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The paradox of Treasuring Engineers performance determinants and road construction activities in Uganda: Empirical lessons learnt from Kakumiro-Hoima, Bulisa projects.

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Abstract: *Over the decades, there has been a growing concern about the challenges of engineers 'performance determinants and road construction activities in Uganda. The study adopted descriptive mixed methods to enable the collection of qualitative and quantitative data. A case research design was adopted to enable an in-depth understanding of the variables under investigation. A sample of 166 representatives was engaged in the study. The study used, survey, interviews, focused group discussion and documentary review in data collection. The data was analysed with maximum care. The data collected was entered using SPSS version 21 and analysed with Structural Equation Modelling using AMOS version 21 to test hypothesizes. The results show that a unit improvement in contractor selection leads to 23% improvement the performance of road construction projects (r = 0.231, p=0.006). On the other hand a unit improvement in contractor supervising leads to 50% improvement in performance of road construction projects (r = 0.50, p<0.05). The study further demonstrated that the moderating effect of the PPDA as an oversight agency on performance on road construction projects is felt more via the selection process at 7.5% (r=0.075, p=0.002) than in contractor supervising at 1.2% (r=0.0117, p=0.001). The study identified some key factors that are affecting performance, such as focusing more on preliminary eligibility requirements. Conclusion: Contractors' competence and experience affect performance, delayed contractor payment and weak machinery. Therefore, the road agency in Uganda should focus more on supervising contractors since it is where the best elements of performance, that is, time, cost and quality, will be most improved. The study recommends a proactive collaboration focus on contractors' capability rather than eligibility in selection; review the contractor procedures in the PPDA Act; and improve the skills of the supervising teams, develop an information sharing mechanism to support decision-making and enhance transparency among agencies involved in road infrastructure development. The study achieved the overall purpose the evaluation of Engineer's performance and road construction activities, hence recommending improvement in the performance of road construction projects in Uganda.*

Keywords: contractors' expertise, road construction, performance, supervising

Introduction

The challenges of treasuring Engineers performance determinants and road construction activities in Uganda have taken different direction over age. There are a number of driving forces that, affect Engineers' performance and their road construction activities. The inappropriate performance of engineers in the activities affects infrastructure national development and retards political agenda of the government. It is essential to improve productivity, welfare, and security for rural and urban transformation (Saich & Zhang, 2023). Production costs, employment creation, markets access, and investment depend on infrastructure. The quality of infrastructure is the prime factor separating nations that are economic winners from those that lose ground or remain non-starters. Conversely, for developing countries road infrastructure is often mired with inefficiency and ineffectiveness (Nations et al., 2023), (Saich & Zhang, 2023). Road construction is affected by supply chain relationships, ability to adopt new technologies and management styles.

In Uganda for better road infrastructure performance, the National Roads Authority, Uganda Road Fund and Public Procurement Authority under Ministry of Finance and Economic Development (Ajodo-Adebanjoko, 2021). This organization was established to coordinate procurement and supervision of road contractors. However, for the last decade, performance of road constructions is worrying with reported project delays, cost overruns and inferior roads (A. D. Bank et al., 2018). Accordingly, this study examined the effect of contractor selection and supervising on performance of road infrastructure projects in Uganda. There are several important factors that influence performance and these include past experiences, cognitive biases, commitment and individual differences, which include age and socio economic status (Mancuso et al., 2014). Organization size is another factor that influences strategic performance.

Huemann & Turner, (2024)found that managers of smaller business units usually have greater involvement in performance supervising making process than managers of large units. According to Otim & Alinaitwe, (2013) repeatedly awarding contracts to a single contractor be precluded; an impartial method must be used for selecting contractors who are to receive bid solicitations. Cheung, (2021) posit that the selection of a contractor for a project is a critical decision for the developer because they often rely on the contractor to manage the process of transforming a feasible concept into a functioning project. Although some owners have the

expertise, resources and desire to lead the development effort on their own, choosing the right contractor can greatly improve the likelihood of project success. Contractor selection in this study referred to procurement methods, evaluation criteria, competency, capacity, commitment, cost, consistency, culture and communication (Elhoseny et al., 2022).

The dependent variable was performance of road infrastructure projects. In Uganda, roads classification is by their type of surfacing, purpose or by the authority concerned with their management and maintenance (Elhoseny et al., 2022). A road might be classified as National, District, Community Access and urban roads. National Roads are under management of the Uganda National Roads Authority (UNRA) and they consist of tarmac and high-class gravel roads (Reddy et al., 2021). District roads are mostly gravel, which under the District Local Governments and they connect rural areas to the national road networks and to other social amenities such as schools, health centers, markets and places of worship. Community access roads are small, normally earth roads which connect the very remote areas to the District roads and they are under the authority of the sub-county local Governments and the communities, which are charged with the responsibility of maintaining them (Salim & Emrah, 2022). Meanwhile, urban roads run and connect various areas like commercial to industrial, civic centers to residential neighborhood, residential centers to commercial, residential to institution within an urban area and are under the authority of the Urban Councils.

The town councils, municipal councils or city council and high-class gravel roads For the purpose of this study, National Roads were the subject of focus in this study. Band et al., (2020) observed that road performance is the accomplishment of a given task measured against present known standards of accuracy, completeness, cost and speed. In a contract, performance deemed as the fulfillment of an obligation in a manner that releases the performer from all liabilities under the contract (Ochol et al., 2023). In this study, operationalisation of performance of road infrastructure performance was by using three performance indicators namely cost and quality. In support, (Cheung, 2021)note that, to establish the construction performance objective measures like time, cost, safety and environmental considerations; while subjective measures include quality, functionality and satisfaction of project participants. Orlov, (2016) posited that performance is not just about efficiency but achieving desired results. They identified performance indicators to measure the success of construction projects, which include client satisfaction, stakeholder engagement, service delivery, investment return, urban renewal, defect minimization, trust, dispute avoidance, innovation, safety and standard. He noted, however, that the most commonly cited indicators are time of completion, project cost and workmanship (Khan & Le, 2022)

On selection of contractors to carry out specific construction works in an organisation, the role is for the clients (or employees of the organisation. This role is vital to the success of any project, therefore great care should be taken to ensure an appropriate contractor is selected (Salmon, 2020)

In the construction industry, the process of selecting a contractor is generally referred to as ‘tendering’ and involves preparing tender documents that describe the project, and then inviting tender submissions from prospective contractors from which as selection can be made. Normally, contractor selection involves consideration of group decisions, since factors and perceptions employees involved in the process influence this choice (Eisenmann, 2021). Therefore since the selection of a capable contractor is a strategic question for the good performance of the construction project they are two essential issues in the selection process namely adequate criteria and methods of contractor evaluation. In this context, if the criteria are inadequate, the contractor selected may not perform to the expectation, even if the decision-making was conducted rightly (Schweizer & DiStefano, 2017).

The selection process involves the employer preparing the tender documents adequately describing the project scope and the selection criteria. Then the tender advertised and potential contractor buys the tender documents and proceeds to prepare their bids, evaluated by the client on submission. Under the decentralised procurement process in Uganda, the staff of the government agency evaluates the contractors’ submitted (T. W. Bank et al., 2021).

The moderating variable in this study was the oversight role of PPDA. Oversight by PPDA is to ensure transparency and compliance in contractor selection and execution of road construction works. This oversight in road construction primarily lies with Public Procurement and Disposal of Public Assets Authority (PPDA Act, 2013; (Ahmad & Islam, 2024). Other agencies that get involved in oversight activities include, IGG, OAG and Parliamentary Committee including the Presidential committee on infrastructure. For the purpose of this study, the moderator variable considered the perception of employees in the responsible government agencies about the oversight-moderating role of PPDA (Flanagan et al., 2020). Government agencies involved in road sector construction should aim at working in a coordinated manner in order to have a common goal that is timely completion of high quality and cost effective roads. Accordingly, PPDA in this study is a moderator variable because by its mandate has a causal relationship with the independent variable and with the dependent (Stor, 2022). In this regard, the parameters used to assess PPDA moderator role include perception about compliance enforcement, advisory and capacity building in Uganda.

Methodology

The descriptive mixed methodology was adopted to enable collection of both qualitative and quantitative data for this study (Macharia, 2022). The study used correlational design was adopted to provide a systematic explanation of the research objectives (Eisenmann, 2021). A correlational approach enabled the researcher to assess the relationship between the study variables. Descriptive correlation design used was suitable together the required data analyse the variables under investigations and assisted in getting deeper understanding of the study. The collected quantitative primary and qualitative secondary data to provide insights about the research hypothesis (Kothari & Garg, 2014).

The two sets of data collected enabled triangulation of quantitative and qualitative information considering the positivist and interpretivist stance. This approach posted in pragmatism philosophy that made this study successful in nature. The study development of hypotheses that were tested and the results confirmed the assertion (Macharia, 2022). From the interpretivism perspective, there was focus on Engineers' performance and the implementation of their activities in the study areas. There was focus on understanding the in-depth of the relationship between the study variables under investigation.

The study engaged a sizeable sample of 166 research representatives as participants who are key stakeholders involved in the two sites of road construction activities. These members were drawn from Kakumiro Hoima and Hoima Bulisa construction projects. The unit of analysis road infrastructure projects and the unit of inquiry were members of that have a direct stake in these projects (Cheung, 2021). The study used survey, interviews, focused group discussion and documentary review in data collection. The sample was selected using relevant sampling techniques that included simple random, convenient and purposive. This was made in order to avoid bias and in order get accurate information form the targeted representatives. It is from the selected agencies involved in road construction, contractors' association, local leaders represented by Civil Society Organizations (CSOs) and members of parliament on infrastructure committee the researcher selected individuals to participate in the study (Macharia, 2022).

Thereafter, for procurement professionals, project engineers, consultants and contractors clusters, adopted purposive sampling to select the determined number of respondents (Cheung, 2021). In particular purposive sampling targeted senior procurement, engineers, consultants and contractors who are directly involved in road projects management. For each cluster, the respondents were the selected purposively to ensure maximum participation of the targeted groups. Furthermore, the decision to put the population into groups was due the fact the under institutional framework, different players are involved in the selection and supervising of contractors (Irhiam et al., 2023). The decisions and involvement roles of these different groups feed into the performance if road infrastructure projects.

Descriptive statistics were generated (mean, variance, standard deviation, kurtosis and skewness) in SPSS 21.0 and later exported to AMOS 21. The correlation of data to assess the relationship between the study variables was in the AMOS 21 in the Structural Equation Model (Liu et al., 2024). Finally the study used qualitative approach to collect data that was then used to validate quantitative findings. The confidentiality of the information obtained from the subjects is another important issue for all human subject research (DePoy, 2024).

The researcher conducted a number of tests to the quantitative data to check if it meets the statistical requirements for the use of Structural Equation Modeling (SEM) (Jr et al., 2021). Initial descriptive statistics revealed normality in the data distributions owing to the skewness and kurtosis levels being within accepted tolerances. In this study used SEM, a multivariate statistical analysis technique to investigate the relationship between the study variables set out in section 1.4 above (DePoy, 2024). Many studies, particularly those in the behavioural sciences, increasingly use SEM as a statistical method. The rationale behind the selection of SEM for the current study is as follows: First, this study was a confirmatory research study that aimed to confirm theoretically informed research hypotheses deduced from previous theoretical and empirical results in the literature. SEM was an appropriate statistical analysis method for testing the hypotheses in confirmatory researches (Bartels & Wittmayer, 2020). Furthermore, the study included latent constructs, that is contractor selection and contractor supervising, that are not directly observable and that consist of multiple indicators.

After the completion of each interview and at the end of each day in the field, the researcher typed field notes about the interviewee, the interview location, the cluster field representation, and other observational data (Humble & Radina, 2018). While in the field, the researcher reviewed notes from the interviews to determine if there were relations with the research hypothesis and quantitative results generated by SEM. As the researcher worked through the data, theoretical memos that highlighted key issues in the data that related to multivariate analysis results under SEM were incorporated (Jr et al., 2021). Documentary review was concurrent during quantitative and interview data collection and analysis processes.

Results

The findings of the study clearly indicated analysed basing on the descriptive data generated. This study engaged 166 research representatives from Kakumiro Hoima raod up to Bulisa oil drilling sites. The response rate of 92.2% and only declined to participate in the study7.8% respectively. This response rate is high enough to ensure more accurate survey results. .The high response rate was owing to the researcher's prior lessons learnt from the focus group discussions. The table 1 below show contractors engaged into the study

Table1: Contractor supervising results

	N=166	Mean	Variance
CM1	Inadequate supervisory skills among Staff designated to monitor contract is affecting performance	4.0	.166
CM2	Failure by contract managers to clearly understand contractor supervising procedures is affecting performance	4.0	. .166
CM3	Contract supervising staff do not care to prepare contractor-supervising plans.	4.0	. .166
CM4	Project staff do not care to communicate to contractors expected project goals and expectations	4.0	. .166
CM5	Contract supervising staff does not bother to make appraisal of contractors during project implementation.	4.0	. .166
CM6	Record management during project implementation is not taken serious contract supervisors	4.0	. .166
CM7	Delayed payments affect contractor supervising	4.0	. .166
CM8	Laxity to invoke penalties due to delayed or poor quality works affects supervising	4.0	. .166
CM9	There are irregular site inspections by contract monitors	4.0	. .166
CM10	Poor feedback between contractor and employer affects contractor supervising.	4.0	. .166

Source: Primary Data (2025)

According to results in table 1: above 80% of the participants, agree that there is inadequate skills among supervising staff, failure by contract supervisors or managers to under understand supervising procedures. The contracts supervising staff lack contractor supervising plans, projects staff do not communicate projects goals and expectations to contractors, there no appraisal for contractors by supervising staff and there is laxity to keep records. Furthermore, the respondents agree that there is delayed payment of contractors, laxity by contractor supervising staff to invoke penalty due to delays and poor quality of works, irregular site visits and poor feedback between employer and contractors. In addition the cross tabulation of the adequacy of supervisory skills among the staff supervising contractors verses position as indicated in table 1. It is clear that, from the level of officer to senior management majority agreed that there are inadequate skills among staff. This makes skilling critical contractor supervising to enhance performance of road construction projects.

Overall, the results show weaknesses in contractor supervising. These findings validated by the following individual interviews and documentary review. This was the view noted during interview. In one of the individual interviews, an interviewee observed that:

> *"The problems are the poor supervision by the assigned UNRA project engineer. The contractors are left to execute works the way they wish and the engineer just approved certificates without verifying. This could be due to lack of skills, competency or corruption. This explains the poor quality of road works"* ***March 2025 Procurement Professionals***

This is an area of concern because supervising cannot improve by merely putting adequate procedures but also skilling the supervisors with modern supervising systems and ensuring they perform. Markow, (2012)noted that this could be avoided through design and build project models. However, this study did not cover the merits and demerits of design and build.

Developing effective working relationships between UNRA and the contractor can improve quality roads and enhance meeting of government and public expectations (Office, 2007). The primary goal for contractor supervising is to ensure that commitments and obligations of government and the contractors are visible and known by all stakeholder during project implementation (Schweizer & DiStefano, 2017).

A respondent interviewed noted that;

> *"Feedback mechanism is an important component of communication. He observed that the role of communication on a construction project could not be overstressed. The common cause of construction disputes is a breach in communication and expectations. Whether supervisor of a project by UNRA staff or externally, there must be an established central hub for effective flow of communications in order to build a relation"* ***March 2025, A member of CSO***

The study also revealed that rigid bid evaluation rules that call the lowest priced bid to be awarded lead to a challenges at implementation. The contractors tend to be slow and unscrupulously try to recover their lost profits through use of substandard materials and poor workmanship (Markow, 2012). This call for vigilance both at selection and supervising to ensure better results is realized. On the issue of awarding road works to contractor who have seriously under-priced the works, during interviews a respondent noted that:

> *"The issue of under-pricing by contractors in order to win tender is real in UNRA and it is becoming a trend. Most of these contractors has requested for variation during implementation, which is becoming a challenge to UNRA. In addition, where contracts a lump sum the contractor try to play games of poor quality work. He however, noted that the problem is the way the PPDA Act and Regulations. There is need for UNRA to conduct due diligence on under quoting contractors prior to contract signing"* ***March 2025 A member of UACE***

Similarly, once supervising is poor on a contractor who has under quoted the result is delays, cost overruns and poor quality works (Alinaitwe, Apolot & Tindiwensi, 2013).

During interviews, a respondent noted that:

> *"There is irregular use of price adjustment clause perpetuated by staff supervising contractors during implementation. This is not just affecting the final project cost by it is a red flag for fraudulent acts"* ***March 2025 Member of Parliament on the Infrastructure Committee***

The Auditor General in the report issued for the Financial Year 2023/2024 concurred that inadequate designs and underestimation of quantities on the construction led to increased contract price, which distorted the project cash flows at implementation stage. The same report it indicated actual works quantities of some items varied by more than 1,000%. The report further revealed by the design consultant did not performing initial lime consumption tests on the lime-stabilized sub-base of the road constructed. This led to failure in obtaining the materials that could meet the specifications and hence delays due to design review. This caused time overrun on the project and led to cost overrun and possible compromise on quality of the road works.

The Auditor General further revealed that inadequate planning by UNRA caused a change in scope of works by adding a section of 163 meters left out during design leading the increased cost of Uganda 3 billion during the implementation. The Auditor General report observed that delayed payment of contractors' certificates led to an increase in project costs in terms of interests on late payments.

The Construction Sector Transparency Review (COST) report of March 203 concurs that there are long delays in commencement of works after contract awards in UNRA. Most road construction works projects in UNRA commence 25 months after signing of contracts. Such delays cause challenges of time overrun and cost overruns during project implementation and at times leads to costly design changes.

Similarly the PPDA Annual procurement performance Report issued in 2024 depicted that delay to commence works on construction of road lead to further deterioration of the road forcing UNRA to change the scope of works (to have a higher class of road), which resulted in huge increase of works and also made contract price to increase by almost 100%. The contract price could have been lower if the commencement or road works was on time. Delayed land acquisition le to time overrun in project implementation of project as noted in the PPDA Report (2018).

The correlation results using the SEM model indicate a statistically significant positive moderate direct effect of contractor selection to road infrastructure performance (at $r = 0.466$, $p < 0.05$). For this study hypothesis 2: *Contractor supervising has a significant positive direct effect on performance of road Infrastructure in Uganda* is accepted. The details are in the SEM model depicts a positive correlation. The computation of the coefficient of correlation indicates that every positive increase in contractor supervising there is positive increase in road infrastructure performance of 47%.

In order to determine the direction and strength of the relationship, regression results were generated under the SEM model ($r=0.50$, $p<0.05$). The results confirm a positive coefficient of regression and are statistically significant. Thus as the value of contractor supervising improves (the independent variable), the mean value of road infrastructure project performance (the dependent variable) significantly.

During interview, a responded noted that;

> *"…. PPDA influence in contractor supervising will remain insignificant because the PPDA Act and Regulations are largely silent on the procedures agencies should follow during implementation. As a regulator PPDA should incorporate supervising procedures in the Act. Agencies use FIDIC guidelines which are not part of PPDA guidelines. These FIDIC guidelines are robust*

and international and can be incoprated in the PPDA regulations, this way PPDA can monitor through complaince assements, but as for now PPDA is no where" ***March 2025 - Procurement Professional***

According to Construction Sector Transparency Initiative (CoST), performance of road infrastructure is a key sector with required resources estimated at $ 1.4 billion per year over the next decade world over. Uganda already spends approximately $ 1 billion per year on public infrastructure, equivalent to about 17 percent of its Gross Domestic Product. In addition, the Government of Uganda spends at least 3.3 trillion shillings annually to improve its road network to bitumen standard, which roads transport around 97% of the country's cargo, yet the quality of the roads constructed remains substandard. This call for oversight agencies to step up their supervising roles both during award process and contract implementation so as to ensure value for money and prompt delivery of roads for economic development. The position highlighted by Construction Sector Transparency Initiative (CoST), emphases the importance of the oversight role in road sector development.

On the role of PPDA a respondents noted that;

PPDA's role premised on strengthening transparency, which includes ensuring legal standards that require PDEs to contract fairly and to publish awards on the Government Procurement Portal (GPP) PPDA also holds Procurement Barazas in partnership with Civil Society Organisations at all levels to disseminate to the public findings from procurement audits. ***March 2025 – PPDA Respondent***

The correlation results using the SEM model indicate a statistically insignificant direct effect of PPDA oversight role on road infrastructure performance (at r =0.076, p> 0.05). For this study hypothesis 3: *PPDA oversight has a significant direct positive effect on road infrastructure Performance in Uganda*. *Hypothesis 3 rejected.* The results show that the effect of PPDA is not conclusive; a wider study to cover the wider public may be required. The details presented in the model in figure 4.2. In order to determine the direction and strength of the moderating effect, regression results were generated under the SEM model (r=0.146, p>0.05). The results confirm that the coefficient of regression is statistically insignificant.

Effect of Contractor selection and Performance

This study, considered PPDA to have a moderating effect on contractor selection as an independent variable and performance as a dependent variable, accordingly the hypothesis 4 was tested: *PPDA oversight role has a strong moderation effect on performance of road infrastructure via Contractor selection was accepted*. The data sets used to test the hypothesis. Using the SEM model two correlation coefficient were determined (PPDA-CS r=0.311 p=0.000), (PPDA-PERF r=0.076 p=0.063). These results confirm that PPDA's moderating effect is positively associated to selection and performance and that the association is stronger with selection than performance.

Moderator effect of PPDA on Contractor supervising and Performance

In the study, PPDA had a moderating effect on contractor supervising as an independent variable and performance as a dependent variable, accordingly the hypothesis 5 was tested: '*PPDA oversight role has a strong moderation effect on performance of road infrastructure via Contractor supervising*(Cheung, 2021). The data sets used to test the hypothesis five were from supervising. Using the SEM model results in table 4.19 above, two correlation coefficient were determined (PPDA-CM r=0.129 p=0.007), (PPDA-PERF r=0.076 p=0.063). These results confirm that PPDA's moderating effect although positively associated to supervising and performance and that the association is stronger with supervising than performance.

In order to determine the direction and strength of the moderation, conducted a multivariate regression analysis using the SEM Model. The results confirm a weak positive coefficient of regression and statistically insignificant. The results confirm that a unit change in PPDA is moderating role of PPDA on performance through contractor supervising leads to small increase 1.2% of road infrastructure performance. In this study hypothesis five (5) *PPDA oversight role has a strong moderation effect on performance of road infrastructure via Contractor supervision rejected*. When asked about the effectiveness of PPDA as an over sight agency, a respondent noted:

"The interference by oversight agencies delays the completion of the selection process, this is common when bidders seek administrative review and PPDA as an oversight agency overturns the award…. in all cases PPDA has ordered a repeat of the process and consequently the cost outcome is always higher than the earlier submitted costs" ***March 2025- Procurement Professional***

All in all as indicated in the study findings, the PPDA interventions though well intentioned have led to cost overrun especially in projects where decision is to re-tender. The study observed that none of the projects that PPDA has ordered to be re-done where cost have gone down and time saved. Some of the projects have collapsed because funds sent back to treasury and re-allocated to other priorities. Although the mandate of PPDA is to conduct contract and performance audits on road projects, PPDA lacks professionals'

engineers to conduct detailed analysis on quality. He noted that this makes PPDA incompetent to ensure quality of road projects. There is need for PPDA to recruit professional engineers to handle this area. Similarly, Abedin & Hajek, (2023) contended that poor contract supervision and contractors delivering poor quality works are the key issues affecting public procurement performance.

Discussion

Road infrastructure project performance might seem quite straightforward, namely awarding and execution of contract. However considering the challenges involved in contractor selection, supervising , and the duty to ensure the contracts implementation is efficient and effective; it becomes a complex task (Abedin & Hajek, 2023). It is this concern that results in the previous chapter 4, point to: - a number of obstacles to performance of road infrastructure projects. In this chapter, the main findings discussed base on extended literature, documentary review and qualitative data gathered. The discussion focuses on four themes namely contractor selection and performance; contractor supervising and performance; and the moderating effect of PPDA oversight role contractor selection, supervising and performance of road infrastructure projects (Irhiam et al., 2023). The chapter ends with a section summary and discussion.

Contractor Performance of Road Infrastructure Projects

This section presents a discussion of results to understand how contractor selection is associated with the road infrastructure performance in Uganda. From the literature review, road infrastructure performance considers completion time, quality of the road works (Bartels & Wittmayer, 2020). Consistent with literature results presented in table 4.15 above, the three parameters were measured on 5 Likert Scale. Out of the 13 question, 10 had a mean ranging from 3.2 to 4, in particular the highest concern was noted to be unexplained delays of road project commencement (mean =4) and delayed road completion (mean=4). Other performance delay factors identified relate to contractor payment (mean=3.9), design reviews (mean=3.9) and delayed compensation (mean=3.9). The study reveals that road sector agencies in Uganda should pay closer attention to above in order to improve performance road construction projects. This observation in the study was based on the previous scholars have previously argued that the consequences of delay spill over into poor workmanship and cost overruns as well as conflicts (Nazri, 2019).

Contractor infrastructure delays to completion

Study findings revealed that there is a significant positive relationship between contractor selection and performance of road projects. In order to understand the causative factors of delay, the study examined the function of contractor selection (Cheung, 2021). The following causes were identified, interruption due the complaints by bidders during the selection process (mean=2.7), unnecessary approval stages (mean=2.9); focus on minor omissions and eligibility requirements (mean=2.8) as discussed below.

a) Interruption due the complaints: bidders raise complaints during the selection process leading to halting the process by oversight agency. This causes delays since the process cannot proceed until the compliant is resolved. These complaints often result in cancellation of the entire process. As Education 2030 & UNESCO, (2020) noted political influence negatively affects the performance of the road construction projects in terms of quality and costs. On appropriateness of selection criteria, contractor selection criteria were not appropriate for complex roads projects.

b) Unnecessary approval stages: selection of contractor process goes through different approval levels. This involves approval by the user departments, approval by the Accounting Officer and approval by the contracts committee (PPDA Act, 2013). The study reveals that the approval process is tedious and hence a cause of delay for road project commencement. The following interview responses. Contractor selection bases on procedure, for example; the firms that are eventually awarded contracts by the contracts committee should be in regard with the evaluation committee recommendations. Roberto & Albert, (2021) gives the powers to award contracts in accordance with applicable procurement or disposal procedures, as the case may be to the Contracts Committee. Selecting a contractor is one of major decisions that influences the progress and success of any construction project. Otim & Alinaitwe, (2013) posits that existing literature on contractor selection mainly deals with how to identify and assess the criteria to make the most appropriate decisions.

c) Focus on minor omissions and eligibility requirements: This part of the evaluation criteria, which is under the PPDA Act, 2013. This criterion is a preliminary requirement assessed on passes or fail basis. A bidder is required to satisfy these criteria before preceding the next stage of evaluation. Where a bidder has missing document the agency may request a bidder to produce them, which causes delays.

Contractor cost of road infrastructure projects

Cost overrun is, an excess of actual road construction costs over budget (Office, 2007) A cost overrun involves unexpected excess cost occurred due to budget underestimation of the proposed the infrastructure projects. Despite the benefits of avoiding the cost overruns, the study results show that cost overruns are due to inflated costs prior to contract commencement (mean = 3.3) and change in road design (mean = 3.4). The implication of this is that, contractors can make claims for additional costs. This is one of the strategies that contractors selected using Lowest Evaluated Bidder (LEB) principal use to make up losses from the unreasonably low rates used during bidding (Roberto & Albert, 2021). Sampled road projects records 15 out of the 20 road projects identified had cost overruns of over 50% (Appendix VI). Among the factors that resulted in this high percentage increase in contract sum are the modifications in the original design (mean = 3.4). From the above, it can be inferred that the cost over runs are partly due to claims made by contractors who attempt to make up for losses resulting from the unreasonably low rates used at the tender stage

The documentary review at UNRA depicted that weakness in planning coupled with conflict of interests and political interference caused delays on, road thus leading to cost overruns due to increase in rates of inputs like fuel and other materials supplied like cement for road stabilization (Senocak, 2012).
Similarly, (Education 2030 & UNESCO, 2020)concurred that political influence negatively affects the performance of the road construction projects in terms of quality and costs. On appropriateness of selection criteria, contractor selection criteria were not appropriate for complex roads projects. Contractor selection procedures allowed unnecessary interference through complaints, which caused delays of Hoima Bulisa and Kakumiro Hoima respectively. On analysis of contractor competency, the selection criteria did not provide for methods to analyse and confirm contractor competency. The selection criteria did not require for certified evidence from bidders to demonstrate their capacity to execute works on same road project. The basis of this analysis was on samples selected randomly for review from the UNRA records (Unruh & Williams, 2013).
The study investigated a selected sample of 150 construction professionals operating in Malaysia to identify the actual criteria used by clients for the selection of contractors from the current practice in Chaina. The results showed that track performance, financial capacity and technical capacity were the most important criteria considered crucial for the selection of contractors in Malaysia. The study also focused on the criteria and not the entire process of contractor selection and possible challenges.

Other issues that make the work more difficult are a shortage of demand forecasts and poor quality and flow of information within the organization (Aurel, 2020) further assert that the present content of procurement and the selection criteria do not encourage innovation or flexibility. The current procedures in the PPDA Act, 2013 and Regulations (2014) on management of tenders are very precise and give no opportunity to offer innovative solutions. Flexibility in contractor selection can have an influential role in the procurement process, for example, in the definition of the contents of the procured item and its goals (Roberto & Albert, 2021) On the contrary, the aims and goal of contractor selection and it connect to the whole service delivery is often left out of the definition. The conclusion and recommendations of the above authors mainly focused on the criteria for contractor selection.

Conclusion

This study examined the relationship between contractor selection and performance of road infrastructure projects in Uganda. The findings of this study indicate a statistically significant positive direct effect of contractor selection to road infrastructure performance at ($r = 0.124$, $p < 0.05$). The coefficient of further indicates that a unit improvement on contractor selection leads to 1.54% improvement in road infrastructure performance. Also the regression results ($r=0.231$, $p=0.006$) confirms that as the value of contractor selection improves (the independent variable), the mean value of road infrastructure project performance (the dependent variable) also tends to increase. Therefore, the study concludes that the lead agency in road construction (UNRA) role in contractor selection has a positive effect performance of road infrastructure projects. Using the principal-agent theory, the study reveals that contractor selection directly affects quality of road infrastructure projects, much as it may lead to cost and time overruns.

Contractor Performance of Road Projects

The study concludes that there is relationship between contractor supervision and performance of road infrastructure projects in Uganda. In accordance with the findings of this study, indicate a statistically significant positive moderate direct effect of contractor selection to road infrastructure performance (at $r = 0.47$, $p < 0.05$). The coefficient of determination confirms that a unit change in contractor supervising leads to 23% change in performance of road infrastructure projects. Further regression results ($r=0.50$, $p<0.05$) confirm that contractor supervising improves the mean value of road infrastructure project performance significantly. Therefore, the study concludes that the lead agency in road construction (UNRA) role in contractor supervising ($r=0.50$, $p<0.05$) is stronger than contractor selection ($r=0.231$, $p=0.006$) on performance of road infrastructure projects. Using the principal-agent theory, the study reveals that contractor supervising directly affects quality of road infrastructure projects, much as it may lead to

cost and time overruns. The study also reveals that priority efforts on contractor supervising by UNRA should be on improvement on feedback, regular inspection and skilling of monitors and contractor appraisal.

Role of PPDA and Performance of Road Projects

The aim of objective [3] was to assess the moderating effect of PPDA oversight on contractor selection, supervising and performance of road infrastructure projects in Uganda**.** Overall, the results indicate that the moderating effect of PPDA oversight is only statistically significant and positive on contractor selection ($r=0.325$, $p<0.05$) but otherwise insignificant for PPDA moderating role on performance ($r=0.146$, P=0.0.063). Multiple regression results further reveal that the moderating effect of PPDA oversight is felt more on performance vis contractor selection ($r=0.075$, P=0.002). In addition, descriptive statistics indicate that the oversight moderating effect affects cost and time overruns. Thus the study concludes that PPDA oversight moderating effect on performance is more felt via contractor selection ($r=0.075$, P=0.002) as opposed to Contractor supervising $r=0.12$, P=0.001). Based on qualitative data the PPDA moderating effect on performance via contractor selection is felt more cost and time performance indicators.

Recommendations

Basing on major finding and discussion we recommend that:

(i) The lead agency in road construction (UNRA) should pro-actively collaborate with PPDA in to revise the contractor selection criteria and place more emphasis on contractors' proven capability rather than eligibility. To minimise cost and time overruns as well as improve quality UNRA should executive the contractor decision-making in consultation with PPDA.

(ii) The lead agency has the principal role in contractor supervising as depicted by the findings; PPDA has minimal influence performance of road. The study identifies a policy and regulatory gap in supervising to be addressed by the principals in road infrastructure in Uganda. As a result filling gap will provide guidelines on feedback mechanism and capacity building.

(iii) The study identifies an information asymmetry gap. UNRA together with other principal agencies of government involved in road construction should develop information sharing mechanism on road sector performance, contractor selection and supervising to ensure principal agencies are supportive in decision-making and for enhancing transparency.

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