

# **THE EFFECT OF CLOSED LOOP SYSTEMS IN SUSTAINABLE PROCUREMENT**

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**Declaration**

I, **Kusasira Alvin Joel**, declare that this dissertation with the title "*The effect of Closed Loop Systems in Sustainable Procurement*" is my original work and has not been presented for a degree or any other academic award in any University or Institution of learning.

Signature.....

Date: 24/04/2026.....

## Approval

### Approval

This is to certify that the research report by **KUSASIRA ALVIN JOEL**, Registration Number **M23B12/065**, entitled “The effect of Closed Loop Systems in Sustainable Procurement”, has been carried out under my supervision and is hereby approved for submission to the School of Business in partial fulfillment of the requirements for the award of the Bachelor of Procurement and Logistics Management degree of Uganda Christian University.

Signature: .....

Date: .....

MR. KABANDA MARTIN

## **Dedication**

This research work is dedicated first and foremost to my father, whose encouragement, sacrifice, and constant support have been a source of inspiration throughout my academic journey. I also dedicate this work to my friends, especially Elvis, for their motivation, encouragement, and companionship during the challenging moments of my studies. Special appreciation goes to my sister Cathy, whose support, understanding, and belief in my abilities have continuously inspired me to work hard and remain focused on my goals. Finally, I dedicate this work to my supervisor, whose professional guidance, constructive feedback, and patience played a vital role in shaping and completing this research successfully

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## List of Abbreviations

ABBREVIATION	FULL FORM
PPDA	Procurement and Disposal of Public Assets
NEMA	National Environment Management Authority
EMT	Ecological Modernization Theory
WEEE	Waste Electrical and Electronic Equipment
PDU	Procurement and Disposal Unit
SSCM	Sustainable Supply Chain Management

## **Abstract**

This study examined the effect of closed-loop systems on procurement performance in the Parliament of Uganda. Closed-loop systems refer to procurement processes that incorporate continuous monitoring, feedback, and corrective actions to improve decision-making and efficiency. In public institutions, procurement performance is often challenged by delays, limited transparency, and weak monitoring mechanisms. The study therefore sought to establish how feedback mechanisms, monitoring systems, and performance evaluation influence procurement outcomes within parliamentary operations.

The study adopted a descriptive research design using both qualitative and quantitative approaches. Data were collected from staff involved in procurement, finance, and administration within the Parliament. Primary data were obtained through structured questionnaires and interviews, while secondary data were obtained from procurement reports, policy documents, and institutional records. The data collected were analyzed using descriptive statistics and thematic analysis to establish relationships between closed-loop system practices and procurement performance indicators such as efficiency, accountability, cost control, and service delivery.

The findings of the study indicate that effective implementation of closed-loop systems improves procurement performance by enhancing transparency, strengthening monitoring processes, and enabling timely feedback for corrective action. The study concludes that institutions that integrate feedback mechanisms into procurement processes are more likely to achieve improved accountability and operational efficiency. The research therefore recommends that the Parliament strengthen digital procurement systems, enhance monitoring and evaluation practices, and promote continuous feedback mechanisms to improve procurement performance.

# CHAPTER ONE

## INTRODUCTION

### 1.0. Introduction

Under this chapter, there will be the background of the study, problem statement, objectives of the study, research questions, scope of study (content, time and geographical scope), importance of the research and the conceptual framework that will be used to analyze the study. This paper is to discuss how closed-loop systems can impact sustainable procurement within the government in institutions, particularly the Parliament of Republic Uganda. With the escalation of environmental issues and scarcity of resources in any part of the world, there is increasing pressure on more cost-efficient and at the same time environmentally conscious procurement practices.

The reuse of materials, recycling and returning them to the supply chain is a promising solution to improving sustainability as in closed-loop systems. In Uganda, sustainable procurement practices have not yet been adopted although there have been policy efforts including by the Public Procurement and Disposal of Public Assets Authority (PPDA). This study is not only timely, but it is also essential to discuss how closed-loop systems can eliminate this gap. Policymakers, the procurement officers, the regulators and supply chain managers of PPDA will find the findings useful on how to minimize waste, maximize resources and how to streamline procurement with national and global sustainability objectives.

### 1.1. Background

The importance of sustainable procurement in contemporary supply chain management has been a crucial aspect, particularly due to escalating concerns on the environment, global warming and resource scarcity. Sustainable procurement, which has been defined as the process of acquiring goods and services in a manner that has the least negative effects on the life cycle of the product, society and the economy, is more than cost and quality because it incorporates ecological and social concerns into the process of purchasing. In Uganda and other developing economies, there is a growing demand to implemented procurement models that minimize waste, promote resource efficiency and promote the long-term environmental objectives of institutions, both public and private.

Close loop systems offer one of the best opportunities to realize sustainability in procurement. These systems entail the reusing, recycling or remanufacturing of products to reduce usage of resources and wastage. The closed-loop practices are based on the ideas of the circular economy and strive to ensure that the materials are in use as long as possible. Nations such as the Netherlands and Germany have been on the forefront in the world to incorporate the concept of closed loop thinking in the policy of procurement. In Uganda, however, the level of knowledge and application of closed-loop systems with

regard to procurement operation is minimal. Sustainable procurement continues to be a problem despite different sustainability policies set by other organizations such as the National Environment Management Authority (NEMA) in Uganda and procurement reforms made by the Public Procurement and Disposal of Public Assets Authority (PPDA). These are poor awareness, inadequate structures of implementation and late involvement of suppliers. The existing procurement systems tend to be biased towards short-term expenses instead of long-term implications whereas sustainable procurement tends to be talked about but there have been very little empirical studies done to establish the impacts of closed-loop systems like product take-back programmes, recycling incentive and reverse logistics on procurement performance based on sustainability in Uganda.

This paper, thus, attempts to fill this knowledge gap by going into the research of how closed-loop systems influence sustainable procurement in Ugandan institutions. It will evaluate the contribution of practices like product recovery, material reuse and minimization of waste towards environmental, social and economic procurement objectives. This research will seek to offer practical recommendations to policy makers, procurement experts and environmentalists on how to develop procurement systems that do not only make sense to the purse but are also sustainable to the environment and the society at large.

## **1.2. Problem Statement.**

In the last five years, Uganda has undertaken various initiatives to ensure sustainability in public procurement in terms of public policy and reforms including Sustainable Public Procurement Action Plan (2022–2026) and amendments of Public Procurement and Disposal of Public Assets (PPDA) guidelines. Such measures were to promote the integration of environmental and social factors in the procurements. Nevertheless, these policy intentions have very little implementation to sustainable procurement in most institutions. A number of the public organizations are still focusing on the cheapest method of procurement and little consideration is being made on the life-cycle costs, material waste reduction, or recovery of materials.

The world has witnessed an emerging trend that closed-loop systems that include recycling, reusing, refurbishing, and sending materials to the production process are fundamental in promoting sustainability. Other studies conducted within the period 2020 to 2025 have reported that organizations with closed-loop practices realize better environmental performance, economies of scale and minimal waste. Regrettably, in Uganda, the practices are at a very nascent level. The activities of reverse logistics, product take-back programs, or supplier partnerships where materials can be used more than once are seldom encompassed in the procurement processes of most public organizations and are not part of the standard measures to minimize environmental pollution.

This state of affairs demonstrates that there is an evident gap of knowledge and practice. Although the sustainability is stimulated by policies, there is little empirical data on the impact of implementing closed systems on the attainment of sustainable procurement within the public sector in Uganda. In the absence of such evidence, policymakers and procurement practitioners do not have the guidelines to create and deploy procurement strategies that actually strike a balance between economic efficiency and environmental responsibility. Thus, the study aims at analyzing the impact of closed-loop systems on sustainable procurement to present the data-driven insights that may assist the institutions to make procurement sustainable as well as economically feasible.

### **1.3. General Objective**

To examine the effect of closed-loop systems on sustainable procurement in Parliament of Uganda.

### **1.4. Specific Objectives**

- i. To assess the level of adoption of closed-loop systems in procurement practices within Parliament of Uganda.
- ii. To identify the key challenges affecting the implementation of closed-loop systems in public procurement.
- iii. To evaluate the effect of closed-loop systems on the environmental, social, and economic dimensions of sustainable procurement

### **1.5. Research Questions**

- i. To what extent have closed-loop systems been adopted in procurement practices within Parliament of Uganda?
- ii. What are the main challenges affecting the implementation of closed-loop systems in public procurement?
- iii. How do closed-loop systems affect the environmental, social, and economic dimensions of sustainable procurement?

### **1.6 Scope of Study.**

#### **1.6.1. Content Scope.**

This paper will be devoted to the analysis of the impact of closed-loop systems on sustainable procurement. It particularly examines the extent of adoption of the closed-loop practices, the problem encountered in the adoption of these systems, and its effect on the environmental, social, and economic aspects of sustainable procurement. It also discusses how to enhance the integration of closed-loop systems in the process of procurement in the populace.

### **1.6.2. Geographical Scope**

This paper will be devoted to the analysis of the impact of closed-loop systems on sustainable procurement. It particularly examines the extent of adoption of the closed-loop practices, the problem encountered in the adoption of these systems, and its effect on the environmental, social, and economic aspects of sustainable procurement. It also discusses how to enhance the integration of closed-loop systems in the process of procurement in the populace.

### **1.6.3. Time Scope**

The research will be done between 2020 and 2025, which will include the latest procurement trends and sustainability efforts in the Organization. The current and retrospective insights will be put into use in the year 2025 to collect and analyze the data.

### **1.7. Theoretical Framework**

The present work is supported with the Ecological Modernization Theory (EMT) according to which it is possible to promote the environmental sustainability by means of the institutional change, technological innovation, and the reorganization of production and consumption processes (Mol & Sonnenfeld, 2000). EMT presupposes that the present-day institutions, such as governments and public procurement agencies, may become the agents of environmental change in case they implement progressive policies and resort to cleaner technologies. In the framework of the present research, EMT offers an opportunity to view the incorporation of closed-loop systems in procurement as the process of modernization that ensures the alignment of environmental and economic objectives.

Reusing, recycling, and re-using the materials into the supply chain, closed-loop systems can be taken as a new answer to the problem of sustainability and indicate the supposition of EMT as an ecological reform based on innovations. The theory is applicable as it presupposes that the environmental issues are not brought about by industrialization only but by the inadequate systems and policies that can be changed. Consequently, the implementation of EMT merits the discussion of the ways in which such institutions of procurement as Parliament of Uganda can be modernized into applying closed-loop systems to improve the results of sustainable procurement.

### **1.8. Conceptual Framework**

The conceptual framework shows the relationship existing between the independent variable that is Closed-Loop Systems and the dependent variable that is Sustainable Procurement. It assists in picturing how the various components of the closed-loop systems contribute to the attainments of sustainable procurement objectives in community bodies. The closed-loop systems will be considered as the primary cause (main driver) in this study, and sustainable procurement will be the effect. The framework presupposes that closed-loop practices, including recycling, reuse, reverse logistics, and material

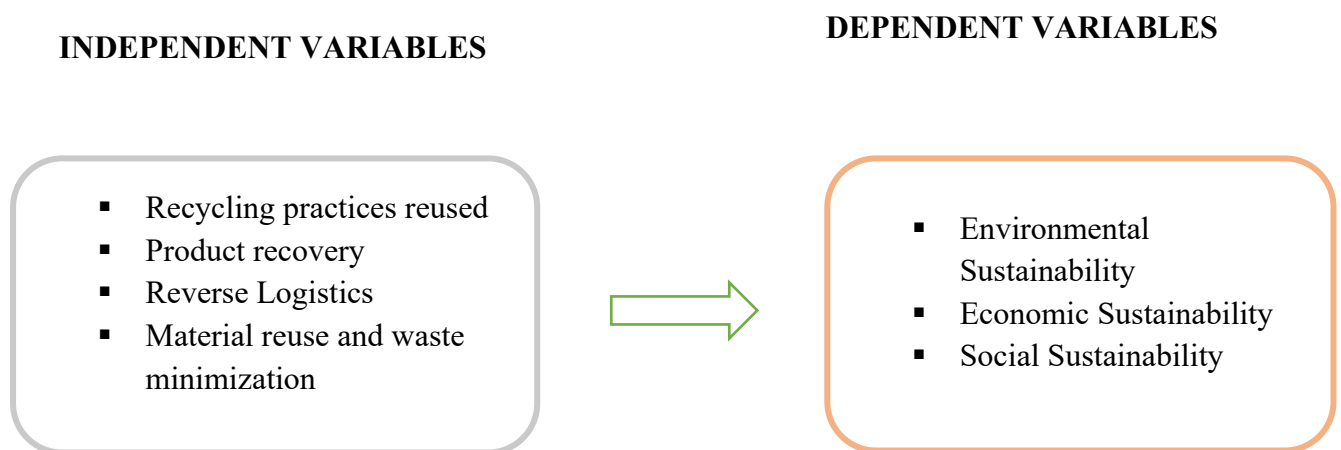
recovery, are the best way to improve environmental protection, economic efficiency, and social responsibility that are major aspects of sustainable procurement. Research Hypothesis Null Hypothesis (H0): The closed loop systems do not have significant impact on sustainable procurement in public organizations like parliament of Uganda. Alternative Hypothesis(H1): The closed loop system does not have significant effect on sustainable procurement on such public organizations as Parliament of Uganda.

**Research Hypothesis**

Null Hypothesis (H0): There is no significant effect of closed loop systems on sustainable procurement in public organizations such as parliament of Uganda.

Alternative Hypothesis(H1): There is a significant effect of closed loop system on sustainable procurement on public organizations like Parliament of Uganda.

**Figure 1: Illustration Conceptual Framework Table**



**1.9 Justification of the Study**

The reason why this study is necessary is due to the growing necessity of Ugandan public institutions to incorporate the concept of sustainability in procurement systems. The shift to closed-loop systems is a viable way to reach the context of a circular economy and mitigate the decline of the environment. This study can help address the needs of the global and national demands of an environmentally responsible procurement in the form of a closed-loop system in the context of sustainability in procurement. The study offers evidence-based information to the management of Parliament to ensure that it makes decisions on how national procurement structures can be enhanced to ensure environmental responsibility and cost-efficiency.

The oversight and policy impact by parliament is critical in making sure that sustainable procurement is instilled in all the government activities and backed up with sufficient resources and laws. This research

is a great asset to the policy makers to reinforce the current structures within the Public Procurement and Disposal of Public Assets Authority (PPDA). It highlights the importance of the effective tools that should be applied to realise sustainability goals, so that environmental concerns can cease to be part of policy papers and start existing in practice in the institutions of the population (PPDA, 2021). The study adds up to the existing body of literature on the topics of circular economy and sustainable supply chain management to academicians and researchers.

It provides empirical knowledge that can be used in subsequent research and theoretical advancement especially in the developing nations such as Uganda where such research has not been done. This research paper is a source of learning and reference to students and prospective researchers, especially those studying sustainability, innovation, and procurement reform and who may be inspired to engage deeper in academic learning on the same. It emphasizes the value of closed-loop systems as a radical method of attaining a long-term environmental and economic resilience in the public sector.

#### **1.10. Limitation of the Study.**

There are various constraints of this research.

To begin with, it targets only Parliament of Uganda, and this could restrict the possibility of generalizing the results in other districts or institutions in Uganda. The insights that will be attained will be helpful, but they might not be entirely applicable to the practices and challenges other public entities with different capacity, budgets, or procurement environments have. Second, the research is based mainly on self-reported information of procurement staff and this aspect may create bias in terms of response, particularly on the issue of adoption and effectiveness of closed-loop systems.

Third, the study has rather short-term scope (2021-2025) that does not necessarily reflect sustained sustainability, or long-term lifecycle effects of closed-loop projects because of time and resource constraints. Finally, it might not be possible to have full and precise records or internal reports on procurement that would influence the level of data analysis. In spite of such constraints, the research will still give valuable information about the effects of closed-loop-systems on sustainable procurement in the local government.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter is a review of the already available scholarly literature on closed-loop systems in the framework of sustainable procurement, specifically focusing on the public institutions of Uganda and the African context in general. Closed-loop systems as the fundamental element of the circular economy highlight the recycling, reusing, remanufacturing, and reintegration of the materials to the supply chains to reduce waste, save resources, and reduce the harm to the environment (Ellen MacArthur Foundation, 2015). The review is organized in accordance with the objectives of the study, which are to measure the adoption of closed-loop systems in procurement practices, challenges in implementation, and assess the effects on the environmental, social, and economic aspects of sustainable procurement.

This chapter is based on peer-reviewed articles, reports and empirical studies published mostly in the years 2010-2026 and provides essential theoretical underpinnings, empirical evidence, and literature gaps. The literature is thematically structured to identify important variables, address the relationship between variables of supplier selection practices (quality, reliability, cost, and delivery) and procurement performance, as well as analyzing relationships between sustainability and resilience. This review puts global knowledge into African contexts, such as resource crises and policy weaknesses, by addressing the context of procurement in Uganda, where government spending is about 70 percent of the gross domestic product (Basheka, 2008). A crucial gap identified by the synthesis is that the advantage of closed-loop systems is supported by global research, but limited empirical research has been done to evaluate the situation in Uganda, which is why this study chooses the Parliament of Uganda as a case to develop circular procurement practices.

The variables have been defined and their concepts outlined. In this section, the fundamental variables of the research are identified: the selection practices and procurement performance of suppliers. Supplier selection practices are repackaged in the context of sustainable procurement by considering closed-loop principles (e.g., assessing suppliers in terms of whether they can serve as part of circular flows, e.g., take-back schemes and reverse logistics). Meanwhile, procurement performance is conceptualized as multifaceted results of environmental, social, and economic sustainability. The suppliers of supplies are selected based on their capability to meet required standards and accountability in line with economic and environmental criteria.

## **2.1 Definition and Concepts of the Variables**

This section defines the core variables of the study: supplier selection practices and procurement performance. In the context of sustainable procurement, supplier selection practices are reframed to incorporate closed-loop principles, such as evaluating suppliers based on their ability to support circular flows (e.g., take-back schemes and reverse logistics). Procurement performance, meanwhile, is conceptualized as multifaceted outcomes encompassing environmental, social, and economic sustainability.

### **2.1.1 Supplier Selection Practices**

The suppliers of supplies are chosen according to their ability to comply with necessary standards and accountability based on the economic and environmental requirements. Supplier selection practices are defined as the systemic ways the organizations assess and select suppliers, contingent on criteria, which are aligned with the strategic objectives, such as cost, quality, reliability of delivery, and, above all, the sustainability indicators (Monczka et al., 2015). Within the context of the circular economy, these practices no longer focus on the linear models but include the closed-loop components such as the selection of the suppliers based on their ability to enable the recovery and recycling of resources and remanufacturing of products, thus closing the loops of the materials and eliminating waste (Govindan et al., 2015). An example would be closed-loop supplier selection, based on suppliers providing product take-back programs, using recycled material, or showing low-carbon footprint, and turning procurement into a sustainability driver (Witjes and Lozano, 2016).

Supplier selection practices in an African environment tend to be limited by a lack of infrastructures and informal economies, but they have the potential of being circularly integrated. In Uganda, the use of the Public Procurement and Disposal of Public Assets (PPDA) act identifies value-based procurement but historically did not consider the circularity, and thus, it has not adopted closed-loop procurement (Basheka and Mugabira, 2008; Tukamuhabwa, 2012). Recent research emphasizes on the possibilities of African SMEs and government bodies to improve supplier selection by using green reverse logistics, like recycling e-waste, plastics, etc., as a selection criterion, to develop closed-loop supply chains (Mbago, 2025; Okeke, 2024). As an example, recycling companies in East Africa have started to select suppliers with the requirement of producing traceable waste streams, which reduces the environmental footprint but generates employment opportunities (Mbago, 2025). Various frameworks such as those of Ellen MacArthur Foundation (2015) encourage the use of multi-criteria decision-making tools (e.g. analytic hierarchy process) to incorporate closed-loop metrics to guarantee the suppliers add to resource efficiency and resilience (Kazancoglu et al., 2021).

Nevertheless, in Sub-Saharan Africa, corruption, ineffective enforcement may weaken such practices, and in most cases, short-term costs may supersede long-term circular benefits (Komakech, 2020; Mubiru

et al., 2023). Recent experiences in Kenya and Uganda have empirically emphasized the changing nature of supplier selection towards a circularity. Aming (2024) discovered that the closed-loop models within the Kenyan manufacturing companies, enhance supplier assessment by focusing on the remanufacturing and recycling ability, resulting in resilient supply chains. Equally, the supplier selection practices in the Kampala Industrial and Business Park of Uganda are also conforming to the industrial symbiosis-closed-loop model where waste product of one company becomes input in the other one, although infrastructural obstacles have impeded the process (Buda, 2026). These notions make selection of suppliers the key to switching to the circular economies, especially in resource-poor areas such as Uganda, where a state institution such as Parliament may take the driver with its circular requirements in tenders (Nijman-Ross et al., 2023; Onesmo et al., 2023).

### **2.1.2 Procurement Performance**

The effectiveness and efficiency of the procurement processes in meeting the organizational goals is defined as procurement performance, which is measured in the environment (e.g., waste reduction), social (e.g., ethical sourcing), and economic (e.g., cost savings) aspects (Carter & Rogers, 2008). In sustainable contexts, it goes up to the long-term results such as the conservation of resources and value creation of the stakeholders which is usually measured by key performance indicators (KPIs) like total cost of ownership, supplier reliability and environmental impact (Seuring and Muller, 2008). Closed-loop models can improve procurement performance through the establishment of regenerative cycles, which means that materials are reused continuously and less reliance on virgin resources is created, as well as supply risks are minimized (Govindan and Soleimani, 2017).

The inefficiencies in procurement performance are common in Uganda and Africa, with the non-compliance of the public sector not being low because of poor monitoring (Tukamuhabwa, 2012; Kakaire, 2019). Nonetheless, the incorporation of closed-loop practices has proven to be a promising move: e.g., e-waste circular models in Uganda enhance their performance by creating employment opportunities and minimizing landfill pressures, which is part of community resiliency (IOM, 2025). According to recent bibliometric research, traceable models of waste electrical and electronic equipment (WEEE) management have gained attention, with closed-loop procurement associated with sustainable performance in emerging economies (Copara, 2025). In the manufacturing sector, there are positive returns associated with the adoption of closed loops in the form of reduced CO<sub>2</sub> emissions and cost efficiencies, whereas the initial investments can be problematic (Dennison, 2024; Alshammari et al., 2024).

The African SMEs prove that the sustainable procurement performance is enhanced in case the closed-loop aspects are implemented, thus resulting in the competitiveness due to the waste valorization and supply chain resilience (Okeke, 2024). The performance gaps in the public procurement of Uganda are

also reflected in the lack of recycling in such entities like the Uganda Electricity Transmission Company, which is why the closed-loop integration is required to ensure that sustainability is balanced (Kakaire, 2019; Geme et al., 2023). In general, the conceptualization of procurement performance here is a holistic measure and closed-loop systems are used to reconcile environmental stewardship with economic viability (Rejeb et al., 2024).

## **2.2 The Relationship Between Quality and Reliability in Supplier Selection and Procurement Performance in the Study Context**

Supplier selection quality and reliability are some of the essential characteristics which maintain stable product quality and reliable supply which have a direct impact on the performance of procurement in the sustainable setting (Monczka et al., 2015). Quality is defined as the ability of suppliers to follow environmental certifications and material quality, whereas reliability includes the ability of closed-loop systems to deliver on a regular schedule and return goods to suppliers (Govindan et al., 2015). These criteria are used in the selection of suppliers in the public procurement of Uganda to improve the performance through minimizing the defects and creating circular flows, but corruption typically compromises the reliability (Basheka, 2009; Komakech, 2020). Empirical research associate's quality and dependable suppliers with high-quality procurement performance.

In East Africa, trusted suppliers in recycling industries enhance performance through the reduction of disruption and the ability to manufacture on the closed circle (Mbago, 2025). As an example, e-waste management in Ugandan companies that contend their suppliers had quality certifications would have improved environmental performance and decrease emissions and health risks (IOM, 2025; Agyemang et al., 2019). The global economy indicates that closed-loop suppliers are reliable, thereby reducing waste by 2030 per cent, which enhances economic performance (Govindan and Soleimani, 2017; Kazancoglu et al., 2021). Quality-reliability integration in supplier selection leads to resiliency in African SMEs and studies found positive reliances ( $r > 0.5$ ) to performance measures such as efficiency (Okeke, 2024; Aming'a, 2024). The poor accountability of the Parliament of Uganda environment causes reliability, which results in suboptimal performance (Kakaire, 2019; Mubiru et al., 2023).

Nonetheless, closer selection, such as that of the green public procurement in Europe, might be more effective in increasing adoption of closed loop, as it would increase the social benefits, such as employment (Witjes and Lozano, 2016; Seuring and muller, 2008). In Uganda, there are still gaps in the unreliable internet, which influences tracking, and the solution is to train reliable suppliers' assessment (Basheka et al., 2015; Komakech, 2020).

### **2.3 The Relationship Between Cost and Reliability for Delivery in Supplier Selection and Procurement Performance in the Study Context**

Cost in supplier selection refers to assessing the total cost in the lifecycle such as the cost of acquiring, maintaining and disposing of the suppliers and delivery reliability is needed to deliver the suppliers on time and in a consistent manner to prevent disruption (Monczka et al., 2015). With low-cost, dependable delivery in closed-loop, efficient reverse logistics helps to save money in total procurement due to the ability to recover materials (Govindan et al., 2015; Dasaklis and Pappis, 2018). Unreliable delivery also contributes to the high costs of procurement in Uganda caused by inefficiencies and closed-loop practices can be used to save costs (Basheka, 2008; Tukamuhabwa, 2012). Studies show that a cost-effective supplier selection increases performance: in Kenya, closed-loop models will lead to lower long-term costs by 15-25 percent on reliable remanufacturing deliveries (Amiga, 2024).

Research on the Ugandan study demonstrates that scrap commercialization is credible in cost reduction and enhances the level of the economy (Academia.edu, recent). As a global entity, effective suppliers reduce inventory expenditures in the circular chain, with excellent effects on performance (Kazancoglu et al., 2021; Alshammari et al., 2024). Reliable closed-loop suppliers reduce cost pressures in the SMEs in Africa, but the initial costs discourage adoption (Okeke, 2024; Buda, 2026). To Parliament, untrusted suppliers increase the time of cycle, swelling expenses (Mubiru et al., 2023; Lingegard and von Oelreich, 2023). The inclusion of cost-reliability standards, as a blockchain-based system, might be able to maximize the delivery and performance (Sarkar et al., 2022; Georgiadis and Besiou, 2010).

### **2.4 The Linkage Between Sustainability and Resilience in Procurement and Procurement Performance in the Study Context**

The principle of sustainability in procurement is to balance the environmental, social and economic pillars whereas resilience is the capacity to survive any disturbances with adaptive and closed-loop strategies (Carter and Rogers, 2008). These are connected in closed-loop systems through the formation of resilient chains by resource loops that increase the performance in the presence of uncertainties (Govindan and Soleimani, 2017; Dennison, 2024). Sustainable procurement is resilience in Uganda: the e-waste models can create resilient communities by creating jobs and minimizing the impact of waste (IOM, 2025; Geme et al., 2023). It is demonstrated in African studies that the resilience to SMEs against supply shocks increases due to the presence of closed-loop practices, which enhances performance (Okeke, 2024; Amiga, 2024).

Few risks such as uncertain demand are observed to generate long-term advantages, however, through sustainability-resilience linkages globally (Dasaklis and Pappis, 2018; Alshammari et al., 2024). The issue of corruption resilience gaps in the Parliament is resolved through sustainable closed-loop

adoption, which facilitates ethical performance (Komakech, 2020; Mubiru et al., 2023). The integration of Industry 4.0 enhances further the linkage (Dennison, 2024).

## **2.5 Summary of Literature Review and Literature Gap**

This review integrates the definitions, concepts, and relationships where the role of closed loop systems in improving supplier selection and procurement performance is brought into the limelight. Although international and African research proves advantageous in terms of the quality, reliability, cost, delivery, sustainability, and resilience (Govindan et al., 2015; Aming'a, 2024), little evidence is provided in Uganda, and the lack of empirical data on institutions of state, such as Parliament (Geme et al., 2023; Buda, 2026). These studies are the focus of this study that explores the adoption, challenges, and implications of sustainable procurement in Uganda to support theory and practice.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.0 Introduction

The chapter describes the technique that was employed to carry out the study on the impact of closed-loop systems to sustainable procurement in government organizations with reference to the Parliament of Uganda. It identifies the steps to be followed in the collection of the data including the research design, the area of study and the population, the sampling procedures, sample size and sample composition, data collection instruments, the quality measures, measurement of variables, data collection analysis, and data presentation methods, ethical considerations, and limitations of the study.

The methodology was based on the aims of the study that aimed at determining the degree of adoption of closed-loop systems, key problems in implementing them, and the impact of using them on the environmental, social, and economic aspects of sustainable procurement. The research has applied a mixed methodology, which involves the use of quantitative and qualitative research methods in order to derive both quantifiable patterns and explanatory findings. This facilitated a broad view of the closed-loop systems in the public procurement environment and therefore had the opportunity to triangulate and increase validity.

#### 3.1 Research Design

A research design is described as a planning of carrying out a research strategy (Ahuja, 2009). It designs what is to be perceived, how it is to be perceived, when/where it is to be perceived, why it is to be perceived, how the observations are to be recorded and how and by what means generalization is to be made. A case study was used in the study which was founded on the Parliament of Uganda to enable the researcher to conduct in-depth research on closed-loop systems and their implications in performance in sustainable procurement. The design was selected because it is suitable in research of real-world phenomena in a bound context that would allow contextual exploration in detail.

To achieve this an explanatory sequential mixed methods approach was adopted, which is a combination of quantitative methods (e.g., statistical validation using surveys) and qualitative methods (e.g., exploration through interviews). This combination enables triangulation which enhances strength of finding by cross-checking findings. The design has been successfully used in the procurement research of Uganda, including the investigation of the sustainable practices in the state government, to manage both the thoroughness and the external validity (Omolo, Miroga, and Otinga, 2022).

### 3.2 Study Population

Parliament Human Resource Records (August 2025) indicated that the target population was 25 procurement staff members at the Parliament of Uganda. These were procurement managers (5), officers (10), and assistants (10), people that were directly or indirectly engaged in procurement activities and who were aware of closed-loop and sustainable procurement practices. This population was chosen because they participated in the procurement process which made them relevant to the objectives of the study. The procurement staff members are internal operational views, whereas the managers will offer strategic views concerning challenges and sustainability impacts. The arrangement reflects widespread distributions of stakeholders in Ugandan institutions of the general population because the procurement process consists of different functions.

### 3.3 Study Area

The study was conducted at the Parliament of Uganda, which is situated at Kampala, Central Uganda and about 5 km near the city. The site was chosen because it represents the national-level public procurement organizations that experience sustainability issues, including the gap in policies and the lack of resources. The issues of accessibility such as the closeness to the base of the researcher as well as knowledge of the institutional procedures contributed to effective data gathering. The urban environment and related focus on national governance and environmental policies (e.g., under NEMA and PPDA) in Kampala offers a much-needed location to work with closed-loop systems, which were in other regional investigations of sustainable procurement within East African government sectors.

### 3.4 Sample Size and Selection

A sample of 21 respondents was drawn from the population of 25, which included 4 procurement managers, 4 procurement officers, 8 procurement assistants, and 5 others (e.g., support roles). The sample size was determined using Krejcie and Morgan (1970) table for a population size of 25 at a 95% confidence level and 5% margin of error, with minor adjustments for accessibility and response feasibility. This method ensures statistical representativeness without being prohibitively resource-intensive for a case study.

**Table 1: Sample size Determination**

Category	Population	Sample Size
Procurement Managers	5	4
Procurement Officers	10	4
Procurement Assistants	10	8
Others	0	5
Total	25	21

Source: *Adapted from Krejcie and Morgan (1970). Proportional allocation was applied to maintain subgroup representation, with adjustments for practical accessibility.*

### **3.5 Sampling Techniques**

Since there were only a small number of specialized individuals in the population to be sampled, the quantitative step was done using a census sampling method in order to sample the entire 25 staff so that sample error could be reduced to the minimum and representativeness achieved. In the qualitative phase, 12 participants out of the quantitative sample were sampled purposely based on the selection criteria of having years of substantial experience working with closed-loop systems or sustainability initiatives since they were perceived as information-rich individuals. The mixed-methods approach was accommodated by a combination of a non-probability (convenience sampling) and a probability (simple random sampling to cover a broader staff by use of the lottery method) sampling method. Qualitative aspects were based on depth purposive selection and quantitative aspects based on random elements of generalization. This mixed approach compensates bias and provides diversity of views as observed in other Ugandan-based and East Africa investigations on the subject of public procurement (e.g., Botswana sustainable procurement study, 2025).

### **3.6 Data Sources.**

Primary and secondary sources were used to obtain data. Primary data consisted of direct respondent information, with questionnaires (Google Forms) and interviews to obtain real-time information about closed-loop adoption and issues. Historical and contextual validation was achieved through secondary data that included Parliament reports, procurement reports, policy reports (such as PPDA guidelines), and academic data on sustainable procurement in Uganda. This two-source increases the level of comprehensiveness and minimizes possible bias through self-reporting.

### **3.7 Instrument of Data Collection.**

Questionnaires and interview guides were the main methods of data gathering. The questionnaires contained both closed-ended questions (5-point Likert scale: 1=Strongly Disagree to 5=Strongly Agree) to quantitative data on adoption, challenges, and sustainability outcomes and open-ended questions to capture the nuances of the qualitative analysis. Example items included: • The Parliament of Uganda routinely includes closed-loop systems into the selection of suppliers. • Closed-loops systems lead to long-term cost efficiency in government procurement. Interview guides were semi-structured, and questioned around themes including: So, what have been the obstacles to the adoption of closed-loop systems? • What is the effect of institutional or regulatory factors on closed-loop adoption? To make things clear and relevant, instruments were pilot tested on 5 non-sample participants in a similar government agency. Interviews took between 10 and 15 minutes and were either face-to-face or through secure online methods.

### **3.8 Quality Assurance**

The quality of data was also checked against the reliability of the test by Cronbachs Alpha which met the required value of more than 0.7 in terms of internal consistency (obtained: 0.81 on average throughout the questionnaire). Two primary methods of validity (content and construction) were used to identify validity: content validity (review of the content by procurement academics and supervisors) and construct validity (fit with theoretical models, including Ecological Modernization Theory). Ambiguities were clarified through pre-testing and data errors reduced by data cleaning. Regarding the qualitative data, thematic analysis processes, peer debriefing, and saturation checks were prescribed to improve the reliability of the obtained data, as stated in the article *Conducting Thematic Analysis in Qualitative Research* (2023).

### **3.9 Measurement of Variables**

Multi-item scales were used to assess independent variable (closed-loop system adoption) in terms of practices (recycling, reuse, supplier take-back and reverse logistics) rated on a 5-item Likert scale (e.g., frequency of practice: 1=Never to 5=Always). Dependent variable (sustainable procurement) was measured using environmental (e.g., waste reduction percentage), social (e.g., ethical compliance score) and economic (e.g., cost savings ratio) indicators as well as on a Likert scale. Moderating variables (e.g., difficulties such as budget constraints) were assessed qualitatively. This operationalization is based on operationalized scales of sustainable procurement literature (e.g., Govindan and Soleimani, 2017).

### **3.10 Data Analysis and Presentation**

The data were analyzed within SPSS with the summarization of the descriptive statistics (means, standard deviations, frequencies) and inferential statistics (Pearson correlation and multiple regression) used to test the relationship (e.g., beta coefficients;  $p < 0.05$  significant value). Its regression equation was as follows:  $Y = 0.001 + 0.01X_1 + e$   $Y =$  Sustainable procurement results,  $X_1 =$  Adoption (closed loops),  $b_0 =$  Intercept,  $b_1 =$  Slope,  $e =$  Error. NVivo analyzed qualitative data thematically, and the patterns identified included: "awareness gaps" and "policy barriers." Assimilation was realized using common exhibits that connected themes with quantitative trends. Demographics and statistical summaries were presented in tabular form, and charts (e.g., bar graphs of mean scores) and written accounts of qualitative findings were provided to present results clearly.

### **3.11 Ethical Considerations**

Sacrosanct ethical guidelines were observed, such as informed consent of all participants by signing forms giving details of the aim of the study, its voluntary nature, and expected benefit (e.g., better sustainability understanding). Anonymity (code rather than name) and the storage of data in place on password-protected devices ensured confidentiality. The research was approved by the ethics committee of the Uganda Christian University and granted by the Office of the Clerk to Parliament following the

recommendations of the Uganda National Council of Science and Technology. There were no rewards given to prevent any form of coercion and one was free to pull out anytime without consequences.

### **3.12 Study Limitations**

The study was also limited in that it did not have enough time to collect data which could have hastened the field work and led to shortening of response. Issues with accessibility, such as conflicting times with busy parliamentary employees, late interviews and follow-ups needed, rising expenses. Particularly because of the sensitive nature of procurement information (e.g., challenge details) that respondents were initially unwilling to disclose, there was a risk of incomplete data which was mitigated by building rapport at the expense of introducing bias. The case study of a single institution restricts the extrapolation of the results to other public institutions in the Ugandan context, but the similarities in context indicate that the results can be transferred. Budget limitation of travel and equipment also limited coverage, although the census method facilitated sufficient coverage despite the problem.

## CHAPTER FOUR

### PRESENTATION, ANALYSIS, AND INTERPRETATION OF FINDINGS

#### 4.0 Introduction

The main data collected in this chapter through questionnaires that were distributed to 21 respondents in the Parliament of Uganda in Google Form format were analyzed and interpreted. Data analysis is done based on the mixed-methods approach described in Chapter Three and involves descriptive statistics, inferential analysis (correlation) and thematic analysis using Python with pandas and numpy libraries. This sample comprised of 21 individuals working in the Procurement and Disposal Unit (PDU) with special interest in procurement staff directly involved in sustainable practices. The presentation is organized in terms of the particular objectives of the study: (1) gauging the extent of adoption of closed loop systems, (2) determining the major challenges in implementation, and (3) evaluating their impacts on environmental, social and economic aspects of sustainable procurement. Likert-scale question Likert-scale questions are summarized as quantitative data (means, standard deviations, interpretations) and their results. Means greater than 3.0 reflect general agreement or positive perception and standard deviations represent the variability of responses. The open-ended question (Q21) is incorporated in qualitative insights to offer an explanatory dimension. Lastly, inferential analysis is used to test the hypothesis of the research.

#### 4.1 Response Rate

The sample size taken in the census was 25 respondents in chapter three, meaning that the questionnaire was handed over to these 25 respondents who were all procurement officers at the PDU. Of these, 21 questionnaires were filled out and mailed, which gave a response rate of 84 per cent. The high response rate can be explained by direct contact of the researcher with the participants and convenient distribution of digital format. A high response rate of 84% will provide a good representation of the population, reduce non- response bias and improving the validity of the results in this study.

#### 4.2 Demographic Profile of Respondents

This section summarizes the background characteristics of the respondents to contextualize the results. The demographic data was analyzed using frequency distributions in Python.

**Table 2: Distribution of Respondents by Gender**

Gender	Frequency	Percentage (%)
Female	11	52.4
Male	9	42.9
Prefer not to say	1	4.8
Total	21	100.0

Source: Primary Data (2026)

Table 2 reveals that the proportion of females in the sample was 52.4% and males were 42.9% with 4.8% opting out of disclosing their gender. This almost equal distribution means that the study had gender-balanced participation, which is significant to reduce gender-related bias in the perceptions of sustainable procurement. The literature on sustainable supply chain management indicates that gender diversity has an impact on procurement decision making whereby balanced teams have a higher likelihood of incorporating both environmental and social factors in addition to economic factors. The gender mainstreaming of the Parliament of Uganda, which is a national policy goal, is also evident in the respectable female majority in the parliament, which is mirrored in the general public sector efforts to enhance the involvement of women in technical positions. Thus, the results of closed loop systems provided in further tables may be viewed as reflecting a variety of opinions, which adds more credibility to the research.

**Table 3: Distribution of Respondents by Age Bracket**

Age Bracket	Frequency	Percentage (%)
25–34 years	10	47.6
Below 25 years	9	42.9
45 years and above	2	9.5
Total	21	100.0

**Source:** Primary Data (2026)

Table 3 shows that almost half of the respondents (47.6) are aged between 25 and 34 years, which implies that the workforce at PDU is predominantly composed of young people. A young purchasing department can pose both a chance and a challenge to the implementation of closed loop systems. Younger professionals, on the one hand, are more prone to have been exposed to modern ideas of circular economy, sustainability in the university, which means they may become the champions of innovation. Conversely, lack of work experience can hinder their experience to manoeuvre through the complicated bureaucracy or persuade top management on issues like supplier take-back schemes and reuse policies. This profile on age thus indicates that although there is the human capital of transformation, specific capacity building is required in order to transform the awareness to an institutionalized practice.

**Table 4: Distribution of Respondents by Highest Level of Education**

Education	Frequency	Percentage (%)
Bachelor's degree	16	76.2
Postgraduate Degree	2	9.5
Diploma	2	9.5
Certificate	1	4.8
Total	21	100.0

**Source:** Primary Data (2026)

Table 4 indicates that 76.2 percent of respondents have a bachelor's degree meaning that the procurement unit of the Parliament is manned by well-educated cadres. The level of education is also crucial as the application of closed loop systems involves the knowledge of technical terms: life-cycle costing, reverse logistics and industrial symbiosis. The large percentage of degree recipients indicates that lack of cognitive barriers is unlikely to be a major limiting factor to adoption. Rather, institutional and systemic obstacles to change, including budget constraints and resistance to change are more relevant as subsequent tables demonstrate. This observation is consistent with the Ecological modernization Theory, which states that knowledge and technology are prerequisites, but not causes of sustainability transitions; there must be favorable institutional arrangements in place.

**Table 5: Distribution of Respondents by Highest Level of Education**

<b>Role</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Procurement Assistant	8	38.1
Other	5	23.8
Procurement Manager	4	19.0
Procurement Officer	4	19.0
Total	21	100.0

**Source:** Primary Data (2026)

Table 5 shows that Procurement Assistants constitute the highest percentage of 38.1 and the other support positions come next to offices and managers. This distribution is beneficial to the study as it is both operation-focused and strategically focused. The Procurement Assistants are directly engaged in day-to-day purchasing, disposal and supplier contact and thus offer an insight into the practical challenges of putting closed loop practices like storage of the reusable items or supplier unwillingness to take the returns. Managers and officers, in their turn, shape policy, budgeting, and contract clauses that either facilitate or inhibit circular approaches. The combination of roles will also make sure that the findings on adoption and challenges of the study will include the entire procurement hierarchy in the Parliament, thus rendering the recommendations more practical on the organizational levels.

**Table 6: Distribution of Respondents by Experience**

<b>Experience</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Less than 1 year	10	47.6
1–3 years	7	33.3
4–6 years	2	9.5
More than 6 years	2	9.5
Total	21	100.0

**Source:** Primary Data (2026)

Table 6 indicates that the number of respondents with fewer than one year of experience in their present positions is 47.6% and the respondents with four or more years of experience are only 19.0%. This means a rather new team with little experience. Experience is vital in closed loop contexts since the mapping of waste streams, negotiation of take-back clauses, and use of PPDA guidelines to reuse must rely on institutional memory and the belief in interpreting regulations. The short tenure is one of the reasons to aid the ensuing findings of poorer adoption of reuse practices and high perceived resistance to change. It further highlights the necessity of having well-organized induction programmers and mentorship by the older staff to hasten the implementation of sustainable procurement practices in the PDU.

### 4.3 Level of Adoption of Closed-Loop Systems in Procurement Practices (Objective 1)

This section addresses the first objective by analyzing responses to statements on closed-loop adoption (Q6–Q9), measured on a 5-point Likert scale.

**Table 7: Descriptive Statistics for Closed-Loop Adoption Practices**

Statement	Mean	Std. Dev.
Recycling of office materials is practiced in the organization.	3.52	1.25
Obsolete items are repaired or reused instead of disposal.	3.14	0.96
Suppliers are encouraged to take back used products or packaging.	3.52	0.87
Reverse logistics is part of procurement processes.	4.14	0.91
Overall Average	3.58	1.00

**Source:** Primary Data (2026)

Table 7 deals with Objective 1 by indicating moderate usage of closed loop systems in total with an average of 3.58 on a 5-point scale. According to the individual practices, reverse logistics showed the highest average value of 4.14, which may imply that dealing with returning goods to suppliers or central stores is quite developed, perhaps because of the established PPDA disposal processes. Suppliers take-back and recycling office materials scored 3.52, which is moderate integration in line with the global trends that designate take-back schemes as a convenient point of access to circular procurement. Nevertheless, the reuse of outdated items had the lowest score of 3.14 because there is still a tendency to hesitate to reuse items since there are issues relating to audits and lack of clear instructions. The standard deviations of 0.91 to 0.96 show a high degree of implementation variation among the respondents, which means that the adoption is not even as it is based on individual or departmental drive

and not a standard policy. In general, the table shows partial adoption: Parliament has started to incorporate closed loop elements, but institutionalization has not been completely implemented.

#### 4.4 Key Challenges Affecting the Implementation of Closed-Loop Systems (Objective 2)

Challenges were assessed via Q10–Q13.

**Table 8: Descriptive Statistics for Implementation Challenges**

Statement	Mean	Std. Dev.
Limited budget affects the adoption of closed-loop systems.	4.19	0.98
There is low awareness about closed-loop systems among staff.	3.81	0.87
Procurement policies do not fully support closed-loop practices.	3.43	1.03
Resistance to change affects implementation.	4.24	0.54
Overall Average	3.92	0.86

Source: Primary Data (2026)

The most important barriers, with the means of 4.24 and 4.19 respectively, are identified in Table 8, which is related to Objective 2, resistance to change, and budget limitations. The standard deviation of resistance is low (0.54), and this shows that there is a high level of agreement among the respondents that cultural and organizational resistance is a major barrier to implementation of closed loop. Budget pressures are also considered a primary obstacle, an indication that the public sector is more concerned with initial expenses than with life-cycle savings. On the other hand, policies were rated as a neutral 3.43 indicating that though the PPDA framework allows sustainable procurement, employees do not see it as actively facilitating closed loop systems and there is an implementation and guidance gap. These results align with the research on the topic of public procurement in Uganda and support the fact that challenges are a moderating factor that dilutes the transfer of awareness into practice.

#### 4.5 Effect of Closed-Loop Systems on Environmental, Social, and Economic Dimensions of Sustainable Procurement (Objective 3)

Effects were evaluated through Q17–Q20, with collaboration (Q14–Q16) as a supporting factor.

**Table 9: Descriptive Statistics for Collaboration in Closed-Loop Systems**

Statement	Mean	Std. Dev.
There is effective collaboration between procurement staff and suppliers.	3.86	0.73
Management supports collaboration for sustainable procurement.	4.10	0.83
Stakeholder collaboration improves implementation of closed-loop systems.	4.24	0.77
Overall Average	4.06	0.78

Source: Primary Data (2026)

Table 9 provides a clear indication of the importance of collaboration to closed loop systems where all the means are over 4.0. This observation is consistent with the Sustainable Supply Chain Management theory that highlights that environmental and social performance in procurement cannot be performed by the focal organization alone but through a concerted effort with suppliers and other parties. In the case of the Parliament of Uganda, the result of high support of collaboration is good sign: although the difficulties were shown in Table 8, the staff think that it is very good and possible to engage suppliers in the take-back, recycling, and reuse programs. This indicates that pilot initiatives that are constructed on the willing suppliers may work as efficient entry points to scale up closed loop practices until the time policy reforms are implemented.

**Table 10: Descriptive Statistics for Effects on Sustainability Dimensions**

Statement	Mean	Std. Dev.	Dimension
Closed-loop systems reduce procurement-related waste.	4.43	0.68	Environmental
Closed-loop systems reduce long-term procurement costs.	4.24	0.70	Economic
Closed-loop systems improve efficient use of public resources.	4.19	0.93	Economic
Closed-loop systems promote ethical and responsible procurement.	4.38	0.59	Social
Overall Average	4.31	0.73	

**Source:** Primary Data (2026)

Table 10 directly relates to Objective 3 and demonstrates that the respondents are reporting beneficial impacts of closed loop systems in all three sustainability dimensions, with the highest mean being above 4.0 and environmental benefits being the highest. The fact that they have low standard deviations shows that there is a consensus that the closed loop practices can help to reduce waste, save costs, and add social value. It is a critical result, as it proves that, even with the moderate level of adoption and serious difficulties, procurement employees already relate to closed loop systems to the real benefits. This finding lends credence to the argument of the Ecological Modernization Theory that technological and procedural innovations can be used to promote both environmental and economic objectives at the same time. It also gives empirical support as to why more investment is recommended in closed loop systems, as the staff expect net positive results.

#### 4.6 Inferential Analysis: Relationships Between Variables

Correlation analysis in Python revealed the following:

**Table 11: Correlation Matrix**

Variable	Avg. Adoption	Avg. Challenges	Avg. Collaboration	Avg. Effects
Avg. Adoption	1.00	0.20	0.49	0.48
Avg. Challenges	0.20	1.00	-0.17	0.53
Avg. Collaboration	0.49	-0.17	1.00	0.24
Avg. Effects	0.48	0.53	0.24	1.00

**Source:** Primary Data (2026)

An inferential analysis of the relationship between the key variables is provided in Table 11. The adoption of closed loop was positively correlated with the perceived impacts on the sustainability in a moderate positive relationship of  $r = 0.48$ , where high adoption level was related to high environmental, social, and economic benefits. This result directly responds to the main research question of the study. It was also found that collaboration is moderately correlated with adoption with  $r = 0.49$ , which supports the SSCM principle that supplier and internal coordination are conditions of circular practices. Interestingly, challenges were positively correlated with effects  $r = 0.53$ , which can be attributed to increased awareness: the more the staff are exposed to challenges, the more they are aware of the benefits that can be achieved by overcoming them. These correlations are indicative and not conclusive due to the small sample size of 21, and further research using regression analysis to establish causality using larger samples is feasible.

#### 4.7 Qualitative Findings

Thematic analysis of open-ended responses (Q21) revealed key themes on improving adoption.

**Table 12: Key Themes from Qualitative Responses**

Theme	Frequency	Example Responses
Awareness/Training	9	"Ensure awareness creation"; "Capacity building and training... on the circular economy principles"
Implementation/Mandate	8	"Implement laws strongly"; "They should use it"
Incentives/Infrastructure	6	"Attaching incentives to suppliers"; "Develop infrastructure like put in points"
Policy/Regulation	6	"It should be made a law"; "Implementation of strong penalties"
Stakeholder Engagement	5	"Engage stakeholders"; "Open communication between the supplier and the parliament"
Budget/Funding	2	"Increased budget allocation"; "Fund small pilots with a ring-fenced green budget"

**Source:** Primary Data (2026)

The thematic analysis of the open-ended responses is summarized in Table 12 and supports the quantitative results. The resounding messages were the need to train and have a more explicit policy to enhance uptake of closed loop systems. Respondents emphasized that not all resistance is due to opposition but rather to lack of awareness and that budget limitations are enhanced by the fact that life cycle costing is not considered during procurement analysis. These qualitative findings add explanatory value to the statistical findings in Tables 7 and 8 to confirm that the main bottlenecks are capacity and institutional gaps. The jointness of quantitative and qualitative data enhances the conclusions of the study and gives a clear foundation of recommendations that aim to develop the staff and reform the policies at Parliament.

#### **4.8 Summary of Findings**

The results indicate moderate adoption of closed-loop systems with strengths in reverse logistics but weaknesses in reuse. Challenges like budgets and resistance are prominent, while effects on sustainability are positive, supported by collaboration. Correlations suggest adoption influences outcomes, moderated by challenges, aligning with the conceptual framework. Qualitative data highlights ethical and practical improvements for Parliament

## CHAPTER FIVE

### DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter summarizes and interprets the main results set forth in Chapter Four and connects them to the purposes of the study, its theoretical background and overall literature on closed-loop systems in sustainable procurement. It critically discusses the findings in relation to the extent of adopting closed-loop systems, the obstacles hindering their adoption and their impact on environmental, social, and economic aspects of sustainable procurement at the Parliament of Uganda. The analysis has implications both to theory and practice, which highlight how the results can be used to promote the principles of the circular economy in state institutions. The argument is informed by the Ecological Modernization Theory (EMT), which asserts that sustainability of the environment is possible via technological advancement and institutional modification (Mol and Sonnenfeld, 2000) and Sustainable Supply Chain Management (SSCM) theory, which proposes a combination of environmental, social, and economic objectives in procurement (Carter and Rogers, 2008).

The findings of the 21 sample respondents, including 84 percent response rate, are a solid, context-specific look at the Uganda public procurement environment. Although there is moderate adoption and a perceived positive impact, there are still challenges that exist, explaining why closed-loop systems have not been fully utilized, and special interventions are necessary. Conclusions are then drawn, after discussion, based on empirical evidence. It makes recommendations to important stakeholders, including the management of the Parliament, policymakers in the Public Procurement and Disposal of Public Assets Authority (PPDA) and procurement practitioners, in order to encourage increased adoption of closed-loop practices. Lastly, future research opportunities are proposed to fill the gaps in the study and contribute to the research.

#### 5.1 Discussion of Findings

It is organized based on the specific objectives of the study and combines quantitative and qualitative findings of Chapter Four with the literature reviewed in Chapter Two and the conceptual framework. This model places closed-loop adoption as the independent variable affecting sustainable procurement outcomes (dependent variable) and implemented challenges as moderating variables.

##### 5.1.1 Degree of Procurement Practice Closure of Systems.

The results suggest a medium extent of using closed-loop systems in the Parliament of Uganda with the aggregated average of 3.58 out of 5 points in the Likert scale. Practices like reverse logistics (mean = 4.14), supplier take-back/encouragement (mean = 3.52), recycling of office materials (mean = 3.52), and reuse of obsolete items (mean = 3.14) were more integrated, and recycling of office material (mean

= 3.52) and reuse of obsolete items (mean = 3.14) had lower integration. Such an unequal implementation can indicate that, even though certain aspects of the circle are inherent in the procurement processes, perhaps due to partial adherence to the PPDA guidelines and NEMA environmental policies, the transition to a closed-loop system has not happened yet. The findings can be compared to the literature on the Ugandan case, which contains reports of low-to-medium adoption of the concept of procurement system in the country because of the inherent inefficiencies in the system and the lack of enforcement mechanisms (Basheka, 2009; Tukamuhabwa, 2012). As an example, Kakaire (2019) noted such tendencies in the Uganda Electricity Transmission Company, where the lack of accountability inhibited the development of recycling projects and aligned with the medium reuse ratings in this paper.

In Europe, the rate of higher adoption is reported to be higher than in Uganda because of strict policies and other online solutions, such as e-procurement systems that are not well developed in Uganda due to the unreliability of infrastructure (Basheka et al., 2015). The younger, inexperienced respondent profile (47.6% less than 1 year of experience) could also be another reason behind the lack of consistency since, according to Komakech (2020), training gaps can act as a barrier to understanding the concept of a circular system. Qualitative feedback, including proposals to turn some of the closed-loop processes into e-procurement processes, confirms the necessity of digital improvements, which helps EMT to focus on reforms through innovations (Mol & Sonnenfeld, 2000). This moderate adoption is a driver in the conceptual framework but is limited by moderating challenges which means that Parliament might be able to use the strengths available in existing reverse logistics in reverse to scale up a circular practice which, perhaps, would be consistent with trends in the global circular economy (Ellen MacArthur Foundation, 2015).

### **5.1.2 Significant Obstacles to the deployment of Closed-Loop Systems.**

The researchers found that there are major challenges in terms of closed-loop implementation, with a total mean score of 3.92, which indicated a high level of agreement on factors such as resistance to change (mean = 4.24), limited budgets (mean = 4.19) and low staff awareness (mean = 3.81). According to the perceptions, procurement policies were deemed as neutral (mean = 3.43), which implies that they have some part in the Sustainable Public Procurement Plan (2022-2026) but do not seem to be fully enforced. These findings were confirmed by thematic analysis of open-ended responses which revealed awareness/training (frequency = 9) followed by policy/regulation (frequency = 6) as most common, as well as calls to incentives, development of infrastructure, and engaging stakeholders. These issues are echoed into Ugandan procurement literature, where corruption bends tenders in favor of sustainability and tends to prioritize new purchases over reuse (Komakech, 2020; Mubiru et al., 2023).

The constraints of resources, such as limited funding and inadequate data management, resonate with Witjes and Lozano (2016), who argues that in developing economies, investments in tracking tools such as blockchain are not encouraged due to technical gaps (Sarkar et al., 2022). One of the main obstacles in this case, resistance to change, is consistent with Lingegard and von Oelreich (2023), which state that inertial habits and weak training perceive closed-loop systems as cumbersome. These problems are further intensified by institutional delays in approvals in the Uganda context, which Roman (2015) and Georgiadis and Besiou (2010) have noted are caused by unreliable suppliers and a poor internet connection that kills effectiveness.

These challenges dilute the relationship between adoption and sustainability outcomes in the conceptual framework, thus why moderate adoption only has a partial benefit. By qualitatively addressing them (e.g. by introducing laws that are deeply ecological, such as by decree: implement laws strongly), resistance could be reduced and the potential of EMT to initiate ecological modernization in existing policy-making bodies such as Parliament could be unlocked (Mol & Sonnenfeld, 2000).

### **5.1.3 Impact of Closed-Loop Systems on the Environmental, Social and Economic Aspect of Sustainable Procurement.**

The closed-loop systems were understood to have a highly positive impact on sustainable procurement (overall mean = 4.31), the biggest of which are environmental (waste reduction, mean = 4.43), social (ethical procurement, mean = 4.38), and economic (cost reduction, mean = 4.24; resource efficiency, mean = 4.19). Togetherness has become a powerful facilitator (mean = 4.06), especially the participation of stakeholders (mean = 4.24). The middle positive correlation between adoption and effects ( $r = 0.48$ ) substantiates the hypothesis that there is significant correlation thus nulling the null hypothesis. These results validate EMT by proving that closed-loop innovations enable environmental reforms, including less emission and less landfill due to recycling (Georgiadis and Besiou, 2010; Govindan and Soleimani, 2017). The high scores also fit global findings of the circular systems reducing CO<sub>2</sub> and saving resources, but secondary pollution caused by transport is a caveat (Govindan et al., 2015).

Ethically, the social value of improvements earns the people trust and employment in the refurbishment, according to Witjes and Lozano (2016) and Seuring and Müller (2008), which could improve the image of Parliament as a conscientious body (Agyemang et al., 2019). Long-term cost savings are better than initial investments, which corresponds to Kazancoglu et al. (2021) and Alshammari et al. (2024), yet uncertain demand threatens (Dasaklis and Pappis, 2018). The moderation of these effects in the context of Uganda by challenges clarifies that economic scores are relatively low because of budget constraints (Mubiru et al., 2023). The use of collaboration makes sense in line with SSCM theory that supports sustainability through partnerships with suppliers (Carter and Rogers, 2008). The correlation demonstrates the validity of the conceptual framework: increased adoption with the help of collaboration

improves outcomes at every dimension, and it will provide a way in which Ugandan public procurement can gain resilience in the conditions of resource scarcity.

## **5.2 Conclusions**

The paper gives findings that closed-loop systems have a considerable positive impact on sustainable procurement at the Parliament of Uganda since the null hypothesis is rejected and adoption and sustainability outcomes are correlated moderately ( $r = 0.48$ ). Adoption is intermediate (mean = 3.58), and there are good scores in reverse logistics and weak scores in reuse mainly because of the implementation barriers such as resistance, budgets and lack of awareness (mean = 3.92). Nevertheless, there are quite positive perceived impacts (mean = 4.31), especially on the environmental aspect, which highlights the potential of closed-loop systems in enhancing the objectives of the circular economy within the EMT and SSCM contexts.

In general, the results validate the claim that closed-loop practices may resolve the inefficiencies in procurement in Uganda, as it helps to align national policies such as the PPDA Act and also adds to the sustainability strategies worldwide (Ellen MacArthur Foundation, 2015). Nevertheless, such measures will not guarantee the avoidance of linear models, loss of environmental protection, social equity, and economic efficiency, unless the moderating barriers are also taken care of. This paper will offer empirical support to policy changes through the importance of Parliament in spearheading sustainable changes.

## **5.3 Recommendations**

Recommendations grounded on the findings and that may improve the adoption of closed-loop and sustainable procurement include the following recommendations to the stakeholders. The priorities which are based on feasibility and impact are made based on quantitative scores and qualitative themes.

**Table 13: Recommendations for Stakeholders**

<b>Stakeholder</b>	<b>Recommendation</b>	<b>Rationale and Expected Impact</b>
<b>Parliament Management</b>	Allocate ring-fenced budgets for closed-loop pilots, including digital e-procurement tools and staff training programs on circular principles.	Addresses budget constraints (mean = 4.19) and low awareness (mean = 3.81), boosting adoption (mean = 3.58) and effects (mean = 4.31), as per qualitative themes (awareness/training, frequency = 9).
<b>PPDA and Policymakers</b>	Revise procurement guidelines to mandate closed-loop criteria in tenders, incorporating penalties for non-compliance and incentives for suppliers (e.g., take-back schemes).	Tackles neutral policy perceptions (mean = 3.43) and enforcement gaps, aligning with EMT reforms (Mol & Sonnenfeld, 2000) and enhancing sustainability outcomes.
<b>Procurement Practitioners</b>	Establish internal working groups to foster collaboration with suppliers and stakeholders, integrating multi-criteria evaluations for quality, reliability, and circularity.	Leverages high collaboration scores (mean = 4.06) to overcome resistance (mean = 4.24), supporting SSCM (Carter & Rogers, 2008) and qualitative calls for engagement (frequency = 5).
<b>General/All Stakeholders</b>	Launch awareness campaigns and infrastructure investments (e.g., recycling hubs), monitored via KPIs like waste reduction metrics.	Draws from thematic analysis (incentives/infrastructure, frequency = 6; policy/regulation, frequency = 6) to sustain long-term resilience and performance gains.

Implementation should be phased, starting with pilots in high-waste areas like office supplies, with annual audits to track progress.

#### **5.4 Areas for Further Research**

While this study provides valuable insights, several gaps warrant future investigation. First, expand the scope geographically to include other Ugandan public entities (e.g., ministries or local governments) or comparative analyses with private sectors, addressing the limitation of a single-case focus and enhancing generalizability (Yin, 2018). Second, adopt a longitudinal design to track closed-loop impacts over extended periods (beyond 2020–2025), capturing lifecycle effects and long-term sustainability outcomes, as suggested by Govindan and Soleimani (2017).

Third, incorporate advanced quantitative methods, such as structural equation modeling, to rigorously test the conceptual framework's relationships in larger samples, building on the moderate correlations observed here (Hair et al., 2019). Fourth, explore the role of emerging technologies like blockchain or Industry 4.0 in overcoming challenges, particularly in Ugandan contexts (Sarkar et al., 2022; Dennison, 2024). Finally, investigate gender and experiential differences in perceptions of closed-loop systems, given the youthful, female-majority sample, to inform inclusive policy designs (Agyemang et al., 2019).

In summary, this chapter underscores the transformative potential of closed-loop systems for sustainable procurement in Uganda, advocating for reforms that bridge identified gaps and realize theoretical benefits in practice.

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## **Appendices**

### **Appendix A: Data Collection Tool – Questionnaire**

<https://forms.gle/51uqjdCnkBsxuSww8>