Emerging Trends in Sustainable Energy, Smart Systems, and Green Technology – Olukanni et al. (Eds)
© 2027 The Author(s), ISBN: 978-1-041-31073-0

Evaluation of Government Mitigation Measures for Addressing High Building Construction Costs in Uganda

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ABSTRACT: The study assessed government mitigation measures for addressing high building construction costs in Uganda, focusing on identifying and cataloging existing strategies, evaluating their effectiveness, analyzing the impact of these measures, and examining the barriers to building construction cost reduction in Uganda. The population of the research region consisted of professionals employed in the construction companies, developers, and central government. The primary source of data was structured questionnaires administered to 156 key stakeholders, including construction professionals, policymakers, and industry experts. The result of the analysis shows that; The result of the analysis shows that; Material costs, inflation, economy, supply chain issues, land costs, and high interest rate and tax ranked 1st, 2nd, 3rd, 4th, and 5th were key factors contributing to high construction costs in Uganda with the highest RII, having 4.6474, 4.3910, 4.3205, 4.2885 and 4.2244 respectively. Also, regulatory complexity 33% was the most common barrier to building construction cost reduction, followed by resistance to change 25%, lack of communication and coordination 20%, high initial investment 14%, and supply chain disruption 75%. The null hypothesis 1 was rejected because it has t-statistics of 0.0455 respectively which are below 0.05, this means that there is a significant relationship between identified factors and high construction cost. Recommendations included enhancing financial strategies, promoting transparency and sustainable practices, fostering collaboration, tailoring educational programs, and conducting regular strategy reviews. Explore the impact of technological advancements on construction costs, understand socioeconomic factors influencing costs, and assess the long-term environmental and economic impact of sustainable practices in the construction industry.

Keywords: Building project, Construction Costs, Economic factors, Mitigation measures

1 INTRODUCTION

1.1 *Background of the study*

Construction costs are a significant issue in infrastructure and building development worldwide, impacting economic stability and societal progress. Countries like Singapore and Iran have implemented strategies to manage these costs, such as public-private partnerships in European road construction projects, lessons from global nuclear power projects, and green commercial building projects in Singapore. Uganda's construction industry faces challenges, including delays and cost overruns in public sector projects. This study investigates the mitigation of building failures [1–3] in Uganda's construction industry, specifically focusing on the greater Bushenyi district. [1], study aims to systematically evaluate existing mitigation measures, determine their impact on construction costs, and propose strategies tailored to the Ugandan context. This will contribute valuable insights for policymakers, industry stakeholders, and researchers, fostering a more sustainable and economically viable construction sector in Uganda [4,5]. Despite the government's efforts to implement various mitigating measures, high building construction costs remain a significant barrier in Uganda. This highlights the need for a thorough analysis of the efficacy of current government initiatives to pinpoint gaps

DOI: 10.1201/9781003782254-61
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impeding the problem's resolution [6–8]. The ongoing presence of elevated and rising construction expenses necessitates a targeted investigation to comprehend the complexities of the issue, evaluate the shortcomings of existing approaches, and make specific suggestions for improved cost control tactics within the Ugandan construction industry. The study aims to identify and catalog existing government mitigation measures for addressing high building construction costs in Uganda, analyze the impact of these measures, and examine the barriers to building construction cost reduction in Uganda [9,10].

2 LITERATURE REVIEW

Building construction costs have been a persistent challenge in Uganda, affecting both the affordability and availability of housing. The Ugandan government has introduced various strategies to address high construction costs, including subsidies for essential building materials, tax incentives, public-private partnerships (PPPs), training and capacity building, and streamlining regulatory processes [11,12]. These measures aim to stabilize prices, attract foreign investment, and improve efficiency. However, the effectiveness of these measures is questioned due to market dynamics, inadequate funding, bureaucratic inefficiencies, and lack of transparency in governance. Subsidies for construction materials have provided temporary relief but often lack sustainability and are subject to market dynamics [13]. Tax incentives have attracted foreign investment but have not significantly reduced costs for local contractors. PPPs have shown promise in infrastructure development, but challenges in governance and transparency can hinder successful partnerships [14]. Skills development initiatives have resulted in a modest increase in skilled labor availability, but they are often underfunded and fail to reach remote areas. Streamlining regulatory processes has had mixed results, with some improvements in project timelines. Corruption and inconsistent enforcement of regulations continue to create hurdles for builders. [15], literature review examines the causes and mitigation measures for cost overruns in building construction projects, using higher education projects as a case study. [16], analyzed cost overruns in 27 higher education building projects and developed a structural equation model to establish the relationships between causes and mitigation measures. The findings suggest that around 93% of the 27 higher education building projects experienced cost overruns, with the majority overrunning between 5% and 10%. [17], also found that bid evaluation and project planning mitigation measures positively affect efficiency and contract management-related causes, while project initiation and contractor selection mitigation measures positively affect claim management-, efficiency and contract management-, estimation and scheduling-, and design-related causes.

[18], study contributes to the understanding of the challenges faced by higher education building projects in Saudi Arabia. The country is working towards achieving 'Vision 2030', which aims to have at least five Saudi universities among the world's top 100 by 2030. The country's higher education institutions have shown strong potential, with 66% of public universities established in the last two decades. However, achieving cost-overrun-free building projects is challenging due to the inherent nature of construction projects. [19], aims to analyze cost overrun in higher education building projects and develop a relationship model between causes of cost overrun and mitigation measures using partial least squares structural equation modeling (PLS-SEM). Riyadh, the capital of Saudi Arabia, was selected for data collection due to its significant population growth and urbanization, which creates demand for various construction projects, including housing and education facilities [20]. Addressing the challenges associated with cost overruns can improve industry efficiency and contribute to 'Vision 2030' at large. High construction costs have significant implications for economic development, housing affordability, and infrastructure growth. Global experiences, such as nuclear power reactor costs, public-private partnerships, and guaranteed maximum price contracts, provide insights into these concepts [21]. Green building techniques have been supported by grants and subsidies from the UK government, causing building costs for sustainable housing developments to drop by 15% [22]. The literature highlights the need for innovative strategies like "Construction 4.0" and modular construction as a contemporary solution.

Government mitigation measures include the National Housing Policy of Uganda, which aims to promote affordable housing through various strategies, including subsidies and tax incentives. However, the Uganda Building Code and Standards set standards for construction quality and safety, but compliance is inconsistent, leading to quality issues and higher long-term expenses [23]. Subsidies and grants introduced by the Ugandan government have made some impact, but they are often insufficient and poorly targeted, leading to limited benefits for the intended beneficiaries. Tax incentives for construction materials and housing developers have also been introduced, but the complexity of tax regulations and lack of awareness among builders limit their effectiveness. Infrastructure development is crucial for reducing construction costs, but uneven infrastructure development across regions means that some areas still face high costs due to inadequate infrastructure.

[18], Public-Private Partnerships (PPPs) have been utilized to leverage private sector investment in infrastructure and housing projects, but challenges such as complex agreements and lack of coordination between public and private entities have hindered their widespread success. Challenges in implementation include bureaucratic and administrative hurdles, corruption and mismanagement of resources, limited reach and impact due to inadequate funding and poor targeting, and mixed results in the evaluation of outcomes. Successful case studies of government mitigation measures provide valuable insights, but the scalability and replicability of such successes remain a concern. Overall, the effectiveness of government interventions in reducing construction costs and improving access to housing is influenced by various factors, including policy and regulatory frameworks, infrastructure development, and the effectiveness of successful case studies and evaluations.

The Agency Theory in construction management focuses on the principal-agent relationship between project owners and contractors, arguing that misalignment of interests can lead to moral hazard and opportunistic behavior, resulting in cost overruns [24]. This theory is relevant to the study as it provides a lens to analyze the effectiveness of government measures in aligning incentives for cost control. However, it has limitations, particularly in capturing broader societal and economic factors contributing to high building construction costs. The Theory of Cost Overruns provides a foundation for understanding why construction costs often exceed initial estimates [25]. It explains factors such as inaccurate project estimates, scope changes, and unforeseen risks. However, it has limitations in its broad applicability and sometimes retrospective nature, and may not adequately address the specific nuances of government mitigation measures and their proactive role in controlling construction costs [26]. The literature on government mitigation measures for elevated building construction costs in Uganda reveals a mix of successes and challenges, with implementation issues, limited reach, and external factors like corruption often hindering their effectiveness, [27]. Future research should explore how technological innovations and modern construction techniques can be integrated with government measures to reduce costs. Understanding stakeholders including the government's perspectives is crucial for improving the design and implementation of mitigation measures [28,29].

3 METHODOLOGY

A purposeful research technique was adopted by employing a descriptive research design. This design allowed for a comprehensive exploration of the effectiveness of government mitigation measures on high building construction costs in Uganda. The primary sources of data were through oral review and structured questionnaires administered to 156 key stakeholders, including construction professionals, policymakers, and industry experts.

4 FINDING AND DISCUSSION

Table 1 shows high construction costs in Uganda are attributed to various factors, including Material costs, inflation and economy, supply chain issues, land costs, and high interest rate & tax ranked 1st, 2nd, 3rd, 4th, and 5th were key factors contributing to high construction costs with the highest RII, having 4.6474, 4.3910, 4.3205, 4.2885 and 4.2244 respectively. Inefficiencies in project management can lead to cost overruns and extended timelines. In line with [30,31], addressing these issues requires coordinated efforts from the government, the private sector, and stakeholders in the construction industry.

Table 1. Key factors contributing to high construction costs in Uganda.

		SA——————————SD								
S/N	Identified Factors	5	4	3	2	1	TOTAL	EW	RII	Rank
1	Material Costs	114	35	3	2	2	156	725	4.6474	1st
2	Inflation & Economy	98	31	19	6	2	156	685	4.3910	2nd
3	Supply Chain Issues	92	39	12	9	4	156	674	4.3205	3rd
4	Land Costs	87	42	18	3	6	156	669	4.2885	4th
5	High Interest Rate & Tax	86	38	18	9	5	156	659	4.2244	5th
6	Labor Costs	81	31	17	13	14	156	620	3.9744	6th
7	Poor Infrastructure	76	28	14	22	16	156	594	3.8077	7th
8	Effective Project Management	72	29	19	20	16	156	589	3.7756	8th
9	Political stability	69	33	14	19	21	156	578	3.7051	9th
10	Regulatory Framework	61	28	24	16	27	156	548	3.5128	10th

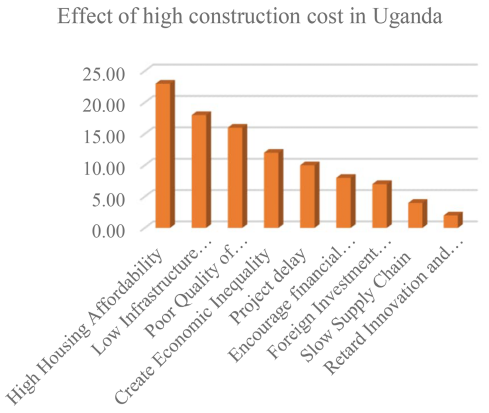

Figure 1. High construction costs in Uganda.

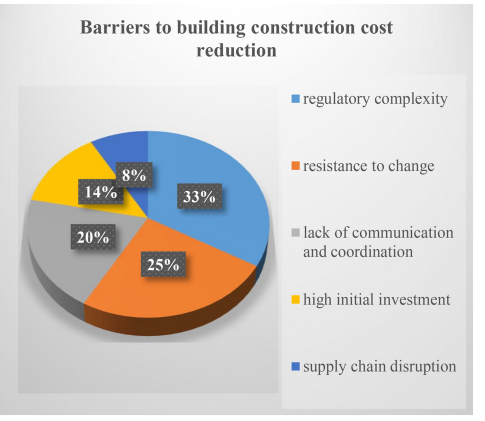

Figure 2. Pie chart showing the barriers to building construction cost reduction in Uganda.

High construction costs in Uganda have significant impacts on various sectors, including housing affordability, infrastructure development, investment deterrence, quality of construction, supply chain challenges, economic inequality, and policy implications. Housing prices are higher, making housing less affordable for many, exacerbated by informal settlements and homelessness. Infrastructure projects may face delays or setbacks due to budget constraints, hindering economic growth and access to essential services. Investment deterrence can slow down economic growth and job creation. Quality of construction may be compromised due to cost management, leading to substandard buildings. Supply chain challenges can also arise, affecting timelines and efficiency. The government may need to intervene through subsidies or policy changes to address high costs.

Figure 2 shows regulatory complexity with 33% as the most common barrier to building construction cost reduction, followed by resistance to change (25%), lack of communication and coordination (20%), high initial investment (14%), and supply chain disruption (75%).

Table 2 shows the ranked of 5 existing government mitigation measures for addressing high building construction costs in Uganda. Tax Incentives and Subsidies ranked 1st with a standard deviation score of 4.61, Bulk Purchasing and Supply Chain Support, Award Process, Improved Technology and Training, and Financial Accessibility ranked 2nd 3rd 4th and 5th respectively with standard deviation of 4.39, 4.34, 4.29, 4.27 respectively. These findings, in line with [32,33] study, provide a nuanced understanding of the current state of government mitigation measures in addressing high building construction costs in Uganda.

The graph in Figure 3 shows the impact of government mitigation measures for addressing

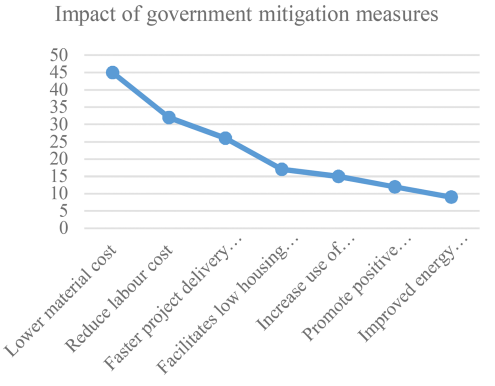

Figure 3. Government mitigation measures' impact on addressing high building construction costs.

Table 2. Existing government mitigation measures on high building construction costs in Uganda.

Mitigation Measures	Highly impacted	Impacted	Medium	Low	Very low	Total	Standard deviation	Rank
Tax Incentives and Subsidies	110	34	10	2	0	720	4.61	1st
Bulk Purchasing and Supply Chain Support	92	36	26	1	1	685	4.39	2nd
Award Process	86	40	28	2	0	678	4.34	3rd
Improved Technology and Training	84	38	31	2	1	670	4.29	4th
Financial Accessibility	80	42	32	1	1	667	4.27	5th

Table 3. Significance of identified factors and high cost of construction.

	Test Value = 0					
					95% Confidence Interval of the factors	
	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
There is no significant relationship between identified factors and high construction cost	0.0455	10	0.0167	17171.84	13321.91	18568.22

high building construction costs, which include lower material cost, reduced labour cost, faster project delivery time, facilitating low housing cost, increased use of technology, promoting positive completion and improved energy efficiency. If investigated, this can determine practical cost-reduction techniques.

Test of hypothesis

Regarding Table 3, R which is used in analyzing the correlation between the impacts and mitigation strategies yields a strong correlation of r = 0.95 as illustrated in the Figure 4. This, therefore, implies that enhancement of mitigation measures within a construction project leads to an increase in construction costs further indicating that a certain factor comes into play or that enhanced measures lead to more complicated and expensive projects, thus mitigation measures affect construction cost greatly.

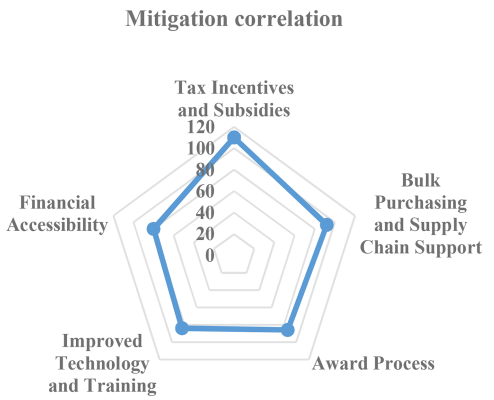

Figure 4. The correlation between the impacts and mitigation strategies.

5 CONCLUSION AND RECOMMENDATION

The Ugandan government's mitigation measures for addressing high building construction costs have shown some success, with the following impact; lower material cost, reduced labour cost, faster project delivery time, facilitated low housing cost, increased use of technology, promoted positive competition, and improved energy efficiency. By focusing on the effectiveness of the following barriers, regulatory complexity, resistance to change, lack of communication and coordination, high initial investment, and supply chain disruption, the evaluation can offer valuable insights for government, and policymakers, helping them refine and enhance their mitigation measures for addressing high building construction costs in Uganda.

5.1 *Contribution to knowledge*

This study evaluates government mitigation measures for high building construction costs in Uganda, focusing on factors like material costs, inflation, supply chain issues, and regulatory complexities. It highlights the impact of tax incentives and subsidies, but also reveals barriers to effective implementation. The research introduces a robust methodological framework and recommends financial strategies, transparency, and collaboration for sustainable construction practices.

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