

**STAKEHOLDERS' PARTICIPATION AND THE SUSTAINABILITY OF  
STREET LIGHTING PROJECTS IN KIAMBU COUNTY: A CASE  
STUDY OF RUIRU SUB-COUNTY**

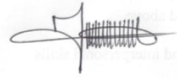
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**An Applied Project Research Submitted in Partial Fulfilment of the  
Requirements for the Award of the Master of Monitoring and Evaluation  
Degree in the School of Business of Africa Nazarene University**

**JUNE 2024**

**DECLARATION**

I declare that this applied research project is my original work and that it has not been presented in any other university for academic credit.



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**SUPERVISOR'S DECLARATION**

I confirm that the work reported in this applied research project was carried out by the candidate under my supervision.

Signature



Date: 25<sup>th</sup> June 2024

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**DEDICATION**

This study is dedicated to my family, whose unwavering support, encouragement, and belief in me have been the driving force behind my academic pursuits. I specifically dedicate this work to my late parents, Joshia Maraga and Mary Nyakerario Maraga for their love for education and ensuring that I obtained the best education that I could during their lifetime.

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## ABSTRACT

Although the Ruiru town, within Ruiru Sub-County, is well lit, the other areas outside the town are either poorly lit or not lit at all. Besides, many of street lighting units are not functioning. The primary objective of this study was to investigate the influence of stakeholder participation on the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County, Kenya. The independent variable (IV) was stakeholders' participation while the dependent variable (DV) was the sustainability of the street lighting projects. The specific objectives were to evaluate how stakeholder communication strategies influence the sustainability street lighting projects, determine how stakeholder relationship practices influence the sustainability of lighting projects, and to examine how stakeholder empowerment strategies influence the sustainability of street lighting projects. The research adopted the evaluation research design, suitable for assessing an ongoing initiative. The target population was 20,777 households and 17 key informants. Using Yamane's formula, a sample size of 392 households was determined for the study. Thirteen (13) key informants were purposively selected including the County Government, provincial administration, and the Kenya Power and Lighting Company (KPLC). Primary data was collected using structured questionnaires administered in person to households and key informants. Secondary data was collected from the County Government of Kiambu and KPLC. Thirty-nine questionnaires, which is 10% of the household study sample, were pre-tested in the neighboring Kiuu Ward to ensure the validity and reliability of the research instruments. The study used Cronbach's alpha method to check for reliability of the instruments, whereas it used the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity methods to ensure construct validity of the instruments. Data processing involved cleaning and entry into Excel, followed by analysis using SPSS Version 22. Qualitative data from key informants were analyzed thematically and reported verbatim. The key findings of the study showed that communication strategies, relationship practices, and empowerment strategies influenced the sustainability of street lighting projects. The study concluded that effective communication, positive relationships, and empowerment are essential to enhance stakeholder participation, leading to project sustainability. The findings underscore the importance of structured stakeholder participation frameworks to ensure project sustainability. For policy development, the study recommended that policymakers implement a comprehensive stakeholder communication policy that mandates regular, transparent communication and feedback channels. For practice, the study recommended for the development and implementation of a robust stakeholder empowerment strategy aimed at increasing active participation in decision-making processes. Based on the findings, a critical area for future research would be the investigation of specific strategies to improve stakeholder inclusion in decision-making processes, with specific focus on exploring the barriers to effective stakeholder inclusion, identification of best practices from similar projects and development of tailored approaches that can be applied to enhance decision-making.

## DEFINITION OF TERMS

**Project Sustainability** – The study defines project sustainability as the ability of a project to maintain or support activities over time, ensuring that project outputs, outcomes, and benefits are sustainable over a long period and/or capable of being scaled up.

**Stakeholder Communication** – In this study, stakeholder communication pertains to the exchange of information with stakeholders through various mediums, including meetings, noticeboard announcements, and phone calls.

**Stakeholder Empowerment** – In this study, stakeholder empowerment means the active engagement and collaboration with stakeholders to enhance their ability and confidence in making project decisions and taking ownership of them.

**Stakeholder Participation** – In this study, stakeholder participation refers to a structured approach to engaging or interacting with individuals directly or indirectly affected by the activities of street lighting projects.

**Stakeholder Relationship** – This study defines stakeholder relationship as the process of maintaining effective working relationships with stakeholders by accurately identifying their needs and expectations, and by planning and implementing various tasks to engage with them.

**Street Lighting** – The provision of lighting at night in public places to illuminate streets and/or roads.

**ABBREVIATION/ACCRONYMS**

**ABD** – African Development Bank

**ANU** – Africa Nazarene University

**CDF** – Constituency Development Fund

**CGK** – County Government of Kiambu

**CIDP** – County Integrated Development Plan

**CSR** – Corporate Social Responsibility

**ICT** – Information and Communication Technology

**IMO** – International Maritime Organization

**KES** – Kenya Shilling

**KNBS** – Kenya National Bureau of Statistics

**KPA** – Kenya Ports Authority

**KPLC** – Kenya Power and Lighting Company

**KTDA** – Kenya Tea Development Agency

**LG** – Lucky Goldstar (Electronics Corporation)

**NACOSTI** – National Commission for Science, Technology and Innovation

**NOAA** – National Oceanic and Atmospheric Administration

**PLS-SEM** – Partial-Least Structural Equation Modelling

**SCPS** – Special Certificate Programmes

**SDG** – Sustainable Development Goal

**SPSS** – Statistical Package for Social Sciences

**TMC** - Time, Quality and Cost

**TVET** – Technical and Vocational Training

**TQC** - Time, Quality, and Cost

**UNDP** – United Nations Development Programme

**VCU** – Virginia Commonwealth University

## CHAPTER ONE

### INTRODUCTION AND BACKGROUND

#### **1.1 Introduction.**

This chapter includes a brief introduction and background to the study with focus on the study variables. The study investigated the influence of stakeholders' participation on the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County. In the study, the dependent variable (DV) was sustainability of street lighting projects whereas the independent variable (IV) was stakeholders' participation. The independent variable was assessed from three perspectives: stakeholder communication, stakeholder relationship, and stakeholder empowerment. As part of chapter one, the researcher discusses the background of the study, statement of the problem, research objectives, research questions, significance, scope, delimitations, limitations, assumptions, theoretical framework and the conceptual framework.

#### **1.2 Background of the Study.**

The study focused on stakeholders' participation in the sustainability of street lighting projects in Ruiru Sub-County of Kiambu County. Ruiru Sub-County has the highest population in Kiambu County and ranks second nationally after Starehe Constituency. Covering an area of just 400 km<sup>2</sup>, Ruiru Sub-County has a population of 600,000, resulting in a density of 1,500 people per square kilometer (CDF, 2024).



This large population necessitates efficient energy sources to serve the population which the County has been striving to provide. For example, with financing from the World Bank, the Kenya Power and Lighting Company (KPLC) has installed 204 flood masts and 235 street lighting units in Kiambu County (CIDP 2018-2022; CIDP, 2023-2027). However, many of these flood masts and street lighting units are non-functional due to high operation and maintenance costs or vandalism by criminal elements within the public. The street lighting electricity bill is significantly straining the County budget, prompting consideration of alternative energy sources such as solar power.

### **1.2.1 Sustainability of Street Lighting Projects.**

In the study, the sustainability of street lighting projects was the dependent variable. The working definition of sustainability was adapted from Gonibeed, Aparna, Kah, Sally, Wanjiru, and Roseline (2023), who define sustainability as the capacity of a project to remain in operation and achieve its goals for the longest time possible. Similarly, Chepkemoi and Kisimbii (2021) describe sustainability as a project's ability to continue existing and delivering services to recipients once outside support has ended.

To assess the sustainability of the street lighting projects, several item statements were developed to measure sustainability. These included project longevity, sustained benefits, stakeholder ownership, safety and wellbeing, and inclusivity of stakeholders in project governance and management decision-making, and ownership.

## **1.2.2 Stakeholder Participation.**

In this study, stakeholders' participation was the independent variable. Stakeholder participation, as adapted from UNDP's (2020) definition, encompasses individuals or groups with an interest in a project or the capacity to influence its outcomes, whether positively or negatively. The fundamental question arises: why is stakeholder participation important?

Traditionally, project success metrics primarily revolved around Time, Quality, and Cost (TQC) dimensions in project implementation (Molwus, Erdogan & Ogunlana, 2014). However, as highlighted by Umararungu & Mulyungi (2018), stakeholder participation - a critical indicator of project sustainability - doesn't neatly align with the TQC framework, yet it has long been assumed in project implementation. Various factors contribute to project unsustainability, such as inadequate stakeholder communication, deficient stakeholder relationships, and a lack of stakeholder empowerment. This is expounded in the following sub-sections where each factor has been briefly discussed.

### **1.2.2.1 Stakeholder Communication.**

In accordance with Sonnenwald (2006), stakeholder communication encompasses a range of activities through which information is disseminated to others, either proactively or upon request, shaping their perception of the world and fostering a shared understanding. Caputo & Russo (2016) highlight that

effective stakeholder communication plays an important role in establishing the necessary conditions for stakeholder participation, thereby contributing significantly to project sustainability. Moreover, Caputo and Russo (2016) emphasize that stakeholder communication ensures stakeholders are regularly updated on project progress. Insufficient communication can result in stakeholders struggling to provide and receive feedback, leading to confusion regarding responsibilities within the project.

To ascertain the effect of stakeholder communication on street lighting projects, various item statements were measured including, awareness and understanding of project goals, engagement and participation, communication channels and effectiveness, feedback mechanisms and responsiveness, perceived impact and sustainability, and obstacles to communication. These item statements provide insights into the influence of stakeholder communication strategies on project sustainability.

#### **1.2.2.2 Stakeholder Relationship.**

Stakeholder relationship is critical in fostering openness within the participation continuum. Effective stakeholder relationship not only facilitates valuable experiences and perspectives but also significantly enhances a project's sustainability. Demirskesen & Reinhardt (2020) underscore this by highlighting that projects with well-managed stakeholder relations achieve sustainability, whereas projects with poorly managed relations face challenges in achieving desired results.

In this study, an in-depth evaluation was conducted to ascertain the influence of stakeholder relationship on the sustainability of street lighting projects. To ascertain the influence of stakeholder relationship on project sustainability, several item statements were measured, including initial stakeholder engagement, communication and collaboration practices, stakeholder needs assessment, feedback information and integration, conflict resolution, stakeholder satisfaction, and capacity-building and empowerment. These item statements serve as critical benchmarks in evaluating the influence of stakeholder relationship on project sustainability.

### **1.2.2.3 Stakeholder Empowerment.**

According to Ouko, Abuya & Odundo (2020), stakeholder empowerment emerges as a critical determinant for the successful implementation of programs. Empowered stakeholders exhibit active participation in project activities, demonstrate readiness to support decisions aligning with project goals, and contribute creative and innovative solutions to challenges in program implementation. Additionally, empowered stakeholders display a propensity to endorse both short and long-term strategies of a program, indicative of a shared sense of project or program ownership.

Traditionally, project success metrics primarily focused on time, quality, and cost dimensions of project implementation (Molwus, *et al.*, 2014). However, involving stakeholders in governance structures, particularly in decision-making processes, yields multifaceted benefits, as noted by NOAA (2015). These benefits

include enhanced outcomes and decisions, increased public support, tapping into valuable local knowledge, fostering public understanding, conflict resolution, smooth program implementation, regulatory compliance, insights into management strategies, and forging new stakeholder relationships.

To comprehensively establish the influence of stakeholder empowerment on the sustainability of street lighting projects, a number of item statements were measured. These included: identification of stakeholder groups, empowerment initiatives, inclusion in decision-making, access to information and resources, feedback and evaluation (effectiveness), feedback and evaluation (improvements), empowerment and sustainability, and long-term engagement and empowerment sustainability. These item statements provide critical insights into the influence of stakeholder empowerment on project sustainability.

#### **1.2.2.4 Profile of Street Lighting Projects in Ruiru Sub-County**

The total number of households connected to electricity within the municipality is 65 percent. The Sub-County has in the past installed flood masts and street lighting units. Further, Kenya Power and Lighting Company (KPLC) has been playing a key role in providing other street lighting masts. Although the Ruiru town is well lit, the other areas outside the town are either poorly lit or not lit at all. The County Government has encouraged developers and citizens to adopt more sustainable sources of power such as solar (CGK, 2018-2022).

### **1.3 Statement of the Problem.**

Street lighting plays a critical role in enhancing safety for motorists and pedestrians, curbing criminal activities, and facilitating ongoing economic activities during nighttime hours. However, despite these efforts, several street lighting projects have encountered challenges, with some failing outright and others struggling to maintain functionality. Kiambu County has endeavored to provide street lighting infrastructure by installing flood lights and street lighting units. However, many of these flood masts and street lighting units are non-functional due to operational and maintenance challenges, inadequate stakeholder participation to necessitate ownership and vandalism by criminal elements within the public. These challenges have hindered sustainability of street lighting initiatives in the sub-county.

By examining the extent to which stakeholders are communicated with, interact with the projects, and empowered in the project implementation of the street lighting projects, the study aimed to investigate, in detail, how these factors influence the sustainability of the projects. The findings of the study will provide actionable insights for policy makers and project practitioners to develop effective strategies for enhancing stakeholder participation thereby leading to sustainability of street lighting projects in the Kiambu County, in particular, and the whole country, in general.

#### **1.4 Purpose of the Study.**

The purpose of the study was to investigate how stakeholders' participation influences the sustainability of street lighting projects, in Ruiru Sub-County, Kiambu County.

#### **1.5 Objectives of the Study.**

- i. To evaluate how stakeholder communication strategies, influence the sustainability street lighting projects in Ruiru Sub-County of Kiambu County,
- ii. Determine how stakeholder relationship practices influence the sustainability of lighting projects in Ruiru Sub-County of Kiambu County,
- iii. Examine how stakeholder empowerment strategies influence the sustainability performance of street lighting projects in Ruiru Sub-County of Kiambu County.

#### **1.6 Research Questions.**

The study sought to answer the following research questions:

- i. How does stakeholder communication strategies influence the sustainability of street lighting projects?
- ii. How does stakeholder relationship practices influence the sustainability of street lighting projects?
- iii. How does stakeholder empowerment strategies influence the sustainability of street lighting projects?

### **1.7 Significance of the Study.**

The Government of Kenya, at both national and county levels, has prioritized the development of critical infrastructure, notably electricity provision, to drive economic growth in both urban and rural areas. The insights gleaned from this study could serve as valuable recommendations, not only for the county government of Kiambu but also for other counties in Kenya implementing street lighting projects. By fostering robust stakeholder participation, authorities can enhance the sustainability of street lighting initiatives, thus maximizing their socio-economic benefits to stakeholders.

### **1.8 Scope of the Study.**

The study was conducted in Ruiru Sub-County of Kiambu County, focusing on two select wards due to budgetary and time constraints. Specifically, the study concentrated on Kahawa Wendani and Mwihoko wards. Kahawa Wendani represents an unplanned urban cosmopolitan ward, whereas Mwihoko encompasses a mix of planned and unplanned peri-urban neighborhoods.

In terms of target population, the study surveyed key stakeholders involved in street lighting, including representatives from the Provincial Administration, Kenya Power and Lighting Company, the County Government of Kiambu, and local households. This targeted approach ensured a comprehensive assessment of stakeholder perspectives and experiences related to street lighting initiatives.



### **1.9 Delimitations of the Study.**

This study constituted a case study within Ruiru Sub-County, known for its substantial number of wards (8) within Kiambu County. However, the study's scope was limited to specific wards, namely Kahawa Wendani and Mwihoko. These wards were chosen due to the rationale highlighted in the scope above.

In terms of stakeholders, the study focused on key stakeholders critical to street lighting initiatives, including the county government, responsible for resource allocation; the Provincial Administration, tasked with ensuring public safety and security; Kenya Power and Lighting Company (KPLC), the electricity provider; and local households, beneficiaries of the street lighting projects. This targeted stakeholder selection approach ensured a comprehensive understanding of varied perspectives and contributions to the street lighting initiatives.

Furthermore, the study concentrated on overarching aspects of project implementation, including stakeholder communication, stakeholder relationship, and stakeholder empowerment. Focusing on these higher-level factors rather than delving into the details of project implementation cycle, enabled a focused examination of critical factors influencing the sustainability of street lighting projects within the study area, thus learning from stakeholders rather than using the narrower approach of looking at sustainability purely from the project cycle perspective.

### **1.10 Limitations of the Study.**

This study adopted a socio-cultural approach, which inherently posed challenges in eliciting responses to research inquiries. Initially, the researcher encountered skepticism from County Government staff who perceived the study as an evaluation of their performance. To mitigate this, the researcher provided the study permit from Africa Nazarene University (ANU) and National Commission for Science, Technology and Innovation (NACOSTI), clarifying that it was an academic investigation rather than an evaluation of their mandate. Subsequently, the researcher faced reluctance from members of the local community in sharing information. To alleviate this concern, the researcher demonstrated the research permits and assured respondents of utmost confidentiality in handling their responses.

Lastly, the researcher encountered resistance from Kenya Power and Lighting Company (KPLC), which felt scrutinized regarding their duties. The researcher addressed this by presenting the research permits and guaranteeing the company of confidentiality in handling their feedback. These strategies were instrumental in overcoming the initial hesitations and fostering cooperation among stakeholders involved in the study.

### **1.11 Assumptions of the Study.**

The researcher initially presumed that county government staff overseeing street lighting would readily cooperate and provide honest responses to survey

inquiries. Similarly, it was assumed that members of local households would willingly participate in the survey without expecting any form of appreciation. Furthermore, the researcher anticipated that Kenya Power and Lighting Company staff would be forthcoming with truthful answers to the study's questions. However, these assumptions did not entirely align with reality.

Despite these initial expectations, the researcher encountered challenges as some stakeholders exhibited reluctance or skepticism. Nevertheless, through effective communication, assurance of confidentiality, and presentation of necessary permits as noted above, the researcher successfully navigated these challenges and managed to collect data smoothly for the study. This adaptability and strategic approach was pivotal in overcoming initial obstacles and ensuring the study's progress.

### **1.12 Theoretical Framework.**

The study was underpinned by four fundamental theories: stakeholder theory, development communication theory, relationship management theory, and empowerment theory. Among these, stakeholder theory held prominence as the primary theoretical framework, shaping the study's understanding of the interconnection between stakeholder participation and sustainability. Concurrently, the other theories played important roles in anchoring the study's variables and were instrumental in interpreting and discussing the findings derived from the study. Together, these theoretical foundations provided a comprehensive framework for examining the dynamics of stakeholders'

participation and its influence on project sustainability within the context of the study.

### **1.12.1 Stakeholder Theory.**

The study's theoretical framework drew extensively from Stakeholder Theory, conceptualized by Edward Freeman in 1984. Freeman's model categorized groups within an organization based on their presumed interests, suggesting that society's support for an entity is contingent upon the value received in return (Freudenreich, Florian & Stefan, 2020). This study harnessed Stakeholder Theory, viewing stakeholders in street lighting projects as critical for their sustainability. The manner in which a business or organization, such as the County Government of Kiambu in this context, engages with its stakeholders (including the provincial administration, business community, Kenya Power and Lighting Company, and local households), influences their attitudes, perceptions, and behaviors toward the street lighting projects, consequently influencing their sustainability.

### **1.12.2 Development Communication Theory.**

The theory of development communication, initially articulated by Quebral, focuses on the interface between human development and communication, aiming for rapid societal change for the betterment of its people (Bharti & Singh, 2021; Quebral, 2001; Okunnu, 2014). Additionally, the World Bank views development communication as strategically integrating communication into development projects based on contextual realities (World

Bank, 2008; Odoom, 2020). Manyonzo (2012) emphasizes that development communication plays a vital role in building consensus and facilitating knowledge sharing, leading to positive changes in development endeavors. Moreover, Mazud & Hossain (2012) highlight that development communication contributes to successful and sustainable outcomes by bridging the gap between intended objectives and actual ground realities.

In the context of this study, the theory of development communication was particularly relevant to objective one. The study aimed to delve into the communication processes between street lighting projects and stakeholders, focusing on awareness and understanding of project goals, engagement and participation, communication channels and effectiveness, feedback mechanisms and responsiveness, perceived impact and sustainability, and obstacles to communication. Understanding these dynamics was essential in exploring their influence on the sustainability of street lighting projects.

### **1.12.3 Relationship Management Theory.**

The Relationship Management Theory, pioneered by Tom Peters and Robert Waterman in 1982, outlines principles for effective organizational management (Gordon, 2022). Emphasizing relationships, this theory delves into processes and outcomes that lead to successful results. Well-managed relationships are seen as investments and social currencies, yielding positive outcomes (Massawe, 2022). Customer loyalty, a hallmark of effective stakeholder relationship, is nurtured through personal and relational approaches, relying on

mutual benefit for sustained interactions (Swann, 2020). This theory is particularly impactful in client-consultant relationships, fostering consensus and commitment (Massawe, 2022).

Within the scope of this study, the Relationship Management Theory played a crucial role, especially concerning objective two. It enabled the researcher to explore the aspects of stakeholder relationship including initial stakeholder engagement, communication and collaboration practices, stakeholder needs assessment, feedback and information integration, conflict resolution, stakeholder satisfaction, and capacity-building and empowerment. Understanding these dynamics was essential for comprehensively examining the influence of stakeholder relationship on project sustainability.

#### **1.12. 4 Empowerment Theory.**

The study incorporated the Empowerment Theory alongside stakeholder participation, viewing stakeholder empowerment as integral to project sustainability. This theory, pioneered by Zimmerman, emphasizes giving power to individuals and communities, thereby enabling them to enhance their lives (Perkins & Zimmerman, 1995; Zimmerman & Warschausky, 1998; Zimmerman, 2000). From a social work perspective, empowerment entails active participation and jointly celebrating outcomes to achieve meaningful development (Virginia Commonwealth University – VCU, 2021).

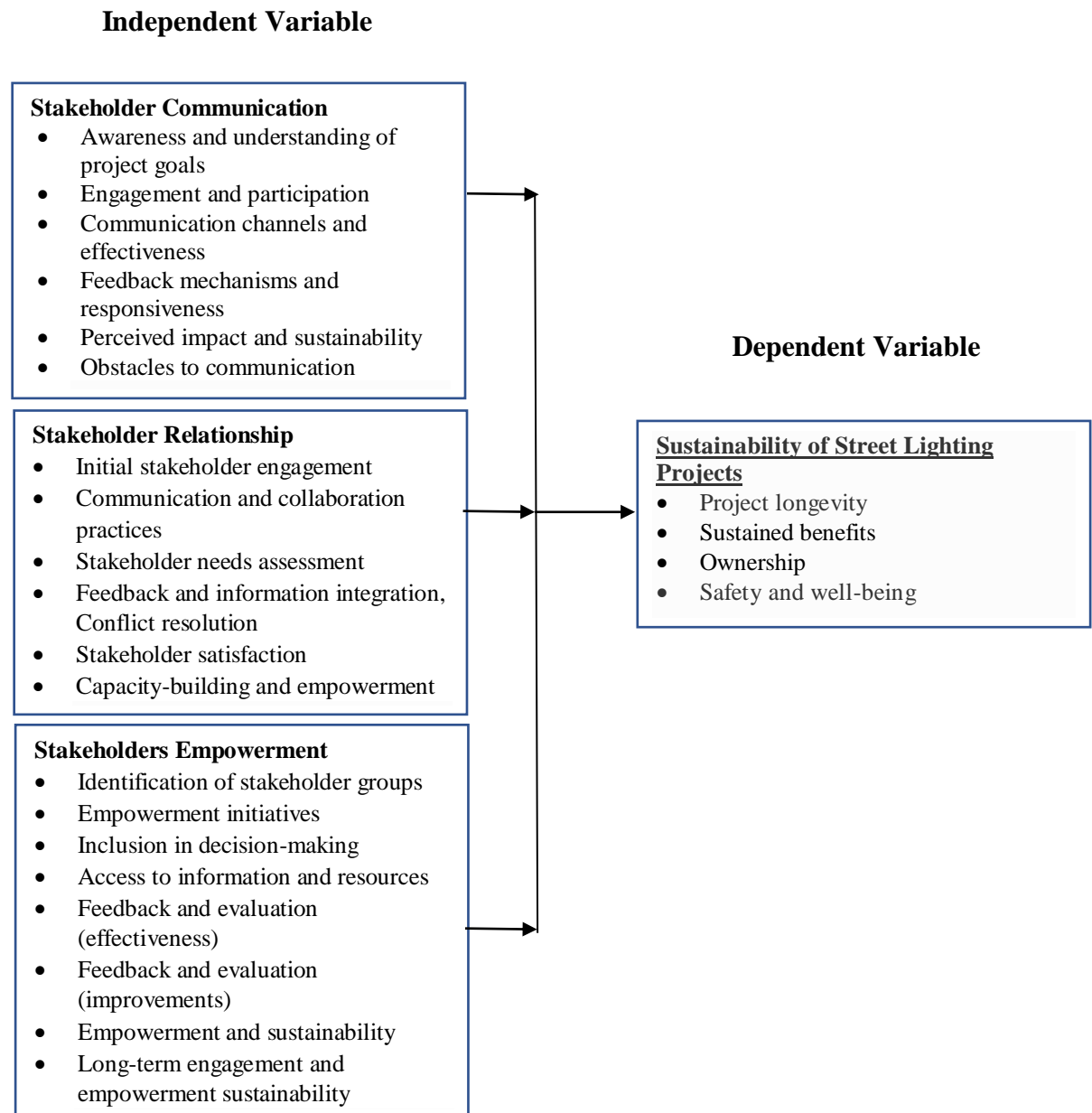
Empowerment encompasses various aspects, including assessing strengths and needs to focus on clients' potentials, building relationships and trust to foster collaboration and stakeholder expression, enhancing skills and knowledge for acquiring new competencies, promoting participation and action for influencing outcomes, and evaluating and celebrating achievements to sustain empowerment (VCU, 2021). This multifaceted approach empowers stakeholders to exercise their rights, participate in decision-making, and influence project outcomes positively.

In the context of this study, the Empowerment Theory was pivotal, particularly concerning objective three. It provided insights into understanding the influence of stakeholder empowerment on project sustainability and included measuring empowerment item statements including identification of stakeholder groups, empowerment initiatives, inclusion in decision-making, feedback and evaluation (effectiveness), feedback and evaluation (improvements), empowerment and sustainability, and long-term engagement and empowerment sustainability. Understanding these aspects was crucial for comprehensively assessing the influence of stakeholder empowerment on the sustainability of street lighting projects.

### 1.13 Conceptual Framework.

**Figure 1**

*Conceptual Framework*



As shown in the framework above, the study delved into three aspects of stakeholder participation to assess their influence on the sustainability of street



lighting projects in Ruiru sub-county, Kiambu County. These included: stakeholder communication, stakeholder relationship, and stakeholder empowerment. Effective stakeholder communication serves as a cornerstone for ensuring alignment and attainment of project objectives. Transparent and clear communication channels convey project values, objectives, and developments to stakeholders, enabling them to stay informed and engaged throughout project phases. Transparent and clear communication minimizes misunderstandings, resolves conflicts swiftly, and addresses emerging issues, thereby mitigating risks of reputational harm and enhancing overall stakeholder satisfaction. The study measured stakeholder communication through use of the following item statements: awareness and understanding of project goals, engagement and participation, communication channels and effectiveness, feedback mechanisms and responsiveness, perceived impact and sustainability, and obstacles to communication.

Effective stakeholder relationship is paramount in project endeavors, as stakeholders often bring valuable insights, expertise, and perspectives critical for informed decision-making. A good relationship with stakeholders can foster innovation, effective problem-solving, and a sense of ownership among stakeholders. Moreover, robust stakeholder relationship promotes transparency, accountability, and a democratic approach to decision-making. The study measured stakeholder relationship through the following item statements: initial stakeholder engagement, communication and collaboration practices, stakeholder

needs assessment, feedback and information integration, conflict resolution, stakeholder satisfaction, and capacity-building and empowerment

Stakeholder empowerment is important as it enables stakeholders to make informed choices and engage meaningfully with issues pertinent to them. The study measured stakeholder empowerment the following item statements strategies: identification of stakeholder groups, empowerment initiatives, inclusion in decision-making, access to information and resources, feedback and evaluation (effectiveness), feedback and evaluation (improvements), and empowerment and sustainability.

The study conceptualized that effective communication with stakeholders, nurturing positive stakeholder relationships, and empowering stakeholders within street lighting projects in Ruiru sub-county, Kiambu County (independent variables) positively influences the sustainability of these projects (dependent variable).

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1 Introduction.**

The primary objective of this study was to investigate the influence of stakeholder participation on the sustainability of street lighting projects. Sustainability of street lighting projects served as the dependent variable, while stakeholder participation functioned as the independent variable. Stakeholder participation was analyzed through three key elements: stakeholder communication, stakeholder relationship, and stakeholder empowerment.

The second chapter of the study provides a comprehensive review of literature, focusing on empirical research related to the study's objectives. It systematically examines existing studies to identify gaps in knowledge and highlights areas where further research is needed. The literature review provides a solid foundation for understanding the dynamics of stakeholder participation and its influence on project sustainability. Additionally, it offers a summary of gaps identified for each element and delineates the overall research gap, setting the stage for the empirical investigation presented in subsequent chapters.

#### **2.2 Empirical Literature.**

This section offers a critical analysis of the current state of knowledge on stakeholder participation in development projects, with a particular focus on street

lighting projects. It aims to identify the research gaps that this study seeks to address. The review is structured around the study objectives, aligning closely with the study elements: stakeholder communication, stakeholder relationship, and stakeholder empowerment.

The literature review employs a funnel-type approach, beginning with a broad overview of each element of stakeholder participation before narrowing down to specific studies and findings related to each element. This method ensures a comprehensive understanding of each element from a general perspective to the specific context of street lighting projects. The review not only synthesizes existing research but also highlights areas where further investigation is warranted, thereby setting the stage for the contributions of this study.

### **2.2.1. Stakeholder Communication and Project Sustainability.**

Communication encompasses various factors such as leadership communication, internal communication, and external communication. This study specifically considers two factors that significantly affect the success of stakeholder communication efforts: internal communication (information flow within street lighting projects) and external communication (exchange of information between street lighting project stakeholders).

Communication involves exchanging ideas, thoughts, and sharing information among stakeholders. According to Hussain *et al.* (2023), project success depends on effective communication, which fosters the sharing of

innovative ideas, prevents disagreements, and encourages project sustainability. Ika and Pinto (2022), and Irfan *et al.* (2021), further note that strategic communication support enhances project satisfaction and organizational backing. Wheeler *et al.* (2022) add that skillful communication helps identify project problems, allowing top management to develop effective plans for project success. Numerous studies have explored stakeholder communication and its influence on project sustainability. These are analyzed below across global, regional, and local contexts.

Globally, Omar *et al.* (2023) studied factors of project success and found that effective communication enhances project sustainability by fostering meaningful stakeholder interactions. Malik *et al.* (2023) observed that stakeholder communication significantly influenced the sustainability of renewable energy projects in Pakistan. Jun and Kim (2021) noted that regular communication among stakeholders aligned LG Electronics with specific SDGs, streamlining its sustainability efforts. Osabajo *et al.* (2021) highlighted that communication influences project sustainability, noting that a lack of communication inhibited sustainable practices in a maritime conservation project.

Regionally, Umumararungu and Mulyungi (2018) found a positive relationship between communication and project sustainability in housing projects in Rwanda. Clear communication channels led to healthier stakeholder relationships and successful project delivery. However, they suggested further

research on communication strategies within projects to gain deeper insights, a gap that this study intends to fill.

Locally, Luhombo *et al.* (2019) observed that stakeholder communication positively influences the sustainability of Special Certificate Programs (SCPS) in Technical and Vocational Training institutions (TVETs) according to a study they conducted in Western Kenya. Kotut and Sakataka (2015) found a correlation between stakeholder communication and sustainability of projects in Uasin Gishu County, noting that formal meetings enable project managers to make informed decisions, leading to successful project outcomes. Olwande (2021) found that stakeholder communication positively affects the performance of anti-retroviral therapy supply chain projects in Kenya.

Bosire (2019) noted that failure in crisis communication management with tea farmers at Kenya Tea Development Agency (KTDA) escalated the crisis, emphasizing the importance of timely communication. Muendo and Nyang'au (2023) observed that stakeholder communication positively influences the sustainability of water projects in Makueni County, highlighting feedback, reports, and meetings as key communication elements. Munyi and Atieno (2021) identified challenges in stakeholder buy-in due to a lack of stakeholder communication in public universities in Kenya.

Kalu (2021) found that stakeholder communication enhances project sustainability at Kenya Ports Authority (KPA) by building positive relationships and preventing apathy. Mumbi and Kimutai (2018) observed that clear

communication channels and strategies improve stakeholder relationships and project management success in open-air market projects in Nyeri County. Gichimu and Mutuku (2022) noted that regular progress reports improve stakeholder confidence and buy-in for county government-funded projects in Nyeri County.

From the foregoing analysis, it is evident that stakeholder communication, crucial for the sustainability of development projects, has not been extensively studied in the energy sector, particularly street lighting projects. Only one relevant study by Malik *et al.* (2023) on renewable energy projects in Pakistan touches on this aspect. Also, Umumararungu and Mulyungi (2018) had suggested further research on communication strategies within projects to gain deeper insights. The study aims to fill these gaps by providing insights that can help implementers achieve sustainable street lighting projects.

### **2.2.2 Stakeholder Relationship and Project Sustainability.**

Stakeholder relationship involves a strategy in which an organization maintains regular engagement with its stakeholders (Kenton, 2023). Massawe (2022) highlights that effective stakeholder relationship is the cornerstone of organizational performance, prosperity, and sustainability. Numerous studies have explored the influence of stakeholder relationship on the sustainability of projects.

Globally, Omar *et al.* (2023) studied the effect of stakeholder relationship on construction project success in the United Arab Emirates. They found that poor

stakeholder relationship among stakeholders leads to negative attitudes toward project activities, diminished trust, and ultimately, poor project sustainability. This underscores the importance of well-managed relationships for project success.

Regionally, Chikato and Gemedi (2021) conducted a study in Ethiopia on customer relationship practices and their impact on customer retention and loyalty at Oromia Credit and Savings Share Company. They observed that stakeholders are more likely to remain loyal if their relationships with managers are built on mutual benefit.

The analysis indicates that while some studies have been conducted on stakeholder relationship, they predominantly focus on construction, business, and entrepreneurship projects. Notably, there is a significant gap in research on stakeholder relationship within the energy sector, particularly concerning street lighting projects in Kenya. This study aims to fill this gap by investigating the influence of stakeholder relationship on the sustainability of street lighting projects in Ruiru Sub-County.

### **2.2.3 Stakeholder Empowerment and Project Sustainability.**

Numerous studies have examined the influence of stakeholder empowerment on the sustainability of projects. Globally, Spath and Anna (2016) observe that stakeholder empowerment in projects rarely goes beyond consultation. They noted that when stakeholders are involved in project activities,



they feel empowered, responsible, and integral to the process, which enhances project sustainability.

Regionally, Edomah, Gogo, and Xavier (2021) studied stakeholders and interventions in Nigeria's electricity sector. They found that the lack of stakeholder empowerment poses significant challenges to effective electricity infrastructure projects. The authors argued that for meaningful stakeholder participation to take place, the government should create avenues for stakeholders to contribute to infrastructure projects, thus empowering them and enhancing project outcomes.

Locally, Ouko *et al.* (2020) conducted a study on stakeholder empowerment and found a significant positive association between stakeholder empowerment and project sustainability. Similarly, Luhombo *et al.* (2019) observed that stakeholder empowerment positively and significantly influences project sustainability. Kalu (2021), in a study on the Kenya Ports Authority (KPA), also found that stakeholder empowerment significantly influences sustainability by increasing stakeholders' ability and confidence to make informed decisions and deliberate on possible choices.

This analysis reveals that most studies on stakeholder empowerment and project sustainability have been conducted in sectors other than the energy sector. The sole study related to energy focused on the energy market structure in Nigeria (Edomah *et al.*, 2021) and even then, the study focused on the broader energy sector and not street lighting. The majority of other studies have concentrated on

education and infrastructure projects. This study aims to bridge this gap by focusing on stakeholder empowerment within the context of street lighting projects.

### **2.3 Summary of Literature and Research Gaps.**

The primary objective of this study was to investigate the influence of stakeholder participation on the sustainability of street lighting projects, with sustainability as the dependent variable and stakeholder participation as the independent variable. Stakeholder participation was analyzed through three key elements: stakeholder communication, stakeholder relationship, and stakeholder empowerment. The chapter provides a comprehensive review of the literature, systematically examining existing studies to identify gaps in current knowledge and highlighting areas where further research is needed. Below is a summary gleaned from the empirical literature review.

Effective communication among stakeholders is crucial for the success of projects, as it helps share ideas, prevent conflicts, and encourage innovative solutions. Studies from various parts of the world, including those by Omar *et al.* (2023) and Malik *et al.* (2023), have shown that effective communication improves project sustainability by fostering meaningful interactions and aligning project activities with sustainability goals. For instance, Jun and Kim (2021) found that regular communication among stakeholders helped align LG Electronics with specific sustainable development goals, streamlining its sustainability efforts. Similarly, Umumrarungu and Mulyungi (2018)

demonstrated that clear communication channels led to healthier stakeholder relationships and successful project delivery in Rwanda. Despite these findings, there is limited research on stakeholder communication in the energy sector, particularly for street lighting projects, a gap this study aims to fill.

Building strong relationships with stakeholders is also important for project sustainability. Globally, Omar *et al.* (2023) highlighted that poor stakeholder relationships lead to distrust and negative attitudes, harming project success. In Ethiopia, Chikato and Gemedi (2021) found that strong, mutually beneficial relationships increased stakeholder loyalty and project success. Massawe (2022) also pointed out that effective stakeholder relationships are essential for organizational performance and sustainability. However, there is a scarcity of research on stakeholder relationships specifically in the energy sector, particularly for street lighting projects. This study seeks to explore how stakeholder relationships influence the sustainability of street lighting initiatives.

Empowering stakeholders by involving them in decision-making and giving them a voice is key to project sustainability. Spath and Anna (2016) observed that projects benefit significantly when stakeholders are involved from the planning stage, fostering a sense of responsibility and commitment. In Nigeria, Edomah *et al.* (2021) found that lack of stakeholder empowerment posed challenges to effective electricity infrastructure projects. In Kenya, Ouko *et al.* (2020) and Kalu (2021) identified a positive link between stakeholder empowerment and project sustainability, showing that when stakeholders feel

capable and confident, projects are more sustainable. However, most existing research focuses on sectors other than energy. This study addresses this gap by examining how stakeholder empowerment influences the sustainability of street lighting projects. Overall, this study aims to fill the gaps identified in the literature by providing a deeper understanding of how stakeholder communication, relationships, and empowerment can lead to sustainable street lighting initiatives.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### **3.1 Introduction.**

This chapter outlines the research approach utilized in the investigation. It provides a detailed description of the research design, the site of the study, the target population, and the sampling processes. It also covers the sample size, data collection protocols, and the research instruments used for data collection. Additionally, the chapter discusses data processing and presentation methods, and addresses the ethical considerations pertinent to the study.

#### **3.2 Research Design.**

One of the fundamental functions of research is to understand the nature of a problem and identify the various factors contributing to its occurrence. The essence of research design lies in translating a research problem into data for analysis to provide relevant answers to research questions at a minimal cost. Often, the choice of a research design is guided by a careful analysis of the problem statement, research questions, conceptual/theoretical framework, and a review of relevant literature (Asenahabi, 2019). According to Ansari *et al.* (2022), a research design helps the researcher make correct decisions at each step of the study, highlighting significant tasks and ensuring accuracy, reliability, consistency, and legitimacy of the research topic.

In this study, the sustainability of street lighting projects was the dependent variable, while stakeholders' participation was the independent variable. The independent variable was assessed from the perspective of three elements including stakeholder communication, stakeholder relationship, and stakeholder empowerment. To demonstrate how stakeholders' participation influences the sustainability of street lighting projects, evaluation research approach was employed.

According to Kellaghan (2010), evaluation research is a form of disciplined and systematic inquiry carried out to assess or appraise an object, program, activity, or system, with the purpose of providing information useful for decision-making. This approach was deemed appropriate for the study as it allowed for a comprehensive assessment of the influence of stakeholder participation on the sustainability of street lighting projects, which are ongoing initiatives. Evaluation research design was selected because it helps in the understanding of how well a program or project is working and whether it achieves its goals. The street lighting projects are ongoing and therefore, the evaluation research design is important to provide useful data and information for assessing performance and improving decision-making, thereby enabling practitioners to achieve delivery of effective and sustainable street lighting projects.

### **3.2.1 Process Evaluation Design.**

The study employed evaluation research approach, specifically focusing on a process evaluation design. According to Grant *et al.* (2020), process evaluations are a crucial component of an effectiveness evaluation. They aim to understand the relationship between interventions and context, explaining how and why interventions succeed or fail, and assessing whether they can be transferred to other settings and populations.

The purpose of a process evaluation is to evaluate and explain the relationship between the intervention and its components, context, and outcomes. This type of evaluation helps inform judgments about various forms of validity. By exploring the intervention components and their interrelationships, process evaluation addresses construct legitimacy. It also examines the connections between interventions and outcomes, contributing to internal validity, and assesses the relationship between intervention and context, enhancing external validity.

Moreover, process evaluations distinguish between different types of failures. They differentiate intervention failure, where the intervention is poorly delivered, from design failure, where the intervention's design is flawed. This distinction is vital for understanding the true reasons behind the success or failure of an intervention and for making informed decisions about future implementations and adaptations.

By employing a process evaluation design, this study aimed to provide a comprehensive understanding of how stakeholder participation influences the sustainability of street lighting projects. This approach allowed for a detailed examination of the interventions' components, their effectiveness in different contexts, and their influence on project sustainability. In a nutshell using this design helped in assessing the sustainability of street lighting projects in Ruiru Sub-County.

### **3.3 Research Site.**

The study was conducted in Kahawa Wendani and Mwihoko Wards, located in Ruiru Sub-County of Kiambu County, Kenya. Ruiru Sub-County is part of the greater Nairobi metropolitan area and shares many of the same challenges as Nairobi. One significant issue in both areas is the inadequate and largely dysfunctional urban lighting infrastructure.

### **3.4 Target Population.**

According to Mncedisi Willie (2023), the target population refers to a specific subset within the larger population that is the primary focus of a study. This group consists of individuals who possess certain characteristics or meet specific criteria relevant to the research questions or objectives of the initiative. For this study, the target population consisted of 20,777 local households in Wendani and Mwihoko Wards (KNBS, 2019). Additionally, it included 17 stakeholders from relevant stakeholders including the County Government of



Kiambu, Provincial Administration, and Kenya Power and Lighting Company. (CGK, 2023 – 2027).

### **3.5 Study Sample.**

According to Bhardwaj (2019), a sample is a subset of people, objects, or items selected from a larger population for the purpose of measurement. Shukla (2020) further defines a sample as the unit(s) chosen from the population that represent the various characteristics and types found within the population. Due to practical constraints, data are collected from these sample units rather than from every unit within the population, and the findings are then generalized to the entire population. For this study, a sample of 392 respondents was selected for the local households and 17 key informants, making a total of 405. The methodology used to generate this study sample is detailed in Section 3.5.1 below.

#### **3.5.1 Sampling Procedure.**

The study utilized a combination of purposive sampling and systematic sampling techniques. Purposive sampling was chosen based on the specific information expected from the respondents. As Palinkas *et al.* (2015) note, purposive sampling is widely used in qualitative research to identify information-rich cases related to the phenomenon of interest. The key informants from the County Government departments, provincial administration, and Kenya Power and Lighting Company were selected purposively. This method ensured that these respondents, who were expected to provide comprehensive answers regarding street lighting projects, were appropriately included.

For local households, a mix of purposive and systematic sampling techniques was used. First, the researcher identified and listed streets or roads served by street lighting projects. Notably, not all areas in the selected wards are served with street lighting projects, so interviewing households without such services would not provide meaningful data. Then, systematic sampling was employed to select the households for the study.

### 3.5.2 Sample Size.

The target population for the study was 405 i.e., 20,777 households in Mvihoko Ward and Wendani Ward (KNBS, 2019); 6 (provincial administration), 1 (KPLC), and 6 (County Government of Kiambu). Using Yamane's formula, the sample for the households was 392 households. The sample size was calculated as shown below.

$$n = \frac{N}{1 + Ne^2}$$

Where:

n = is the required sample size

N = is the population size (20,777)

e = is the sampling error @ 95% confidence level (0.05)

Key informants from the County Government of Kiambu, provincial administration, and Kenya Power and Lighting Company were selected purposively due to their critical roles in the study.

**Table 1***Study Sample*

<b>Category</b>	<b>Population</b>	<b>Sample Size</b>	<b>Percentage</b>
Local Households	20,777	392	96.8
Provincial Administration (National Police)	2	2	0.5
Provincial Administration (Chiefs/Assistant Chiefs)	4	4	1
Kenya Power and Lighting Company (KPLC)	1	1	0.3
County Government of Kiambu (ten departments)	10	6	1.5
<b>Total</b>	<b>20,794</b>	<b>405</b>	<b>100</b>

*Source: Researcher, 2024*

### **3.6 Data Collection.**

#### **3.6.1 Data Collection Instruments & Procedure.**

Data collection followed the research procedures established by Africa Nazarene University, starting with securing an authorization letter for the research. Additionally, the researcher obtained a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) (see appendix). With the necessary documents in hand, the researcher commenced data collection, both primary and secondary data. Primary data was gathered through face to face household and key informant interviews, while secondary data was sourced from the County Government of Kiambu and other relevant stakeholders, including the Kenya Power and Lighting Company (KPLC) through perusal of documents.

### **3.6.2 Pilot Testing of Research Instruments.**

The researcher conducted a pre-test of the research instruments in the neighboring Kiuu Ward to ensure their reliability and validity. The pre-test sample comprised 10% of the study sample, amounting to 39 households. Based on the pre-test findings, the researcher refined and improved the instruments accordingly. To facilitate data collection, the researcher recruited and thoroughly trained research assistants. This training ensured they were well-prepared to collect accurate and complete data in the field. Throughout the data collection process, the researcher maintained regular contact with the research assistants to ensure the integrity and reliability of the collected data

### **3.6.3 Instrument Reliability.**

To ensure reliability, the researcher used the Cronbach's alpha method, which measures the internal consistency of items in a questionnaire. This method checks how closely related a set of items are as a group. An alpha value of 0.70 or higher indicates good reliability. Using SPSS software, the researcher performed the necessary analysis to calculate Cronbach's alpha, utilizing pre-test questionnaires from households in the pre-test ward. According to Mugenda & Mugenda (2013), Cronbach's alpha is preferred for testing internal consistency because it only requires one testing session, reducing the risk of inaccuracies that can arise from different test conditions.

#### **3.6.4 Instrument Validity.**

To ensure the validity of our research instrument, the researcher first established content validity by consulting with the supervisor to confirm that all relevant aspects of the research instrument were covered. The researcher then performed a pilot test to check face validity, ensuring that the instrument was able to measure the intended data. To ensure construct validity, the researcher used factor analysis in SPSS, confirming that items loaded appropriately on expected factors with strong factor loadings above 0.4. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity indicated that the study data was suitable for factor analysis ( $KMO > 0.6$ ,  $p < 0.05$ ).

In summary, the validity of the instruments was primarily focused on aligning them with the study's objectives and variables, ensuring that the data collected adequately measured the intended variables. This process was essential to confirm that the instruments effectively captured the necessary information for the study.

#### **3.6.5 Data Collection Procedures.**

According to Bhandari (2023), data collection is a systematic process of gathering observations or measurements. To ensure this systematic approach, the researcher meticulously organized the structured questionnaires to facilitate smooth administration and ensure they collected only the necessary data. The study utilized two sets of structured questionnaires: one for local households and another for key informants. These questionnaires were administered in person by

the researcher and a team of carefully selected and trained research assistants. Each evening, the completed questionnaires were audited to identify any missing data, and follow-up plans were implemented as needed to address any gaps. This thorough approach ensured the integrity and completeness of the data collected.

### **3.7 Data Processing and Analysis.**

The data processing and analysis for the study followed a systematic sequence comprising cleaning, entry, processing, and analysis. Initially, during the cleaning stage, all questionnaires were meticulously audited to ensure there was no missing data or information. At the entry stage, the data were input into Excel and subsequently exported to SPSS Version 22 for further processing.

During the processing stage, the data were thoroughly examined to confirm statistical accuracy. Once validated, the analysis commenced using descriptive statistics. Interpretation of the findings was done by comparing the mean score for each item statement and the composite mean. The influence of each item statement was then determined based on the argument that a mean score of between 2.61 and 3.40 in the Likert scale represented neutral influence and that mean scores of less than 2.61 represented negative influence and scores greater than 3.40 represented positive influence. The range of interpreting the Likert scale mean score was as follows: 1.0 – 1.80 (Strongly disagree); 1.81 – 2.60 (Disagree), 2.61 – 3.40 (Neutral); 3.41 – 4.20 (Agree); and 4.21 – 5.00 (Strongly agree) see table below. This was important to help describe the central tendency of the data

and dispersion. The results of the analysis were presented in tabular format to aid in visualization and understanding.

**Table 2**

*Interpretation of Likert Scale Scores*

<b>Score</b>	<b>Description</b>
1.00 – 1.80	Strongly Disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Neutral
3.41 – 4.20	Agree
4.21 – 5.00	Strongly Agree

*Note: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree.*

*Source: Researcher, 2024*

### **3.8 Legal and Ethical Considerations.**

Legal and ethical considerations were thoroughly addressed on multiple fronts throughout the study. Firstly, regarding respondent privacy and confidentiality, strict adherence to the guidelines outlined in the research permits was maintained. The structured questionnaires included a clause emphasizing voluntary participation, ensuring that respondents were aware that their data would be treated with utmost confidentiality and used solely for academic purposes. This approach prioritized the protection of respondent privacy and confidentiality.

Secondly, in terms of copyright, the researcher took care to appropriately acknowledge and appreciate the works of previous researchers. This practice not only upheld ethical standards but also mitigated the risk of plagiarism, which is often associated with unethical research practices.

Lastly, regarding the dissemination of results, the researcher ensured that the final research product was shared with key stakeholders, including the County Government of Kiambu, provincial administration, and the Kenya Power and Lighting Company Limited. This step fostered transparency and accountability, allowing stakeholders to benefit from and contribute to the study's findings and recommendations.



## CHAPTER FOUR

### DATA ANALYSIS AND FINDINGS

#### 4.1 Introduction.

The sustainability of public infrastructure projects has been a critical concern for the national government, local governments, and communities alike. In Kiambu County, specifically Ruiru Sub-County, the sustainability of street lighting projects has attracted significant attention due their direct impact on public safety, economic activity, and overall quality of life. The primary purpose of the study was to investigate the influence of stakeholders' participation on the sustainability of the street lighting projects in Ruiru Sub-County. By focusing on Ruiru Sub-County, a cosmopolitan urban area, the study sought to provide insights that could inform broader street lighting infrastructure development strategies within Kiambu County and other counties in Kenya.

The study was guided by three specific objectives: First, it evaluated how stakeholder communication strategies influence the sustainability of street lighting projects. This objective was based on the view that effective communication is important for aligning the goals and expectations of stakeholders, ensuring that the projects meet their intended needs and are maintained over time. Second, the study determined how stakeholder relationship practices influence the sustainability of the street lighting projects. Thus, strong, cooperative relationships among stakeholders lead to better project management, resource allocation, and conflict resolution. Third, the study examined how stakeholder

empowerment strategies influence the sustainability of street lighting projects. Empowering stakeholders through involvement and decision-making enhances sustainability and long-term viability of the street lighting projects.

By analyzing the influence of stakeholder communication strategies, stakeholder relationship, and stakeholder empowerment (independent variable) on dependent variable (sustainability of street lighting projects), the study aimed to provide policy and practice recommendations for enhancing the sustainability of street lighting projects not only in Ruiru Sub-County, but also in Kiambu County and at the country at large.

#### **4.2 Characteristics of the Respondents.**

In this study, 392 respondents from local households and 5 key informants were surveyed to understand the influence of stakeholders' participation on the sustainability of street lighting projects in Kahawa Wendani and Mwihoko wards in Ruiru Sub-County. A total of 392 questionnaires were administered to local households and 5 questionnaires to key informants, making it a total of 397 respondents. This section presents an analysis of the local households' respondents' demographic and socio-economic characteristics. The comprehensive analysis of respondents' characteristics contributes to the understanding of how demographic and socio-economic factors influence stakeholders' participation in the sustainability of street lighting projects in Ruiru Sub-County, in particular, and other contexts, in general. In chapter five, the study

will discuss how these demographic and socio-economic characteristics bear on the sustainability of street lighting projects.

#### **4.2.1 Response Rate.**

The response rate of the study was calculated to measure the level of data collection and representativeness of the study. The response rate for the study sample was 98%, which was an excellent turnout. The response rate was determined by dividing the number of completed responses by the total number of questionnaires administered and multiplied by 100 to get a percentage i.e.  $397/405 * 100 = 98\%$ . The percentage reduction from 100% to 98% was affected by the reduction in number of key informants whose number reduced because of as they had duplicate roles and mandate in the case of National Police and Chiefs, and the county government staff.

#### **4.2.2 Demographics.**

The demographic analysis included key variables including gender, age, residence period, level of education, employment, income levels, mode of transport, and ownership and functionality of the street lighting projects. The demographics in this section are for the 392 respondents from the households.

##### **4.2.2.1 Gender.**

The gender distribution of the respondents was analyzed to ensure an equitable representation of both male and females.

**Table 3***Gender of Respondent*

<b>Gender</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Male	182	46.4%
Female	210	53.6%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

The data shows a slightly higher representation of female respondents (53.6%) compared to male respondents (46.4%).

**4.2.2.2. Age Distribution.**

The respondents were categorized into various age groups to understand the age diversity within the sample, with the categories ranging between below 20 years and 60 years and above. The range between the categories was 10 years.

**Table 4***Age of Respondent*

<b>Age Range</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Below 20 years	4	1.0%
20 - 29 years	100	25.5%
30 - 39 years	148	37.8%
40 - 49 years	92	23.5%
50 - 59 years	33	8.4%
60 years and above	15	3.8%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

The majority of respondents (63.3%) are between the ages of 20 and 39, indicating a young adult demographic in the study area.

#### 4.2.2.3 Education Level.

The educational background of the respondents was also analyzed to assess the range of educational attainment within the sample.

**Table 5**

*Education Level of Respondent*

<b>Education Level</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Primary	13	3.3%
Secondary	107	27.3%
University	246	62.8%
Other	26	6.6%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

A significant proportion of respondents (62.8%) have attained a university level of education, indicating a highly educated sample population.

#### 4.2.2.4 Socio-Economic Characteristics.

The socio-economic characteristics of the respondents were also analyzed to provide insights into their economic status and its potential impact on their perspectives regarding the street lighting projects.

#### 4.2.2.5 Employment Type.

The employment type of the respondents was documented, including categories such as self-employed, formal employment, and retired.

**Table 6**

*Type of Employment of Respondent*

<b>Type of Employment</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
self employed	182	46.4%
Formal employment	123	31.4%
Retired	21	5.4%
None	66	16.8%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

The data shows that nearly half of the respondents (46.4%) are self-employed, while 31.4% are formally employed.

#### 4.2.2.6 Income Levels.

The income levels of the respondents were assessed to understand their economic conditions.

**Table 7***Income Level of Respondent*

<b>Income Level</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
less than 50,000/=	231	58.9%
60,000 - 100,000/=	130	33.2%
101,000 - 150,000/=	24	6.1%
151,000 - 200,000/=	7	1.8%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

The majority of the respondents (58.9%) earn less than KES 50,000 per month, indicating a relatively low-income population.

**4.2.2.7 Residence Period.**

The period of residence was considered to gauge the stability and investment of respondents in the community.

**Table 8***Residence period of respondent*

<b>Residence period</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Less than 1 year	29	7.4%
1 - 5 years	168	42.9%
6 - 10 years	149	38.0%
More than 10 years	44	11.2%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

Most respondents (42.9%) have lived in the study area for 1-5 years, while 38.0% have lived in the study area between 6-10 years, reflecting a mix of long-term and relatively new residents.

#### 4.2.2.8 Mode of Transport.

The mode of transport of respondents was considered to gauge the operations and movement of the respondents within and outside the study area.

**Table 9**

*Mode of transport of respondent*

<b>Mode of transport</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Public - Matatu	174	44.4%
Public – Boda Boda	108	27.6%
Private vehicle/motor cycle/bicycle	65	16.6%
Walking	45	11.5%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

A significant portion of respondents (44.4%) rely on public transport (matatu), while 27.6% use Boda Boda, and 16.6% use private means of transport.

#### 4.2.2.9 Ownership of the Street Lighting Projects.

Ownership of the street lighting projects was considered to gauge the level of responsibility in terms of operations and maintenance.



**Table 10***Ownership of Street Lighting*

<b>Ownership of projects</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
County Government	295	75.3%
Community/Estate Welfare/Resident Association	89	22.7%
National Government	7	1.8%
Non-Governmental Organization	1	0.3%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

The majority of the street lighting projects (75.3%) are owned by the County Government.

#### **4.2.2.10 Functionality of the Street Lighting Projects.**

Functionality of the street lighting projects was considered also to gauge the level of responsibility in terms of operations and maintenance.

**Table 11***Functionality of the street lighting projects*

<b>Functionality of the projects</b>	<b>Respondents (N)</b>	<b>Percentage (%)</b>
Functional	173	44.1%
Non-functional	219	55.9%
<b>Total</b>	<b>392</b>	<b>100%</b>

*Source: Researcher, 2024*

A notable finding is that more than half of the street lighting projects (55.9%) are non-functional.

### **4.3 Presentation of Research Analysis, Findings, and Interpretation.**

This section provides comprehensive summary of the findings, analysis and interpretation of data collected in the study. The results are presented according to the specific objectives and research objectives, focusing on the influence of stakeholders' participation on the sustainability of street lighting projects in the Sub-County. As shown in chapter 3, the interpretation of the findings was done by comparing the mean score for each item statement and the composite mean.

The influence of each item statement was then determined based on the argument that a mean score of between 2.61 and 3.40 in the Likert scale represented neutral influence and that mean scores of less than 2.61 represented negative influence and scores greater than 3.40 represented positive influence. The range of interpreting the Likert scale mean score was as follows: 1.0 – 1.80 (Strongly disagree); 1.81 – 2.60 (Disagree), 2.61 – 3.40 (Neutral); 3.41 – 4.20 (Agree); and 4.21 – 5.00 (Strongly agree) see table below. This was important to help describe the central tendency of the data and dispersion.

#### **4.3.1 Stakeholder Communication Strategies and Sustainability of Street Lighting Projects.**

In this section, the researcher presents results for objective one which was to evaluate the influence of stakeholder communication strategies on the sustainability outcomes of street lighting projects in Ruiru Sub-County of

Kiambu County. The research question was: how does stakeholder communication influence the sustainability of street lighting projects?

To help us achieve the results for the objective and answer the research question, the researcher measured seven item statements relating to stakeholder communication. These included: awareness and understanding of project goals, engagement and participation, communication channels and effectiveness, feedback mechanisms and responsiveness, perceived impact and sustainability (long-term sustainability), perceived impact and sustainability (action on feedback), and obstacles to communication. The descriptive results for the item statements are as shown below.

**Table 12**

*Descriptive Statistics for Objective One: How Stakeholder Communication*

*Influences Sustainability of Street Lighting Projects*

<b>Item Statements</b>	<b>SD f (%)</b>	<b>D f (%)</b>	<b>N f (%)</b>	<b>A f (%)</b>	<b>Af (%)</b>	<b>Mean</b>	<b>Std</b>
Awareness and understanding of project goals	78 (19.9)	95 (24.2)	28 (7.1)	103 (26.3)	88 (22.4)	3.07	1.483
Engagement and participation	29 (7.4)	101 (25.8)	59 (15.1)	77 (19.6)	126 (32.1)	3.43	1.361
Communication channels and effectiveness	59 (15.1)	63 (16.1)	48 (12.2)	93 (23.7)	129 (32.9)	3.43	1.461
Feedback mechanisms and responsiveness	47 (12.0)	55 (14.0)	70 (17.9)	88 (22.4)	132 (33.7)	3.52	1.389
Perceived impact and sustainability (long-term)	45 (11.5)	65 (16.6)	59 (15.1)	97 (24.7)	126 (32.1)	3.49	1.385
Perceived impact and sustainability (action on feedback)	35 (8.9%)	70 (17.9%)	59 (15.1%)	104 (26.5%)	124 (31.6%)	3.54	1.334
Obstacles to communication	35 (8.9)	70 (17.9)	59 (15.1)	104 (26.5)	124 (31.6)	3.54	1.334
<b>Composite mean and standard deviation</b>						<b>3.41</b>	<b>1.402</b>

*Note: N=392; SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, and*

*SA=Strongly Agree.*

*Source: Researcher, 2024*

The first item statement measured was awareness and understanding of project goals. The researcher aimed to determine whether the goals and objectives

of the street lighting projects were clear to the stakeholders. Clear goals and objectives ensure all stakeholders are aligned and working towards the same outcomes, reducing confusion and enhancing coordinated efforts. Among the 392 respondents, 103 (26.3%) agreed and 88 (22.4%) strongly agreed that the goals were clear, while 28 (7.1%) were neutral, 95 (24.2%) disagreed, and 78 (19.9%) strongly disagreed. The mean score for this item was 3.07 with a standard deviation of 1.483, which is lower than the composite mean of 3.41 with a standard deviation of 1.402. This suggests that awareness and understanding of project goals do not influence the sustainability of the street lighting projects.

The second item statement measured was engagement and participation, which was aimed at establishing whether stakeholders felt their input was valued and integrated into the project's development and implementation phases. Valuing and integrating stakeholder input increases their commitment and support, leading to more effective and sustainable project outcomes. Among the respondents, 77 (19.6%) agreed and 126 (32.1%) strongly agreed that their input was valued, while 59 (15.1%) were neutral, 101 (25.8%) disagreed, and 29 (7.4%) strongly disagreed. This item had a mean of 3.43 and a standard deviation of 1.361, which is slightly higher than the composite mean, indicating a moderate positive influence on the sustainability outcomes of the street lighting projects. Responding to whether the street lighting projects integrated stakeholders' input into the projects, the key informant from the Provincial Administration (Area Chief, Mwihoko Ward) said:

*'The provincial administration works closely with the County Government, especially the Ward Administrator. Whenever a street lighting project is implemented, we are always informed and asked to provide the necessary information such as the areas to be given priority. These include areas with incidences of insecurity occasioned by lack of lighting'.*

This assertion was also confirmed by the Officer Commanding Police Station (OCS) for Mwhoko Station who remarked that:

*'The police are keen on street lighting and together with the area chief and assistant chiefs, always discuss street lighting among other issues in the area and do provide suggestions to the County as this issue touches on security'.*

The third item statement measured was communication channels and their effectiveness. The researcher aimed to determine if effective communication channels were fostering dialogue, collaboration, and problem-solving among stakeholders. Effective communication channels facilitate timely and efficient information exchange, helping to address issues quickly and promote collaborative solutions. A total of 93 respondents (23.7%) agreed and 129 (32.9%) strongly agreed, while 48 (12.2%) were neutral, 63 (16.1%) disagreed, and 59 (15.1%) strongly disagreed. The mean score for this item was 3.43 with a standard deviation of 1.461, suggesting the presence of effective communication

channels. Responding to this item statement the area chief (Kahawa Wendani) said:

*'The provincial administration is always in touch with the County Government and we do phone calls whenever there is an issue that needs to be addressed regarding street lighting'.*

Asked whether there is any other form of communication other than calling, the Chief said:

*'Making a phone call is enough since street lighting incidences are not many. We don't need to communicate through memos. Only serious incidences would require formal communication, for example when the County wants us to suggest new areas for electrification'.*

The fourth item statement measured was feedback mechanisms and responsiveness, where the researcher aimed to establish whether there were formal mechanisms for stakeholders to provide feedback and suggestions regarding the street lighting projects. Formal feedback mechanisms ensure that stakeholders can voice their concerns and suggestions, leading to continuous improvement and higher project acceptance. Out of 392 respondents, 88 (22.4%) agreed and 132 (33.7%) strongly agreed, while 70 (17.9%) were neutral, 55 (14.0%) disagreed, and 47 (12.0%) strongly disagreed. The mean score for this item was 3.52 with a standard deviation of 1.389, indicating a moderate positive reception to feedback mechanisms.

The fifth item statement measured was the perceived impact on sustainability, focusing on whether stakeholder communication influenced the long-term sustainability of the street lighting projects. Effective communication with stakeholders ensures ongoing support and engagement, which are crucial for the long-term sustainability of the projects. Here, 97 respondents (24.7%) agreed and 126 (32.1%) strongly agreed, while 59 (15.1%) were neutral, 65 (16.6%) disagreed, and 45 (11.5%) strongly disagreed. The mean score was 3.49 with a standard deviation of 1.385, suggesting a moderate positive perception of long-term sustainability.

The sixth item statement measured was the perceived impact on sustainability regarding action on feedback. The researcher aimed to establish whether the street lighting projects acted on stakeholder feedback. Acting on stakeholder feedback demonstrates responsiveness and accountability, fostering trust and improving project outcomes. Among the 392 respondents, 104 (26.5%) agreed and 124 (31.6%) strongly agreed, while 59 (15.1%) were neutral, 70 (17.9%) disagreed, and 35 (8.9%) strongly disagreed. This item had a mean score of 3.54 with a standard deviation of 1.334, the highest among the item statements, indicating a moderately strong agreement on the positive impact of stakeholder feedback on the sustainability of the street lighting projects. Responding to whether the projects acted on feedback from stakeholders regarding the street lighting projects, all the key informants surveyed (Ward administrators, Area Chiefs, the Police, Members of County Assembly and Kenya Power and Lighting



Company concurred that the street lighting projects act on the stakeholders' feedback. The MCA for Kahawa Wendani remarked:

*'Street lighting is one of our mandates as elected leaders and the citizens are always coming to us for a solution whenever there is an area with insecurity or when the transformer blows up and takes long to replace. In fact, I have saved the KPLC emergency phone number as priority to call them as fast as possible and find a solution whenever something happens'.*

On his part, the MCA for Mwhoko Ward said:

*'I recently installed street lights in the ward and whenever they fail, the resident association chairpersons have my number to alert me when there is a problem. I also alert KPLC immediately, otherwise the citizens will camp in my home and office if the issue is not addressed'.*

The seventh item statement measured was obstacles to communication, in which the researcher aimed to establish whether language and technical barriers hindered effective communication among stakeholders. Eliminating language and technical barriers ensures inclusive and clear communication, allowing all stakeholders to fully participate and contribute. Out of the 392 respondents, 104 (26.5%) agreed and 124 (31.6%) strongly agreed, while 59 (15.1%) were neutral, 70 (17.9%) disagreed, and 35 (8.9%) strongly disagreed. The mean score for this item was 3.54 with a standard deviation of 1.334, indicating some perception of obstacles to communication but generally a moderately positive view.

In summary, the findings indicate that while awareness and understanding of project goals need improvement, engagement and participation, effective communication channels, feedback mechanisms, and responsiveness positively influence the sustainability of street lighting projects. Addressing obstacles to communication can further enhance these positive outcomes.

#### **4.3.1.1 Answering Research Question One: How does Stakeholder Communication Influence the Sustainability of Street Lighting Projects?**

The first objective of the study was to evaluate the effect of stakeholder communication on the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County. The research question addressed was: how does stakeholder communication influence the sustainability of street lighting projects? The data collected provides a comprehensive evaluation of the strategies used for stakeholder communication and their influence on the sustainability of the street lighting projects.

The study measured stakeholders' awareness and understanding of project goals, revealing a mean score of 3.07, which was lower than the composite mean of 3.41. This indicated that stakeholders' understanding of project goals was moderate, with 44.1% of respondents disagreeing or strongly disagreeing that the goals were clear. Thus, it was found that stakeholders' awareness and clarity regarding project goals did not significantly influence the sustainability of the street lighting projects.

In contrast, the engagement and participation of stakeholders showed a mean score of 3.43, slightly above the composite mean. This aspect was critical in determining whether stakeholders felt their input was valued and integrated into the project's development and implementation phases. With 51.7% of respondents agreeing or strongly agreeing that their input was valued and integrated, the findings suggest that effective stakeholder involvement positively influences the sustainability of the projects.

The study also assessed the effectiveness of communication channels, which had a mean score of 3.43, indicating that such channels exist and positively influence project sustainability. Additionally, feedback mechanisms and responsiveness had a mean score of 3.52, with 56.1% of respondents agreeing or strongly agreeing that these mechanisms were in place. These findings underscore that effective communication channels and responsiveness to stakeholder feedback are crucial for project sustainability. Furthermore, the perceived impact of stakeholder communication on long-term sustainability had a mean score of 3.49, with 56.8% of respondents agreeing or strongly agreeing that communication influenced long-term sustainability.

In conclusion, the study demonstrates that effective stakeholder communication strategies, including engagement and participation, effective communication channels, and responsiveness to feedback, positively influence the sustainability of street lighting projects. While challenges such as awareness and understanding of project goals and communication obstacles exist, they do not

significantly detract from the overall positive impact. Based on the findings, the research question was answered affirmatively, indicating that effective communication fosters better stakeholder involvement, responsiveness, and collaboration, thereby enhancing the sustainability of street lighting projects. Continuous improvement in communication strategies is essential for further bolstering project sustainability.

#### **4.3.2 Stakeholder Relationship Practices and the Sustainability of Street Lighting Projects.**

In this section, the researcher presents results for objective two of the study which was to determine the influence of stakeholder relationship practices on the sustainability of lighting projects in Ruiru Sub-County of Kiambu County. The research question was: how does stakeholder relationship influence the sustainability of street lighting projects?

To help achieve the results for the objective and answer the research question, the researcher measured seven item statements including initial stakeholder engagement, communication and collaboration, stakeholder needs assessment, feedback information and integration, conflict resolution, stakeholder satisfaction, and capacity-building and empowerment. The descriptive results for the item statements are as shown below.

**Table 13**

*Descriptive Statistics for Objective Two: How Stakeholder Relationship*

*Influences Sustainability of Street Lighting Projects*

<b>Item Statements</b>	<b>SD f (%)</b>	<b>D f (%)</b>	<b>N f (%)</b>	<b>A f (%)</b>	<b>SA f (%)</b>	<b>Mean</b>	<b>Std</b>
Initial stakeholder engagement	50 (12.8)	108 (27.6)	48 (12.2)	77 (19.6)	109 (27.8)	3.22	1.432
Communication and collaboration practices	25 (6.4)	103 (26.3)	65 (16.6)	76 (19.4)	123 (31.4)	3.43	1.336
Stakeholder needs assessment	55 (14.0)	54 (13.8)	58 (14.8)	94 (24.0)	131 (33.4)	3.49	1.429
Feedback information and integration	52 (13.3)	56 (14.3)	59 (15.1)	104 (26.5)	121 (30.9)	3.47	1.398
Conflict resolution	39 (9.9)	61 (15.6)	57 (14.5)	122 (31.1)	113 (28.8)	3.53	1.318
Stakeholder satisfaction	51 (13.0)	60 (15.3)	53 (13.5)	90 (23.0)	138 (35.2)	3.52	1.430
Capacity-building and empowerment	27 (6.9)	63 (16.1)	69 (17.6)	98 (25.0)	135 (34.4)	3.52	1.430
<b>Composite mean and standard deviation</b>						<b>3.46</b>	<b>1.396</b>

*Note: N=392; SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, and*

*SA=Strongly Agree.*

*Source: Researcher, 2024*

The first item statement measured was initial stakeholder engagement, where the researcher aimed to find out whether the criteria used to identify stakeholders in the street lighting projects were clear. Clear identification criteria ensure all relevant stakeholders are included, leading to more comprehensive and effective project planning and implementation. Among the total respondents surveyed, 50 (12.8%) strongly disagreed, 108 (27.6%) disagreed, 48 (12.2%) were

neutral, 77 (19.6%) agreed, and 109 (27.8%) strongly agreed. This item had a mean score of 3.22 and a standard deviation of 1.432. The relatively high standard deviation indicates a broad range of responses, suggesting variability in how stakeholders perceive their initial engagement in the street lighting projects. The composite mean and standard deviation of 3.46 and 1.396, respectively, show that initial engagement (mean score of 3.22 and a standard deviation of 1.432) is slightly below the overall average, with more pronounced variability. The key informants also had mixed variability of responses on this item statement. Responding to this item statement, the Officer Commanding Mwhoko Police Station (OCS) said:

*‘The stakeholders of the street lighting projects are fairly known. Other than KPLC which supplies the power and the County Government which pays for it, the others are the community and institutions like us who need the street lighting for safety (local households) and the provincial administration for providing security. The criteria for identification of stakeholders is not, therefore a big concern here’.*

The second item statement measured was communication and collaboration practices. Here, the researcher aimed to find out whether there were formal structures or platforms for ongoing dialogue and information sharing between the projects and the stakeholders. Formal structures for dialogue promote transparency and continuous communication, helping to build trust and resolve issues promptly. The distribution of responses showed that 25 (6.4%) strongly

disagreed, 103 (26.3%) disagreed, 65 (16.6%) were neutral, 76 (19.4%) agreed, and 123 (31.4%) strongly agreed. This item had a mean score of 3.43 with a standard deviation of 1.336. The mean score suggests a generally favorable perception, and the standard deviation indicates some differences in opinion among stakeholders. The composite mean and standard deviation suggest that communication and collaboration practices are close to the overall average, with a similar level of variability.

The third item statement measured was stakeholders' needs assessment. With this item statement, the researcher aimed to establish whether stakeholder needs and expectations regarding the projects' infrastructure and sustainability factors were clearly identified and addressed. Addressing stakeholder needs and expectations ensures the project meets community requirements and enhances its relevance and sustainability. The respondents' feedback included 55 (14.0%) who strongly disagreed, 54 (13.8%) who disagreed, 58 (14.8%) who were neutral, 94 (24.0%) who agreed, and 131 (33.4%) who strongly agreed. The stakeholder needs assessment item was perceived positively, with a mean score of 3.49 and a standard deviation of 1.429. The significant proportion of positive responses highlights the importance of accurately assessing stakeholder needs. The composite mean and standard deviation indicate that needs assessment is slightly above average in terms of perceived effectiveness, with variability in line with the overall standard deviation. This item also scored favorably with key informants, especially the area chiefs who indicated that needs of the stakeholders in areas

served with the street lighting projects were considered. On his part, the area chief for Mwiwoko remarked:

*‘Normally, the need for street lighting comes from the community. They are the ones who know the areas with insecurity and those like market centers that need lighting for business to take place. Once these are identified, the Nyumba Kumi leaders (village heads) then communicate to us about the need. Note that KPLC and the County Government cannot just install the lights without collaborating with the local community leaders and the community’.*

On his part, the area chief for Kahawa Wendani said that:

*‘The stakeholders must collaborate, otherwise the bad elements in community would interfere with key installations like electricity transformers and transmission cables and we, as administrators will end up blaming each other’.*

The fourth item statement measured was feedback information and integration. Here, the researcher aimed to establish whether stakeholder feedback was incorporated into decision-making and adjustments to improve project sustainability performance. Incorporating stakeholder feedback into decision-making processes leads to better-informed decisions and more adaptive and resilient project implementation. Among the respondents surveyed, 52 (13.3%) strongly disagreed, 56 (14.3%) disagreed, 59 (15.1%) were neutral, 104 (26.5%)



agreed, and 121 (30.9%) strongly agreed. This item had a mean score of 3.47 and a standard deviation of 1.398. The data underscores the role of effective feedback mechanisms in enhancing stakeholder satisfaction. The composite mean and standard deviation show that feedback information and integration are slightly above average in effectiveness, with variability consistent with the overall average. This item also had favorable responses from the key informants as well. For instance, the Kenya Power and Lighting Company respondent said:

*'The community is normally very fast in reporting cases such as vandalism of transformers and transmission cables. KPLC has a hotline available to citizens through which they report such instances. KPLC then follows up immediately. In some cases, there may be delays because a transformer would need to be changed and it is not in store. In such a case, the stakeholders have to wait for appropriate replacement'.*

The fifth item statement measured was conflict resolution. Here, the researcher aimed to establish whether the projects effectively and adequately addressed any implementation issues such as stakeholder conflicts or grievances. Effectively addressing conflicts and grievances minimizes disruptions and fosters a collaborative working environment, enhancing project efficiency and success. The responses indicated that 39 (9.9%) strongly disagreed, 61 (15.6%) disagreed, 57 (14.5%) were neutral, 122 (31.1%) agreed, and 113 (28.8%) strongly agreed. The conflict resolution item was rated highly, with a mean score of 3.53 and a standard deviation of 1.318. The relatively lower standard deviation suggests

more consistent positive perceptions of conflict resolution practices. The composite mean and standard deviation suggest that conflict resolution practices are above average in effectiveness and have slightly lower variability. Responding to this item statement, the KPLC respondent noted that conflicts or grievances in regard to street lighting projects are few and far apart. He said:

*'There is no other supplier of power apart from KPLC and therefore, we do not expect conflicts. We have even connected households in Mwihoko through community initiatives and we have never encountered any conflict'.*

But on his part, the MCA for Mwihoko Ward had this to say:

*'Conflicts and grievances do occur especially when people from some areas feel left out. However, we address these by indicating that lighting projects are not dished out but are provided to areas that need them most'.*

The sixth item statement measured was stakeholder satisfaction, where the researcher measured whether stakeholders were satisfied with the operation and management of the projects. Stakeholder satisfaction indicates the project is meeting their needs and expectations, which is crucial for ongoing support and project sustainability. The distribution included 51 (13.0%) who strongly disagreed, 60 (15.3%) who disagreed, 53 (13.5%) who were neutral, 90 (23.0%) who agreed, and 138 (35.2%) who strongly agreed. The mean score for stakeholder satisfaction was 3.52 with a standard deviation of 1.430. This

indicates a generally high level of satisfaction among stakeholders, though some variability exists. The composite mean and standard deviation suggest that stakeholder satisfaction is in line with the overall average, with a comparable level of variability.

The seventh and last item statement measured was capacity-building and empowerment. Building stakeholder capacity empowers them to take an active role in the project, promoting sustainability and long-term success. The responses showed that 27 (6.9%) strongly disagreed, 63 (16.1%) disagreed, 69 (17.6%) were neutral, 98 (25.0%) agreed, and 135 (34.4%) strongly agreed. Capacity-building and empowerment had a mean score of 3.52 and a standard deviation of 1.430. These results highlight the critical role of empowering stakeholders in achieving project sustainability. The composite mean and standard deviation indicate that capacity-building and empowerment practices are on par with the overall average in terms of effectiveness, with a standard deviation consistent with the overall average. Responding to capacity-building the KPLC key respondent noted:

*'Of late, the local communities have organized themselves under the MCAs and request for power connection for street lighting. We do not allow the community members to connect themselves but we have experienced private experts who we normally engage to connect the communities. The connection is done from the posts and there are not meters. No layman can do that unless they are trained'.*

In conclusion, the results from the descriptive statistics provide valuable insights into the effectiveness of different stakeholder relationship practices. The high mean scores across most practices reflect a positive overall perception, while the standard deviations indicate the extent of variability in stakeholder experiences. This information is critical for identifying areas of strength and potential improvement to enhance stakeholder satisfaction and project sustainability. The consistency of the composite mean and standard deviation across variables suggests that while there is a general trend of positive feedback, individual experiences can vary significantly, highlighting the need for targeted improvements in stakeholder management practices. Furthermore, the composite mean of 3.46 and the overall standard deviation of 1.396 indicate a generally positive perception of stakeholder relationship practices across various dimensions. The composite mean suggests that, on average, stakeholders view these practices favorably, while the standard deviation points to some level of variability in their responses.

#### **4.3.2.1 Answering Research Question Two: How does Stakeholder Relationship Practices Influence the Sustainability of Street Lighting Projects?**

The study aimed to determine the influence of stakeholder relationship practices on the sustainability of street lighting projects in Ruiru Sub-County of Kiambu County, addressing the central research question: how does stakeholder relationship practices influence the sustainability of street lighting projects? To

achieve this objective, seven key areas of stakeholder relationship practices were measured: initial stakeholder engagement, communication and collaboration, stakeholder needs assessment, feedback integration, conflict resolution, stakeholder satisfaction, and capacity-building and empowerment. The descriptive statistics for these areas provide valuable insights into the effectiveness of these practices and their impact on project sustainability.

Firstly, initial stakeholder engagement, which assessed whether stakeholders were clearly identified, had a mean score of 3.22 with a standard deviation of 1.432. This suggests variability in perceptions, with some stakeholders feeling that the criteria for identifying stakeholders were not entirely clear. Communication and collaboration practices received a more favorable perception, with a mean score of 3.43 and a standard deviation of 1.336, indicating that formal structures or platforms for ongoing dialogue and information sharing among stakeholders exist, although opinions varied.

The assessment of stakeholder needs aimed to establish whether their needs and expectations were clearly identified and addressed, resulting in a positive mean score of 3.49 and a standard deviation of 1.429. This suggests that stakeholders believe their needs are well identified and addressed, which is crucial for project sustainability. Feedback integration also received positive feedback, with a mean score of 3.47 and a standard deviation of 1.398, indicating that stakeholders feel their feedback is effectively incorporated into decision-making and project adjustments.

Conflict resolution practices were rated highly, with a mean score of 3.53 and a standard deviation of 1.318, reflecting consistent positive perceptions and effective resolution of stakeholder conflicts. Stakeholder satisfaction and capacity-building and empowerment both scored highly, with mean scores of 3.52 and standard deviations of 1.430, indicating high levels of satisfaction and the importance of empowering stakeholders to achieve project sustainability. The composite mean score of 3.46 and the standard deviation of 1.396 indicate a generally positive perception of stakeholder relationship practices, with some variability in experiences.

In conclusion, the results suggest that stakeholder relationship practices positively influence the sustainability of street lighting projects. The consistent positive feedback across multiple dimensions, such as communication, needs assessment, feedback integration, conflict resolution, and capacity-building, demonstrates the importance of these practices in enhancing project sustainability. Despite some areas needing improvement, the research provides robust evidence that effective stakeholder relationship practices contribute significantly to the sustainability of street lighting projects. Thus, based on these findings, the research question is affirmatively answered, showing that these practices are indeed crucial for ensuring the long-term success and sustainability of such projects.

### **4.3.3 Stakeholder Empowerment Strategies and the Sustainability of Street Lighting Projects.**

In this section, the researcher presents results for objective three of the study which was to examine the influence of stakeholder empowerment strategies on the sustainability of street lighting projects in Ruiru Sub-County of Kiambu County. The research question was: how does stakeholder empowerment influence the sustainability of street lighting projects?

To help achieve the results for the objective and answer the research question, the researcher measured eight item statements. The item statements included identification of stakeholder groups, empowerment initiatives, inclusion in decision-making, access to information and resources, feedback and evaluation (effectiveness), feedback and evaluation (improvements), empowerment and sustainability, and long-term engagement and empowerment sustainability. The descriptive results for the item statements are as shown below.

**Table 14**

*Descriptive Statistics for Objective Three: How Stakeholder Empowerment*

*Influences Sustainability of Street Lighting Projects*

<b>Item Statement</b>	<b>SD</b> <i>f (%)</i>	<b>D</b> <i>f (%)</i>	<b>N</b> <i>f (%)</i>	<b>A</b> <i>f (%)</i>	<b>SA</b> <i>f (%)</i>	<b>Mean</b>	<b>Std Dev</b>
Identification of Stakeholder Groups	55 (14.0)	63 (16.1)	98 (25.0)	102 (26.0)	74 (18.9)	3.18	1.29
Empowerment Initiatives	30 (7.7)	37 (9.4)	125 (31.9)	79 (20.2)	121 (30.9)	3.57	1.27
Inclusion in Decision-Making	57 (14.5)	47 (12.0)	84 (21.4)	103 (26.3)	100 (25.5)	3.36	1.41
Access to Information and Resources	23 (5.9)	54 (13.8)	88 (22.4)	92 (23.5)	135 (34.4)	3.67	1.27
Feedback and Evaluation (Effectiveness)	40 (10.2)	71 (18.1)	68 (17.3)	94 (24.0)	119 (30.4)	3.47	1.37
Feedback and Evaluation (Improvements)	31 (7.9)	52 (13.3)	81 (20.7)	104 (26.5)	124 (31.6)	3.61	1.32
Empowerment and Sustainability	32 (8.2)	70 (17.9)	76 (19.4)	86 (21.9)	128 (32.7)	3.53	1.34
Long-Term Engagement and Empowerment	22 (5.6)	58 (14.8)	71 (18.1)	100 (25.5)	141 (36.0)	3.72	1.23
<b>Composite Mean and Standard Deviation</b>						<b>3.51</b>	<b>1.30</b>

*Note: N=392; SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, and SA=Strongly Agree.*

*Source: Researcher, 2024*

The first item statement focused on the identification of stakeholder groups. The researcher aimed to measure whether key stakeholders were clearly identified based on their roles, interests, and potential contributions to



sustainability. Clearly identifying key stakeholders ensures that all critical perspectives are considered, enhancing the project's relevance and sustainability. Out of the 392 respondents surveyed, 176 (44.9%) agreed or strongly agreed that key stakeholders were clearly identified. This item had a mean score of 3.18 and a standard deviation of 1.29, indicating that while there is room for improvement, the influence of stakeholder identification on sustainability is relatively weak, as evidenced by its lower mean compared to the composite mean of 3.51.

The second item statement measured empowerment initiatives. The researcher sought to establish whether the street lighting projects conducted capacity-building activities, trainings, or workshops to empower stakeholders. Capacity-building activities equip stakeholders with the necessary skills and knowledge, empowering them to contribute effectively to the project. Among the 392 respondents surveyed, 200 (51.1%) believed that empowerment initiatives were effective, with a mean score of 3.57 and a standard deviation of 1.27. This suggests a positive influence on sustainability, as the mean is slightly higher than the composite mean of 3.51.

The third item statement measured was the inclusion of stakeholders in decision-making processes. The researcher aimed to establish whether stakeholders were actively involved in decision-making processes related to project planning, design, and implementation. Active involvement in decision-making fosters ownership and accountability, leading to more committed and supportive stakeholders. While 203 respondents (51.8%) felt actively involved,

the mean score of 3.36 and a standard deviation of 1.41 were below the composite mean, highlighting the need for improvement in this area to positively impact sustainability. In regard to this item statement, some stakeholders had reservations. Responding to this item statement, the OCS said:

*'We only collaborate with KPLC and the County Government but do not get involved in the issue of planning, design or implementation of the projects. We don't get involved in their decisions. We only come in when there is an issue such as vandalism'.*

However, the Ward Administrator, Mwihoko, had this to say:

*'The local people are actually involved in issues that affect their well-being. The county takes public participation seriously and no development project can take place before we solicit the views from the people. For example, in April, the Department of Housing and Planning in Kiambu County undertook a public participation forum for the ten-year CSP programme running from 2023-2024 Financial Years. The residents from Mwihoko attended and provided very good contributions including upgrading the roads and providing security lighting'.*

The fourth item statement measured access to information and resources. The researcher set out to establish whether stakeholders had been provided with access to relevant information, resources, and technical expertise related to the projects. Providing access to information and resources ensures stakeholders are

well-informed and capable of making meaningful contributions. Among the respondents, 227 (57.9%) agreed they had adequate access to relevant information and resources, with a mean score of 3.67 and a standard deviation of 1.27, indicating a positive influence on sustainability compared to the composite mean.

The fifth item statement measured feedback and evaluation mechanisms. The researcher sought to establish whether stakeholders had opportunities to provide feedback and evaluations regarding the effectiveness of empowerment strategies in achieving sustainability goals. Opportunities for feedback ensure that empowerment strategies are effective and can be adjusted based on stakeholder input, promoting continuous improvement. About 213 respondents (54.4%) indicated they could provide feedback on effectiveness, with a mean score of 3.61 close to the composite mean, suggesting a moderate influence on sustainability.

The sixth item statement measured stakeholder feedback and evaluation in relation to project improvements. Utilizing stakeholder feedback for improvements ensures the project remains relevant and effective, adapting to emerging needs and challenges. Here, 228 respondents (58.1%) agreed that their feedback was used effectively for project improvements. This item had a slightly higher mean score (3.53) than the composite mean, indicating a positive influence. The researcher aimed to measure if stakeholder feedback was utilized to make improvements or adjustments to the projects.

The seventh item statement measured was the impact of empowerment on sustainability. Empowerment strategies enhance stakeholder engagement and

capacity, leading to more sustainable project operations and management. Here, 214 respondents (54.6%) agreed on its positive impact, closely aligning with the composite mean. The researcher sought to establish whether stakeholders' empowerment strategies had influenced the operations, management, and sustainability of the projects.

The eighth and final item statement measured was long-term engagement and empowerment sustainability. The researcher aimed to establish whether there were efforts to sustain stakeholders' empowerment in the projects. Sustained empowerment efforts ensure ongoing stakeholder engagement and capacity building, supporting the long-term success and sustainability of the projects. Among the 392 respondents, 241 (61.5%) agreed on sustained stakeholder empowerment, with a mean score and standard deviation higher than the composite mean, indicating a robust positive influence on sustainability.

In conclusion, while areas like empowerment initiatives and long-term engagement showed strong positive influences on sustainability, other areas such as inclusion in decision-making require improvement to enhance overall project sustainability.

#### **4.3.3.1 Answering Research Question Three: How does Stakeholder Empowerment Influence the Sustainability of Street Lighting Projects?**

The study aimed to examine the influence of stakeholder empowerment strategies on the sustainability performance of street lighting projects in Ruiru

Sub-County of Kiambu County. The central research question was: how does stakeholder empowerment influence the sustainability of street lighting projects? To address this question, the researcher measured eight critical areas: identification of stakeholder groups, empowerment initiatives, inclusion in decision-making, access to information and resources, feedback and evaluation (effectiveness), feedback and evaluation (improvements), empowerment and sustainability, and long-term engagement and empowerment sustainability.

Firstly, the identification of stakeholder groups was assessed to determine whether key stakeholders were clearly identified based on their roles, interests, and potential contributions to project sustainability. This item had a mean score of 3.18 and a standard deviation of 1.29, suggesting that while some stakeholders were clearly identified, there is room for improvement in this area. The relatively lower mean score indicates that stakeholder identification had a weaker influence on sustainability compared to other aspects.

Empowerment initiatives, measured to establish the extent of capacity-building activities, training sessions, or workshops conducted by project management, showed a mean score of 3.57 and a standard deviation of 1.27. This reflects a positive influence on sustainability, as 51.1% of respondents perceived these initiatives as effective. Similarly, access to information and resources received a high mean score of 3.67 and a standard deviation of 1.27, indicating that 57.9% of respondents felt they had adequate access to relevant information, resources, and technical expertise, thus strongly supporting project sustainability.

Inclusion in decision-making processes, which evaluated stakeholders' active involvement in project planning, design, and implementation, had a mean score of 3.36 and a standard deviation of 1.41. Although 51.8% of respondents felt actively involved, the lower mean score suggests a need for greater inclusion to enhance sustainability. Additionally, feedback and evaluation mechanisms, both for effectiveness and improvements, were positively received, with mean scores of 3.47 and 3.61, respectively. These findings indicate that stakeholders felt their feedback was incorporated into decision-making and project adjustments, contributing moderately to project sustainability.

Finally, the measures for empowerment and sustainability, as well as long-term engagement, had mean scores of 3.53 and 3.72, respectively, indicating positive influences on sustainability. The latter, with 61.5% of respondents agreeing on sustained stakeholder empowerment, highlighted the strong impact of long-term engagement on project sustainability. These results affirm that stakeholder empowerment strategies, particularly those focusing on long-term engagement and effective feedback integration, are crucial for enhancing the sustainability of street lighting projects.

In conclusion, the study demonstrates that stakeholder empowerment strategies positively influence the sustainability of street lighting projects. Positive influences were particularly noted in empowerment initiatives and long-term engagement, though areas like inclusion in decision-making require improvement. The overall composite mean score of 3.51 and standard deviation of 1.30 reflect a

generally positive perception of these strategies, affirming that they play a crucial role in achieving sustainable street lighting projects. Thus, based on the findings, the research question is affirmatively answered, showing that effective stakeholder empowerment is key to the sustainability of street lighting projects.

#### **4.4 Summary of the Research Questions**

The study effectively addressed its research questions concerning the influence of stakeholder communication, relationship practices, and empowerment strategies on the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County.

Firstly, the study successfully evaluated how stakeholder communication influences project sustainability. It found that while stakeholder awareness and understanding of project goals were moderate, engagement and participation had a positive influence on project sustainability. Effective communication channels and responsiveness to feedback were crucial in enhancing project outcomes. The study concluded that effective stakeholder communication fosters better involvement, responsiveness, and collaboration, affirmatively answering the research question.

Secondly, the study determined the influence of stakeholder relationship practices on project sustainability. The results indicated that practices, including communication, collaboration, needs assessment, feedback integration, and conflict resolution, positively influenced sustainability. High levels of stakeholder

satisfaction and capacity-building efforts further supported the positive influence. Despite some variability in experiences, the research provided robust evidence that effective stakeholder relationship practices are essential for the long-term success of street lighting projects.

Lastly, the study examined the influence of stakeholder empowerment strategies. It found out that initiatives such as capacity-building activities, access to information, and long-term engagement significantly contributed to project sustainability. While the identification of stakeholder groups and inclusion in decision-making processes showed room for improvement, the overall positive feedback underscored the importance of empowerment strategies. The study concluded that effective stakeholder empowerment is key to achieving sustainable street lighting projects.

In summary, the research questions were effectively addressed, demonstrating the positive inference of communication strategies, relationship practices, and empowerment strategies on sustainability of the street lighting projects. However, areas like stakeholder awareness and inclusion in decision-making could be further improved to enhance project outcomes.



## CHAPTER FIVE

### DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

#### **5.1 Introduction.**

This chapter discusses the findings of the study thus providing an interpretation in light of the empirical literature in chapter two and the research findings in chapter four. The chapter also presents the summary, conclusions and recommendations of the study. The discussion is based on the objectives of the study which included: evaluating the influence of stakeholder communication strategies on the sustainability street lighting projects in Ruiru Sub-County of Kiambu County, determining the influence of stakeholder relationship practices on the sustainability of lighting projects in Ruiru Sub-County of Kiambu County, and examining how stakeholder empowerment strategies influence the sustainability performance of street lighting projects in Ruiru Sub-County of Kiambu County.

#### **5.2 Discussion.**

The demographic and socio-economic findings of this study provide an essential context for understanding the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County. The gender distribution, which shows a slight majority of female respondents, ensures an equitable representation and highlights the importance of considering gender perspectives in the planning and implementation of street lighting projects. This balance is critical for achieving

gender equity, which has been shown to contribute positively to project outcomes by incorporating diverse viewpoints and needs.

The age distribution, with a significant proportion of respondents being young adults between 20 and 39 years, underscores the importance of engaging this demographic in sustainability efforts. Younger individuals are often more open to new technologies and innovations, which can be advantageous for the adoption and maintenance of sustainable street lighting solutions. Their active participation and support are crucial for the long-term success of these projects, as they are likely to be the primary beneficiaries and caretakers of these initiatives in the future.

The high level of educational attainment among respondents, with a majority having university-level education, indicates a well-informed and potentially more engaged community. This educational background suggests that stakeholders are likely to understand the technical and managerial aspects of street lighting projects, facilitating better communication and collaboration. Educated stakeholders can more effectively participate in decision-making processes, provide valuable feedback, and advocate for necessary improvements, thereby enhancing the overall sustainability of the projects.

Socio-economic characteristics, such as employment type and income levels, further enrich the study by providing insights into the economic conditions of the community. A significant proportion of self-employed and formally employed respondents indicates a stable economic environment, which can

support the financial aspects of maintaining and expanding street lighting projects. Understanding these socio-economic factors helps in designing projects that are economically feasible and can garner community support, ensuring long-term sustainability.

In conclusion, the demographic and socio-economic data contribute significantly to the study by highlighting the diversity and specific needs of the community. This information aids in tailoring communication strategies, ensuring effective stakeholder participation, and empowering the community to take an active role in the sustainability of street lighting projects. The findings underscore the importance of considering demographic and socio-economic factors in the planning and implementation of sustainable development initiatives, in general, and street lighting projects, in particular.

### **5.2.1 Stakeholder Communication Strategies and the Sustainability of Street Lighting Projects.**

The significance of effective stakeholder communication in project sustainability has been consistently emphasized in numerous studies. Globally, Omar *et al.* (2023) and Malik *et al.* (2023) found that robust communication channels enhance project sustainability by fostering meaningful interactions and stakeholder engagement. This aligns with the findings from the current study which highlight that communication channels and their effectiveness play a pivotal role in the sustainability of street lighting projects in Ruiru Sub-County.

However, there are divergent views regarding the specific aspects of communication that most significantly influence project sustainability. For instance, while Wheeler *et al.* (2022) emphasize the role of strategic communication in identifying project problems, the current study reveals that awareness and understanding of project goals are areas needing improvement.

Regionally, studies like those by Umumararungu and Mulyungi (2018) highlight the positive correlation between clear communication and project success, a sentiment echoed in local studies such as Luhombo *et al.* (2019) and Olwande (2021). These studies indicate that formal communication mechanisms, such as regular meetings and progress reports, are crucial for maintaining stakeholder engagement and ensuring project sustainability. The current study corroborates these findings, showing that feedback mechanisms and responsiveness are highly valued by stakeholders.

In terms of gaps, previous research has often overlooked the energy sector, particularly street lighting projects. Malik *et al.* (2023) is one of the few studies touching on renewable energy projects, emphasizing the need for more sector-specific research. The current study addresses this gap by focusing on street lighting projects in Ruiru Sub-County, providing valuable insights into how stakeholder communication can be optimized to enhance sustainability in this context.

### **5.2.2 Stakeholder Relationship Practices and the Sustainability Outcomes of Street Lighting Projects.**

Stakeholder relationships are fundamental to the sustainability and success of projects, as evidenced by studies globally, regionally, and locally. Omar *et al.* (2023) found that poor stakeholder relationships lead to negative attitudes and poor project sustainability in construction projects. This is mirrored in the current study's findings, which underscore the importance of maintaining positive relationships with stakeholders to achieve sustainable outcomes in street lighting projects.

Regionally, Chikato and Gemedi (2021) highlighted the importance of mutual benefit in stakeholder relationships, which enhances loyalty and project success. This perspective is supported by the current study's findings, which indicate that engagement and participation are crucial for project sustainability. Stakeholders who feel their input is valued and integrated into project development are more likely to support and sustain the project.

Locally, studies like those by Kalu (2021) and Mumbi and Kimutai (2018) emphasize the importance of clear communication channels and strategies in improving stakeholder relationships. The current study extends this understanding by showing that effective feedback mechanisms and responsiveness to stakeholder concerns are key to fostering positive relationships.

Despite the extensive research on stakeholder relationships in various sectors, there is a notable gap in the energy sector, particularly street lighting projects in Kenya. The current study fills this gap by providing empirical evidence on how stakeholder relationships influence the sustainability of street lighting projects in Ruiru Sub-County. This contribution is significant as it offers practical insights for project implementers and policymakers to enhance stakeholder engagement and project sustainability.

### **5.2.3 Stakeholder Empowerment Strategies and the Sustainability**

#### **Performance of Street Lighting Projects.**

The empowerment of stakeholders is a critical factor influencing project sustainability, as highlighted by several studies. Globally, Spath and Anna (2016) noted that involving stakeholders in planning activities from the project's inception enhances their sense of responsibility and ownership, leading to better project outcomes. This finding is consistent with the current study, which shows that stakeholder empowerment significantly influences the sustainability of street lighting projects in Ruiru Sub-County.

Regionally, Edomah *et al.* (2021) found that the lack of stakeholder empowerment poses significant challenges to infrastructure projects in Nigeria. The current study supports this view, revealing that stakeholders in street lighting projects appreciate being empowered to contribute to decision-making processes. The positive association between stakeholder empowerment and project

sustainability found in studies like those by Ouko *et al.* (2020) and Luhombo *et al.* (2019) is also evident in the current study's findings.

Locally, Kalu (2021) highlighted that empowering stakeholders at the Kenya Ports Authority led to increased confidence and informed decision-making. Similarly, the current study shows that stakeholders who feel empowered are more likely to support and sustain the street lighting projects.

The current study addresses a significant gap in the literature by focusing on stakeholder empowerment within the context of street lighting projects in Kenya. Most previous studies have concentrated on education and infrastructure projects, leaving a gap in the energy sector. By providing empirical evidence on the influence of stakeholder empowerment on the sustainability of street lighting projects, this study offers valuable insights for enhancing stakeholder participation and project sustainability in this sector.

In conclusion, the current study provides a comprehensive analysis of how stakeholder communication, relationship, and empowerment influence the sustainability of street lighting projects in Ruiru Sub-County. By filling gaps identified in previous research, this study offers valuable insights for project implementers and policymakers to enhance the sustainability of development projects through effective stakeholder participation. The findings underscore the importance of clear communication, positive relationships, and stakeholder empowerment in achieving sustainable street lighting projects.

### **5.3 Summary of Main Findings.**

The purpose of the study was to investigate the influence of stakeholders' participation on the sustainability of street lighting projects in Ruiru Sub-County, Kiambu County. The study had three specific objectives.

The first objective was to evaluate the influence of stakeholder communication strategies on the sustainability of street lighting projects. The findings indicated that effective communication, including engagement, participation, clear communication channels, and responsiveness to feedback, significantly enhances project sustainability. While there were challenges in awareness and understanding of project goals, these did not greatly diminish the overall positive impact. The study concluded that continuous improvement in communication strategies is essential for fostering better stakeholder involvement, responsiveness, and collaboration, ultimately enhancing the sustainability of the street lighting projects.

The second objective was to determine the influence of stakeholder relationship practices on the sustainability of street lighting projects. The study revealed that these practices, including communication and collaboration, feedback information and integration, conflict resolution, and capacity-building, positively influence the sustainability of street lighting projects. Despite some areas needing improvement, the evidence strongly supports the notion that effective stakeholder relationship practices are crucial for ensuring the long-term success and sustainability of the street lighting projects.



The third objective was to examine the influence of stakeholder empowerment strategies on the sustainability of street lighting projects. The study demonstrated that empowerment strategies, such as empowerment initiatives and long-term engagement, significantly enhance sustainability. However, it noted that inclusion in decision-making processes requires improvement. The research concluded that effective stakeholder empowerment is key to the sustainability of street lighting projects.

#### **5.4 Conclusion.**

Based on the findings, both from households and key informants, three conclusions can be drawn. Effective communication strategies are important for the success and sustainability of street lighting projects. Ensuring that stakeholders are well-informed and actively engaged can significantly enhance the sustainability of these projects.

Strong stakeholder relationship practices are essential for project sustainability. Proper assessment of stakeholder needs, integration of feedback, and conflict resolution are critical for the sustainability of street lighting projects. Capacity-building stands out as particularly impactful, underscoring the need for ongoing training and resource provision.

Empowering stakeholders through inclusion in decision-making processes, providing access to necessary information and resources, and fostering long-term engagement are important for the sustainability of street lighting projects. These

strategies ensure that stakeholders remain committed and proactive in maintaining the projects, ultimately enhancing their sustainability.

## **5.5 Recommendations.**

### **5.5.1 Policy Recommendation.**

To enhance the sustainability of street lighting projects, it is recommended that policymakers implement a comprehensive stakeholder communication policy that mandates regular, transparent communication and feedback channels. This policy should require project managers to establish clear, accessible communication platforms that facilitate active stakeholder engagement and ensure continuous updates on project goals, progress, and challenges. Furthermore, integrating feedback from all stakeholders into decision-making processes should be institutionalized to promote a sense of ownership and accountability. By fostering an environment of open dialogue and responsiveness, this policy can significantly improve stakeholder involvement and collaboration, thereby enhancing the overall sustainability of street lighting projects.

### **5.5.2 Practice Recommendation.**

In practice, it would be essential to develop and implement a robust stakeholder empowerment strategy aimed at increasing active participation in decision-making processes. This strategy should focus on providing stakeholders with the necessary information, skills, and resources to participate meaningfully in project activities. Regular workshops and training sessions could be conducted

to build stakeholder capacity and awareness regarding the importance of their role in the project implementation. Additionally, creating mechanisms for continuous long-term engagement, such as stakeholder committees or advisory boards, can ensure sustained participation and commitment. By empowering stakeholders through these practical measures, the sustainability of street lighting projects can be significantly enhanced, as stakeholders become more proactive and committed to success and sustainability of the street lighting projects.

### **5.3 Areas of Further Research.**

Based on the findings, a critical area for future research is the investigation of specific strategies to improve stakeholder inclusion in decision-making processes. Although the study highlighted the importance of empowerment strategies, it also pointed out the need for better inclusion. Future research could explore the barriers to effective stakeholder inclusion, identify best practices from similar projects, and develop tailored approaches that can be applied to enhance decision-making. Understanding and addressing these barriers would provide deeper insights into optimizing stakeholder participation and ultimately improve the sustainability of street lighting projects.

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APPENDICES

APPENDIX 1: HOUSEHOLD QUESTIONNAIRE

AFRICA NAZARENE UNIVERSITY

DEPARTMENT OF MONITORING AND EVALUATION, SCHOOL OF BUSINESS

Study Questionnaire

I am, James Nyanchoka Maraga, a student at Africa Nazarene University, pursuing a Master’s Degree of Arts in Monitoring and Evaluation. I am carrying out a study on “Stakeholders’ Participation and the Sustainability of Street Lighting Projects: A Case Study of Ruiru Sub-County (Kahawa Wendani and Mwihoko Wards).” I guarantee to you that the information you provide will be treated with confidence and the study has an academic purpose only.

Date: \_\_\_\_\_ Ward \_\_\_\_\_

**Section A: Respondent’s Profile.**

Kindly **TICK** the correct answer and enter the selected **CODE** on the far right square

**Example**

x Town of respondent.....

- 1. Nairobi
- 2. Kisumu ✓
- 3. Mombasa

a) Gender.....

1. Male

2. Female

b) Age.....

1. Below 20 years

2. 20-29 years

3. 30-39 years

4. 40-49 years

5. 50 59 years

6. 60 years and above

c) Residence.....

1. Less than 1 year

2. 1-5 years

3. 6-10 years

4. More than 10 years

d) Level of education.....

1. Primary

2. Secondary

3. University

4. Other

e) Type of employment.....

1. Self-employed

2. Formal employment

3. Retired

4. None

f) Income level (in KES).....

- 1. Less than 50,000
- 2. 60,000 – 100,000
- 3. 101,000 – 150,000
- 4. 151,000 – 2000,000
- 5. More than 201,000

g) Mode of transport .....

- 1. Public (Matatu)
- 2. Public (Boda Boda)
- 3. Private vehicle/motor cycle/bicycle
- 4. Walking

**Section B: Ownership and Functionality of Street Lighting Project.**

a. **Ownership** of the street lighting project .....

- 1. County Government
- 2. Community/Estate/Resident Association
- 3. National Government
- 4. Non-Governmental Organization

b. **Functionality** of the street lighting project .....

- 1. Functional
- 2. Non-functional

**Section C: Influence of Stakeholder Communication Strategies on Sustainability of Street Lighting Projects.**

In the following sub-section, using a scale of 1-5, indicate how much you agree/disagree with the following statements, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. Please indicate, by ticking (✓) appropriately, the extent to which you agree with the following statements on the stakeholders' participation and sustainability of street lighting projects.

No	Item Statements	Rating				
		1	2	3	4	5
SC1	<b>Awareness and understanding of project goals:</b> The goals and objectives of the street lighting projects are clear among stakeholders.					
SC2	<b>Engagement and participation:</b> The stakeholders feel that their input was/is valued and integrated into the projects' development and implementation phases.					
SC3	<b>Communication channels and effectiveness:</b> There are effective communication channels in fostering dialogue, collaboration and problem-solving among stakeholders.					
SC4	<b>Feedback mechanisms and responsiveness:</b> There are formal mechanisms in place for stakeholders to provide feedback and suggestions regarding the street lighting projects.					
SC5	<b>Perceived impact and sustainability:</b> Stakeholder communication have influenced the long-term sustainability of the street lighting projects.					
SC6	<b>Perceived impact and sustainability:</b> The street lighting projects act on feedback from stakeholders.					
SC7	<b>Obstacles to communication:</b> There were no language and technical barriers that hinder effective communication among stakeholders.					

**Section D: Influence of Stakeholder Relationship Practices on sustainability  
of street lighting projects.**

No	Item Statements	Rating				
		1	2	3	4	5
SR1	<b>Initial stakeholder engagement:</b> The criteria to identify the stakeholders in the street lighting projects was/is clear.					
SR2	<b>Communication and collaboration practices:</b> There were/are formal structures or platforms for ongoing dialogue and information sharing between the county government and stakeholders.					
SR3	<b>Stakeholder needs assessment:</b> Stakeholder needs and expectations regarding the projects infrastructure and sustainability factors were/are clearly identified and addressed.					
SR4	<b>Feedback information and integration:</b> Stakeholder feedback was/is incorporated into decision-making and adjustments to improve project sustainability performance.					
SR5	<b>Conflict resolution:</b> The projects effectively and adequately address any implementation issues such as stakeholder conflicts/grievances etc.					
SR6	<b>Stakeholder satisfaction:</b> Stakeholders are satisfied with the operation and management of the projects.					
SR7	<b>Capacity building and empowerment:</b> The county government has built the capacity of stakeholders and empowered them to fully participate in operations and management of the projects.					

**Section E: Influence of Stakeholder Empowerment Strategies on sustainability of street lighting projects.**

No	Item Statements	Rating				
		1	2	3	4	5
SE1	<b>Identification of stakeholder groups:</b> Key stakeholders were clearly identified based on their roles, interests and potential contributions to sustainability.					
SE2	<b>Empowerment initiatives:</b> The County government conducted capacity-building activities/training sessions and/or workshops to stakeholders as a way of empowering them.					
SE3	<b>Inclusion in decision-making:</b> Stakeholders were/are actively involved in decision-making processes related to project planning, design and implementation.					
SE4	<b>Access to information and resources:</b> Stakeholders have been provided access to relevant information, resources and technical expertise related to the projects.					
SE5	<b>Feedback and evaluation:</b> Stakeholders have opportunities to provide feedback and evaluations regarding the effectiveness of empowerment strategies in achieving sustainability goals.					
SE6	<b>Feedback and evaluation:</b> The feedback from stakeholders is utilized to make improvements or adjustments to the projects.					
SE7	<b>Empowerment and sustainability:</b> Stakeholders empowerment strategies have influenced the operations, management and sustainability of the projects.					
SE8	<b>Long-term engagement and empowerment sustainability:</b> There are efforts to sustain stakeholder empowerment in the projects.					

**Thank you for your participation**



## APPENDIX II: KEY INFORMANT QUESTIONNAIRE

I am James Nyanchoka Maraga, a student at Africa Nazarene University, pursuing a master's degree of Arts in Monitoring and Evaluation. I am carrying out a research on *“Stakeholder's Participation and the Sustainability of Street Lighting Projects: A Case Study of Ruiru Sub-County (Wendani and Mwihoko Wards).”* I guarantee to you that the information received will be treated with confidence and the study has an academic purpose only.

Date \_\_\_\_\_

Organization \_\_\_\_\_

Responsibility \_\_\_\_\_

### Section A: Respondent's Profile

Kindly tick the correct answer

1. Age bracket

Below 20

20-29

30-39

40-49

60 years and above

2. Period you have worked with your organization

Less than 1 year

1-5 years

6-10 years

More than 10years

3. Level of Education

Primary

Secondary

Undergraduate

Post graduate

**Section B: Stakeholder Communication Strategies**

1. Does there exist a plan, policies or guidelines in stakeholder communication?
2. Do the street lighting projects have well established channels of communication to reach stakeholders and which stakeholders can use to reach the management?
3. Does street lighting management act on the feedback of stakeholders?
4. What barriers or challenges were encountered in implementing effective stakeholder communication within the projects?

**Section C: Stakeholder Relationship Practices**

1. How were stakeholders needs and expectations regarding the projects identified and addressed?
2. Were/are there any instances of conflicts or disagreements among stakeholders during implementation of the projects and how are these resolved?
3. How would you assess stakeholders' overall satisfaction with the level of engagement and responsiveness of stakeholders to their needs and concerns?

4. Did/does the County government include capacity-building initiatives to empower stakeholders in the operations and management of the projects?

**Section D: Stakeholder Empowerment Strategies**

1. Which stakeholders' groups were identified as key participants in the projects?
2. How were these stakeholders categorized based on their roles, interests and potential contributions to sustainability of the projects?
3. To what extent were stakeholders involved in decision-making processes related to project planning, design and implementation?
4. Do stakeholders have opportunities to provide feedback and evaluations regarding the effectiveness of empowerment strategies?

Thank you for your participation

**APPENDIX III: INTRODUCTION LETTER**

James Nyanchoka Maraga

Africa Nazarene University,

P.O Box 53067-00200

NAIROBI

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

**REF: REQUEST FOR ASSISTANCE IN RESEARCH PROJECT**

I am a Master of Arts in Monitoring and Evaluation graduate student at Africa Nazarene University (**Reg. No: 14S03EMME001**). I am doing a research study on Stakeholders' Participation and the Sustainability of Street Lighting Projects: A Case of Ruiru Sub-County (Wendani and Mwhoko Wards). The research is part of the fulfilment for my post graduate course.

I would appreciate if you would kindly respond to the questions by filling out the questionnaire. Your answers will be treated confidentially.

Thank you in advance,

Yours faithfully,

James Nyanchoka Maraga

### APPENDIX IV: NACOSTI RESEARCH PERMIT

Republic of Kenya  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 698985 Date of Issue: 05/June/2024

#### RESEARCH LICENSE




This is to Certify that Mr. James Nyanchoka Maraga of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev:2014) in Kiambu on the topic: Stakeholders' Participation and the Sustainability of Street Lighting Projects in Kiambu County: A Case Study of Ruiru Sub-County, for the period ending : 05/June/2025.

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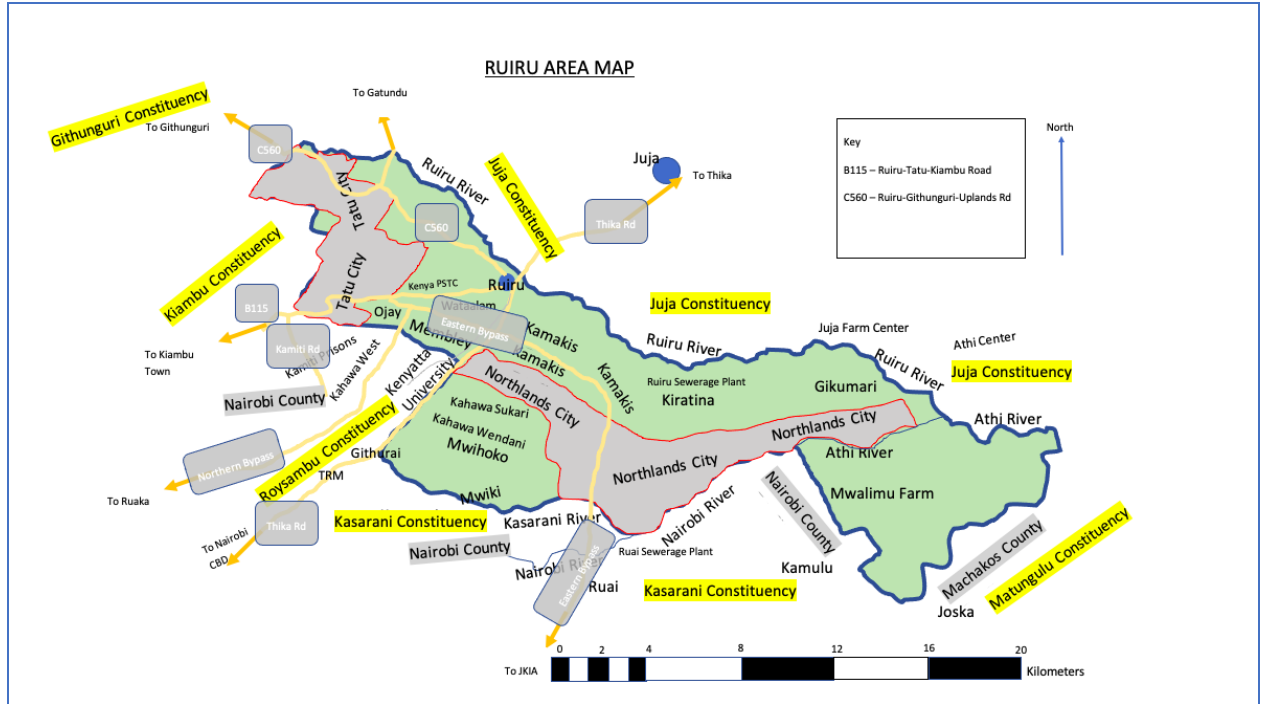


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### APPENDIX V: MAP OF STUDY AREA

Map of Ruiru Sub-County



## APPENDIX VI: SUMMARY OF LITERATURE AND RESEARCH GAP

Author	Study Area	Research Gap(s)	Focus of Current Study
Malik, <i>et.al.</i> (2023)	Renewable Energy	The study focused only on variable of stakeholder participation i.e. stakeholder communication	The current study focuses on three variables of stakeholder participation i.e. stakeholder communication, stakeholder relationships management and stakeholder empowerment.
Jun & Kim (2021)	Business – Electronics	The study focused on stakeholder communication, stakeholder involvement and, stakeholder engagement an assessed stakeholder participation from the business angle. The study was silent on stakeholder empowerment yet empowerment is one of the key factors in project performance and sustainability.	The current study will assess stakeholder empowerment in addition to the other variables i.e. stakeholder communication and relationships management.
Luhombo, <i>et.al.</i> (2019)	Vocational Training (TVET)	The study focused on Technical and Vocational Training (TVET) institutions	The current study will focus on street lighting and add knowledge to complement Luhombo's and other studies.
Kotut & Sakataka (2015)	Governance	The focus of the study was on a range of county funded projects with varied background set ups that may not allow for generalization of study findings.	The current study focuses on one project i.e. street lighting projects enabling an exhaustive investigation on the various variables of stakeholder participation.
Gichimu & Mutuku (2022)	Governance	The focus of the study was on a range of county funded projects with varied background set ups that may not allow for generalization of study findings. In addition, sample selection is not clear.	The current study focuses on one project i.e. street lighting projects enabling an exhaustive investigation on the various variables of stakeholder participation.
Olwande (2021)	Public Health	The focus of the study was on health	The current study is on street lighting projects.
Bosire (2019)	Agriculture	The focus of the study was on agriculture	The current study is on street lighting projects.
Muendo & Nyang'au (2023)	Governance/WASH	The focus of the study was on water	The current study is on street lighting projects.
Munyi &	Tertiary Education	The focus of the study was	The current study is on

Atieno (2021),		on education sector	street lighting projects – energy sector.
Kalu (2021),	Infrastructure	The focus of the study was on infrastructure sector	The current study is on street lighting projects – energy sector.
Omar, <i>et.al.</i> (2023)	Infrastructure	The focus of the study was on infrastructure sector	The current study is on street lighting projects – energy sector.
Chikato & Gemedi (2021)	Business/Entrepreneurship	The focus of the study was on business and entrepreneurship	The current study is on street lighting projects – energy sector.
Sulaiman & Musnadi (2020)	Business/Entrepreneurship	The focus of the study was on business and entrepreneurship	The current study is on street lighting projects – energy sector.
Ouko, <i>et.al.</i> (2020)	Education	The focus of the study was on the education sector	The current study is on street lighting projects – energy sector.
Edomah, <i>et.al.</i> (2021)	Energy	The focus of the study energy market stakeholder participation analysis.	The current study is on street lighting projects – energy sector.
Mumbi & Kimutai (2018)	Governance	Communication was only addressed as a sub-component of the first objective which was to determine the influence of stakeholder need and expectation identification; communication	This study aims to focus on stakeholder communication as a full objective and add more knowledge on the subject.
Umumararungu & Mulyungi (2018)	Infrastructure/ Business/Entrepreneurship	The study focused on stakeholder participation in the project cycle stages	This study takes a holistic picture of stakeholder participation beyond the project cycle.

*Source: Researcher (2024)*