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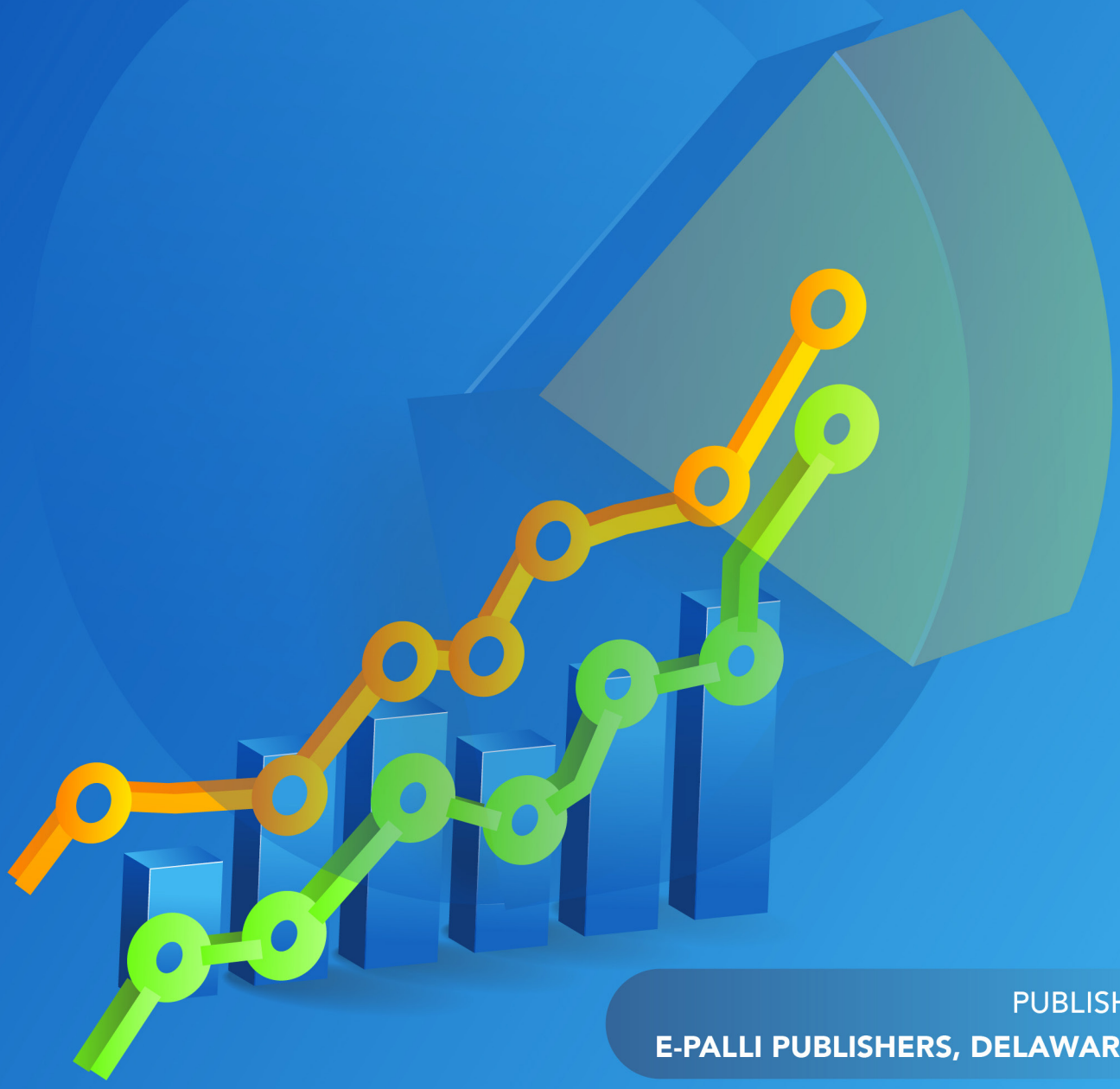

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Project Procurement Practices and Its Effective Implementation in Public Institutions in Rwanda: A Case of Water Supply Infrastructure and Services Improvement Project in MUHANGA-Southern Province

Venant Ndamyumugabe[1*]

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ABSTRACT

Over time, the significance of the procurement function has increasingly been emphasized in the broader framework of global supply chain management. Nonetheless, the failure to execute proper procurement procedures has led to substandard procurement practices. The research examined the associations between Project procurement practices and successful execution of projects in public institutions in Rwanda, focusing on the Water Supply Infrastructure and Services Improvement Rwanda, in Muhanga-Southern Province. The specific objectives were to evaluate the impact of procurement planning on the efficient implementation of the projects in public institutions in Rwanda, and to assess the effect of supplier selection on the successful execution of projects in public institutions in Rwanda. Both primary and secondary data were utilized in the study, with primary data collected through questionnaires and document analysis, while secondary data were gathered from prior studies on the relevant subjects. The target population comprised 234 em-ployees in the management team of the Water Supply Infrastructure and Services Improvement Project in Muhanga-Southern Province, with a sample size of 148 respondents selected using a simple random sampling method. Data analysis was conducted through correlation analysis and multiple linear regressions. The findings indicated a substantial influence of procurement plan-ning on the successful implementation of the project, demonstrating a notable correlation between supplier selection and effective project execution. It is recommended that decision makers and project implementers of WASAC projects provide comprehensive training for beneficiaries cover-ing project management, natural resources management, and catchment development. Addition-ally, beneficiaries should be assigned responsibilities such as managing infrastructures on the site and utilizing them efficiently.

INTRODUCTION

Over time, the significance of the procurement function has increasingly been emphasized in the broader framework of global supply chain management. Globally, public procurement has garnered attention and sparked discussions, leading to reforms, restructuring, and the implementa-tion of regulations (Kabega *et al.,* 2016). Many governments have a continuous outsourcing pro-cess in place, with a significant portion of service provision being handled by the private sector. The performance standards for operations in public sector organizations are consistently increas-ing as they strive to deliver services to the general public effectively. This illustrates how the out-sourcing of procurement functions transforms it into a deliberate and strategic concern (Plant-inga & Dorée, 2016; Danis & Kilonzo, 2014; Benabbou & Karim, 2024). In Present-day business landscape, there is a widely accepted perspective on the transfor-mation of the procurement function from a mere support service to a pivotal leadership role that facilitates organizations in navigating uncertainties. As noted by Van Weele and Rozenmeijer (1999), the progression of the information society, globalization in trade, and demanding customer preferences have played a significant role in enhancing the strategic importance of procurement within companies. In particular, the correlation between procurement and organizational performance under-scores the importance of adopting best practices for achieving current organizational success. Procurement practices are prevalent across various industries globally, and they have emphasized that numerous public institutions in both developing and developed countries have implemented procurement reforms that encompass laws and regulations (Hussein & Masau, 2020., Kabega *et al.*, 2016). However, a key challenge has been the lack of adequate regulatory compliance within these institutions. Public entities are significant spenders and manage substantial budgets (Rood-hooft & Abbeele, 2006). Moreover, Mahmood (2010) has reiterated that public procurement was estimated to constitute 18.42% of the world's Gross Domestic Product (GDP). Recognized as cru-cial for service delivery, public procurement represents a substantial proportion of total expendi-ture (Basheka & Bisangabasaija, 2010; Ningsih, 2025).

According to Mwangi and Moronge (2019) Procurement processes play a critical role within the public sector as they are fundamental to transparent financial management within organiza-tions. World Bank often advises developing countries to enhance their procurement systems. Nonetheless, the failure to

[1] Protestant University of Rwanda, Rwanda
[*] Corresponding author's e-mail: n.vena84@gmail.com

execute proper procurement procedures has led to substandard pro-curement practices. Challenges in public procurement practices include increased operational expenses, disruptions in the supply chain, subpar quality of purchased goods, deficient supplier management, unfavourable supplier evaluations, lack of familiarity with the procurement process, and non-compliance with procurement standards (Basheka & Bisangabasaija, 2010). According to Mak (2014), Procurement encompasses the acquisition of goods, services, and works through various contractual means; procurement encompasses the acquisition of goods, services, and works through various contractual means, such as purchasing or hiring. Public pro-curement involves the acquisition of goods, services, and works through a competitive process and contractual agreement by a public entity. Carr and Smeltzer (1997) adds that procurement prac-tices involve the strategic actions taken by purchasing departments to optimize performance, en-hance productivity, and minimize costs and time. Moreover, it involves activities such as vendor selection, rigorous vetting processes, negotiation of payment terms, contract negotiations, and the actual acquisition of goods (Weele, 2018).

Moreover, the procurement methods utilized by public institutions have evolved considera-bly. This evolution is a result of transitioning away from traditional procurement practices that were predominant over the past twenty years. Instead, public institutions have embraced a varie-ty of strategies such as design and build, design-build-maintain, private finance initiative, and project alliancing (Wagner *et al.*, 2013). These options were developed as methods for project de-livery within organizations (Plantinga & Dorée, 2016). Many companies in developed nations such as the USA, Canada, and various European countries have reassessed their strategies for managing supplies and supply chains due to heightened competition from their industry counter-parts. Consequently, businesses have shifted their focus towards re-engineering their core com-petencies and establishing partnerships with other entities, resulting in the outsourcing of many operational functions and services (Handfield *et al.*, 2013).

Recent approaches in procurement have focused on investing in project partnerships and col-laboration within the supply chainwhich advocated for a shift towards supply chain management and procurement contract development (Egan Report, 1998). According to Tookey *et al.* (2001), procurement can be seen as a series of calculated risks. Instead of seeking a universal approach, many professionals tend to search for a strategy that can be applied to various projects within a company. Erkisson and Vennstrom (2009) suggest that most clients tend to stick to a procurement method they have used previously, regardless of the project at hand. However, the main goal of a procurement contract strategy is to mitigate risks and uncertainties that may occur during pro-jects, as noted by Chadwick (2013). Given these considerations, it is crucial to develop a strategy that can meet project objectives while addressing the needs of all parties involved with minimal conflict.

In this context, they also referenced the idea that a strategic approach to procurement should be seen as a powerful strategic tool, with the primary goal of establishing a solid alliance with similar companies to enhance competitive edge. Indeed, developing collaborative relationships and partnerships with suppliers typically have a significant positive impact on a company's overall performance over time. This can be attained through shared resources and knowledge exchange (Handfield *et al.*, 2013).

According to Shale (2015), the emphasis on the value of currency in Rwanda supports the en-hancement of productive partnerships between public procurement entities and significant suppli-ers. This collaboration aims to optimize the benefits of agreements by pinpointing cost-saving opportunities and embracing inventive strategies, thereby lowering expenditures on the procure-ment of assets and infrastructure for project execution in Rwanda.

Electronic procurement systems have helped governments reduce expenses and enhance transparency in the procurement process. Beginning in 2014, the Government of Rwanda em-barked on a mission to lead Africa in embracing these benefits by collaborating with a South Ko-rean company to create its own e-procurement system. A pilot system was initiated by the gov-ernment in mid-2016, followed by the nationwide implementation of e-procurement in mid-2017 (Mukamurenzi, 2020).

As a result of the limited capacity of most procurement officers in the implementation of pro-jects in the Southern Province of Rwanda, a variety of issues have arisen within procurement units affecting the timely completion of public projects such as water projects and district initiatives. These challenges stem from a lack of comprehensive procurement strategy planning and inade-quate monitoring processes for the execution of plans (Siew-Phaik *et al.*, 2013).

According to a report by the Ministry of Local Government (2016), the Southern Province managed to deliver only 35% of the planned projects, while procurement officials claimed that 63% equivalent to Rwf 10 billion were successfully carried out. However, the projects suffered from inadequate procurement planning, impacting their value for money, particularly in the areas of construction and maintenance, installation of traffic lights, and building health centres. An allo-cation of Rwf 2.5 billion was set aside for the construction of health centres in various districts such as Gisagara, Huye, Kamonyi, Muhanga, Nyanza, Nyamagabe, Nyaruguru, and Ruhango. Re-grettably, none of these health centres were completed as originally intended. For instance, a sum of Rwf 1.9 billion was designated for road maintenance and construction in Huye, Nyanza, and Muhanga back in 2012 with a projected completion deadline of 2017. However, as of 2018, only 55% of the work had been completed (Aimable *et al.*, 2019).

In Rwanda, 57% of the population has access to safe drinking water within a 30-minute dis-tance from their

residence. This poses a particular challenge for girls, as they are typically bur-dened with the majority of household responsibilities. Despite the proximity of water sources to their homes, the water available is often contaminated and unsafe for consumption. The Water and Sanitation Corporation (WASAC) has implemented numerous projects aimed at expanding access to clean water in Rwanda. These initiatives are designed to ensure that more households and communities have access to reliable and sustainable water and sanitation services, promoting good hygiene practices among children and families (Bimenyimana, 2013).

This paper aims to investigate how various procurement practices such as planning and sup-plier selection might impact the successful execution of water projects in the southern province of Rwanda under WASAC. Data show that procurement projects in Rwanda have led to the success of projects in public sector in Rwanda (Aimable *et al.*, 2019; Siew-Phaik *et al.*, 2013). However, other studies show that many projects managed by WASAC have been criticized for failing to ad-here to established timelines, often leading to delays in implementation. These delays are believed to stem from inefficiencies in the procurement process, particularly in sourcing materials from suppliers (Gasore, 2019). This study will display various and existed impacts of procurements practices like procurement planning and procurement selection on enhancement of public pro-curements projects. Finally, it will establish various recommendations on how procurements projects can lead to the success of projects in public sector.

Exploring the Relationship between Project Procurement Practices and Effective Imple-Mentation in Public Institutions

Various studies in economics and development have emphasized the role of procurement practices for growth and development. Procurement plays a critical role in the success of organi-zations, with its strategies now recognized as integral to achieving business excellence. The op-timization of efficiency and competitiveness through procurement necessitates a thorough consid-eration of the strategic factors influencing the performance of the procurement function. Project procurement management involves collaborating with external stakeholders to establish trust-based partnerships for mutual benefit and shared objectives. This strategy improves project re-sults, promotes the exchange of knowledge, encourages innovation, and guarantees adherence to regulatory standards, thereby advancing ethical business practices (Lim & Lu, 2014; Snider, 2006; Lloyd & McCue, 2004; Penfold & Reyburn, 2003).

Besides, Karlsson (2011) conducted a comparative study that focused on project management practices in Sweden and Ethiopia. The aim was to pinpoint effective project management strate-gies employed in Swedish projects that could potentially be implemented in Ethiopian operations and vice versa, in order to enhance efficiency and mitigate risks in construction projects. The study involved a qualitative analysis, utilizing data obtained from informal interviews and on-site observations within construction sites. The analysis was centered around the nine knowledge are-as within project management, including project procurement management. Karlsson concluded that Ethiopian construction projects often face challenges due to inadequate procurement plan-ning, resulting in delays or shortages of essential materials, equipment, and components. Addi-tionally, project procurement managers in Ethiopia have limited influence and control over sub-contractors.

According to Sollish and Semanik (2012), procurement practices encompass a series of ac-tivities conducted by an organization to enhance the efficient management of its supply chain. Effective implementation of these practices facilitates competitive purchasing and acquisition of high-quality materials. The primary objectives of procurement practices involve the mitigation of risks related to quality, finances, and technology, as well as the reduction of complexities and lack of knowledge in procurement processes. Furthermore, they aim to foster integrity within the organization and protect it from competition (Ravenswood & Kaine, 2015).

Seife (2015) investigated the efficacy of public procurement management in the successful implementation of public projects in Ethiopia, focusing on the Addis Ababa city government hous-ing development project office. The study delves into the influence of current public procure-ment practices on the construction of condominium housing, procurement planning, procurement methods, procurement contract administration, and procurement policy. To gather data, the re-searcher employed purposive sampling techniques, utilizing interviews and questionnaires as the research instruments, and subsequently analyzed the data using descriptive statistics. Martha suggests that the organization under study should establish its own procurement policy, engage in procurement planning with relevant stakeholders, cultivate long-term partnerships, and implement electronic record-keeping systems to enhance contract management processes.

Kebede (2020) conducted a study at Jimma University to examine the impact of procurement practices on procurement performance. The research utilized a sample size of 130 individuals and gathered data through the use of a questionnaire. The results indicated that variations in pro-curement performance were attributed to supplier management, information communication tech-nology, procurement procedures, and resource allocation, all of which were found to have a statis-tically significant influence on organizational procurement performance. The research findings suggest that procurement practices, while differing in implementation levels across organizations, are vital for ensuring optimal leadership in organizational procurement performance. Transition-ing towards utilizing sourcing, e-procurement bid, and vendor management software can stream-line processes, saving time for the organization to concentrate on strategic initiatives and fostering strong supplier relationships.

Leiya (2016) conducted an analysis on the procurement practices and their impact on the or-ganizational performance of the University of Nairobi. The research was predicated on the belief that effective inventory management, oversight of procurement processes, implementation of pro-curement controls, strategic procurement planning, and employee training can enhance organiza-tional performance. The study employed a descriptive research methodology. It was revealed that the University of Nairobi had moderately adopted procurement practices. Additionally, it was determined that procurement planning and employee training play a crucial role in shaping the organization's performance. The research concluded that the successful implementation of procurement practices within the organization hinges on meticulous planning and comprehensive employee training.

In his work Cherop (2016) examined the impact of procurement practices on project imple-mentation within public institutions in Kenya, focusing specifically on the Kenya Electricity Gen-erating Company. The primary objective of the research was to evaluate the status of project im-plementation within the public sector in Kenya, with the study population categorized into three main groups based on their management levels within the organizational structure: senior man-agement, middle management, and lower-level staff. The findings highlighted the significant in-fluence of procurement practices on the successful execution of projects at KenGen. Specifically, the careful selection of suppliers was identified as a key factor in mitigating conflicts of interest between suppliers and organizational management, thereby enhancing staff productivity. Moreo-ver, the implementation of effective performance indicators – a procurement practice identified by the study was shown to contribute to cost-saving measures within the organization, minimize risks, and foster customer loyalty.

Based on research conducted by Kirungu (2011) regarding the factors affecting the execution of Donor Funded Projects, specifically the Financial and Legal Sector Technical Assistance Pro-ject (FLSTAP), it was discovered that the Ministry of Finance has struggled to meet its objectives within the expected project timeframes. This difficulty is primarily attributed to the limitations imposed by both the procurement systems of the World Bank (WB) and the Government of Kenya (GOK).

Ntayi *et al.* (2010) carried out an investigation into the procurement practices and supply chain performance of small and medium enterprises in Kampala. The research found that the will-ingness to take risks in purchasing significantly affected supply chain performance, whereas ex-pertise in procurement and strategic purchasing did not. On a global scale, the study revealed that governments frequently engage in trade, procurement of goods and services (including defence equipment), provision and receipt of aid, and management of diplomatic missions in foreign coun-tries, leading to financial risk and accountability challenges associated with these activities.

In the study conducted by Kipchilat (2006) the effects of public procurement regulations on the procurement processes within Kenyan universities were assessed. The results revealed that adherence to these regulations is necessary for public universities when engaging in procurement activities. Consequently, the management of risks in the competitive environment poses chal-lenges in ensuring accountability, as the roles and responsibilities of individuals involved in the process may lack clarity.

In her research on the factors affecting adherence to procurement regulations in public sec-ondary schools, Onyinkwa (2013) recognized the significance of ethics, awareness, and training in ensuring compliance with procurement procedures and regulations. However, she emphasized the need for greater efforts to enhance ethical behavior and employees' understanding of procurement regulations and training programs, as non-compliance poses a risk of substantial financial losses for government funds.

Kirungu (2011) examined the various factors that influence the execution of Donor Funded Projects within the Procurement Systems of the Financial and Legal Sector Technical Assistance Project under the Ministry of Finance. His findings revealed that 11% of the participants viewed policies as having a significant impact on the project implementation, with 20% indicating a sub-stantial influence, and an additional 22% noting a moderate effect. Kirungu ultimately deter-mined that the principal challenges faced in the implementation of donor funded projects are tied to procurement policies and guidelines from donors, compounded by bureaucratic hurdles leading to reduced disbursement of financial aid.

Through the utilization of triangulation methodology, it was disclosed by Ashok (2013) that procurement systems, and subsequently supply management, have a considerable favourable im-pact on project performance. The study also uncovered that collaborative strategies play a signif-icant role in enhancing various aspects of project success. Furthermore, partnering and collabora-tive practices were found to greatly impact key project success factors such as time, cost, and quality, in addition to fostering innovation, competitive advantage, and post-project support.

Research on the correlation between procurement practices and project advancement has un-veiled a significant connection between these two factors, yet minimal guidance has been offered to address the obstacles identified that could bolster or improve procurement management. Fur-thermore, scant focus has been directed towards pivotal components of project procurement prac-tices such as selection and planning. Consequently, this analysis aims to elucidate the influence of two project management practices, namely project procurement planning and planning, on the efficiency of public sector projects. Finally, recommendations will be provided to address the challenges uncovered in this study.

MATERIALS AND METHODS

Research Design

The research utilized quantitative and correlational methodologies. Through a quantitative lens, the study examined the impact of procurement planning on the successful execution of pro-jects within the WASAC Southern Province of Rwanda, as well as the effect of supplier selection on project implementation in the same region. The correlational approach was employed to dis-cern the relationship between various variables. Both primary and secondary data sources were incorporated into the study. Primary data was gathered through the dissemination of question-naires to participants and through a thorough review of relevant documents. Secondary data was acquired from a wide array of documents pertaining to the Water supply infrastructure and ser-vices improvement project in Muhanga-Southern Province.

Study Population

The target population was 234 employees in management team of Water supply infrastructure and services improvement Project in Muhanga-Southern Province include engineers, project de-signers and planners, project technicians, project managers and assistants, team committee of fol-low up of water projects of WASAC in southern.

Sample Size

In this study, sample size was selected from the target population. This study uses 5% of mar-gin errors and confidential is 95%. The study applies the formula of Taro Yamane (1982)

n = sample size N= Total population e= margin error

Sampling Technique

This study applied simple randomly sampling technique to select the respondents. All re-spondents were given equal chance to participate in the study, but the luckiest 148 respondents were involved in this study.

Data Collection Instruments

Questionnaire

In this research, surveys were disseminated to 148 individuals involved in the Water Supply Infrastructure and Services enhancement Project in Muhanga-Southern Province. The surveys consisted of closed-ended questions with an anticipated response rate of 100%. In constructing the survey, the researcher implemented five Likert scales to evaluate the respondents' sentiments.

Document Review

A comprehensive analysis of documentation was conducted by a researcher in order to gather information on a specific phenomenon. This study focuses on examining reports from the years 2017 to 2020 that pertain to water projects and their execution in the southern province.

Validity and Reliability

Validity

In this research, a questionnaire was distributed to supervisors and other experts in order to assess the relevance of the inquiries posed. The reliability of the questionnaire was tested by ad-ministering it to various groups of participants on two separate occasions to determine consisten-cy in their responses. A pre-test was conducted using Cronbach's Alpha with a score of 0.70.

Legend Cronbach's Alpha Test of Reliability

Cronbach's Alpha Internal consistency

$\alpha \geq 0.9$ Excellent
$0.8 \leq \alpha < 0.9$ Good
$0.7 \leq \alpha < 0.8$ Acceptable (Surveys)
$0.6 \leq \alpha < 0.7$ Questionable
$0.5 \leq \alpha < 0.6$ Poor
$\alpha < 0.5$ Unacceptable

Data Processing and Analysis Methods

Correlations Analysis

In this research, a correlation coefficient was utilized to assess the connection between two variables. Specifically, the correlation coefficient was employed to analyse the association be-tween project procurement practices and the successful execution of water projects undertaken by WASAC in the southern province of Rwanda.

Regression Analysis

Finally in respect of this study, the multiple linear regression models were formulated to measure the relationship between sub-variable representing project procurement practices and ef-fective implementation of projects.

Model Estimation

The models were as follows:

X= independent variable = project procurement practices (PPP), which has four indicators:

1. x1=Procurement Planning (PP)
2. x2=Supplier Selection (SS)
3. x3=Monitoring and Control (MaC)
4. x4=Contract Review (CR)

Y= dependent variable= Effective project implementation (EPI)which also has five indicators as follows:

1. y1= Respecting Timeliness of Project
2. y2= Effective use of budget use/cost of project
3. y3= Quality of project
4. y4= Effectiveness of project

Regression Equation

Y= f(X) Therefore,

$Y= EPI= \beta0+\beta1PP+\beta2SS+\beta3MaC+\beta4CR+\varepsilon$

Where $\beta0$= Constant, $\beta1$- $\beta4$ are coefficients of determination.

Ethical Considerations

To maintain the confidentiality of data provided by participants and adhere to ethical standards in the study, a range of ethical principles were upheld. Participant

identities were anonymized through coding rather than using their names. Written permission was sought from authorities in the study locations. Informed consent forms were presented to participants for their signature. Academic sources were acknowledged through appropriate citations and references by the author.

RESULTS AND DISCUSSIONS

Project Procurement Practices

Findings presented perceptions of respondents on the influence of procurement planning on effective implementation of Water supply infrastructure and services improvement project in Mu-hanga and the influence of supplier selection on effective implementation of Water Supply Infra-structure and Services improvement Project in Muhanga

Perception of Respondents towards Procurement Planning

Respondents were asked on how they perceive project planning in terms of increasing num-ber of orders; to reduces number of complaints; helping projects completed on time; facilitates procurement systems; checker whether resources are well utilized through procurement planning; to reduce conflict of interest; to improve project performance; to reduce project costs.

Table 1: Perception of respondents towards procurement planning

Perception of respondents towards Procurement planning	Mean	Std Dev.
1. Procurement p"lanning increases number of orders	1.597	.520
2. Procurement planning reduces number of complaints	1.460	.714
3. Procurement planning help projects completed on time	1.985	.833
4. Procurement planning facilitate in uniform of procurement systems	1.971	.416
5. Resources are utilized trough procurement planning	2.122	.726
6. Procurement planning reduces conflict of interest	1.474	.593
7. Procurement planning improves performance	1.654	.656
8. Procurement planning reduces costs	1.474	.745
9. Procurement planning is meeting performance indicators	1.964	.811
10. Procurement planning is meeting organizations objectives	1.949	.347
Overall mean and standard deviation	**1.765**	**0.636**

Source: Primary data (2021)

Results from a survey of stakeholders involved in the Water Supply Infrastructure and Services improvement Project in Muhanga District suggest that effective procurement planning plays a crucial role in the successful implementation of the project. The average rating of 1.765 and a standard deviation of 0.636 indicate a moderate level of influence. The responses reflect a range of perspectives on how procurement planning impacts various aspects of project implementation, such as increasing the number of orders, reducing complaints, ensuring timely completion of pro-jects, standardizing procurement systems, optimizing resource utilization, mitigating conflicts of interest, enhancing project performance, and lowering overall project costs. Overall, the findings suggest that procurement planning aligns with the performance indicators and objectives of the water supply infrastructure and services improvement project in Muhanga District.

Perception of Respondents towards Supplier Selection

Respondents were also asked on how supplier selection can have impactful results in terms of : reduces number of project risks; reducing conflict of interest; to help organization to have clear policies on projects through supplier selection; increases quality of goods and services; to be used as effective utilization of resources; increases reliability; it increases number of projects com-pleted on time; it reduces number of complaints; and increases number of orders; corporate social responsibility are part of the projects; and key stakeholders are involved during project implementation and environmental factors.

Table 2: Perception of respondents towards supplier selection

Perception of respondents towards supplier selection	Mean	Std Dev.
Supplier selection reduces the number of project risks	2.122	.6858
Supplier selection reduces conflict of interest	1.489	.6297
Organization has clear policies on projects through Supplier selection	2.525	1.187
Supplier selection increases quality of goods and services	.5791	.7739
Supplier selection uses as effective utilization of resources	1.474	.7739
Supplier selection increase's reliability	1.971	.8070

Supplier selection increased number of projects completed on time	1.661	.6762
Supplier selection reduces number of complaints	1.446	.6933
Supplier selection increases number of orders	1.971	.8070
Corporate Social Responsibility are part of the projects	1.971	.4331
Key stakeholders are involved during project implementation	2.136	.7142
Environmental factors are considered in Supplier selection	1.489	.6411
Overall mean and standard deviation	**1.737**	**0.735**

Source: Primary data (2021)

According to the findings in table 2 show Perception of respondents towards supplier selec-tion in Water supply infrastructure and services improvement Project of Muhanga has presented overall average of (=1.737and SD=0.735) that influence effective implementation of Water supply infrastructure and services improvement project of Muhanga district; this means there is reasonable mean and the evidence of existing fact and heterogeneity of responses of the influence of influence of supplier selection in effective implementation of Water supply infrastructure and services improvement Project of Muhanga district as supplier selection reduces number of project risks; reduces conflict of interest; organization has clear policies on projects through supplier se-lection; increases quality of goods and services; it uses as effective utilization of resources; sup-plier selection increases reliability; it increased number of projects completed on time; it reduces number of complaints; and increases number of orders; corporate social responsibility are part of the projects; key stakeholders are involved during project implementation and environmental factors are considered in supplier selection of Water supply infrastructure and services improvement Project of Muhanga district.

Correlation Matrix Analysis

Table 3 illustrates findings on correlation matrix test of this study between variables of pro-ject procurement practices as independent variable and effective implementation in public institu-tions as dependent variable.

Table 3: Correlation Matrix Analysis

Variables		Procurement Planning	Supplier Selection	Contract Monitoring and Control	Contract Review	Project Procurement practices	Effective project implementation
Procurement Planning	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	139					
Supplier Se-lection	Pearson Correlation	.968**	1				
	Sig. (2-tailed)	.000					
	N	139	139				
Contract Monitoring and Control	Pearson Correlation	.850**	.877**	1			
	Sig. (2-tailed)	.000	.000				
	N	139	139	139			
Contract Re-view	Pearson Correlation	.980**	.960**	.847**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	139	139	139	139		
Project Pro-curement practices	Pearson Correlation	.981**	.985**	.922**	.979**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	139	139	139	139	139	
Effective pro-ject imple-mentation	Pearson Correlation	.842**	.877**	.941**	.866**	.911**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	139	139	139	139	139	139
**. Correlation is significant at the 0.01 level (2-tailed)							

Source: author computation of data by using SPSS 28.0

According to the correlation matrix Table 3 the findings suggest a substantial correlation between procurement planning and successful project execution, with a Pearson correlation coefficient of .842** and a p-value of 0.000. This p-value is lower than the standard significance levels of 0.05 and 0.01, indicating that among the various factors influencing project implementation, procure-ment planning from project procurement practices stands out as having a significant impact on the success of the Water supply infrastructure and services project in Muhanga.

The findings reveal a robust correlation between supplier selection and successful project execution, with a Pearson correlation coefficient of .877**. The p-value of 0.000, below the typi-cal significance thresholds of 0.05 and 0.01, suggests that supplier selection is the only factor among project procurement practices significantly linked to effective project implementation in the Water supply infrastructure and services project, at a level of 87.7%.

Analysis from the correlation Table identifies a strong positive correlation between Contract Monitoring and Control and successful project execution, with a Pearson correlation coefficient of .941**. The p-value of 0.000, below the standard significance levels of 0.05 and 0.01, indicates that contract monitoring and control is the sole factor significantly associated with project im-plementation in the Water supply infrastructure and services project, at a level of 96.4%.

The findings indicate a robust association between Contract Review and successful project execution, with a Pearson correlation coefficient of .866**. The p-value, which stands at 0.000, falls below the commonly accepted significance thresholds of 0.05 and 0.01. This suggests that, among various factors examined, only contract review demonstrates a notable impact of 86.6% on the implementation of projects within the water supply infrastructure and services sector.

The results indicated a p-value of 0.000, lower than the commonly used significance levels of 0.05 and 0.01, suggesting a significant relationship between project procurement practices and the successful implementation of water supply infrastructure and services projects. This was fur-ther supported by a Pearson correlation coefficient of .911**, indicating a positive and highly ro-bust correlation between the two variables in the context of water supply projects in Muhanga District, Rwanda.

Regression Analysis

the following functions have been set: Y= f(X) Therefore,Y= EPI = $\beta_0+\beta_1$PP+β_2SS+β_3MaC+β_4CR+ε. However, this study verified each of the five null research hy-pothesis we had in this study as follows.

Table 4: Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.974a	.949	.947	2.36852
a. Predictors: (Constant), Contract Review, Contract Monitoring and Control, Supplier Selection, Procurement Planning				

Source: author computation of data by using SPSS 28.0

Table 4 illustrates that the R-squared value in this investigation is 0.949, or 94.9%, which signi-fies that nearly 95% of the successful execution of the Water Supply Infrastructure and Services Enhancement Project in Muhanga (dependent variable) can be attributed to the independent varia-ble related to project procurement practices (PPP). These practices are characterized by procure-ment planning (PP), supplier selection (SS), Monitoring and Control (MaC), and contract review (CR). This robust percentage suggests a highly effective model where the independent variables notably account for the variations in the dependent variable. The adjusted R-squared value is uti-lized to account for additional variables within the model, yielding a figure of 94.7% in this in-stance.

Table 5: ANOVA[a]

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	13891.946	4	3472.986	619.084	.000b
	Residual	751.723	134	5.610		
	Total	14643.669	138			
a. Dependent Variable: Effective project implementation						
b. Predictors: (Constant), Contract Review, Contract Monitoring and Control, Supplier Selection, Procurement Planning						

Source: author computation of data by using SPSS 28.0

In this instance, according to the ANOVA Table 5 the level fit mode registers at 619.084, and the corresponding p-value is 0.000b, falling below the designated standard significance level of 0.01. Consequently, the researcher has opted to reject the null hypothesis positing that there is no substantial impact of procurement practices such

as Procurement Planning (PP), Supplier Se-lection (SS), Monitoring and Control (MaC), and Contract Review (CR) on the successful execu-tion of the Water supply infrastructure and services enhancement project in Muhanga. Instead, they have embraced the alternative hypothesis, which asserts that these independent variables have a meaningful influence on the project's progress in Muhanga District.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.550	.993		.554	.001
	Procurement Planning	1.475	.276	.605	5.345	.000
	Supplier Selection	.189	.155	.108	1.218	.002
	Contract Monitoring and Control	1.926	.096	.840	20.103	.000
	Contract Review	1.162	.183	.639	6.359	.000
a. Dependent Variable: Effective project implementation						

Source: author computation of data by using SPSS 28.0

The models were X is independent variable equals project procurement practices (PPP), which has four indicators where x1= Procurement Planning (PP); x2= Supplier Selection (SS); x3= monitoring and control (MaC); x4= Contract Review(CR) while Y= dependent variable= effective project implementation (EPI) which also has five indicators which were y1= respecting timeliness of Project; y2= Effective use of budget use/cost of project; y3= quality of project; and y4= Effec-tiveness of project. Therefore, $y= \beta_0+\beta_1 PP+\beta_2 SS+\beta_3 MaC+\beta_4 CR+\varepsilon$.

α=Constant

€ =Error

β =Coefficient of the Disbursement

y= 0.550+1.475x1+0.189x2+1.926x3+1.162x4+0.99

The regression equation illustrates that the successful execution of the Water supply infra-structure and services improvement project is consistently influenced by a coefficient of 0.550, irrespective of the presence of other variables. The additional factors indicate that any alteration in project procurement practices will correspondingly influence x1, x2, x3, x4, with coefficients of 1.475, 0.189, 1.926, and 1.162, respectively, impacting the effective implementation of the Water Supply Infrastructure and Services improvement Project in Muhanga District.

RESULTS AND DISCUSSION

This study investigated the impacts of Project Procurement Practices and Its Effective Im-plementation in Public Institutions in Rwanda: A Case of Water Supply Infrastructure and Services Improvement Project in Muhanga-Southern Province. Data were collected by using both interview and document review.

According to the data, there is a significant correlation between project procurement practic-es and their execution within public institutions in Rwanda. For instance, it is indicated that prac-tices such as procurement planning and supplier selection are vital for the success of projects within the organization. These findings are consistent with earlier research on procurement prac-tices in public institutions and the impact on project management effectiveness within these or-ganizations (Cherop, 2016; Ntayi *et al.*, 2010; Kipchilat, 2006; Onyinkwa, 2013).

Initially, the research uncovered that project procurement has a positive impact on various aspects such as increasing the number of orders, decreasing the number of complaints, ensuring timely completion of projects, streamlining procurement systems, assessing resource utilization through strategic planning, minimizing conflicts of interest, enhancing project performance, and ultimately reducing project costs. Furthermore, feedback gathered from stakeholders engaged in the Water Supply Infrastructure and Services enhancement initiative in Muhanga District indi-cates that effective procurement planning is instrumental in the project's successful execution. The survey results, with an average rating of 1.765 and a standard deviation of 0.636, suggest a moderate level of influence of procurement planning on project outcomes.

According to the correlation matrix the findings suggest a substantial correlation between procurement planning and successful project execution, with a Pearson correlation coefficient of .842** and a p-value of 0.000. This p-value is lower than the standard significance levels of 0.05 and 0.01, indicating that among the various factors influencing project implementation, procure-ment planning from project procurement practices stands out as having a significant impact on the success of the Water supply infrastructure and services project in Muhanga. R-squared value in this investigation is 0.949, or 94.9%, which signifies that nearly 95% of the successful execution of the Water Supply Infrastructure and Services Enhancement Project in Muhanga (dependent var-iable) can be attributed to the independent variable related to project procurement practices (PPP). The results are consistent with previous research on the impact of procurement planning on pro-ject management efficacy within public sectors. Previous

studies have indicated that organiza-tions that utilize procurement planning experience a range of advantages, including enhancing or-ganizational orderliness, lowering production costs, mitigating customer complaints, and improv-ing production efficiency (Cherop, 2016; Eyaa Ntayi *et al.*, 2010; Ramabodu, 2014; Ibrahim, 2015; Aliza & Bambang, 2011).

Secondly, research indicates that the careful selection of suppliers can significantly impact the development of projects in the public sector. For instance, studies have shown that this pro-cess leads to a decrease in the number of risks associated with projects, mitigates conflicts of in-terest, facilitates the establishment of clear project policies through supplier selection, enhances the quality of goods and services, optimizes resource utilization, improves reliability, boosts on-time project completion rates, decreases the frequency of complaints, and increases order volumes. Furthermore, considerations for corporate social responsibility are integrated into projects, and key stakeholders are engaged throughout project implementation while also factoring in environ-mental concerns. Moreover, according to the findings in table 4.3 show Perception of respondents towards supplier selection in Water supply infrastructure and services improvement Project of Muhanga has presented overall average of (=1.737and SD=0.735) that influence effective im-plementation of Water supply infrastructure and services improvement project of Muhanga dis-trict. The findings reveal a robust correlation between supplier selection and successful project execution, with a Pearson correlation coefficient of .877**. The p-value of 0.000, below the typi-cal significance thresholds of 0.05 and 0.01, suggests that supplier selection is the only factor among project procurement practices significantly linked to effective project implementation in the Water supply infrastructure and services project, at a level of 87.7%. the R-squared value in this investigation is 0.949, or 94.9%, which signifies that nearly 95% of the successful execution of the Water Supply Infrastructure and Services Enhancement Project in Muhanga (dependent var-iable) can be attributed to the independent variable related to project procurement practices (PPP). The results are consistent with prior research on the impact of procurement selection on project management effectiveness in the public sector. Past studies have demonstrated that procurement selection in public organizations has resulted in risk mitigation, improved reliability, efficient re-source allocation, and ultimately a more effective production of goods and services (Cheung *et al.*, 2001., Skitmore & Marsden,1988; Thanh Luu & Eng Chen, 2003; Buzzetto, 2020; Alhazmi & McCaffer, 2000).

CONCLUSION

In this instance, according to Table 5 of the ANOVA analysis, the degree of model fit is 619.084, with a p-value of 0.000b, below the standard significance level of 0.01. Consequently, the null hy-pothesis, which posited that procurement practices such as Procurement Planning (PP), Supplier Selection (SS), Monitoring and Control (MaC), and Contract Review (CR) do not have a signifi-cant impact on the successful execution of the Water supply infrastructure and services improve-ment project in Muhanga, was rejected in Favor of the alternative hypothesis, stating that these independent variables do indeed influence the project's implementation effectively in Muhanga District. The results obtained resolved the research problem, achieved the research objectives, and provided answers to the research questions. Hence, the study confirmed a meaningful and fa-vourable correlation between project procurement practices and the successful implementation of the Water supply infrastructure and services project in the southern province of Muhanga District, Rwanda.

In order to establish a robust connection between project procurement practices and the suc-cessful execution of water supply infrastructure and services projects, it is crucial for decision makers and implementers of WASAC projects to offer comprehensive training sessions to benefi-ciaries. These training programs should encompass various aspects such as project management, natural resources management, and catchment development. The beneficiaries are expected to assume responsibilities for the management of infrastructures on site and ensure their efficient utilization. Government officials should actively engage with communities and provide guidance on lifestyle choices during construction projects.

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