

## **A STUDY ON CAUSATIVE FACTORS OF COST OVERRUN IN CONSTRUCTION PROJECTS IN MOGADISHU, SOMALIA**

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### **ABSTRACT**

**Objective:** Construction sector in Somalia has seen significant growth in recent years, leading to cost overruns that are often poorly managed. Cost overruns are a pressing issue in Somalia's construction industry. Investors are increasingly worried about this problem, highlighting the need for a thorough study to uncover potential solutions. This creates a research gap where it needs comprehensive research on cost overruns, particularly in Somalia's construction sector. Therefore, this study aims to identify and assess the primary causes of cost overruns and propose strategies to address this issue in construction projects, with a focus on the capital city of Mogadishu.

**Research Method:** This research employed a thorough examination to identify barriers, utilizing a quantitative approach for a comprehensive investigation. The study targeted a population of 127 Grade A contractors, with a sample size of 96 respondents. The methodology involved distributing a questionnaire to registered Grade A contractor companies associated with the Ministry of Public Works and Reconstruction in Somalia. Out of the distributed questionnaires, 60 were completed and returned. The collected data underwent analysis using descriptive statistics, focusing on measures of central tendency, along with the Relative Importance Index (RII).

**Findings:** The study's findings revealed that understanding the causative factors of cost overrun in construction projects and devising effective strategies to address them require a comprehensive recognition of key elements: materials, project management, contractor oversight, and unforeseen ground conditions. A consensus among most respondents suggested that both the reasons behind cost overruns and potential solutions align. The top four prevalent issues identified encompass challenges with materials, including the surge in material prices; concerns related to the project manager's experience and capability; issues with the contractor, particularly financial difficulties faced by them; and unanticipated problems arising from ground conditions, leading to additional claims by the employer. The research also pinpointed the management of the contractor's engineering sequence as the most effective strategy for mitigating cost overruns in construction projects in Mogadishu. This strategy secured the highest rating, with a mean score value of 4.233. These insights not only contribute to the understanding of factors influencing cost overruns but also offer practical guidance for addressing these challenges in construction projects in the specific context of Mogadishu.

**Originality:** Therefore, this result helps the parties of the construction industries and policymakers who seek to overcome cost overruns in construction projects in Mogadishu, Somalia.

**Keywords:** Cost Overrun, Construction Projects, Construction Industry, Mogadishu, Somalia

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## 1. INTRODUCTION

According to Gaal & Afrah (2017), Somalia is a country located in the Horn of Africa. It is nonbordering to the southwest, the Indian Ocean to the east, Ethiopia to the west, Djibouti to the northwest, and the Gulf of Aden to the north. Also mentioned is that Somalian infrastructure development has been left uncared for the last three decades due to financial recession, inadequate standards of habitation, environmental disasters, racial cleansing, tribal wars, and mostly political stability. The lack of investment in infrastructures such as building construction, transportation, water energy, and communication technologies obstructs economic growth and hinders the improvement of poverty. This demonstrates that infrastructure, such as the construction sector is an important contributor to the country's gross domestic product (GDP). Similarly, the construction sector in Somalia is strategically crucial to rebuilding the country from decades of devastation and mostly to economies in terms of good accessibility for a functioning society and job creation. Therefore, Somalia is in need of building construction, new road developments, and an improved built environment.

Generally, the construction industry is a significant component of the national economy and plays an essential role in the development of both the national economy and society. The construction sector has its own set of features, which must be understood to function properly (Ofori, 2015). Ullah (2018), mentioned that construction must be completed within budget if the project is to be considered a success. However, budget overruns have become a regular occurrence in the construction sector, causing a variety of undesirable outcomes, such as a reduction in construction activity, a decrease in revenue, disagreements among construction stakeholders, and the abandonment of projects. Besides that, budget overruns plague the vast majority of building projects across the world. Cost overrun, cost rise, cost variance, and cost escalation are all terms for budget overrun (Ismail, 2021). Furthermore, the construction activities are divided into three (3) phases. The pre-construction phase, the construction phase, and the post-construction phase. The project manager and the project team have the same goal of completing the project's work to achieve the project goals. Every project has a beginning, a middle period, and a final phase that culminates in completion (either successful or unsuccessful). The pre-construction phase, construction phase, and post-construction phase are the three main phases of a typical project. Each has its own set of activities and difficulties to address (Eskerod, 2013).

On the other hand, cost overruns in construction activities are defined as the completion of work that is later than the anticipated or contract timeline. Cost overruns are common in building projects, and they almost always occur in the above three stages. Cost overruns are also a serious issue that must be addressed immediately (Yap, 2021). Pham (2020), explained that cost overruns have become an increasingly common concern throughout the world and are especially prevalent in developing countries. In construction activities, cost overruns have had a devastating effect on the economy and the reputations of numerous companies. Budget control is a common goal of many of the project management solutions that have been created. However, the construction industry's high rate of cost overruns suggests that the industry's cost control is still lacking. Our goal is to detect and classify probable construction project cost overruns in this study (Karunakaran, 2018). Moreover, Ethiopia's building sector is an important aspect of the country's development strategy. It shares many of the country's scant financial resources. The building industry in Ethiopia receives the most government funds in terms of growth plans. As a result, Ethiopia is still in the process of development and the building industry utilizes about 60% of the total yearly consumption. There is still a significant amount of development activity that has yet to begin. Significant investment in the private and public sectors is one of the most important aspects of ensuring that a growing country like ours

achieves the required level of economic growth. The building industry is leading the way in this growth drive (Ababa, 2015).

Amusan (2018), revealed that projects that go over budget are a frequent topic of discussion in the media, both in Somalia and around the globe. Evidence from throughout the world shows that the likelihood of a project going over budget increases in proportion to its extent and also this information demonstrated that cost overruns were ascribed to faulty material estimation, increases in the cost of materials, and a lack of competence with the particular type of project. Rivera (2016), discovered more buildings will be built in the next 30 years than in the last 2000 years. Accordingly, the cost is an important factor in project success. This is especially true in developing nations like Somalia, where public construction activities must be completed with little funds. Recent Somali building challenges show that contractors need to strengthen cost management and reduce cost overruns. This modification is needed to align Somalia's practices with international standards. The amount of money spent is one of the most important factors to consider when evaluating the project success, and this is especially true for construction projects carried out in developing countries. In impoverished nations, building projects are often carried out with insufficient resources, which is why this has happened and frequently experience issues involving a shortage of materials (Nega, 2008). In most cases, a project is deemed to have been successful if it was completed without exceeding the budgeted amount.

Thus, this research concentrated on the causative factors of cost overruns for construction projects in Somalia. Using the findings from this study, Somalia's construction industry may be better prepared for the future.

## **2. LITERATURE REVIEW**

This literature clarifies the purpose of this chapter and point out all relevant topics about causative factors of cost overrun in construction projects. So, this review seeks to place the current work into the larger context of research.

### **2.1 COST OVERRUN IN CONSTRUCTION PROJECTS**

Cost overrun is defined as an additional cost that exceeds the contractual cost agreed upon through tender process. Also, cost is the budgeted expenditure which the client has agreed to commit for creating/acquiring the desired construction facility (Shehu, Endut, & Akintoye, 2014). Furthermore, cost overrun is described as the difference between the actual cost and the budgeted cost. The term "cost overrun" refers to the variance that exists between the planned costs and the actual costs of construction projects. The term "cost overrun" is synonymous with "cost escalation" or "budget overrun" (Ngobeni, 2018). In addition, the most significant factor in determining the success of a project is the performance of the costs. Not only does it demonstrate the profitability of the company, but it also demonstrates the productivity of companies at every point in the construction process. It may be viewed in the project account and is consistently utilized as a performance metric for the project (Azhar, 2008).

Nowadays, construction project's is a high value, time bound, special construction mission of creating a construction facility o service, with predetermined performance objectives defined in terms of time completion, budgeted cost, and quality specification and other specified constraints (Ahady, 2017). Cost is one of the five main parameters that can sufficiently define a construction project. Other parameters are scope, quality, resources and completion of time. The five parameters are interactive which means that each parameter is a function of other. The evaluation and balancing of interrelationship among the five parameters are a completed process. However, in a given project, the scope and quality of work in terms of quantity and specifications are specified and these parameters are not subjected to change (unless scope changes substantially). Resources and costs are co-related. Therefore, for a given quality, in

such situation, time, cost, and scope are core parameters. These parameters are interlinked and must be kept in balance to achieve project objective efficiently and effectively within changing environments (Alhomidan, 2013).

Nevertheless, even a margin cost overburden can sweep away the profit of a job, and continues cost overburden in most of the projects a firm can lead to bankruptcy (Akinci & Fischer, 1998). Organization faces a major challenge in controlling project budgets over the time span between project initiation and the completion of construction projects. The development of cost estimation that accurately reflect project scope, economic conditions, and are attuned to community interest and the macroeconomic condition provided a baseline cost that management can use to impart discipline into design process. Thus, projects can be delivered on budget but the requires a good starting estimate, project management discipline and an awareness of factors that can cause cost escalation (Shane, 2009).

## **2.2 PREVIOUS STUDIES ON COST OVERRUN IN CONSTRUCTION PROJECTS**

The aim of this previous study is to identify and get an understanding of the factors that contribute to cost overruns and then to develop a plan to address the problem. As a consequence, this section conducted a review of the findings of several studies linked to the cost overruns in the construction project that were conducted by earlier researchers.

An in-depth literature review identifies thirty (30) common causative factors of cost overrun in construction projects adopted by previous scholars as depicted in Table1.

## **3. METHODOLOGY**

Research methodology adopted to achieve the study objectives associated by literature review and questionnaire survey. The literature review is done by reviewing academic research journals, textbooks, the information available on the internet to study on causative factors of cost overrun in construction projects, identifying causative factors of cost overrun, determining the significant causative factors of cost overrun and ultimately suggesting the recommended strategy to overcome cost overrun. Furthermore, this study adopted a quantitative approach in carrying out the research objectives and used a stratified simple random sampling techniques to collect the relevant data. A questionnaire survey was distributed construction contractor companies that are registered from the Ministry of Public Works and Reconstruction under Grade A in Mogadishu, Somalia. In this study, the unit analysis was civil engineer, architectural engineer, project manager, and quantity surveyor. Thus, the causative factors of cost overrun in construction projects were identified in the literature and were categorized into eleven (11) group: project manager, contractor, consultant, Client, others/external, material, financial, unexpected ground conditions, poor project management, design team, and health and safety. Also, three (3) main group criteria of strategies to overcome cost overrun which are time management, cost management, and quality management.

Additionally, the data was collected and then analyzed using SPSS version 22 to conduct the test required for the achievement of the research objectives. The descriptive analyzed were used to present the background details of the respondents, the mean and standard deviation analysis, and then ranked by group and overall ranking using relative importance index (RII). A pilot study was then undertaken to test the questionnaire validity to ensure that the items/questions involved are sufficient to fulfill the objectives of this study. The pilot test is a small study done before the real distribution of the questionnaire (Lawless, 2010).

**Table 1.** Summary of Common Causative Factors of Cost Overrun in Construction Projects

No	Common Causative Factors of Cost Overrun in Construction Projects	Herrera et al., 2020	Memon et, 2011	Aziz, 2013	Shanmugapriya & Subramanian, 2013	Ahady et al., 2017	Mahamid, 2013	Muhwezi, 2014	Baloyi & Bekker, 2011	Naizi & Painting, 2017	Azhar et al., 2008	Ameh et al., 2010	Memon, 2012	Ofori, 2015	Nega, 2008	Chang, 2002	Ismail et al., 2021	Ababa, 2015	Rahman et al., 2013	Ullah et al., 2018	Frequency
1	Improper project management	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	19
2	Improper Planning	√	√	√	√	√	√	√			√	√	√	√	√	√	√	√			15
3	Lack of contractor experience	√		√		√	√		√			√	√	√	√		√	√	√	√	13
4	Underestimate project duration	√		√		√	√	√		√		√	√	√							9
5	The slowdown in design preparation	√	√	√	√	√	√	√	√	√				√		√	√	√	√		14
6	Delay in approval design				√	√	√	√	√		√		√				√	√	√	√	11
7	Financial difficulties faced by owner				√	√		√				√			√	√	√				7
8	Delay in payment					√		√	√	√	√			√		√	√	√	√		10
9	Shortage of site workers				√	√	√	√		√	√	√	√	√	√						10
10	Equipment failure									√	√	√	√	√							5
11	Delay in material procurement	√		√	√		√	√	√	√	√	√									9
12	Overestimation of costs	√	√	√	√	√	√	√	√	√	√	√	√	√							13
13	Inadequate contract evaluation			√	√	√	√			√	√	√	√	√	√	√					11

	a documentation																				
14	Poor site management and supervision		√	√	√	√	√	√	√	√	√										<b>10</b>
15	Lack of financial management and planning		√	√	√	√	√	√	√												<b>7</b>
16	Lack of planning and coordination					√	√	√	√	√	√	√	√	√	√	√	√	√	√		<b>13</b>
17	Lack of control over time and cost inputs					√	√	√	√	√	√	√	√	√	√	√	√	√	√		<b>13</b>
18	Lack of end-use involvement								√	√	√	√	√	√	√	√	√	√			<b>10</b>
19	Changes in surface ground condition		√	√	√	√	√	√	√	√	√	√									<b>12</b>
20	Contractor’s late completion					√	√	√	√	√	√	√	√	√	√	√					<b>11</b>
21	Contractor’s extra work					√	√	√	√			√	√	√	√	√					<b>9</b>
22	Changing particular methods										√	√	√	√							<b>4</b>
23	Lack of subcontractor’s skills					√	√	√	√	√	√	√	√	√	√	√	√				<b>12</b>
24	Delay in site mobilization									√	√	√	√	√							<b>5</b>
25	Project design complexity							√	√	√	√	√	√	√							<b>8</b>
26	Poor inspection plan by consultants				√	√	√	√	√	√	√	√									<b>9</b>
27	Conflicts between labors			√	√	√	√	√	√												<b>5</b>
28	Low productivity of labors			√	√	√	√	√	√												<b>5</b>
29	Corruption										√										<b>1</b>
30	Security										√										<b>1</b>



In this research, the pilot study was conducted among the construction professionals whose involves in Grade A contractors in Mogadishu. Next to that, random sampling was utilized. This type of sampling is very good in making sure that a large number of populations are represented. The target population of this study described as the contractors registered under Grade A and the number of construction companies registered contractors from the Ministry of Public Works and Reconstruction in Somalia is 127. Thus, the sample size for the target population of 127 are 96 respondents (Krejcie & Morgan, 1970).

According to Vagias, (2006), prescription, this research used a 5-point Likert scale ranging from 1 to 5 as follows: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree. Thus, respondents were requested to rate a list of 57 causative factors of cost overrun from 1 to 5.

#### 4. RESULTS AND DISCUSSIONS

This chapter presents the study's results using the Statistical Package for Social Science Software (SPSS Version 22). Data analysis method used is percentage, frequency, mean score, group ranking and overall ranking. The next analysis in this chapter begins with respondent profiles. After analyzing the reliability of the study questionnaire design, descriptive analysis findings were given based on 96 questionnaires from respondents. So far, 60 respondents obtained from questionnaire surveys were relevant for analysis. After the debate, all study survey results will help Grade A construction contractor companies in Mogadishu, Somalia.

##### 4.1 RESPONDENTS RATE

The pilot study was performed by the researcher to enhance the structure and consistency of the survey. A pilot test is a test that is done to find out whether the questionnaire operates properly before the actual study is done. This test must be conducted with 10 professional individuals who have like those who were involved in the study (Blumberg, 2014). The result of this pilot test showed that there is no difficulty of understanding the questionnaire by the respondent and positively improving questionnaire quality in terms of content, language, and design.

The questionnaires were distributed online, and 60 responses were received out of 96 respondents. All questionnaires were considered as they show that the respondent answered properly. Thus, the total number of questionnaires that were analyzed is 60, which represents 47% return rate. According to Fellows (2003), the normal expected usable response rate ranges from 25% to 35%. Therefore, the total response received has been considered sufficient for the purpose of this research. The data and response rate are summarized in Table 2.

**Table 2.** Respondents Rate

Target Population	Sample Size	Questionnaire Returned	Returned Rate
127	96	60	47%

##### 4.2 RELIABILITY TEST

A reliability test was conducted to evaluate the consistency of a study or measurement test using an instrument. This test aims to determine whether variables are internally consistent and reliable. The purpose of measuring reliability is to test whether the quality of the data in the questionnaire is reliable or not in order to generate an accurate result. Hence, the researcher uses Cronbach's Coefficient Alpha to calculate the reliability of the research. Thus, the reliability test would be outstanding (excellent) if Cronbach's alpha coefficient was greater than 0.90. Cronbach's alpha coefficients between 0.80 and 0.89 indicate very good reliability. In

contrast, when it is between 0.70 and 0.79, it is considered to have good reliability, whereas when the coefficient of Cronbach's alpha is between 0.60 and 0.69, it has a fair level of reliability. Finally, when it is between 0.50 and 0.59, it is regarded as having poor reliability, and when it is less than 0.50, the reliability and performance level are deemed unacceptable (Cleland, 2020). Table 3 shows Cronbach's alpha coefficient in order to determine the level of reliability of the variables.

**Table 3.** Range of Reliability and Cronbach's Alpha Coefficient (Cleland, 2020)

No	Cronbach's Alpha Coefficient Range, $\alpha$	Level of Reliability
1	More than 0.90	Excellent
2	0.80 - 0.89	Very Good Reliability
3	0.70 - 0.79	Good Reliability
4	0.60 - 0.69	Fair Reliability
5	0.50 - 0.59	Poor Reliability
6	Less than 0.5	Unacceptable

Table 4 indicates that 57 questions of the questionnaire items have been included to test the reliability of the variables. Consequently, the study Cronbach's Alpha Coefficient of the reliability has valued of 0.953, which is acceptable and considered excellent.

**Table 4.** Reliability Test Result

Cronbach's Alpha	N of Items
0.953	57

#### 4.3 DEMOGRAPHIC PROFILE

According to the questionnaire, Table 5 shows the demographics of the respondents. A questionnaire was distributed using a Google Form, an inquiry was sent out via email and WhatsApp, and a total of 60 Grade A contractors responded. Likewise, it provides insight into the company's past and present undertakings. Government agencies' projects account for 30.0%, Private firms' project types account for 46.7%, while both government and private firms' projects accounting for 23.3% of all responses. The majority of respondents had a master's degree 56.7%, the second majority of respondents had a bachelor's degree 30.0%, and also respondents had a PhD 13.3% in their educational background. Yet, 12 respondents had 6–10 years of work experience. They account for almost 20% of the total number of people that took the survey. Another 61.7% of those with 1–5 years of work experience responded to the poll, totaling 37 people. Aside from that, civil engineers and project managers comprise 56.7% and 20.0% of the responses, respectively. Also, 35.0% and 33.3% of the respondents were employed by enterprises whose primary focus was in the residential and infrastructural industries. Meanwhile, 31.7% of those surveyed were employed in the commercial sector (19 responses).

**Table 5.** Summary of Respondents Demographic Profile

Involvement in a Certain Industry	Category	Frequency	Percent (%)
Types of Projects	Government	18	30
	Private	28	46.7
	Both Government and Private	14	23.3
	<b>Total</b>	<b>60</b>	<b>100%</b>
Educational Level	Bachelor's Degree	18	30



	Master's Degree	34	56.7
	PhD	8	13.3
	<b>Total</b>	<b>60</b>	<b>100%</b>
Years of Experience	1 – 5 years	37	61.7
	6 – 10 years	12	20
	11 – 15 years	7	11.7
	Above 15 years	4	6.7
	<b>Total</b>	<b>60</b>	<b>100%</b>
Position of Firm	Project Manager	12	20
	Architectural Engineer	9	15
	Quantity Surveyor	5	8.3
	Civil Engineer	34	56.7
	<b>Total</b>	<b>60</b>	<b>100%</b>
Company's Primary	Residential	21	35
	Commercial	19	31.7
	Infrastructure	20	33.3
	<b>Total</b>	<b>60</b>	<b>100%</b>

#### 4.4 TO DETERMINE THE SIGNIFICANT CAUSATIVE FACTORS OF COST OVERRUN IN CONSTRUCTION PROJECTS IN MOGADISHU, SOMALIA

The first goal of this research is to identify the causative factors of the construction project cost overrun. The data analysis results were tabulated in Table 6, which ranked the important processes of managing construction cost overruns in Mogadishu construction projects from highest to lowest mean value. The highest-ranking has a mean score value of 4.084 while the lowest ranking is 3.929. The identification to conduct the important construction cost overrun management processes on construction projects. Materials based on the table below, the highest-ranking of the important construction cost overrun on construction activities in Mogadishu. The second rank is project manager of cost overrun management 4.047 of important processes of managing construction cost overruns. The third ranking is handlings of contractor's management 4.030 of important processes of managing construction cost overrun. The fourth ranking is unexpected Ground Conditions management 4.008 for important processes of managing construction cost overrun. The fifth ranking is an external cost overrun management 3.996 for important processes of managing construction cost overrun. The sixth ranking is Financial 3.989 for important processes of managing construction cost overrun. The seventh ranking is Poor Project Management 3.983 for important processes of managing construction cost overrun. The eighth ranking in Health and Safety 3.978 for important processes of managing construction cost overrun. The ninth ranking is a client 3.967 for important processes of managing construction cost overrun. The tenth ranking is Design Team 3.939 for important processes of managing construction cost overrun. The eleventh ranking is consultant 3.929 for important processes of managing construction cost overrun. The section and this objective are the respondent's responses that the identification of the causes of the construction project cost overrun. Which had been applied in the construction projects in Mogadishu Somalia.

**Table 6.** Significant Causative Factors of Cost Overrun in Construction Projects

Group Causative Factors of Cost Overrun	N	Mean	Group Ranking	Overall Ranking
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<b>1. Project Manager</b>	<b>60</b>	<b>4.047</b>		<b>2</b>
Project manager's inexperience and incapability	60	4.233	1	1
Failure of project manager to coordinate and demotivate the workforce	60	4.067	2	5
A project manager's incapacity to make the right decision	60	4.050	3	6
The project manager's lack of leadership abilities	60	4.000	4	9
The project manager's lack of technical expertise	60	3.883	5	15
<b>2. Contractor</b>	<b>60</b>	<b>4.030</b>		<b>3</b>
Improper planning	60	4.017	3	8
Improper project management	60	4.050	2	6
Lack of contract experience	60	3.933	4	13
Financial difficulties faced by the contractor	60	4.167	1	2
Lack of relationship between management and labor	60	3.983	5	10
<b>3. Consultant</b>	<b>60</b>	<b>3.929</b>		<b>11</b>
Poor contract management	60	3.800	3	16
Mistake in design	60	3.917	2	14
Underestimate project duration	60	4.000	1	9
Delay in approval of design changes	60	4.000	1	9
<b>4. Client</b>	<b>60</b>	<b>3.967</b>		<b>9</b>
Financial difficulties faced by the owner	60	4.100	1	3
Practice assigning the contract to a lower bid	60	3.833	4	15
Lack of communication with the consultant	60	3.917	3	14
Delay in payment	60	4.017	2	8
<b>5. Others/External</b>	<b>60</b>	<b>3.996</b>		<b>5</b>
High cost of machines	60	3.967	3	11
Shortage of site workers	60	3.933	4	13
Delay in material procurements	60	4.017	2	8
Unskilled labor	60	4.067	1	5
<b>6. Materials</b>	<b>60</b>	<b>4.084</b>		<b>1</b>
Shortage of construction materials	60	4.067	3	5
Change in material specification	60	4.083	2	4
Escalation of material price	60	4.167	1	2
Fluctuation of prices of material	60	4.017	4	8
<b>7. Financial</b>	<b>60</b>	<b>3.989</b>		<b>6</b>
Fluctuation in the money exchange rate	60	3.983	2	10
Lack of financial management and planning	60	4.050	1	6
Fluctuations in the cost of labor	60	3.933	3	13
<b>8. Unexpected Ground Conditions</b>	<b>60</b>	<b>4.008</b>		<b>4</b>

Changes in surface ground conditions	60	3.950	4	12
Contractor's late completion	60	3.967	3	11
Contractor's extra works	60	4.033	2	7
The employer got claimed for additional payment	60	4.083	1	4
<b>9. Poor Project Management</b>	<b>60</b>	<b>3.983</b>		<b>7</b>
Lack of planning and coordination	60	3.950	2	12
Lack of control over time and cost inputs	60	4.083	1	4
Lack of end-user involvement	60	3.917	3	14
<b>10. Design Team</b>	<b>60</b>	<b>3.939</b>		<b>10</b>
Lack of relationship between team members	60	4.050	1	6
Ineffective communication and information management by design team	60	3.833	3	15
Inability to work with a great project team is critical	60	3.933	2	13
<b>11. Health and Safety</b>	<b>60</b>	<b>3.978</b>		<b>8</b>
The inattention to health and safety factors in the organization	60	4.067	1	5
Unreportable accidents rate in a project	60	3.833	3	15
Lack of assurance rate of project	60	4.033	2	7

#### **4.5 DISCUSSION ON SIGNIFICANT CAUSATIVE FACTORS OF COST OVERRUN IN CONSTRUCTION PROJECTS IN MOGADISHU, SOMALIA**

The main objective of this research is to identify causative factors of cost overrun in construction projects in Mogadishu, Somalia and the second goal was to determine the significant causative factors of cost overrun in construction projects in Mogadishu, Somalia. Among all questions has been asked in this section of the questionnaire, it is analyzed using average the mean score. This means that the causes of cost overrun construction activities with the highest mean rank are the most important in objectives 1 & 2. As presented in Table above, the rating of the causes of cost overruns on construction activities based on average values. Overall, it's clear that the highest is material, such as selecting the winner supplier base on a lower price, this means that the most significant cause of the construction activities is a lack of materials in Mogadishu. When it comes to lack of materials in the local market owing to a lack of dependable suppliers based on the degree of the work is crucial. While the project manager of cost overruns second represented rating was also positively received from the respondents where most of them answered by proper project manager's experience and capability it's important in the construction activities, its effective communication between all project parties in construction projects.

On the other hand, the findings from the research indicated that handling cost overrun is influential in construction activities most respondents agreed cost overrun should be careful contractors in construction activities. Also, the finding of the research shows that shortages of materials are the highest critical problem that causes

cost overrun also respondents agreed on the needed proper project managers in construction management. Surprisingly, the last two causes of the construction project cost overrun in Mogadishu which is tenth and eleventh are Design Team and consultant respectively with mean ranks of 3.939 and 3.929. Moreover, cost overruns have remained a major setback in the implementation of construction projects in Mogadishu Somalia. In the Somalia construction industry, some projects have had cost overruns to a tune of 100% and are partly attributed to design flaws. Unfortunately, this study identified the results from questionnaires of construction activities in Mogadishu, most agreed it's not so effective for predicting their impact on cost overruns design team. Yet, the consultants do not also have more effect on cost overruns in construction activities in Mogadishu, as recorded through the questionnaire survey in this study.

#### **4.6 TO SUGGEST THE RECOMMENDED STRATEGY TO OVERCOME THE CAUSES OF THE COST OVERRUN IN CONSTRUCTION PROJECTS IN MOGADISHU, SOMALIA**

The second goal of this research is to suggest the recommended strategy to overcome cost overrun in construction projects in Mogadishu, Somalia. The data analysis results are presented in Table 7, with the determined recommended strategy to overcome cost overrun in construction projects in Mogadishu ranked from highest to lowest. The frequency of the mean score of each (Time Management 4.017, Quality Management 3.987, and Cost Management 3.967) are examined among all of the questions asked in this section of the questionnaire.

According to the below Table, the strategy of managing the contractor's engineering sequence has the greatest rating among the strategies to overcome cost overrun in construction projects in Mogadishu. With a mean score value of 4.233, this strategy has the top ranking. As the average mean index, the meaning of the score value is that it falls within the ranking of 3.50 Average Index 4.50, which falls under the category of "Agree." This ranking category indicates that the majority of respondents are certain that inadequate management of plan costs is one of the strategies to overcome cost overrun in construction projects in Mogadishu. The strategy of delaying the creation of a plan ranked last among strategies to overcome cost overrun in construction projects in Mogadishu, with an average mean score of 3.833. As a result, the conclusion of this section and this aim is that the respondents strongly agreed that these strategies to overcome cost overrun in construction projects in Mogadishu, Somalia may be employed.

**Table 7.** Recommended Strategy to Overcome Cost Overrun in Construction Projects in Somalia

<b>Group of Recommended Strategy to Overcome Cost Overrun</b>	<b>N</b>	<b>Mean</b>	<b>Group Ranking</b>	<b>Overall Ranking</b>
<b>1. Cost Management</b>	<b>60</b>	<b>3.967</b>		<b>3</b>
Management of Plan costs is lacking	60	4.233	1	1
Estimated expenses are missing	60	3.900	3	11
The inability to set a budget	60	3.867	4	12
The failure to put good design and planning into action	60	3.850	5	13
The absence of a well-	60	3.983	2	8

functioning management structure and skilled staff				
<b>2. Time Management</b>	<b>60</b>	<b>4.017</b>		<b>1</b>
Lack of control over the planning and execution of the work schedule	60	4.167	1	2
Actions are disrupted by activities that are not clearly defined	60	3.967	4	9
Unnecessarily underestimate the resources required for an undertaking	60	4.117	2	3
Inaccurate Activity Duration Estimates	60	4.000	3	7
Delay in the creation of a plan	60	3.833	5	14
<b>3. Quality Management</b>	<b>60</b>	<b>3.987</b>		<b>2</b>
Lack of quality control for the plan	60	3.867	5	12
Lack of Perform quality assurance	60	3.917	4	10
Lack of Quality Control	60	4.100	1	4
Uncompleted understanding of the works and processes	60	4.033	2	5
Lack of System of review and feedback on the site problems hindering good workmanship	60	4.017	3	6

#### 4.7 DISCUSSION ON SUGGESTION TO OVERCOME COST OVERRUN IN CONSTRUCTION PROJECTS IN MOGADISHU, SOMALIA

For the second goal, all items in this section were answered with an average mean of 4.233, which falls within the category of "Agree" in the mean. Since most respondents strongly agreed with the statements presented, we may conclude that the following conclusions are true: The majority of respondents strongly agreed that Somalia's lack of a strategy for managing the contractor's engineering sequence is significant to cost overruns in construction projects, and these respondents found ways to overcome cost overruns in construction projects by appropriately managing the contractor's engineering sequence. So, this conclusion is in line with other studies (Riedel & Al-Keim, 2017). An encouraging result was found in regards to the issue of contractor engineering sequence inspection, with the overwhelming consensus that projects in Mogadishu, Somalia face a problem due to the absence of contractor engineering sequence inspection, and that construction firms can avoid cost overruns by performing such inspections. As well, research based on this method was supported by its findings (Azis, 2013).

To minimize cost overruns, it is critical to stress the importance of effective project execution, which was cited by many survey participants as a major cause of project delays and overruns in Somalia. Using proper design and planning, as well as an effective management system, skilled employees, and the correct materials, are other ways to avoid cost overruns. This approach is backed up by studies conducted by (Azis, 2013). As a final point, all respondents strongly agreed that cost overruns in construction projects in Somalia may be avoided by using a variety of solutions, which are supported by a large body of research (Riedel & Al-Keim, 2017; & Azis, 2013). They are:

- Review and feedback system for problems on the job site that impede quality



work.

- Comprehensive knowledge of work procedures.

## 5. CONCLUSIONS

The fragility of Somalia's construction industry, attributed to the nation's limited financial resources, underscores the significance of addressing construction-related challenges. Consequently, conducting a study in this domain becomes imperative for Mogadishu, Somalia. A crucial aspect involves minimizing or preventing cost overruns in construction projects, necessitating a thorough examination of the contributing factors. The primary objective of this study is to unearth and delve into the root causes of cost overruns in construction projects within the context of Mogadishu, Somalia. The research meticulously explores the variables that give rise to cost overruns in construction projects in the region, offering insights into effective preventive measures. Additionally, the study presents a concise summary of its key findings, aligning them with the overarching goals outlined at the outset. This comprehensive approach aims to contribute valuable knowledge to the enhancement of construction practices in the specific context of Mogadishu, Somalia.

This study employed descriptive analysis to pinpoint the causative factors of cost overrun in construction projects in Mogadishu, Somalia. Through the utilization of SPSS software, eleven distinct groups of causative factors were meticulously examined, revealing that the four most significant contributors to cost overrun in the context of Mogadishu are: materials, project management, contractor-related issues, and unexpected ground conditions. Furthermore, the study employed SPSS software to assess three key criteria groups of recommended strategies aimed at mitigating cost overrun in construction projects in Mogadishu, Somalia. The results underscored the significance of all three groups—time management, cost management, and quality management—as highly effective in overcoming cost overrun challenges. This rigorous analytical approach enhances our understanding of the nuanced dynamics influencing cost overruns in construction projects in Mogadishu and provides valuable insights into strategies for their prevention and mitigation..

In conclusion, the research determined that the most effective strategy for mitigating cost overruns in construction projects in Mogadishu is the management of the contractor's engineering sequence, receiving the highest rating with a mean score value of 4.233. This underscores the critical importance of this strategy in addressing and preventing cost overruns. Given the limited existing research on the factors influencing cost overruns in construction, this study serves as a foundational step toward developing comprehensive plans to tackle cost overruns and enhance their future management. The insights generated from this research are particularly valuable for contractors in Mogadishu seeking effective strategies to navigate and prevent cost overruns in their construction projects

## FUTURE STUDY

This study is part of Master research. The scope of this study will be extended to identify the significant causative factors of cost overrun in construction projects in Somalia using the results presented in Table 6. Finally, strategies recommended will be developing by overcoming causative factors of cost overrun in construction projects in Mogadishu, Somalia as indicated in Table 7.

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