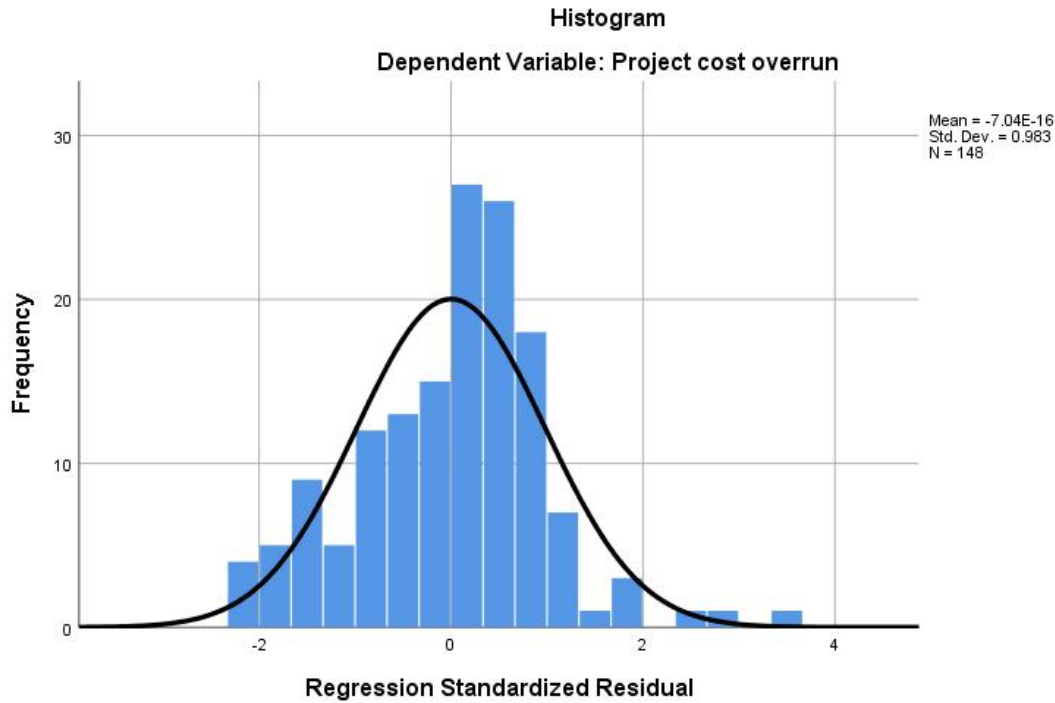
Figure 4. 1 Histogram
Source: Survey result, 2023

Test for Autocorrelation

If the observations have a natural sequence in time or space, the lack of independence is called autocorrelation. Assumption that is made of the multiple linear regression's disturbance terms is that the covariance between the error terms over time (or cross-sectional, for that type of data) is zero. To test the presence of autocorrelation, the popular Durbin-Watson Test was employed in this study. The Durbin-Watson statistic is 1.863 found with the specified range from 1.5 to 2.5, representing that the residuals are uncorrelated; therefore, the independence assumption is met for this analysis (Frost, 2017).

Model Summary

Model	Durbin-Watson
1	1.863

Table 4. 5 Result of Durbin-Watson (N=148)

Source: Survey result, 2023

a. LC, CMP,RPC, ERC, CRC

b. Dependent Variable: Project cost overrun.

Linearity Test
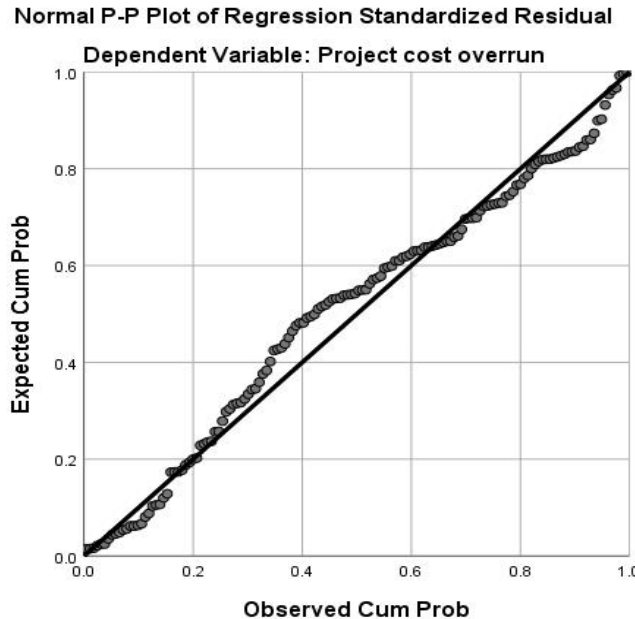
Figure 4. 2 Normal P-P Plate

Source: Survey result, 2023

The mean value of response variable (Y) is a straight-line function of the independent variables, X' A violation of this assumption may indicate that there is a non-linear relationship between the response and explanatory variables. In consequence, the linear regression model may not be applicable or fitted to the data under consideration. Therefore, the graph below shows that the regression can run.

Error Term

Test for average value of the error term is zero (E (ut) = 0); the first assumption required is that the average value of the errors is zero. Therefore, since the constant term (i.e. α) was included in the regression equation, the average value of the error term in this study is expected to be zero.

4.4.2.2 MULTIPLE REGRESSION TEST RESULTS

The below table portrays the results of multiple regression test and its measurement is made by inferring the value of Adjusted R square to explain the magnitude of the effect of the independent variable on the dependent variable. Here below illustrated are the linear regression

of 5 independent variables and dependent variable. As exposed in the below table, the overall bundle of determinant factors of the 5 independent variables were 50.8 % (Adjusted R = .508) explained the dependent variable. This suggests that 50.8 % of project cost overrun depends on the independent variables while the remaining 49.2% is determined by other unaccounted factors in the study.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.713[a]	.508	.491	.53795

a. Predictors: (Constant), LC, CMP,RPC, ERC, CRC

b. Dependent Variable: Project cost overrun

Table 4. 6 Regression Test Results Model Summary (N=149)

Source: Survey result, 2023

ANOVA

As the table shows the result F= 29.356, it can be concluded that the combination of determinant factor has positive effect on project cost overrun which is statistically significant. Thus, this study rejects the null hypothesis. F-test is used to determine whether any one of the predictor variables is related to explanatory variable in model equation. From the below table, it is evident that F significance value is less than .05 thus; at least one independent variable is linearly related to dependent variably thereby proving the validity of model equation.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.476	5	8.495	29.356	.000[b]
	Residual	41.093	142	.289		
	Total	83.569	147			
a. Dependent Variable: Project cost overrun						

b. Predictors: (Constant), LC, CMP,RPC, ERC, CRC

Source: Survey result, 2023

Test of Significance - Regression Test Results Coefficients

As the table shows the regression equation gives us two unstandardized slopes, both of which are partial statistics. OLS unstandardized coefficients can be interpreted as a one unit increase in X is associated with a coefficient sized increase (decrease) in Y. Standardized coefficients are the estimates resulting from an analysis carried out on variables that have been standardized so that their variance is 1. This means that they are in "standard deviation" terms or units and can be compared to each other. Whereas unstandardized coefficients literally tell us the change in Y for every 1 unit change in X. He also stated that the model summary table reports the strength of the relationship between the independent and the dependent variable.

This study employed multiple regression table and it found there is a positive and significant effect of contract management (.000) on cost overrun of the project . It helps to integrate schedules that allow eluding any gaps and mismatching between budget planning and expectations; so it has positive effect on cost overrun of the project.

Using multiple regression table, this study found that there is a positive and significant effect of improper contract management process (.046) on cost overrun of the project . In line with this study, Pall *et.al* (2020) among the main sector specific largely causes cost overrun right of way (ROW) problems is the most critical factor that implies it has positive effect on cost overrun of the project.

This study used multiple regression table and it found there is a positive and significant effect client engagement (.000) on the cost overrun of the project. That mean it has positive effect on transmission cost overrun.

This study deployed multiple regression table and it found there is a positive and significant effect of external related factor (.002) on the cost overrun of the project and occurrence of delay factors the perspective of project cost overrun. Actually, the least mentioned cost overrun causes in both the case scenarios included; accidents during work, corruption challenge, political interference and monopolization of material by the owner.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.613	.509		1.205	.230
	Responsible parties for causes of cost overruns (Contractor)	.292	.077	.231	3.785	.000
	Cause related to Contract Management Process	-.189	.094	-.119	-2.012	.046
	Client-Related Cause	.422	.063	.449	6.694	.000
	External-related cause	.190	.062	.204	3.084	.002
	Level of competitor	.134	.063	.140	2.124	.035

a. Predictors: (Constant), LC, CMP,RPC, ERC, CRC

b. Dependent Variable: Project cost overrun

Table 4. 8 Test of Significance - Regression Test Results Coefficients

Source: Survey result, 2023

Model Specification

Multiple linear regression model extends simple linear regression to include more than one explanatory variable. In both cases, we still use the term 'linear' because we assume that the response variable is directly related to a linear combination of the explanatory variables. The equation for multiple linear regression has the same form as that for simple linear regression but has more terms:

Yi = α+ β1(X1) +β2(X2) +β3(X3) +β4(X4) +β5(X5) + β6(X6) +β7(X7) +β8(X8) +β9(X9) +β10(X10) + e

As for the simple case, β0 is the constant – which will be the predicted value of y when all explanatory variables are 0. In a model with p explanatory variables, each explanatory variable has its own β_coefficient. Again, the analysis does not allow us to make causal inferences, but it does allow us to investigate how a set of explanatory variables is associated with a response variable of interest.

4.5 Hypotheses test

From the analysis results of the regression analysis, it was found that five of the independent variables (Level of competitor, Cause related to Contract Management Process , Responsible parties for causes of cost overruns (Contractor), External-related cause, Client-Related Cause) were significantly related to the dependent variables of cost overrun.

The pre-established hypothesis testing was made based on β, t, and P values. Hence using those coefficient results, the proposed hypotheses for this study were tested as follows.

H1: **Effectiveness of Contractor related causes will be having significant effect on the cost overrun.**
The results of multiple regression indicated under table 4.7 shows that contractor related cause has a beta value of 0.292 and it is significant at ($p<0.05$) This means 29.2% change in project success is due to a change in contractor identification and holding the other independent variables constant. It shows that contractor identification significantly affects the cost overrun of the project that funded by donor. Hence, the hypothesis is accepted.

H2: Proper Contract Management   related causes will have significant effect   on cost overrun.

The results of multiple regression indicated under table 4.7 shows that contract management process has a beta value of 0.189 at a significant value of ($p<0.05$). This implies that a 18.9% change in project success is due to a change in contract management process remaining other variables constant and it shows that contract management process affects the cost of the project that funded by donor success. Hence, the hypothesis is accepted.

H3:Examined Client related causes will have effect on cost overrun.

The results of multiple regression indicated under table 4.7 shows that, Client related cause has a beta value of 0.422 at a significant value of ($p<0.05$). This implies that a 42.2 % change in project success is due to a change examined in client related cause and the remaining other variables are constant and it shows that unmanaging client related cause affects the cost of the project's that funded by donor. Hence, the hypothesis is accepted.

H4: Level of compotators in construction industry will have effect on cost overrun.

The results of multiple regression indicated under table 4.7 shows that Level of compotators has a beta value of 0.134 at a significant value of ($p<0.05$). This implies that 13.4% change in project success is due to a change in managing the level of compotator engagement and the remaining other variables are constant. It shows that managing the level of compotators engagement affects the cost overrun on project funded by doner. Hence, the hypothesis is accepted.

H$_5$: External related causes for cost overrun will have tremendous effect on cost overrun.

The results of multiple regression indicated under table 4.7 shows that, external related causes affects the project cost overrun referring $\beta =0.190$, at significant value of $p<0.05$. This implies that 19% change in project success is due to a change in managing external related cause engagement and the remaining other variables are constant. It shows that external related cause engagement affects the cost overrun on project funded by doner. Hence, the hypothesis is accepted.

4.6 Summary of regression findings

Hypothesis	Tool	outcome
H1: Ineffectiveness of Contractor related causes will be having significant effect on the	Multiple Regression	ACCEPTED
H2: Improper Contract Management related causes will have significant effect on cost	Multiple Regression	ACCEPTED
H3:Unexamined Client related causes will have effect on cost overrun.	Multiple Regression	ACCEPTED
H4: Level of compotators in construction industry will have effect on cost overrun.	Multiple Regression	ACCEPTED
H$_5$: external related causes for cost overrun will have tremendous effect on cost overrun.	Multiple Regression	ACCEPTED

Table 4.8

Table 4. 9 Summary of regression findings

CHAPTER FIVE

SUMMARY OF THE KEY FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Key finding

This study explores the cause of cost overrun on project success in the case of International Rescue Committee. Investigating the cause of cost overrun on project success was the main objective of the study. The variables (Contractor related causes, improper Contract Management process, client related cause, External related cause, and level of compotator) are expressed as cost overrun process theory.

Out of the total 306 questionnaires that were distributed through online Microsoft 365 form to respondents, 149 (48.69%) questionnaires were properly filled and returned. Only 157 (51.30%) questionnaires were unreturned, and the analysis is conducted based on returned 149 questionnaires, which has a 48.69% response rate. The response rate is enough for further analysis.

Through employing a statistical tool called SPSS version 27 (Statistical Package for Social Science) the analysis was conducted on returned questionnaires. During the analysis, combined mean and standard deviation values were used for the descriptive analysis part, and To achieve the study project objectives a reliability, multi collinearity, normality and linearity test were conducted before conducting Correlation and multiple regression analysis.

The descrptive statistics show that the sample comprised 63.76% male and 36.24% female respondents .the majority of the respondents were experianced from 3 to 10+ years in the construction project,and they had a minimum of a Diploma.

The result of the correllation analysis show that the project cause of cost overrun had a strong correction with cost overrun. The five major cause of cost overrun higher correllation were responsible party for cause of cost overrun (contractor), Cause related to contract management process, Client related cause, external related cause and level of compitator signifinatly correcleted with the project cost overrun. The adjusted R -square value was 0.508(50.8%),which indicate that the model is good fit for the data.

From the result alternative hypothis related with effectiveness of Contractor related causes,

proper Contract Management process, client related cause, External related cause and level of compotator are accepted .

Over all ,this study provide valuable insights into the complex relationships between the cause of cost overrun in project and the effect of cost overrun. However ,further research is needed to know the remaining factors which are impacted the program cost overrun the donor funded project in the case of International Rescue Committee.

5.2 Conclusion

Financial resources are so scarce in developing countries like Ethiopia hence, cost related issues in donor funded construction projects are sensitive issues. Therefore, carrying out research in this area will have a paramount importance. Knowing the key causes of cost overrun is a prerequisite to minimize or to avoid cost overrun in the construction industry. Respondents of the study were all asked to identify causes, impact and measures against cost overrun. The analysis of the results from the closed and partly open-ended questionnaire was carried out using descriptive analysis. From the results of the analysis the following conclusions are drawn.

Cost overrun is a real life in construction projects in Ethiopia. This has been argued by most of them for they have such an experience across the country for their experience in working with private, non-governmental and public projects. There are significant variations in the total amount of cost overrun for different donor funded construction projects. However, construction of bore halls and health facilities has been investigated to have the highest rate of cost overrun due to their details in nature as compared to the rest of the projects.

Based on the broad objective the study made the following conclusion with regard to the specific objectives and research questions that guided the study. It was found that five most significant factors such as causing cost overrun in donor funded construction project in International Rescue Committee at different field office were as follows.

- The correlation results indicated that Contractor related factors, Contract Management process factors, client related factors, external related factor and level of compotator factors are positively or significantly correlated with cost overrun in construction project in International Rescue Committee.
- The result also shows that economic factors, due to change in interest rate and market fluctuation, exchange rate fluctuation, fluctuation in raw material price are the major factors leads to cost overrun.
- Regarding managerial factors, due to Delays in Decision making process, Poor project management leadership , and client interference are the major factors. This confirms that the delay is one of the leading issues often faced the construction project sites due to that the cost overrun highly embarked.
- The output related with the construction techniques and design factors, due to Frequent Design change, Design errors and mistakes, incomplete design at time of tender, deficient

design and delays in design process and Risk management strategy are significant factor for the occurrences of cost overrun.

5.3 Recommendation

It is apparent that construction project needs to be seriously consider all the internal and external factors causing cost overrun. Based on the analysis of research findings the following recommendations are advocated for further research

- It's recommendable that the project manager create good coordination, collaboration and communication with contractor, sub-contractors, and the employees of the organization. Coordination and good communication between the parties involved in the project creates a good and conducive working environment that motivates to a better work and can minimize the complexity of the construction project as well as the cost of the construction project.
- The contractor should be aware about the future economic factors to minimize the risk related with exchange rate fluctuation and variation raw material price whenever the bid computation.
- Construction techniques and design factor this study provides different measure that should be taken to minimize occurrence of the unnecessary change of design during construction, these measures are ensure proper feasibility study before design, ensure effective involvement of the parties during design stage, ensure sufficient budget for the project.
- Risk management strategies shall be applied to all level of the project to avoid cost overrun, implementing a risk management plan at the beginning of a project can help to remove some of the possible problems that can appear during project life cycle, so managers shall apply risks management skill to avoid any cost problems.
- Control costs: The organization shall establish appropriate cost control measure to minimize financial irregularities and optimize the allocation of resources to project activities that deliver the most value. The project manager shall be accountable for all project costs and ensure that the budget is not overrun.
- Enhance Stakeholder engagement: effective stakeholder management is vital for any project's success, and the organization should make it a priority. The key stakeholders should be identified early, and a communication plan should be developed to keep all stakeholders informed of the project's progress.
- The wrong cost estimation technique that resulted from inadequate training program thus the organization is recommended to provide a training program as necessarily. Wrong cost estimation may result in cost underestimation during a project initiation, and this results the difference in planned and actual costs incurred. This implies cost overrun to the company. Providing adequate training program is also essential to improve the capacity and productivity of the labor force.

- The stakeholder who involved on procurement process shall be involved in the bid document preparation such as developing technical specification during the execution of bill of quantities and the design of the project to ensure that value for money as well as time value of money to enhance the procurement process to be more economical, efficient, and effective.

Finally, this study recommended that in donor funded construction projects the concerned body should be provide a good planning and scheduling of all tasks are continuing process during construction. Monitoring the activity, match the resources availability and allocation and assigning right time to develop the work to avoid cost overrun.

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APPENDIX – Questionnaire

Dear respondents,

I am studying master's degree program (MA) with the field of Project Management at St. Mary's University (SMU).

The main purpose of this questionnaire survey is to collect information on "Cause of cost overrun in construction project in the case of International Rescue Committee. You / IRC employees / are asked to answer the questions in the questionnaire based on your personal knowledge and experience regarding the research title in IRC construction projects.

The questionnaire has two sections. The first section (Section A) consists of questions. aimed at collecting General information (profile and experience in construction) of the respondents. The second section (Section B) is aimed at finding out the causes of cost overruns. and responsible parties.

Hence, I request you kindly to fill up this questionnaire which will be of immense help in my study. I assure you that, this study is solely intended for academic purposes and confidentiality of your response is guaranteed.

Please take a look at the required information and try to answer correctly and accurately, as many projects information as possible. Please provide information as soon as you can, as timely reply is very crucial for the analysis.

Finally, thank you very much for your kind cooperation and willingness to fill out the questioner.

With best regards

Shimelis Dagima

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QUESTIONNAIRE FOR RESEARCH THESIS
SECTION A: GENERAL ORGANIZATION INFORMATION

1. Name of organization:- _____

2. Type of organization:- Client ☐ Consultant ☐ Contractor ☒

3. Gender:- Male ☒ Female ☐

4. Respondent's education level:

Diploma ☐ BSC/BA ☐ MSC/MA ☒ PHD ☐

4. Respondent's designation: - Project manager ☒ Site Engineer ☐

Head of Department ☐ Other _____

5. Relevant working experience on Construction project (Years): 1-3 Yrs. ☐ 3-5 ☐ Yrs. ☐
5-10 Yrs ☒ .>10Yrs ☐

6. Relevant working experience in Development/Refugee project (Years):

1-3 Yrs. ☐ 3-5 Yrs. ☐ 5-10 Yrs. ☐ >10Yrs ☐

7. Field Office _____

Please indicate the main cause or factor by ticking on the appropriate boxes. Add any remarks relating to each factor on the last column e.g., as to the reasons, the critical factors, or the solutions.

Significant factors:-

5 = extremely significant (%100); 4 = very significant (%75); 3 = moderately significant

(%50); 2 = slightly significant (%25); 1 = not significant (0)

SECTION B: CAUSES OF COST OVERRUNS ON DONER FUNDED CONSTRUCTION PROJECTS IN INTERNATIONAL RESCUEE COMMITTEE

Question related to project cost overrun	1	2	3	4	5	Remark
1. The project cost overrun is high in project procurement process.						
2. The project has high cost overrun on post execution phase (closure).						
3. The project is highly cost overrun as compared to the total budget allocated.						
4. The project execution plan on each activity highly imposed by cost overrun						

Responsible parties for causes of cost overruns:

   1. Contractor

Cause	1	2	3	4	5	Remark
1. Less emphasis to planning.						
2. Shortage of materials in site						

Cause	1	2	3	4	5	Remark
3. Poor schedule management						
4. Frequent breakdown of construction plants and equipment						
5. Technical incompetence and poor organizational structure						
6. Delays in site mobilization						
7. Inappropriate sub-contractors						
8. Poor qualification of the technical staffs						
9. The ability of the organization to manage risk.						
10. Fraudulent practices and kickbacks						
11. Inaccuracy of material estimate						

2. **Cause related with Contract Management Process**

Cause	1	2	3	4	5	Remark
1. Effective work relationship with contractor						
2. Poor preparation of tender documents in terms of drawing, Bill of Quantities						
3. Scope Changes, poor communication between stakeholders						
4. Poor contract management						
5. The difference between lowest bid and engineer's cost estimate						

Cause		1	2	3	4	5	Remark
6.	Tender-winning prices are unrealistically low.						
7.	Unclear, ambiguous, and contradicting terms in the tender documents						
8.	No proper SOPs or procedures defined for a process.						

3. Client Related Cause

Cause		1	2	3	4	5	Remark
1.	Shortening of contract period						
2.	Initiation of variations						
3.	Changes in site locations						
4.	Lack /poor/ of communication and coordination with contractors						
5.	Slowness of decision-making process						
6.	Additional works						
7.	Delay on site hand overing						

4. External related cause

Cause		1	2	3	4	5	Remark
1.	Escalation of material price						
2.	Fraudulent practices and kickbacks						
3.	Inadequacy of foreign collaboration agreements and monopoly of technology						

Cause		1	2	3	4	5	Remark
4.	Delay in obtaining permits from municipality.						
5.	Lack of labor, materials, equipment and tools in the market						
6.	Poor economic conditions (currency, inflation rate, LC and etc.)						
7.	Changes in laws, regulations and taxes.						
8.	Delay in providing services from utilities (such as water, electricity etc.)						
9.	Instable security situation						

5. Level of competitor

Cause		1	2	3	4	5	Remark
1.	The cost overrun is caused by the competition in the market						
2.	The competition between firms leads to cost overrun						
3.	The government regulation or polices can help to reduce the impact of computation						
4.	The level of competition in a market affects the severity of cost overrun						