

A Review Study to Extract the Reasons Leading to Cost Increase in Construction Projects

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Abstract

Success in building is meeting deadlines within budget and following contract criteria. Construction projects often face issues, with rising prices being the worst. Construction projects often experience cost inflation, which affects sustainability, continuity, productivity, and quality. Parties may also argue. This research study examines relevant literature to identify the main factors that cause construction project cost overruns. This extensive study comprises 96 investigations from 1997 to 2024. This detailed investigation found 45 factors that mostly raise construction project expenses. Methodically categorized aspects included stakeholder elements, technical factors, managerial factors, project resource factors, external factors, and political factors. Decision-makers, construction experts, and project stakeholders benefit from identifying and classifying these aspects. It gives them the tools to develop plans and use modern project management methods. It also helps create and implement cost management plans and monitors project activities throughout. These results allow stakeholders to adopt solutions that lower construction project expenses, assuring safe and effective project execution within budget.

Introduction

Building projects are complicated and demanding, thus they often confront various challenges. Therefore, these issues often delay or terminate projects. When cost control is lacking, project costs rise, which is one of the main issues in this circumstance. Academic research on project cost overruns has grown in recent decades. Research is underway to understand this prevalent issue [1]. Huge construction projects are becoming known for unexpected budgets and lengthy durations. This emphasizes the need to carefully manage expenditures and keep to the budget throughout project planning [2]. The project's budget must be carefully considered during construction. We thoroughly analyze these expenditures during project planning and obtain legal clearance before starting the job. Since the project is ongoing, we track all expenses. Comparing anticipated and actual construction costs is essential for project evaluation [3]. Cost is an important factor in evaluating construction project success because of its influence on the business. However, project management aims to complete projects within budget, where cost is a key factor in project

success [4], and project cost can indicate a project's success and efficient development, or it might cause delays.

Definition of increases in project's cost

Building projects confront several challenges, but one of the biggest is exceeding expected costs [5]. Nearly all construction projects experience cost overruns [6]. Cost increases are a key and dangerous factor affecting building projects. It diminishes business margins, causing significant losses, and threatens project success. Construction stakeholders prioritize this issue. As articulated by [7], cost escalation is characterised by the disparity between the actual expenditures and the initially estimated costs, primarily attributable to various variable factors. [8] Defining cost escalation as the percentage differential between the final total cost and the contracted bid cost. [9] Posit that cost escalation transpires when the agreed-upon contractual amount between the contractor and the project owner, established at the contract's inception, deviates from the actual total cost upon project completion. Cost escalation poses a predicament that adversely affects clients, contractors, and consultants, giving rise to complications concerning financial liquidity, legal disputes, and arbitration [10]. Project management becomes much more complicated when real budgetary expenditures rise, a phenomenon known variously as cost escalation, cost overruns, or cost excess. Consequently, cost control techniques become even more crucial. An example of how costs can quickly escalate beyond initial projections and prevent projects from finishing on time is the concept of budget overruns [11]. When the total sum of a contract deviates from its original award, this is known as cost escalation [12]. The budgeting phase underestimates real expenses, which leads to a discrepancy between the actual construction expenditures and the expected costs established during project planning, which in turn causes the costs to escalate. When project costs keep going up, owners may find themselves unable to pay for unexpected costs, which might postpone construction or even force them to abandon the project altogether [13].

Cost escalation, in its simplest form, occurs when actual project costs end up being more than expected [14]. Cost escalation occurs when real costs rise over the initial or target cost, and it hinders the project's ability to achieve its intended goals [15]. According to [16], this issue arises when infrastructure projects do not have adequate financial planning, which leads to incorrect cost management. Unanticipated discrepancies in spending, whether they rise above or fall short of the anticipated levels, due to a variety of factors, are what constitute cost escalation. This has long been a point of contention among those involved in civil engineering projects, and it happens often. Thus, in order to prevent major implications for building projects, it is crucial to identify the reasons behind cost escalation, develop measures to reduce it, and look into other options [6]. Given the ubiquity of cost escalation in most construction projects, it is vital and mandatory to investigate the underlying variables [17].

The primary purpose of this research is to conduct a thorough literature assessment on the causes of construction project cost overruns. The success of a project depends on these aspects at every point of its life cycle, from planning to execution to closure. All parties involved in building projects need to give these considerations their entire attention to find a solution to the problem.

The main goal of this effort is to ensure that projects are completed safely, as planned, and without incurring any unnecessary costs or delays.

Factors causing project cost increase

The study involved a meticulous review of one hundred and two relevant scholarly works addressing the research subject matter. The subsequent paragraphs will elucidate some of these studies conducted to discern the factors or causes behind cost escalation, as identified from the literature review. These factors were systematically categorised into six distinct groups, each comprising several individual variables that collectively contribute to the increase in project costs. These categories are:

1. Stakeholders related factors
2. Technical
3. Managerial
4. Project resource
5. External
6. Political

It is crucial to acknowledge that the considerations and prominence of specific cost factors may vary from one country to another, contingent upon the unique characteristics of the nations and the nature of the projects undertaken therein. In light of this, the author has discerned the following factors from the comprehensive literature review.

Stakeholders-related factors

Project cost escalation in construction projects can be attributed to many underlying causes. As elucidated in a study conducted by [18], stakeholders, including contractors and clients, emerge as the primary contributors to cost escalation. The study identifies three distinct reasons for these factors.

Client's responsibility

In their research, [19] identified several factors about the client that significantly contribute to cost escalation in construction projects. These factors encompass various elements, such as setting unrealistic contract durations, project implementation delays, work suspension initiated by both the contractor and the client organization, contractor settlements, client claims, delays in the issuance of change orders by the client, protracted decision-making processes within the client organisation, client intervention in construction activities, a lack of cooperation with the contractor resulting in complex contract administration and delayed payments, sluggish project progress due to inadequate communication between the client, contractors, building authorities, government bodies, ineffective coordination between the client and other project stakeholders and an excess of bureaucratic processes within the client management.

Moreover, [10, 20] have also emphasized the client's role in higher project costs. They have identified factors such as contract amendments, replacements, the inclusion of new work in the

project, improvements in specifications and financial aspects, issues stemming from the lack of practical experience, ineffective decision-making, communication challenges, unfavorable relationships with contractors, delayed payments, and financial and economic hardships as contributors to cost escalation. Reference [21] recommends that customers should set aside enough money, use dependable contractors and consultants, and devote enough time to the planning and design stages to avoid these cost overruns.

According to [22], one of the most important factors that might cause construction projects to go over budget is the client's attitude toward modification requests (variations) and how clear their original project brief was. According to research by [23], one of the main causes of budget overruns is when clients want to add more features or change the project's design. Cost overruns will have far-reaching consequences, shaking up the construction industry and its most important players. Loss of ROI due to cost escalation occurs when project expenses go above the client's original budget [24]. The primary causes of project cost overruns, according to [25], are poor planning and scheduling, insufficient client funding, unreasonable cost estimates, pauses in payments instigated by the client, and financial problems experienced by the client.

In addition, a large-scale research on an Indian project [27] identified many elements that contribute to cost overruns. According to their findings, the main reasons for the increase in expenses were the client's delay in paying for extra services and the delay in resolving claims.

Consultant's responsibility

The engineering supervisor, along with the designer or architect, makes up the consulting firm that advises on building projects. The job of an architect includes not just designing and planning structures, but also the landscapes that surround them. In most circumstances, a consultant refers to an individual participating in the design process or any other task involved in the design or implementation of building projects. Therefore, it is apparent that the consultant participating in the building project undoubtedly affects the development of the construction activities by monitoring the activities and ensuring that specific compliance measures necessary for the construction process have been satisfied. Consultants are given the authority to agree to satisfy specific standards such as design, foundations, steel installation, quality of primary materials before construction begins and other construction features and requirements. Therefore, any lack of information and specifics or inaccuracies that were agreed upon would raise the project's cost. Furthermore, [12] indicated in a study he conducted that the factors mainly associated with the responsibility of the consultant that cause cost increase in construction projects are the absence of the consultant's staff from the site, the lack of expertise required by the consultant, the lack of experience of the staff appointed by consultant, late and slow supervision processes that are implemented to take timely decision, incomplete documentation, slow and sluggish giving of instructions, provision of insufficient or incorrect design data [12]. For consultants, cost increases indicate an inability to deliver value for money and can ruin their reputation and lead to losing faith in clients to invest in them [23].

Contractor's responsibility

A contractor is any legal body or individual who can contract with a customer to carry out services or a portion of the task. Therefore, the contractor's performance can delay the building

project in numerous ways and cause a rise in the project cost [27]. [23] conducted a study and found that project costs are more likely to rise when contractors' expertise is limited and uncertain. The research of [7] showed that one of the criteria used to qualify contractors invited to submit bids is the contractor's experience in implementing previous projects with the work team, putting the security of the construction project at risk and increasing the cost. According to the study's findings [4], significant variations in the cost and excesses of a project are the result of the failure of engineering and architectural construction firms to meet project requirements and standards, inadequate bid decisions, and the selection of unqualified contractors as the lowest bids are more likely to be awarded the contract. [28] revealed that the contractor's inefficient site management led to an inability to plan adequately and anticipate the expenses necessary for the project. According to [9], a study of 42 parameters influenced cost escalation. The most notable of these variables are enterprises with limited experience, represented by contractual parties, which are more subject to cost inflation and high expenses, the cost of machinery, the fluctuating cost of made components, and poor quality. Management was the fourth most significant aspect in reducing cost escalation. When the experience and competence of the contractor are not enough, it always makes the task pricey. The result is an increase in cost and a delay in the building project [29], on top of the increased expenses that may lead to rework. Mistakes, rework throughout the building process, and inflated project costs directly result from the contractor's inability to provide accurate estimates and deliver satisfactory technical performance [30, 11]. When contractors do not provide workable schedules and plans from the get-go, it becomes a hassle to monitor progress and ultimately drives up the project's cost [28]. Loss of profit due to increased expenses might cause a contractor to drop a project altogether, slow down on construction, get a bad reputation, and have trouble-getting project financing, or get it only at a higher interest rate. Consequences like this undermine the long-term health of the building industry [24]. The contractor should take the lead in maintaining the site. Everything involved, including fixing any problems that arise during construction. The contractor's failure to monitor progress and respond to issues might result in costly delays [31].

Project manager's responsibility

Completing the construction project within the financial limits and the time provided is impacted by the project manager's ability, especially during project implementation [32]. The positive attitude of the project manager and project participant positive attitude is the most critical indicator of success in quality compliance in the project. [33] stated that a project manager who underestimated the project's human resource demands might generate additional expenditures. A project manager who does not appropriately monitor progress, troubleshoot difficulties when necessary, or handle collaboration issues might face delays in project work phases, which may influence the project cost [34]. Before implementing the work plan, a qualified project manager can correctly estimate the material costs of each project step. If the project manager is not attentive in forecasting and calculating projected expenditures, the project may drastically exceed its budget. This often implies the consumer paying additional costs or the corporation having to bear the expenses. To avoid this circumstance, all project team members should frequently evaluate their budget allocations and send status updates to the project manager [34]. If a project manager does not have proper planning in project management, it may create cost overruns on construction projects. For instance, if the project requires a more extensive workforce than first expected or requires specific knowledge or

skills that cannot be acquired inside the organization and must be outsourced. Using outside resources might boost the project's final cost. In addition, the project manager allocates responsibilities to individuals not fit for specific project phases. The task may take longer to finish, or quality may be degraded again, resulting in additional expenditures to the work, such as human costs. Factors relevant to stakeholders are listed in Table 1.

Table1. Summative stakeholders related factors

	The related factors to this category are:	source
Client's Responsibility	Type of client (public/private)	[35], [21], [36] and [22]
	Client's initial brief (clear scope definition)	[21], [22]
	Ineffective communication between the client and the design team	[37], [38] and [39]
	Client's attitude towards changes (variations)	[40] and [41]
	Client's budget/cash-flow constraints	[40], [42] and [36]
Consultant's Responsibility	Unclear and detailed drawings and specifications	[43], [42] and [22]
	Competency and experience of the consulting firm	[40]and[30]
	Lack of availability of a database for historical cost data	[36]
	Quality of information and requirements between experts	[22] and [42]
	poor estimation of the original cost	[44], [45]
Contractor's Responsibility	Lack of capacity of the contractor	[46] and [27]
	Improper material estimate	[47] and [49]
	Cost of the Reworks.	[2]
	Financial difficulties of contractor	[50], [51] ,[36] and [26]
	lack of contractor experience	[51] , [52] ,[53] and [54]
	Complexity of design and construction	[55], [56] and [57]
	late payment from contractors to subcontractors	[26], [58]
	incompetent subcontractors	[59]
	inappropriate contractor policies	[60] and [61]
	Lack of coordination between general contractor and subcontractors	[60]
Project Manager's Responsibility	Inadequate project manager experience	[34] and[1]
	Lack of negotiation and cost management skills	[34], [1] and [26]

Technical related factors

This category includes five factors including:

1. Lack of accuracy of cost estimate data

Cost estimations based on current pricing information must be considered to prevent mistakes or cost swings and arrive at a realistic offer [62]. Cost estimating papers must be clear and intelligible since the core of successful estimating is the formats, techniques, and processes utilized to estimate the project's cost. Poor estimating comprises typical mistakes and omissions in project numbers and plan details, as well as general inadequacies and subpar performance in planning and estimating methods and methodologies [63]. Extensive experience is needed to make a reasonable approximation of the project cost, as the estimator must calculate costs for quantities of materials and labour, project contingencies, and use techniques to make in-depth analyses, assumptions, and projections of cost rates to avoid future project cost increase [64]. [65] analysed the literature on cost growth and its causes and discovered that erroneous cost estimates are the most critical factor directly impacting cost. Incorrect cost estimates contribute to project budget overruns for numerous reasons, including the inability to gather data and process amounts that need to be linked to data and information [29]. The time available to create cost estimates is one aspect that leads to increased project expenditures [37].

2. Changes in the scope of work

According to research [64], a change in the project's scope might create delays and changes in project expenses by identifying all deliverables needed after project completion. Each project has a specified timeframe and budget assigned during the planning phase. When making any changes to the scope of the project, the likelihood of cost rise becomes high, hence delays in the project [66]. It is conceivable that the project sponsor may wish to incorporate extra aspects into the project or adjust the complete list, which might lead to a cost rise, according to research [23].

3. Errors in interpretation of details between pre-construction stages to post-construction stage [9].

A study discovered a variety of causes that lead to cost increases in various building projects. It was determined that failing to define facts precisely and specifically from the beginning of the project is one of the most critical elements that cause a rise in project expenses. Clarifying and documenting the specifics are incredibly crucial, especially when it is early in the project. The clarity of architectural drawings, plans, technical specifications, and project requirements in all their intricacies helps reduce additional charges and eliminate issues the project may encounter.

4. Design errors

Design flaws are one of the causes that lead to cost escalation. These mistakes frequently need more work from architects and engineers. Also, additional time and cost inputs from the contractor and additional supplies eventually affect the cost rise. A design that contains flaws and tries to remedy these faults, especially in the implementation phase, may contribute to increased expenses

and delays in the project [67]. Design flaws generate fluctuation in the project cost, as project estimates are determined based on the designs produced. As such, any design faults in the form of omissions or modifications in the design may lead to changes in the cost estimate since it may necessitate more labor, change orders, etc. In addition, this generates additional expenditures for the project. Achieving an error-free design needs strong communication with the entire design team and incorporating a carefully planned design process, enabling enough time to make the modifications necessary to create a precise design [34]. [66] revealed that design flaws in building projects were the most critical element that directly influenced the cost. [69] The research was done in Portugal and revealed that design mistakes and direct changes in design were among the contributing causes of increased costs.

5. Methods, Techniques of Construction

Claimed that flaws in construction processes and procedures, effective monitoring and feedback mechanisms, and the contractor's inability to plan and schedule the project at the tender stage were the critical reasons for the cost rise in construction projects in Australia. [56] noted that various reasons considerably influenced the cost of building projects over the cost indicated for the project; the most notable is the lack of information regarding construction processes and procedures utilised in implementing the project.

Table2. Summative of Technical Related Factors

	The related factors to this category are:	source
Technical	Lack of accuracy of cost estimate data	[62], [32], [70] ,[68], [29], [37] ,[71], [9] and [27]
	Changes in the scope of work	[64], [66] and [23]
	errors in the interpretation of details between the pre-construction stage to post construction stage	[9] and [53]
	Design errors	[67], [34], [65], [68] and [51]
	Methods, techniques of construction	[57] and [56]

Managerial Related Factors

This category includes five factors including:

1. Poor Material Management

[72] defined materials management as the system for planning and controlling all of the efforts necessary to ensure that the correct quality and quantity of materials were properly specified promptly, and obtained at a reasonable cost and most importantly were available at the point of use when required. Poor materials management leads to delayed delivery of goods or risks of purchasing at higher prices, resulting in project expenses surpassing the cost indicated at the project's outset. Materials management is crucial to productivity and cost-effectiveness. When materials are managed improperly, the contractor loses money, and the project is in danger, which

leads to increased expenses [29]. However, [27] identified insufficient materials procurement processes and delays in on-site supply delivery as major factors that contribute to project cost overruns.

2. Poor site management and supervision

As previously stated by [59], the analysis pinpointed the three primary factors responsible for Vietnam's costly overruns. The report found that the client was experiencing money problems, that there was little help from project managers, and that there was a lack of oversight and management on the job site. Research by [73] indicates that ineffective site management and coordination, change orders due to client-requested reinforcements, and an excess of materials used during construction are the main reasons why building projects in Ethiopia end up costing more than expected. [75, 39, 53] all found that construction-stage costs increased due to inadequate management and supervision on the job site, which led to larger price variations [70]. Inadequate site management leads to ineffective monitoring of progress. Improper distribution of work, non-compliance of site workers, and inadequate project monitoring directly influence cost increases [39, 62].

3. Poor Communication between Construction Parties

Poor communication between customers and contractors has a detrimental influence on the cost of building projects [75]. [13] described in their study several factors that led to increased costs in construction projects, which were the lack of essential elements of success in projects, the most important of which were regular coordination between the contractor and the client and between the work and the main project parties.

4. Slow decision-making

The critical factor for project cost growth is poor decision-making by the main project stakeholders [76]. The primary factors for producing variations and cost rise in Iran building projects are the difference in expectations from different project participants, poor decision-making, and inability to handle issues [77, 78].

5. Lack of scheduling, planning and management

According to [56], a primary factor contributing to the escalation of project costs was the absence of sufficient knowledge about project construction techniques, related hazards, project background information, project scheduling, and effective project management. Ineffective management, constant plan revisions, and a lack of efficiency are common causes of budget overruns and other problems that arise over a project's lifetime. According to [30], problems like these usually crop up whenever contractors, customers, owners, and consultants face challenges and hurdles while working on a project. A possible solution to the problem of project cost escalation is the use of appropriate monitoring and management methods. The predicted cost rise often exceeds the actual cost of a building project when delays occur, hence this is of utmost importance. [52,18] The research examined the various factors that cause building project costs to escalate. All of these

factors contributed to poor project planning, inaccurate cost estimates, and the introduction of unnecessary restrictions like schedule limits and undetermined completion dates. Excessive spending on construction projects sometimes results from starting off without key success factors, such effective planning [79].

Table3. Summative of Managerial Related Factors

The related factors to this category are:		source
managerial	Poor Material Management	[29], [27], [42] and [80]
	poor site management and supervision	[59], [73], [69], [79] ,[74] [39], [35] and [2]
	poor communication between construction parties	[75], [32] and [13]
	Slow decision-making	[76], [77], [78]
	Lack of scheduling, planning, and management	[56], [30], [18] and [52]

Project Resource-Related Factors

Included in this group are five elements, which are:

1. Inflation (increase in the unit cost of construction materials)

Two studies that looked at the topic of building project costs [45, 81] came up with a number of important criteria. Among these concerns were the lack of available cash, the unstable value of the local currency relative to the dollar, and the rapid increase and volatility of construction material prices. Because of these factors, there was a lack of precision and understanding when the project first began. When the demand for a product or service exceeds its supply, a phenomenon known as material price inflation occurs. This, in turn, affects building costs and can cause projects to go over budget. [59] found that material price inflation occurs when demand exceeds supply of a particular good or service. Project expenditures will go up because of this inflationary influence on building costs. Delays in identifying the required supplies, leading to excessive and needless expenses, is one of numerous root causes of insufficient material procurement and accounting methods, the principal cause of material delivery delays [52]

2. Need for specific materials

Citation [82] investigated the causes of the rise in Brazilian construction project costs and discovered that certain projects need the use of high-quality materials. In order to keep construction costs down, it is important to specify certain materials during budget preparation. Some activities may need specific materials, which might lead to cost overruns and schedule delays. [32] references this.

3. Resource Deficiency Such as Materials and Poor Labor Productivity

Stakeholders' perceptions of rising construction project costs are well-supported by the available literature. A shortage of resources and competent workers is the main cause of project delays and budget overruns [83]. When there is a shortage of resources, projects become more challenging resulting in productivity and subpar performance, among staff members [49].

Rework demands, error frequencies and financial surpasses were more significant, on construction sites with productivity as indicated by research conducted by [84]. Inadequate communication, labor regulations and ineffective organizational leadership all play a role in this inefficiency. Supporting these findings [85] elaborates that issues related to material storage work processes, insufficient labor force and poor labor efficiency were the culprits, for the financial challenges.

Reference [86] discovered that simple challenges could lead to increased construction expenses. These challenges encompass issues such as a scarcity of labor market fluctuations discrepancies in material pricing during bidding processes delayed payments, labor strikes and subpar material quality. [52, 60, 72] highlighted that constraints, on resources, efficiency of labor force and a shortage of personnel can contribute to escalating project expenditures.

Many factors influence construction costs in Nigeria as noted by [88]. Various elements can impact the arrival of materials and equipment, at construction sites. These factors encompass inefficiencies within the transportation system inaccuracies in cost projections fluctuations in market prices, scarcity of workers decreased levels of labor productivity and shortages, in both materials and labor supply.

Table4. Summative of Project Resource-Related Factors

	The related factors to this category are:	source
Project Resource	Inflation (increase in unit cost of construction materials)	[45], [8], [59] and [52]
	Need for specific materials.	[82], [32]
	Resource deficiencies such as materials and Poor labour productivity	[83], [52], [84], [85], [22], [86], [51], [56] and [18]

4. External-related factors

Many external factors can significantly influence the escalation of costs within construction projects. According to [88,89] such exogenous factors include detrimental weather conditions, inhospitable site characteristics (terrain, soil composition, etc.), macroeconomic instability, and shifts in legal and regulatory frameworks that impede project momentum, dictate resource allocation, and affect ancillary support by public agencies in infrastructure, utilities, and civic amenities. These variables are often coupled with bureaucratic inefficiencies that further strain project budgets.

Reference [30] analyses cost augmentation causes, pinpointing unexpected elements like severe weather events and challenging topographical conditions as significant contributors to cost escalations. Additionally, the study reveals that climatic patterns, particularly the interplay between dry seasons and humidity levels, can detrimentally affect labor productivity. Inefficient labor leads to lower output, worker discord, project delays, and cost overruns.

To varying extents, unique project features such, as size, location and inherent qualities influence changes in costs as mentioned by [90]. The rise in construction expenses may vary based on factors like location, duration and project requirements as, per research studies.

Budget overruns are an issue, in the construction sector as noted by [59]. They suggest that exceeding budgets can happen across projects of varying sizes, locations, scopes or types. Effective project management and diligent financial monitoring play roles in preventing errors during construction projects because of their intricate nature.

Table5. Summative of External Related Factors

	The related factors to this category are:	source
External	Unexpected environmental conditions	[22], [30], [91], [85] and [90]
	changes in site conditions	[50]
	Project size , location and type(residential, commercial)	[92] , [30] , [70], [27] and [93]
	degree of complexity of the project	[52]
	Fraudulent practices, corruption.	[2]

5. Political-Related Factors

Reportedly, construction companies adjust their cost estimates in order to secure funding and align projects, with company goals [45]. This deliberate tweaking of estimates often results in exceeding the projected costs.

Dealing with government instability brings about difficulties, in handling the budget for construction projects as emphasized by [75]. The unpredictability, in environments greatly influences construction expenses causing delays and budget increases that surpass the estimates.

Successfully dealing with estimates and uncertainties involves a grasp of cost overruns. To tackle these obstacles it emphasizes the importance of management and strategic long term planning. It emphasizes the importance for stakeholders to consider how these elements can influence project trajectories and outcomes.

Table6. Political Related Factors

	The related factors to this category are:	source
political	changes in laws and regulations	[20], [27], [35] and [45]
	political instability of the government	[75]
	Domination of the construction industry by foreign firms and aids	[18]
	Unsupportive government policies Government oversight and regulations	[80], [50], [94], [95] and [96]
	Obstacles from government.	[2]

Conclusion

The escalating costs associated with construction projects pose a major problem for the construction sector. Hence, the study of cost escalation has emerged as a crucial element in the project life cycle. The study concluded the following:

- 1- Based on a comprehensive analysis of existing scientific works, forty-five factors contributed to the escalation of construction project costs. These factors were subsequently classified into six distinct groups: stakeholder-related factors, technical-related factors, management-related factors, project resource-related factors, external factors, and policy-related factors.
- 2- Identifying and extracting these characteristics makes it easier for project stakeholders to implement subsequent techniques to effectively mitigate the above-mentioned challenges. This contributes to building and sustaining a comprehensive document control system and regular evaluation of project progress.
- 3- Using a group of professional engineers and consultants to facilitate rapid decision-making on behalf of the client. It is advisable to allocate some risk financing during the initial stages.
- 4- Engaging competent quantity surveyors with relevant experience in the field who ensure that the engineering estimate complies with the client's specifications and objectives.
- 5- Senior management must react positively to environmental, political, financial and administrative policy changes, and project stakeholders must have the ability to mitigate problems related to cost escalation within construction projects.

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