

Analysing the Impact of Procurement on Project Performance and Quality of Road Construction Projects in Zambia

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Abstract: This study intends to shed more light on the impact of procurement on project performance and quality of road construction projects in Zambia, focused on the city of Kitwe to be specific. It is of great value to conduct a detailed study on the impact of procurement on project performance as procurement is the backbone of project performance.

The research makes use of theories and models to analyze the information obtained from project documents, and also semi structured interviews in order to shed light on the relationship between procurement, project performance and quality.

The research found that procurement largely influences the results of the projects as different types of contract have different implications on the contract parties. In addition, the manner in which these contracts are implemented and executed by the contract parties will impact the project's quality and performance at large. As such, contract requirements based on the projects unique requirements should be diligently performed for the most desirable results to be obtained from the endeavor.

Keywords: road construction projects, project performance, project's quality.

1. INTRODUCTION

There have been several public outcries concerning road development projects. The majority of them concern how contracts are carried out by the contractors involved, who then blame the customer for their use of low-quality products. Due to issues with how the contracts are acquired, some of these vendors are unable to perform the task. However, owing to political pressure, most contractors are believed to have tried to hurry up the construction, reducing quality as a result of the low grade of materials utilized. This typically goes unnoticed until issues occur that reveal the nature of the work and the materials employed. As a result, evaluating the influence of procurement on project performance and quality becomes critical.

Significance

Public procurement is an important aspect in the economy. An effective public procurement policy is one of the key factors for continuous long term economic growth, business competitiveness, best value public services to taxpayers. It therefore becomes increasingly important for the government to adopt sound procurement procedures and policies for all road construction projects that do not only ensure transparency but also give a company competitive advantage towards its competitors. Public procurement procedures define categories of institutions that are obliged to follow specific rules when conducting procurement of all kinds. This ensures transparency and combats corruption but tend to prolong the procurement and prolong the cycle.

2. RESEARCH AND DATA COLLECTION

Research Design

For this research, qualitative research design was chosen as a research design to underlie the investigation. The data gathered defines a viable design for this investigation. Furthermore, the nature of the study necessitates the development of a general theory about the suggested occurrence, therefore theme research design is a good fit. Thematic design will aid us in identifying trends in our target population's attitude, beliefs, views, and actions, as well as how the procurement function affects road building projects.

The Study Population

The target population for this study included road construction companies in Kitwe and beyond, including those that have been involved in road construction for at least five years. In addition, data was collected from the local authority, Kitwe City Council workers in charge of road project procurement and officials in charge of setting road quality standards.

Sample Size

A sample is a subset of a population, according to Leedy (2005). The size of a subset of a population can be defined as a sample size. According to Khotari (2004), a research sample should be truly representative of population characteristics without bias in order to produce valid and reliable conclusions. This study's sample size was made up of 20 respondent from engineering consultation construction companies, regulatory institutions and government departments in Kitwe with experience in road construction project procurement, as well as three officers in charge of road construction project procurement from Kitwe city council, with a response rate of at least 20 people expected.

Sampling Technique

The study used a census survey method and therefore, there was no need for sampling technique.

Data Collection

Two types of data were collected in this work namely, primary and secondary data.

Secondary Data

The primary secondary data sources were articles, books, journals, magazines, newspapers, and websites, all of which were thoroughly reviewed. The goal was to evaluate literature on the impact of procurement on road building project performance and quality in order to enhance the data obtained during the field work.

Primary Data

The main instrument utilized to collect primary data was a self-administered interview. Individuals with expertise procuring various inputs for road building projects in Kitwe were contacted for interviews in order to get qualitative raw data on the link between procurement and project performance and quality.

3. PREVIOUS RESEARCH

Procurement Weaknesses and Challenges in Project Execution

The Zambian public procurement system despite having a relatively modern legal and regulatory Framework faces a number of challenges resulting from the long procurement procedures, sanctions for breach, resistance to change, limited capacity and simply incompetence in some cases,(ZPPA,2012).

Procurement lead times are affected by lengthy procurement procedures. According to Rouse (2016), lead time comprises everything from the initial attempt to acquire goods or services until the moment they arrive. It thus begins when the end user has a need (for example, the need to replace a spare part on a machine in use) and ends when the need is met, i.e. purchased and delivered to the user. During the procurement process, however, various obstacles exist, and these challenges have the ability to cause a delay by lengthening the turnaround time. Any obstacles that prohibit procurement events from taking place in accordance with the procurement strategy and timeline are frequently the cause of delays in public procurement operations (Lynch 2015). Lynch's approach can be applied to most road building projects, where the protocols and approval processes that must be followed at all times are the restraints that cause the procurement process to take longer.

Procurement Procedures

The processes involved in procurement procedures range from need recognition through need acquisition, according to Laedre et al (2006). In order to improve project performance, a better knowledge of how different procurement methods influence different elements of project performance is critical. Wardani et al. (2006) found that, 20. Independent of project variances, clients prefer to use procurement techniques that they are familiar with. Procurement procedures should be tailored to ensure that different project objectives are met and that project performance is not compromised (Laedre et al, 2006).

Procurement Methods

These refer to the type of procurement that the firm will use, which usually entails the type of bidding and tendering that the project will use. It is believed that the terms and conditions of the various methods may have an impact on the project's performance and quality, so this study aims to determine how the various methods have impacted road construction projects in Kitwe, Copperbelt Province.

Procurement Process Continuous Improvement

Continuous improvement refers to an organization's continual efforts to enhance all aspects of its operations. It is based on the concept that a continual stream of changes, carried out with care, will provide transformative effects, which may be gained by learning from previous experiences. Procurement should be constantly pursuing cost and efficiency advantages throughout procurement, the rest of the organization, and the supply chain through activities such as: Measuring all area of procurement from source to pay and, when applicable, comparing against similar organizations, as well as project setup with the procurement procedures and methodologies utilized, would assist in understanding the impact on project performance and quality.

Project Performance and Quality

Project performance and quality refers to the project's final outcome; however, numerous variables influence the project's performance and quality, and procurement is one such element that this research attempts to investigate in terms of its impact on project performance and quality.

Procurement Contracts

Institutions such as the Road Development Agency (RDA) have become procuring agencies rather than being implementers as set out in their mandate. This is in line with the findings of Mkuni, (2016) who asserts that government institutions aimed at providing leadership in the implementation process are engaging other firms to perform their mandate while they act as agents in the procuring of services on the project. Further, it was found that consultants meant to provide guidance on the quality and performance of works were engaged at a very late stage and this has been the major cause of re-planning and rework on road construction projects and these findings support those of Mkuni, (2016). Silwimba et al, (2017) reviewed that it has been a norm and culture for consultants to be awarded contracts much later after the beginning of the project which has been a major cause of confusion, major rework and cost overruns on the road construction projects in Zambia.

This study reviewed that Zambia being a developing country has been able to learn quite a great deal from foreign contractors on road constructions as these contracts have brought about opportunities to Zambia to learn from the techniques of these firms that mostly come from developed countries like china and bring in a lot efficient and effective ways of getting things done than those largely adopted by most Zambian contractors. These findings however did not support those of Ngomi, (2017) who reviewed that foreign contractors are not desirable as they do not want to work alongside local contractors for the fear of their techniques and ways of doing things being exposed to the locals. As it would cause them to lose future contracts because their skills would be replicated by Zambian contractors leaving their capabilities and competitive advantage absolute.

4. STUDIES AND FINDINGS

This chapter will highlight the findings of the study which was analysed thematically so as to analyse the impact of procurement on project performance and quality of road construction projects.

Level of Response

Construction of roads by government involves the procurement of different works. This usually has an implication on the quality and performance of the project, as such, respondents from the different public sectors, regulatory institutions, as well as some renowned consulting firms involving key experts, identified desk engineers and project manager's with at

least 5 years' experience were interviewed. This was done to get their views on how procurement affects the quality and performance of construction projects in Kitwe and Zambia at large.

At least twenty interviewees were targeted this comprised of the five from regulatory institutions, five from engineering consulting firms, and ten from governments departments and agencies involved in the public road construction. However based on certain challenges, only twelve were interviewed with two being from regulatory institutions, three from engineering consultation firms and seven from government departments and agencies involved in public road construction, others could not manage to be interviewed due to their busy schedules and health concern's to do with the Covid-19. However, all the twelve respondents had at least a bachelor's degree in civil engineering or its equivalent with four from middle management and eight in the upper management of the institutions visited.

Procurement Contracts

Contracting of works on road constructions projects is of great importance as it has a big implication on the success of the endeavour. However, majority of the respondents pointed out that government implementing institutions such as the Road Development Agency (RDA) have become procuring agencies without set or rigorous procurement targets. It was also noted that the majority of consultation contracts were signed after the project had already started, however this at the same time was condemned as being detrimental on the planning process as quality works are usually done when the consultants are engaged at the beginning of the project. Respondents further pointed out that engaging consultant's at a late stage causes re-planning and rework of some of the works done as to ensure the quality of the project. This re-planning and rework has negative implications on the performance of the project as the performance is considered to be bad especially on the project budget and schedule. Respondents also highlighted that complicated contracts with foreign contractors were desirable for project performance and quality. This is because foreign contractors usually lead to transfer of technology and skills to the locals participating on the project , hence to ensure that quality works are done in the future by local contractors, experts must be consulted.

The respondents further reviewed that contracts on some projects were signed without designs and that at times the project would start without a proper design due to political influence. As such, the time allocated for the project would be exceeded as design's would be done during implementation, further contracts would be signed without proper assurance of availability of funds from the treasury, hence such projects would be financially challenged and would receive massive quality compromises that would later make the project a failed endeavour.

Respondents further revealed that the procurement of roads and construction projects in general was heavily politicised and added that some contracts were politicised which later translated to poor project performance and poor quality adherence due to the manner in which these contracts were awarded. Additionally, contracts awarded based on political affiliation rather than competency, experience and skill of the contractor usually do not produce the best results.

Such contracting of roads has resulted in poor quality of works, poor performance, high budget overruns, non-fulfilment of project deliverable, which translates to little or no value for money which is the primary focus for government spending. The political aspects in the contracting of projects also resulted non-qualified individuals filling positions without adequate or desirable qualifications thus leading to inflated poorly planned procurement process of the projects.

Procurement Methods

According to CIPS (2013) Procurement is a business tool that enables management to identify, select, source, access and manage external resources that an organization needs or may need to fulfil its strategic objectives. In public construction projects this is a very important as well as sensitive function as it defines and affects the overall project delivery. As such the study investigates procurement methods as a variable and these methods used and their effects on the quality and performance of the project.

The respondents to the study focused on the provisions of the ZPPA public procurement Act of 2008, the Act provides a wide range of procurement method's that are available for use by all procuring entities in Zambia. The procurement methods available in the Act include; Open Bidding, Open Selection, Limited Selection Bidding, Limited Bidding and Direct Bidding, Simplified Bidding.

From the listed methods of procurement, simplified bidding was identified as the method used by contracting authorities in Zambia when the threshold for procurement does not exceed K500 million for goods, works and non-consulting services. For consulting services, it is applicable only when the threshold for procurement does not exceed K300 million these conditions were all attributed to the procurement Act of 2008.

According to respondents, the threshold should not in any way be the fundamental principle to determine the choice for procurement methods as the cost is mostly determined by the contracting authorities and because of this these authorities mostly adjust costs so as to avoid competition and ensure the contract goes to the desired contractor rather than the most suitable contractor for the project. Respondents also noted that the procurement method being utilized involving public private agreement on roads and toll plaza construction as being inefficient for the economy because private entities usually benefit more, and by the time the facility is handed over to the state, it would be in a dilapidated state needing rehabilitation, as such, value for money is not obtained from such works especially on road construction projects.

Limited bidding and direct bidding was characterized as being one of the most corrupt methods of procurement due to its nature of allowing the procuring authorities with the choice of which contractors to invite and include in the tender process. Respondents pointed out that the only way to justify this procurement method is when dealing with monopoly type of contractors that solely possess a skill or capability like in the case of Electricity and Water distribution companies. For instance, ZESCO and Nkana Water and Sewerage Companies do not have established competitor.

Open tendering has been chosen as the most preferred and advocated for procurement method by experts those that want to see the high quality performance will go for open bidding due to its numerous benefits that usually stem from the competitive nature of the procurement method. However in practice, the politics around the method most times rendered it ineffective as the process is rigid to favor politically affiliated contracting companies. This procurement method is regarded as efficient and effective in its endeavours as it is sited to be a promoter of fairness among the bidders. It is transparent in the way the operations are conducted.

Procurement Planning

Planning is an integral part of quality and performance expectations of each project, the plans highlight what is expected of the deliverable and the responsibility of each participant to delivering the result as such the study asked respondents on the effects that planning has on the quality and performance of road construction in Zambia particularly the Copperbelt province.

Respondents were asked to explain the implication of planning on quality and performance of road construction projects. Most interviewees reviewed that planning was the backbone of the project as it set out the quality and performance expected and desired and that it can be categorized into three planning horizons namely; master planning, look ahead planning and action planning.

Further respondents pointed out that a project that has no plan is very difficult to implement, this because it involves a lot of risk due to the uncertainty around the work. Simply put, the deliverable is not known, plans will define the specifications required however without certain specification the project implementers are blind. Such novel projects like road construction require a set plan as it will also highlight who is responsible for a given task and hence accountable if they have not delivered. Furthermore, it was reviewed that planning requires all major player available to ensure there is harmony among the project participants.

It was reviewed that poorly planned projects will experience challenges such as lack of support, this is because the deliverable is not effectively defined as such, different player's will have different expectation's and this was reviewed as one of the major problems with politically motivated projects.

Respondents further emphasized over the estimate aspect of planning, it was reviewed that planning was important because of estimates which can either make or break a project, for most Zambian projects, poor estimates was a major issue especially those done by local contractor's. For most international contractors, estimating was very effective as most of their project have been completed on time rather than having time and budget overruns. Many failed projects have been due to either poor budget or time estimates since are very important aspects of most projects.

It was reviewed that poor project plans will translate into poor scope control since the scope is determine through the planning process and the scope change is clearly defined. For poor project plans, the scope change or control guidelines may not be effectively done, it was noted that this confusion alone contributes significantly to the time and budget overruns that most road construction projects face.

It was also reviewed that most project problems are attributed to either the client or the contractor considering other aspects that underpin the project such as the planning process. This has resulted in little or no process improvement in the planning process of major projects including road construction projects. Since most clients will contract a consultant to manage the project, the mistakes that come out as compared to the project plans are unbelievable and only pointed out that consultants have not been to site to inspect in works are going as planned and if not have them controlled on time.

5. DISCUSSION

The study attracted respondents from different institutions that are concerned with construction of roads, which comprised of two from regulatory institutions, three from engineering consulting firms and seven from government departments and agencies involved in road construction as they provided data regarding the effects of procurement on road construction project, three variables were chosen to explain the phenomenal these include procurement contract, procurement method and procurement planning and the findings are discussed below.

Procurement Contracts

From the study, it was reviewed that institutions such as the Road Development Agency (RDA) have become procuring agencies rather than being implementers as set out in their mandate. This is in line with the findings of Mkuni, (2016) who asserts that government institutions aimed at providing leadership in the implementation process are engaging other firms to perform their mandate while they act as agents in the procuring of services on the project. Further, it was found that consultants meant to provide guidance on the quality and performance of works were engaged at a very late stage and this has been the major cause of re-planning and rework on road construction projects and these findings support those of Mkuni, (2016). Silwimba et al, (2017) reviewed that it has been a norm and culture for consultants to be awarded contracts much later after the beginning of the project which has been a major cause of confusion, major rework and cost overruns on the road construction projects in Zambia.

This study reviewed that Zambia being a developing country has been able to learn quite a great deal from foreign contractors on road constructions as these contracts have brought about opportunities to Zambia to learn from the techniques of these firms that mostly come from developed countries like china and bring in a lot efficient and effective ways of getting things done than those largely adopted by most Zambian contractors. These findings however did not support those of Ngomi, (2017) who reviewed that foreign contractors are not desirable as they do not want to work alongside local contractors for the fear of their techniques and ways of doing things being exposed to the locals. As it would cause them to lose future contracts because their skills would be replicated by Zambian contractors leaving their capabilities and competitive advantage absolute.

Procurement Methods

Respondents to the study reviewed that the procurement methods adopted for the construction of roads is strictly guided by the ZPPA Act of 2008 which guides how procurement for public infrastructure has to be conducted by the procurement agencies according to terms and conditions surrounding the project this is in line with the findings of Silwimba et al, (2017) as they reported that the ZPPA Act of 2008 provides for the procurement methods that may be utilized based on certain terms and conditions of the contract and project.

Further it was established that simplified procurement method was most desired when there was a threshold of not more than K500 million without consultation, and K300 million with consultation, however this conflicts with the findings of Silwimba & Mwiya, (2017) as they emphasized that the ZPPA requires open bidding to be the default procurement method for public infrastructure and unless in situation where there is other procurement methods will be suitable.

Respondents further condemned the utilization the private public partnerships in procuring government institutions as it was mostly benefiting the private more than the public sector as it was argued that by the time the facilities are handed over to government institutions the facilities would be in a dilapidated state however the study conducted by Ngomi, (2017) reviewed that this procurement method allowed government to gain public infrastructure at a very low price which represented value for money in most cases and that for effective implementation of the project the facilities should be run by the government and only pay-out the amounts due to the private institution so as to ensure the government is responsible for the operation's and maintenance of the facilities to ensure they are keep in good condition so as to promote their durability.

Limited bidding and direct bidding was characterized as the most corrupt procurement method as it was most susceptible to external influence where individuals would conduct the procurement with personal interests at play these findings are in line with those of Silwimba & Mwiya, (2017) as they reviewed that this is the method most corrupt procurement officials advocated and utilized due to its poor transparency implication and lack of accountability of the procurement officials.

Procurement Planning

Procurement planning was labelled as a very significant part of the project as it sets out the activities to be conducted, who is to conducted the activity of the project, the cost implication of the activity that will produce the deliverable, this is in line

with the findings of Ngomi, (2017) as it was established that procurement planning was the backbone of the project quality and performance in terms of time and budget adherence.

It was established that when the procurement plan is poor there is a very big chance that the deliverable will be poor and most likely the project will fail this supports the findings of Silwimba & Mwiya, (2017) as they reviewed that the plans will be an integral part of the success of the project, poor project plans are indicators of the risk of project failure and experts are able to tell between poor and good procurement plans.

Further the study established that poor procurement plans have issues or problems that are most likely to affect the project, among these problems lack of support was apparent as most support comes from experts and these experts are able to evaluate and tell a good procurement plan to a bad one and if it is established that the plan is poor other players will be reluctant to support the project as failure is expected, this is in line with the findings of Silwimba & Mwiya, (2017) as it was noted that poor procurement plans will cause loss of confidence from stakeholders.

Procurement Contracts

From the study, it has been established that contracts will largely influence the results of the projects as different types of contract have different implications on the contract parties. Also the manner in which these contracts are made and executed by the contract parties will impact the project's quality and the performance at large as such contract requirements based on the projects unique requirements should be diligently performed for the most desirable results to be obtained from the endeavour.

Procurement Methods

From the study, it is quite apparent of the influence that the procurement method has on the quality and performance of the project. This is due to the fact that the procurement method used will most times determine the quality of expertise of the contractor that will be engaged. While some procurement methods tend to enable vices such as corruption, others will advocate for the quality of the standards and specifications required on the project. The most desirable procurement methods for public infrastructure projects is open bidding, and as such, the procurement methods used on road construction projects in the past has been part of the reason the project failed or succeeded.

Procurement Planning

Planning is an important part as it directs efforts to activities required for the desired results, as such, procurement planning affects the quality and performance of the project in the sense that the procurement plan sets out the quality standards that are expected from the deliverables. Therefore, procurement plans show which activities are needed and hence they are implemented in order to fulfil the project quality standard. Quality is an important aspect of road construction, as such, only the procurement plans will ensure that the desired quality is achieved, and in case of a deviation from the initial plan, the procurement plan will guide in the change controls needed to ensure the project is on course to achieving its mandate.

6. RECOMMENDATIONS

Procurement is vital since it will give the works and materials necessary to achieve specific quality and performance standards of the project, according to the research. As a result, the procurement process should be viewed as the project's backbone.

Without project blueprints, no work contracts should be permitted to begin. The implementation agency, such as RDA, should be supported and recognized so that it can function independently and without the direct influence of politicians that it currently has.

Regulations and guidelines of the National Council for Construction (NCC) and the Zambia Public Procurement Authority (ZPPA) should be modified to reflect best practices and stakeholders.

Personnel without proper procurement training should not be allowed to handle contract administration tasks, according to the government and procurement agencies. Furthermore, workers in contract administration institutions should have a systematic cycle of educating their staff in procurement and contract administration courses.

The Road Sector Annual Work Plan (RSAWP) should be framed in light of the specific funds available. Currently, strategic work plans for the road sector take into account counterpart funding as well as revenue over which the Agency has no direct control. Furthermore, the government should simplify income collection and decentralize collections so that agencies like the National Road Fund Agency (NRFA) can collect all of their money and fulfill their duty: to mobilize road funds for the maintenance, rehabilitation and construction of public roads in Zambia. Such a move can certainly remove the red tape revealed in the disbursement of road user fees from the Ministry of Finance (MoF) to NRFA.

Limitations of the Study

There are certain limitations to this study, but they provide opportunity for further research. The findings will not be generalizable due to the limited scope of the study, but they should be utilized as a tool to throw additional light on the impacts of procurement on the quality and performance of road building projects in Kitwe, Zambia.

The study was also limited by the fact that data was collected through a self-assessment interview guide for respondents, and some of them may have given responses that were socially desirable because, as Kombo and Tromp (2006) discovered, people tend to exaggerate positive characteristics. As a result, it's possible that false conclusions and generalizations were drawn from the erroneous data collected from the sample. To get around this, the researcher looked for any data that was contradictory among the responses.

The views of various companies were represented by employees from regulatory institutions, government departments concerned with road construction, and engineering consultants. It's possible that such an assumption won't be enough to collect enough data. Because of the COVID 19 epidemic, the researchers did not undertake a pilot test.

Despite these flaws, this study adds to the literature by shedding light on the effects of procurement on the quality and performance of road construction projects, and future research can use some of the ideas from this paper in their work.

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