



Original Article

## Evaluation of Factors Influencing Performance of Building Construction Projects in Uganda: A Case Study of Masaka City

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The construction industry has gained rapid growth for the past decade due to population growth resulting in housing and infrastructure demand. In Uganda, over twelve percent (12%) of the gross domestic product (GDP) is contributed by the building construction sector and is of great significance in the current economy. Despite this contribution to the sector, building construction fails due to performance issues as previously conducted studies have indicated and there are various reasons and factors which contribute to these performance issues. Therefore, there is a need to have a deeper understanding of the major factors attributing to this trend for better performance improvement. This study aimed to establish strategies to improve the performance of building construction projects in Uganda cities, a case study of Masaka city. The study employed a survey research design and targeted a population of 420 participants from which a sample of 201 respondents was selected. Data were collected using a questionnaire and interview guide. SPSS version 21 and Excel were used in data analysis. The following factors were established; cost factors, health and safety factors, time factors, quality factors productivity factors, project stakeholders' factors, environmental factors and resource factors. The regression analysis conducted confirmed time factors, quality factors and cost factors to have evidence of a significant impact on the performance of building construction projects in Masaka city. A framework for improving the performance of building construction projects was developed based on factors with significant impact. These findings highlight the need to prioritize these factors with significant impact when evaluating and managing building construction projects in Masaka City.

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**INTRODUCTION**

In the entire world, the construction industry has performed less compared to other industries (Ingle & Mahesh, 2020). Inadequate resources and institutions to address them are a wide challenge to performance in developing countries (Kirchberger and Martina. 2020). Kenya's construction projects implementation rarely meets the schedule according to Mbaluku and Bwisa, (2013) and according to Githenya and Ngugi (2014), construction projects face big challenges in cost, quality assurance, schedule, safety, and environmental performance.

In Uganda, over twelve percent (12%) of the gross domestic product (GDP) is contributed by the building construction sector and is of great significance in current economies (UNESCO, 2013). It improves citizens' well-being and enables other sectors for economic development. However, there is a high demand for infrastructure in Uganda as indicated by inadequate shelter for the citizens and this is exhibited by the registered annual population growth rate of 2.5% (UBOS, 2019). Through improved technologies and considering the growing population rate, there is a need for infrastructure provision.

National Building Review Board (2020) highlighted that to achieve national economic growth and development, there is a need for national building construction regulations. However, there are many factors still affecting the performance of Uganda's building construction (Alias *et. al.*, 2014). This study, therefore, evaluated the factors influencing performance of the building construction projects in Uganda.

**Problem statement**

In Uganda, the construction industry has gained rapid growth for the past decade due to population

growth resulting in housing and infrastructure demand (NPA, 2019). However, previously conducted studies in Uganda have indicated that failures in performance are the main causes of project failures (Alinaitwe, *et al.*, 2013).

There are various reasons and factors which contribute to building construction projects' performance (Soewin, E and Chinda, T. 2018). However, there is a need to have a deeper understanding of the major factors attributing to this trend for better performance improvement. The purpose of this study was therefore to establish the strategies to improve the performance of building construction projects in Uganda cities, a case study of Masaka city.

**Objectives of the study**

The main objective of the study was to establish strategies to improve the performance of building construction projects in Uganda cities and specifically, the study was guided by the following specific objectives;

- To determine the impact of factors influencing the performance of building construction projects in Masaka City;
- To develop a framework to improve the performance of building construction projects in Masaka city.

**Significance of the study**

The study yield will be beneficial for understanding the factors affecting the performance of construction projects mostly in developing countries, especially Uganda's construction sector. The government will also use the findings to provide stimulation and regulations to ensure policy framework, capacity building and sustainable growth towards achieving millennium goals such as Vision 2040 ((NPA, 2007).

Contractors will also use the outcome of the study to have a deep understanding of factors that affect performance and hence, improvement in profit and reputation

## LITERATURE REVIEW

The study of constraints on management practices, resources and risk in construction projects cannot be ignored due to its influence on project deliverables. The paradigm shift in construction project management emphasizes the importance of identifying major constraint factors against the traditional concept of the triple constraints of time, cost and quality (PMI, 2013).

## METHODOLOGY

A survey research design was employed and data was collected using questionnaires and interviews focused on construction project groups (i.e., consultancy firms, contractors, construction managers, city technical staff's department of works and stakeholders). The targeted population was 420. The Krejcie and Morgan (1970) sample size estimation table was used to determine the sample size of 201 respondents from a targeted population of 420. However, those who responded were 193 representing a respondent rate of 96.02 %.

The factors influencing the performance of building construction projects were established through the following steps;

Literature was reviewed on factors influencing the performance of building construction projects and the following factors were identified; cost factors, health and safety factors, time factors, quality factors productivity factors, project stakeholders' factors, environmental factors and resource factors.

### Level of education of respondents

**Table 5. 1: Level of education of respondents**

Level of education	Frequency	Percentage
Certificate	70	36.3
Diploma	64	33.2
Bachelor's degree	55	28.5
Master's degree	4	2.1
<b>Total</b>	<b>193</b>	<b>100</b>

These factors were deeply validated through interviews and questionnaires given to different experts in the area of study.

The respondents' perception level of these factors was assessed on a five-point Likert scale ranging from factors having no severe impact on the performance to factors having extremely severe impact on the performance, the classification was as follows; 1= having no severe impact on the performance, 2= having least severe impacts on the performance, 3= having severe impacts on performance, 4= having very severe impacts on performance, 5= having extremely severe impacts on the performance.

All the collected data from respondents were then analyzed using Statistical Package for Social Science version 21. From the analysis, the relative important index (RII) of the factors was determined using SPSS and used for ranking various factors. The average relative important index (RII) of 0.663 was computed and used as a baseline point. The factors with RII above average were considered to be significant and have the most impact on the performance of building construction projects and these factors were further validated using regression analysis. From the validation of the regression analysis, a framework to improve the performance of building construction was developed from factors with significant influence.

## RESULTS AND DISCUSSION

### Respondents' demographic

The study presented a number of demographic characteristics in terms of level of education, time spent in the construction industry and positions held.

Table 5.1 represents the respondents' level of education established in order to determine the extent to which this affected the performance of building construction projects. According to the study findings, all respondents had attained a significant level of education, a factor that

represented their understanding of performance factors of building construction projects.

#### **Years spent in the building construction of industry**

**Table 5. 2: Years spent in the construction of industry**

<b>Years spent in the construction of industry</b>	<b>Frequency</b>	<b>Percentage</b>
0-5 years	24	12.4
6-10 years	126	65.3
11-16 years	18	9.3
16-20 years	12	6.2
21 and above years	13	6.7
<b>Total</b>	<b>193</b>	<b>100</b>

Table 5.2 represents findings regarding years spent in the construction industry. According to the findings, the majority of the respondents constituting 126 (65.3%) had spent between 6 to 10 years in the construction industry. The findings indicated that the majority of the respondents had

spent relatively adequate time in the construction industry, a factor that gave them exposure and experience concerning factors affecting the performance of building construction projects.

#### **Position held by respondents**

**Table 5.3: position held by respondents**

<b>Position held</b>	<b>Frequency</b>	<b>Percentage</b>
Department heads	14	7.2
Site engineers	66	34.2
Trade foremen	72	37.3
Superintendents of works	8	4.1
Town planners	3	1.6
Construction managers	26	13.5
Other stakeholders	4	2.1
<b>Total</b>	<b>193</b>	<b>100</b>

Table 5.3 represents positions held by respondents. The findings indicated that the majority of the respondents held key positions hence they were able to understand and explain factors that influence the performance of building construction projects in Masaka city.

#### **Empirical findings**

#### ***Impact of factors influencing the performance of building construction projects in Masaka City***

The study established the impact of factors influencing the performance of building construction projects in Masaka City. The relative importance index was calculated for all sub-factors under the main factors and ranked to obtain those that were more impactful. The results are presented in Table 5.4 and summarized in Table 5.5.

**Table 5.4: Impact of factors influencing performance of building construction projects**

Factors	RII	Rank
<b>Cost factors</b>		
Material and equipment cost	0.860	1
Profit margin of project	0.855	2
Project labor force	0.850	3
Cashflow of project	0.760	4
Liquidity of organization	0.466	5
Project design cost	0.445	6
<b>Productivity factors</b>		
Quality of equipment	0.923	1
Work permits and standardization	0.842	2
Level of employee motivation	0.704	3
Labor force at the site	0.700	4
Communication at the site	0.470	5
Work breakdown structure	0.458	6
<b>Time factors</b>		
Delay in claims approval	0.893	1
The planned time for project construction	0.828	2
Availability of resources as planned through project duration	0.763	3
Material delivery schedule	0.722	4
Implementation of variation orders	0.696	5
Site preparation	0.603	6
<b>Environmental factors</b>		
Weather conditions at the site	0.751	1
Nature of access to the site	0.722	2
Site topography	0.696	3
Site waste management	0.499	4
Air quality at the site	0.442	5
Noise level at the site	0.364	6
<b>Quality factors</b>		
Quality issues in material	0.863	1
Quality assessment system	0.723	2
Construction control meetings	0.698	3
Procurement system to obtain resources and suppliers	0.655	4
Quality training program	0.485	5
Conformance to codes and standards	0.876	6
<b>Health and safety factors</b>		
Accidents and injuries at the workplace	0.869	1
Facilities for First Aid Workplace	0.654	2
Safety awareness at the workplace	0.570	3
Documentation and evaluation plan for health and safety issues	0.564	4
Working environment	0.540	5
Personal protective equipment at the site	0.525	6
<b>Resource Factors</b>		
Building contractors' plant and machinery	0.752	1
Building contractors' qualified personnel	0.699	2
Contractor's experience	0.621	3
Technical experts and skills	0.608	3
Contractors' decision-making capacity	0.571	5
Contractors' manpower and project equipment	0.510	6
<b>Project Stakeholders Factors</b>		
Client/owner obligations fulfilment	0.739	1
Provision of a reliable needed service by external stakeholders	0.640	2
Compensation of project-affected persons	0.622	3
Consultancy support on their responsibility	0.588	4
Contractors' technical experts	0.658	5
Collaboration with project-affected persons	0.498	6
<b>Average</b>	<b>0.663</b>	



**Table 5. 5: Summary of impactful factors**

Factors	RII	Rank
Time factors	0.751	1
Quality factors	0.717	2
Cost factors	0.706	3
Productivity factors	0.683	4
Resource factors	0.627	5
Project stakeholder factors	0.624	6
Health and safety factors	0.620	7
Environmental factors	0.579	8
<b>Total</b>	<b>0.663</b>	

The factors that had a relatively important index (RII) above the overall average RII of 0.663 were considered to be more impactful and those that had an RII below average were considered to be less impactful. As indicated above, the findings revealed that the time factor with RII of 0.751) had the highest impact and was attributed to delays in claim approvals, not maintaining construction planned time, lack of resources as planned through project duration and poor material delivery schedule among others. The findings are in line with Abarinda et al. (2019) who noticed that the time performance of construction projects in Uganda is wanting and most projects are not completed within their original contract duration.

Also, quality factors with an RII of 0.717 had the second highest impact influencing performance and was mainly attributed to quality issues in material, lack of quality assessment system in place and inadequate construction control meetings. Rauzana, *et.al* (2018) found that lack of quality material is a very influential factor in construction project performance and it is in line with this study's findings. These study findings are also in agreement with Mohd *et. al*, (2019) whose findings concluded that the supply of defective materials among others is the most contributing significant factor to poor performance of the construction project.

Cost and productivity factors also had a higher impact in influencing the performance of building construction projects with RII of 0.706 and 0.683 respectively. Cost factors were mainly attributed to the high cost of materials and equipment, low profit for the contractors and high cost of the labour force.

Productivity factors were mainly due to poor quality of equipment used on construction projects, lack of work permits not following guidelines for standard and lack of employee motivation. Health and safety factors (RII 0.620) and environmental factors (RII 0.579) had the least impact on performance although there were instances of accidents and minor injuries on construction projects they did not affect the work progress. Also, there were some cases of seasonal weather changes but on most construction projects, it was pre-planned.

### **Regression analysis**

Regression analysis was conducted to determine the extent to which the factors affect performance in building construction projects. The four most impactful factors were considered in the analysis and a multiple linear regression analysis was conducted. Time factors, quality factors and cost factors had a significant impact on the performance of building construction projects in Masaka city while productivity factors had no evidence of having a significant impact in the model.

**Table 5. 6: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	169.510	10.127		16.739	0.000
Time factors	0.618	0.540	0.119	4.144	0.001
Quality factors	0.906	0.643	0.203	5.409	0.000

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
Cost factors	0.642	0.637	0.128		1.008	0.031
Productivity factors	0.541	0.773	0.105		-0.700	0.485

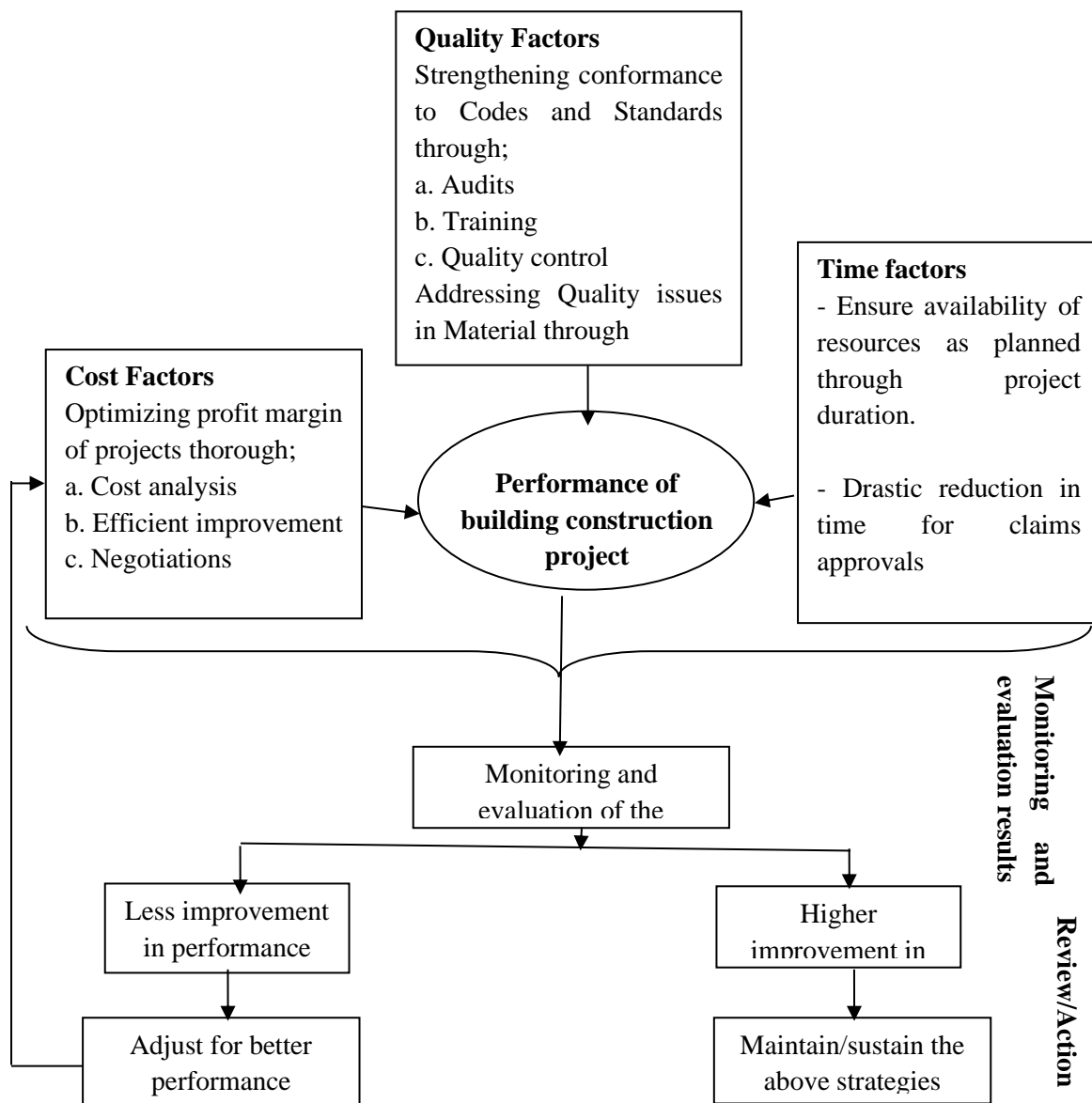
### Interviews

From the interviews, most construction projects delay in terms of completion and it's linked to the financial constraints of the clients. Also, natural materials are delivered directly from their sources to the construction project sites without quality assessment and these affects the quality of work as different materials have different properties from different sources.

### Proposed framework to improve performance of building construction projects.

A framework was developed to establish consistency, measure performance effectively, and drive continuous improvement. It will help create a more transparent, efficient, and sustainable built environment by enabling stakeholders to monitor, evaluate, and enhance performance based on standardized criteria and industry best practices. The framework was developed from factors that have been found to have a significant impact on project performance.

**Figure 5.1 Framework to improve performance of building construction projects**



***Implementation of the developed framework***

This framework will be utilized by familiarizing oneself with its components, assessing current performance, identifying improvement areas, developing action plans, implementing and monitoring progress, reviewing and adjusting strategies, sharing and collaborating with stakeholders, and regularly updating and adapting the framework to suit organizational needs and industry standards.

Given that, factors in the framework have a significant impact, they need to be given priority in efforts to improve the performance of building construction projects. Time factors can be improved by enhancing delays in claims approval through; streamlining the claims approval process to minimize delays, implementing efficient communication channels between project stakeholders and insurance providers, and ensuring that project documentation and evidence of claim are well-prepared and readily available.

Quality factors can also be improved by strengthening conformance to codes and standards through conducting regular audits and inspections to ensure compliance with relevant building codes and standards, provision of training and resources to project teams to enhance their knowledge and understanding of codes and standards, establishing quality control measures to monitor adherence to codes and standards throughout the construction process.

Also addressing quality issues in materials by; establishing rigorous quality control procedures for materials used in construction, implementing strict supplier evaluation and selection processes to ensure the procurement of high-quality materials and conducting regular inspections and testing of materials to identify and address quality issues promptly.

Cost factors can be improved by optimizing the profit margins of projects through; conducting thorough cost analysis and project planning to maximize profit margins, exploring opportunities to enhance project efficiency and reduce costs without compromising quality and negotiating

favorable contacts and agreements with suppliers, subcontractors, and client to improve financial outcomes. Regular monitoring and evaluation should be conducted to assess the effectiveness of the implemented measures and further adjustments if necessary.

**CONCLUSIONS.**

The study determined the impact of factors influencing the performance of building construction projects in Masaka City. The relative importance index (RII) was calculated for each factor and ranked to identify the most impactful factors. The results showed that time factors had the highest impact, followed by quality factors, cost factors and productivity factors. Environmental factors and health and safety factors had less impact on influencing project performance. These findings highlight the need to prioritize these factors of influence when evaluating and managing building construction projects in Masaka City.

In the regression analysis, the impact of various factors on building construction project performance was examined. Four influential factors were considered and multiple linear regression was employed. The regression analysis demonstrated that time factors, quality factors and cost factors significantly impacted project performance. However, no sufficient evidence was found for the significant effects of productivity factors.

A framework for improving the performance of building construction projects was developed and focuses on establishing consistency, measuring performance effectively, driving continuous improvement, supporting decision-making, and fostering collaboration. The framework enables stakeholders to monitor, evaluate and enhance performance based on standardized criteria and industry best practices. Time, quality and cost factors were identified as important considerations in improving performance. By prioritizing these factors and implementing strategies to address them, performance in building construction projects in Masaka City can be improved.



## REFERENCES

- Abarinda, J, Kibwami, N and Tutesigensi, A (2019) Towards Improving Schedule Performance of Construction Projects in Uganda with Lean Construction In Gorse, C and Neilson, C J (Eds) Proceedings of the 35th Annual ARCOM Conference, 2-4 September 2019, Leeds, UK, Association of Researchers in Construction Management, 658-667.
- Alias, Z., Zawawi, E.M., Yusof, K., & Aris, N.F. (2014). Determining Critical Success Factors of Project Management Practice: A Conceptual Framework. *Procedia - Social and Behavioral Sciences*, 153, 61-69.
- Alinaitwe, H., Apolot, R. and Tindiwensi, D. (2013) Investigation into the Causes of Delays and Cost Overruns in Uganda's Public Sector Construction Projects. *Journal of Construction in Developing Countries*, 18(2), 33-47.
- Githenya, M. and Ngugi, K. (2014) 'Assessment of the Determinants of Implementation of Housing Projects in Kenya', *European Journal of Business Management*, 11(1), pp. 230-253.
- Kirchberger, Martina. (2020). The Construction Sector in Developing Countries: Some Key Issues. 10.1093/oso/9780198851172.003.0003. Accessed September 2022
- Ingle, P.V. and Mahesh, G. (2020) 'Construction project performance areas for Indian construction projects', *International Journal of Construction Management*, 22(1), 1-12.
- Mbaluku, H.N. and Bwisa, H., 2013. Delay factors in construction project implementation in the public sector; A case study of the Kenya Agricultural Research Institute construction projects. In 1st JKUAT-SHRD Research Conference, JKUAT, Kenya (pp. 585-597).
- Mohd Y.Y, Waziri.A.A., Sulzakimin.M. and Azlina.M.Y., 2019. Contributing Factors of Poor Construction Project Performance in Nigeria. *International Journal of property science*, 9(1), 1-11
- National Building Review Board, (2020). Building Control Act, 2013 implementation guide. <https://nbrb.go.ug/wp-content/uploads/2020/08/Implemtation-Guide.pdf>. accessed June 2022.
- National Planning Authority, (2019). Terms of reference (tors) for consultancy services to conduct a value chain analysis and undertake pre-feasibility and feasibility studies on the construction industry in Uganda, Kampala, Uganda: national planning authority.
- National Planning Authority (2007). Uganda Vision 2040. Accelerating Uganda's sustainable development to prosperity. Kampala: National Planning Authority, ministry of finance, planning and economic development.
- Project Management Institute (2013) 'A Guide to the Project Management Body of Knowledge', Newtown Square, PA, USA: Project Management Institute, Inc.
- Rauzana, A., Husin, S., and Usni, D.A. 2018. Critical factors affecting quality performance in construction projects. *International Journal of management and administrative science (IJMAS)*, 6(3),13-21.
- Soewin, E. and Chinda T. (2018). Factors affecting construction performance: exploratory factor analysis. *IOP Conference Series: Earth and Environmental Science*. 140. 012102. 10.1088/1755-1315/140/1/012102
- Uganda Bureau of Statistics (UBOS), 2019 statistical abstract [https://www.ubos.org/wp-content/uploads/publications/01\\_20202019\\_Statistical\\_Abstract\\_-Final.pdf](https://www.ubos.org/wp-content/uploads/publications/01_20202019_Statistical_Abstract_-Final.pdf), Accessed, October 2022
- Uganda National Commission for UNESCO. 2013. Uganda and UNESCO. Annual Information Magazine 2012/2013. [Online]. Available at: <http://natcomreport.com/> [Accessed: 20 December 2022].