



Contract Management and Operational Performance of the Road Construction Sector in Uganda: Evidence from the Uganda National Roads Authority

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Abstract: *The study examined the effect of contract management on operational performance of the road construction sector in Uganda, a case of the Uganda National Roads Authority (UNRA) paying attention to three objectives: to examine the effect of contract administration; relationship management and contract monitoring on operational performance of UNRA. A cross sectional research design was used on a sample of 108 participants from whom questionnaires were used to collect data. SPSS (version 25) was adopted to process data while analysis was done through descriptive and inferential statistics. Findings revealed that all tenets of contract management studied are positively related to operational performance (contract administration: $r = 0.53$; $p < 0.01$, relationship management: $r = 0.644$; $p < 0.01$ and contract monitoring: $r = 0.469$; $p < 0.01$). Results revealed that contract management explains 41.3% of the variation in operational performance of UNRA and that contract administration, relationship management and contract monitoring have a positive effect on operational performance with net contributions of 42%, 34.7% and 24.6% respectively. The researchers conclude that contract management positively predicts operational performance. The researchers recommend that the authorities at UNRA should pay keen attention to all dimensions of contract management adopted in the study since they all positively relate with and equally positively influence operational performance of the organization. By doing so, any occurrences that would jeopardize smooth flow of activities and works will be eliminated, hence harnessing operational efficiency.*

Keywords: *Contract Management, Operational performance, National Roads Authority, Construction, Uganda*

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1. Introduction

Operational efficiency in road construction varies across the world; with costs being extremely high in low-income economies and relatively low in developed countries (The World Bank, 2022). Relatedly, the problem is worsened in countries marred by political conflict that increases the risk

and monitoring costs such construction projects (Gerd, Fouad, Torban, & Verdier, 2020)

In Europe, road construction costs are high in some countries such as Austria, Hungary, Slovakia and the Czech Republic where costs have continued to increase consistently over the years (Mantalovas, et al., 2020). For example, it costs about €2.87m per kilometer of a standard 2 lane highway while the cost almost doubles for a 4-lane

highway. However, the quality and size of the roads in turn reduces road carnage by about 95% (Mantalovas, et al., 2020; The World Bank, 2022). In other European countries like Hungary, Slovakia, Czech Republic and Denmark, a kilometer of a standard 2 lane highway costs about €2.6m, €2.43m, €2.17m, and €1.93m respectively, with variations in amounts depending on terrain and size of the road pursued and the number of tunnels. However, given the size and quality of the roads constructed, the cost is worth and operational efficiency is always achieved since the lifespan of the projects undisputed and stands way high compared to most of low income economies (Gerd, Fouad, Torban, & Verdier, 2020; Senka, 2023)

In the United States of America [USA], the average cost of constructing a kilometer of a road remains relatively low ranging between \$1.25m - \$1.875m for a 2-lane standard undivided road in rural areas while the cost relatively goes up to \$1.875m - \$3.125m for the same quality and size of the road in urban locations. Relatedly, it costs about \$2.5m - \$3.75m per kilometer of a 4-lane highway in rural and semi urban areas compared to \$5m - \$6.25m required to construct a 4-lane highway in cities and towns within the USA. This however remains a relatively low cost given the life span and carriage capacity of the roads compared to cost and quality in low-income economies (Kulkami, Zhang, & Naik, 2021; Zheng, Wang, Wang, & Zhao, 2021)

In Uganda, whereas the Uganda National Roads Authority (UNRA) is mandated by the Ministry of Works and Transport mandated to develop the Ugandan road network, its capacity to deliver in an efficient manner suffers serious challenges (Musisi, 2017). While the authority by structure has a legal wing and at the same time benefits directly from the legal advice of the Attorney General of Uganda, UNRA finds itself in a deep slumber as poor negotiations with contractors, hiked project costs and at times pays high fees in compensating property owners to offer a leeway for the road projects to be started several fronts (Office of the Auditor General, 2021). Equally, most projects executed in Uganda are quoted in foreign currencies for fear of fluctuations in the local currency. which exposes the authority to costs emerging from volatilities in the exchange rate (Musisi, 2017). Relatedly, while UNRA through the Ministry of Works and Transport receives a heavy allocation of the national budget every financial year, to date, just an average of 300km is constructed annually. Further still, operational efficiency of the authority remains poor as the average cost of construction per kilo meter currently stands at USD 875,000 being more than double the average cost in Kenya (USD 300,000) and USD 330,000 in Rwanda which is a relatively mountainous country compared to Uganda (Musisi, 2017; Office of the Auditor General, 2021)

The reported inefficiency however continues to manifest amidst existence of both a directorate of legal affairs on one hand as well as a fully-fledged procurement department that together undertake and guide the procurement activities for improved operational efficiency. The continued high costs of constructing a unit kilometer thus create peculiarity on whether its inappropriate contract management that could be responsible for current operational inefficiency. This phenomenon equally raises pertinent questions such as: what is the effect of contract administration on operational efficiency of UNRA? What is the effect of relational management on operational efficiency of UNRA? To what extent does contract monitoring inform operational efficiency of UNRA?

1.1 Statement of the Problem

Effective management of contracts between the respective parties to the contract is believed to spur operational efficiency during the execution of contract terms and propel satisfactory as well as sustainable organizational performance (Azadegan & Doostalab, 2021). However, most organizations suffer from operational inefficiency through delayed completion of projects, escalating project costs, ever changing project scope and at times suffer penalties due to abuse of entered contracts (Maghrebi, Pishdad, & Jalaei, 2020; Azadegan & Doostalab, 2021).

Whereas UNRA is corporate arm under the Ministry of Works and Transport mandated to develop the Ugandan road network, its capacity to delivery on its mandate in an efficient manner suffers serious challenges (Musisi, 2017). While the authority by structure has a legal wing and at the same time benefits directly from the legal advice of the Attorney General of Uganda, UNRA finds itself in a deep slumber as poor negotiations with contractors, hiked project costs and at times pays high fees in compensating property owners to offer a leeway for the road projects to be started (Office of the Auditor General, 2021). Relatedly, while UNRA through the Ministry of Works and Transport receives a heavy allocation of the national budget every financial year, to date just an average of 300km is constructed annually. Further, operational efficiency of the authority remains poor as the average cost of construction per kilo meter currently stands at USD 875,000 which is more than double the average cost in Kenya (USD 300,000) and USD 330,000 in Rwanda which is a relatively mountainous country compared to Uganda (Musisi, 2017).

1.2 Purpose of the study

The purpose of the study was to examine the effect of contract management on operational Performance of the Road Sector in Uganda.

1.3 Objectives of the study

The study was guided by the following objectives:

1. To examine the effect of contract administration on operational performance of UNRA,
2. To examine the effect of relationship management on operational performance of UNRA
3. To examine the effect of contract monitoring on operational performance of UNRA.

2. Literature Review

Existing literature about the relationship between contract management and operational performance in the road construction sector points out to the linkage between the two variables. For example, (Kim & Moon, 2020) examined the relationship between contract management and performance of the Public Road Construction Projects and established effective contract management practices positively influence the operational performance of public road construction projects. The study further identified key contract management factors such as contractor selection, contract administration, and dispute resolution as important drivers of project performance. Another study by (Saeed, Arain, & Lu, 2020) explored the relationship between contract management and operational performance in Public Road Construction projects with intent of examining the moderating role of external factors. The results indicate that contract management practices significantly influence project performance. Additionally, they highlighted the moderating role of external factors, such as project complexity and government support, on the relationship between contract management and performance.

A related study by (Rahman & Moon, 2020) examined the relationship between contract management and performance in large road construction projects. Results reveal that effective contract management, including factors such as contract clarity, performance measurement, and payment mechanisms, positively impacts project performance. Thus, it is prudent for project implementers to emphasize the importance of proper contract management for successful project delivery. Further still, (Nawi, Rahman, & Abdullah, 2021) focused on contract management practices and performance in road construction projects in Malaysia. The study established that contract management practices significantly affect project performance, particularly in terms of cost, time, and quality. Thus, effective contract management, including aspects such as contract administration and coordination, was identified as crucial for achieving successful project outcomes.

A study by (Muhammad, Saoula, Issa, & Ahmed, 2019) examined the association between contract management and performance characteristics of selected sectors in Indonesia. Results indicated that informed contract management through effective contract administration, monitoring and relationship management between key stakeholders greatly propelled performance of firms belonging to different sectors. Thus, effectively managing contracts is instrumental to harnessing operational efficiency within an organization and eventually informs performance. Another study by (Komakech, 2020) examined the effect of relationship management of contracts on the extent of service delivery among local governments paying attention to Serere District in Eastern Uganda. It established that relationship management was paramount to effective service delivery as it facilitated information flow amongst the parties to a contract and accelerated timely delivery of supplies thereby compelling the concerned parties to expedite the entire process and ensure service gets to the people.

Another study by (Byaruhanga & Basheka, 2017) examined the perceived effect of contract monitoring on the national roads sector performance and focused on the activities of UNRA; it was concluded that contract monitoring is an important aspect of contract management that helps the parties to keep track of the covenants to the contract and in so doing provides for a platform for ironing out any challenges or bottlenecks that would impend excellent performance. Further still, (Kongosong, 2017) analyzed the guidelines that would reduce the impacts of government's construction contract management through a synthesis of the factors that would cause delays in construction projects. The study adopted a quantitative survey design on a sample of 34 construction projects and collected data using survey questionnaires. By employing STATA to process the collected data, the results generated through linear regression models indicated that contract management thrives on informed sequencing of activities, contract administration, relationship management, stakeholder engagement, routine communication as well as regular monitoring of the contracted activities.

Equally, relationship management leveled the ground and made interactions more friendly yet formal, breaking down any elements of bureaucracy and providing readjustments where needed. In a similar study, (Kimundu & Moronge, 2019) investigated the effect of contract relationship management on performance of the manufacturing sector and paid attention Kenya. Guided by a cross-sectional study design blending both analytical and descriptive tactics, the study adopted a sample of 97 firms and collected data using questionnaires while data extensions were enabled through an interview guide. Data entry and processing were powered by SPSS software for

quantitative primary data and analyzed using inferential statistics. On the other hand, thematic approaches and content analysis models were adopted for managing qualitative data. The findings indicated a positive and strong association that existed between relationship management and project performance, especially through harmonizing of time, reduced costs and routine communication on changes that happened during the process.

Based on the reviewed literature, the researchers contend that indeed a lot has been done regarding the subject matter under investigation. However, little has been done regarding the construction sector in Uganda, yet cases of project inefficiencies to do with road construction still manifest. This study therefore strived to close this gap by linking contract management activities to operational efficiency with the intent of ensuring that high standard roads are constructed at the least cost possible.

3. Methodology

Given the nature of the research questions, a cross sectional survey design was used on a sample of 108 participants drawn from a population of 150 (staff and contractors at UNRA). Stratified sampling technique was used to categorize study participants into common strata from which Simple Random Sampling (SRS) was used to draw the sample that constituted the study. The study utilized Self-Administered Questionnaires (SAQs) to collect primary quantitative data in which contract management measures as well as the tenets of operational performance were captured. The Statistical Package for Social Scientists (SPSS) Version 25 was adopted to enter and process the data while analysis of the data was done through descriptive statistics (mean and standard deviation) as well as inferential statistics (correlations and regression models). The means helped the researchers to describe the opinions of participants about the variables while standard

deviations were computed to gauge the degree of variation amongst the opinions of the participants. On the other hand, correlations were generated to establish the nature and direction of relationships between the study variables while multiple linear regression models were run to predict operational performance from contract management. Equally, regression analysis was used to examine how the various tenets of contract management affect operational performance.

4. Results and Discussion

4.1 Descriptive Statistics

Here, the researchers aimed at capturing the varying opinions of participants regarding the study variables. To achieve this, means and standard deviations on statements under each variable were generated after which average means and average standard deviations were processed. Table 1 below presents the descriptive statistics about the variables.

Table 1: Descriptive Statistics on Variables

Contract administration	N	Min	Max	Mean	Std. Dev.
The authority has established guidelines for governing contract administration	97	1	5	4.38	1.015
All contract entered by the authority observe the established guidelines on contract administration	97	1	5	4.41	.976
The contracting process is open and unbiased	97	1	5	3.94	1.069
All eligible contractors are shortlisted for works from which the best competitor is awarded the contract	97	1	5	3.92	.886
The contract exercise is participatory and involves stakeholders across board	97	1	5	4.15	1.112
The payments to providers are done promptly in order not to affect road construction performance.	97	1	5	4.21	1.127
UNRA evaluates the quantity and quality of services, works, or products delivered	97	1	5	3.95	1.084
During the preamble to contracting, emphasis is put in value for money to ensure efficiency	97	1	5	4.11	0.929
Average mean and Standard deviation				4.14	1.04
Relationship Management	N	Min	Max	Mean	Std. Dev.
There is Constant communication between contractors and UNRA	97	1	5	4.32	.941
UNRA has a focal person to manage relationship with Contractors.	97	1	5	4.23	.963
There is a mutual understanding between UNRA and the contractors.	97	1	5	3.91	1.032
Regular communication between the organization and Contractors	97	1	5	3.70	1.101
There is timely management of possible problems in the contract	97	1	5	3.96	.946
Relationship management helps greatly in shaping and improving procurement performance at UNRA	97	1	5	4.19	.994
Average Mean and Standard Deviation				4.00	1.000
Contract Monitoring	N	Min	Max	Mean	Std. Dev.
The authority has a well laid down framework for governing contract monitoring	97	2	5	4.03	.968
All undertaken contracted by the authority are monitored with strict observation to this framework	97	1	5	4.18	1.051
UNRA has adequate skilled, experienced, and knowledgeable personnel to monitor and supervise road construction.	97	1	5	4.07	1.269
UNRA monitoring teams always prepare reports which highlight the potential risks to the road construction performance	97	1	5	4.31	.972
UNRA identifies potential risks during road construction and are mitigated early enough	97	1	5	4.20	.943
Routine audits for undertaken projects are sanctioned to ensure activities keep on track	97	1	5	3.76	1.008
To avoid conflict of interest, UNRA at times outsources the contract monitoring function	97	1	5	3.94	1.097
Physical site visits are undertaken by the respective officers to ensure observation of contract terms	97	1	5	4.04	1.020
Average Mean and Standard deviation				4.07	1.04
Operational Performance	N	Min	Max	Mean	Std. Dev.
UNRA has an overall framework for guiding satisfactory operational performance of undertaken projects	97	2	5	3.98	.989
Our projects are usually delivered in a timely manner	97	2	5	3.64	.970
We register minimal complaints from both internal and external stakeholders	97	1	5	3.22	1.183
Our projects are achieved at the least and competitive costs in the market	97	1	5	3.24	1.297
The services offered by the UNRA are reliable	97	1	5	3.58	1.265
The offered services are usually complete	97	1	5	3.20	1.169
UNRA projects always conform to the agreed standards	97	1	5	3.48	1.259
Average Mean and Standard Deviation				3.46	1.16

Source: Field data (2023)

The results in table 1 reveal that given an average mean of 4.14, the participants agreed to the statements formulated to measure contract administration at the authority. This could be attributed probably to the authority undertaking

periodic supplier audits and rectifying compliance mistakes, ensuring that payments to service providers are done promptly to harness workflow as well as ensuring that relevant approvals are obtained for all items procured to

ensure compliance and propelling operational performance of the authorities undertaken road contracts. With a standard deviation of 1.04 however, the variation resulting from the opinions of the participants about the statements is higher implying many variations in responses.

The findings in table 1 show that there was general agreement to the level of relationship management at UNRA given an average mean of 4.00 and an average standard deviation of 1.000. This could probably be attributed to the presence of constant communication between the authority and its contractors, the presence of a focal person to manage relationships between the authority and its contractors as well as ensuring timely management of possible problems arising from the entered contracts between the authority and other stakeholders. Variation is relatively high since standard deviation is 1.000 and this might imply many variations in responses.

An average mean of 4.07 and associated average standard deviation of 1.04 as presented in table 1 indicate that respondents agreed to the statements designed to measure the extent of contract monitoring at UNRA. This could probably be attributed to the authority having a well laid down framework for governing contract monitoring, all undertaken contracted by the authority are monitored with strict observation to this framework, UNRA having adequate personnel to monitor and supervise the project's implementation while considering the timeliness, quality and cost as well as UNRA having adequate skilled,

experienced and knowledgeable personnel to monitor and supervise road construction among others. With a standard deviation of 0.994, variation amongst the views obtained from respondents appears relatively high which might imply many variations in responses.

Findings in table 1 also indicate that respondents didn't pronounce themselves on the level of operational performance at the authority given an average mean of 3.46 and SD of 1.16 which could be premised on delayed project completion, higher costs incurred to procure and deliver the various road construction projects, registered deviation especially on quality compared to what was agreed and the fact that road construction costs remain relatively high in Uganda compared to the neighboring countries. With a standard deviation of 1.16, overall variation regarding the opinions of the participants on the statements measuring operational performance appears high and hence wider variations in responses.

4.2 Correlation Statistics

The researchers performed correlations to establish the interrelationships between the study variables. The Karl Pearson's two tail test statistic was generated for correlation index values of $-1 \leq r \leq +1$. The results generated from the process are presented in the various tables under this section.

Table 2: Correlations between variables

<i>Variables</i>		<i>Contract Administration</i>	<i>Relationship Management</i>	<i>Contract Monitoring</i>	<i>Operational Performance</i>
Contract Administration	Pearson Correlation	1	.874**	.845**	.532**
	Sig. (2-tailed)		.000	.000	.000
	N	97	97	97	97
Relationship Management	Pearson Correlation	.874**	1	.837**	.644**
	Sig. (2-tailed)	.000		.000	.000
	N	97	97	97	97
Contract Monitoring	Pearson Correlation	.845**	.837**	1	.469**
	Sig. (2-tailed)	.000	.000		.000
	N	97	97	97	97
Operational Performance	Pearson Correlation	.532**	.644**	.469**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	97	97	97	97

***. Correlation is significant at the 0.01 level (2-tailed).*

The results presented in table 2 above indicate that contract administration exhibits a moderate positive relationship with operational performance ($r = 0.532$; $p < 0.01$). The results therefore imply that a unit positive change in contract administration at UNRA results into a 0.532 positive change in operational performance. The results are in agreement with (Kongosong, 2017; Muhammad, Saoula,

Issa, & Ahmed, 2019) who concluded that positive association exists between contract administration and operational performance of a firm. Furthermore, the results presented in table 2 above indicate that relationship management exhibits a strong positive relationship with operational performance ($r = 0.644$; $p < 0.01$). The results therefore imply that a unit positive change in relationship

management at UNRA results into a 0.644 positive change in operational performance. The results agree with (Kongosong, 2017; Komakech, 2020) whose works found a positive association between relationship management and operational performance of an entity. The results presented in table 2 above equally indicate that contract monitoring exhibits a moderate positive relationship with operational performance indicated by a correlation index of $r = 0.469$; $p < 0.01$. The results therefore imply that a unit positive change in contract monitoring at UNRA results into a 0.469 positive change in operational performance. The results are consistent with (Byaruhanga & Basheka, 2017; Kim & Moon, 2020; Nawi, Rahman, & Abdullah, 2021) who concluded that a positive significant

relationship existed between contract monitoring and a firm's operational performance.

4.4 Regression Analysis

Having ascertained the interrelationships between the study variables, the researchers went ahead to generate multiple regression statistics aimed at examining the effect of contract management on operational performance. The researchers also generated regression coefficients to examine the individual effects of the dimensions of contract management on operational performance.

Table 3: Model Summary and Coefficients

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.656 ^a	.431	.413	.71757

a. Predictors: (Constant), Contract Monitoring, Relationship Management, Contract Administration

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.246	.402		1.110	1.000
	Contract Administration	.420	.193	.420	5.103	.004
	Relationship Management	.347	.214	.347	4.891	.000
	Contract Monitoring	.246	.185	.246	3.435	.000

a. Dependent Variable: Operational Performance

Results contained in table 3 above indicate that contract management explains 41.3% of the variation in operational performance at UNRA while other factors that were not part of this study explain the remaining variation of 58.7% of the variation in operational performance at the authority. The results thus imply that contract management is a relatively weak predictor of operational performance. The results are consistent with (Byaruhanga & Basheka, 2017; Komakech, 2020; Kulkami, Zhang, & Naik, 2021) who concluded that contract management positively affects the operational performance of an organization.

Equally, multiple linear regression coefficients were run to examine the individual effect of the dimensions of contract management on operational performance and achieved the following findings: contract administration, relationship management, and contract monitoring all positively predict operational performance at UNRA. Contract administration predicts 42%, relationship management which predicts 34.7%, and Contract Monitoring predicts 24.6% of the variation in operational performance of the authority. The results imply that; 100% improvement in contract administration results into a 42% positive improvement in operational performance, 100% positive improvement results into a 34.7% positive improvement in operational performance while 100% positive improvement in contract monitoring results into a 24.6% in operational performance at UNRA. However, the results

imply that all these dimensions are moderate predictors of operational performance at the authority.

5. Conclusion and Recommendation

5.1 Conclusion

The researchers concluded that whereas contract monitoring is positively and strongly related with operational performance, contract management is relatively moderate in predicting operational performance given a moderate prediction power. Therefore, contract management alone cannot lead to sustainable levels of operational performance if not traded with other mechanisms that foster efficiency in operations of an entity.

5.2 Recommendations

The study makes the following recommendations:

1. The authorities at UNRA should pay keen attention to all dimensions of contract management adopted in this study since they all positively relate with and equally positively influence operational performance of the

organization. By doing so, any areas or occurrences that would jeopardize smooth flow of activities and works will be eliminated and the ground leveled for harnessing operational efficiency.

2. More effort should be devoted to effectively administering contracts entered by the authority in a manner that material facts and steps are conclusively followed since contract administration has the highest positive contribution towards operational performance.
3. There should also be routine engagements with contractors and other stakeholders to ensure smooth relationship management coupled with effective communication between the parties as relationship management also has a relative positive effect on operational performance.

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