PROJECT MANAGEMENT CAPABILITIES AND SUSTAINABILITY OF WATER PROJECTS FUNDED BY EMBU COUNTY GOVERNMENT, KENYA

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A PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS, ECONOMICS, AND TOURISM IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER IN BUSINESS ADMINISTRATION DEGREE (PROJECT MANAGEMENT) OF KENYATTA UNIVERSITY

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DECLARATION

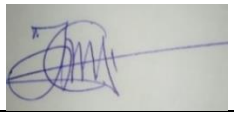
This Project is my original work and has never been presented for examination of degree in another university.

Sign:  Date:_____

Martin Mbogo

D53/EMB/PT/27429/2018

I confirm as the supervisor that the work in this project was done by the candidate with my supervision.

Sign:  Date:_____

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DEDICATION

I dedicate this work to my beloved mother and late father for their unwavering support, love, and encouragement throughout my journey. To my sister and brother, I hope this accomplishment inspires you to pursue higher education beyond the master's level and to continue striving for excellence in all your endeavours.

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OPERATIONAL DEFINITION OF TERMS

Digital inclusion in this research refers to the way integration of information sharing, data analytics, communication, and virtual teams within projects funded by the Embu County Government of Kenya

Management commitment in this research is in terms of staff training, competitive rewards, prioritization of competence and experience, and providing opportunities for career progression, within projects funded by the Embu County Government of Kenya

Project management capabilities in this research include resource allocation, stakeholder participation, management commitment, and digital inclusion among water projects funded by Embu County government, Kenya

Resource allocation in this research refers to distribution and utilization of project funding, project auditing, time resources, and resource scheduling within the projects funded by the Embu County Government of Kenya.

Stakeholder participation in this research entails the active involvement and engagement of relevant parties through the establishment of project committees, adherence to regulations, fostering accountability, and encouraging interactive participation, in the projects funded by the Embu County Government of Kenya,

Sustainability of water projects in this research refers to the long-term viability and effectiveness of a project implemented by the Embu County Government of Kenya, demonstrated through reliable service delivery, high levels of customer satisfaction, ensuring the availability and accessibility of water resources, and maintaining a consistent and reliable water supply to meet the needs of the community.

ABBREVIATIONS AND ACRONYMS

M&E	Monitoring and Evaluation
NACOSTIC	National Commission for Science, Technology, and Innovation
PMCs	Project management capabilities
RBV	Resource-Based View
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model

ABSTRACT

The ever-increasing population growth in Embu, coupled with the county government's limited commitment to sustainable water projects, has resulted in a water sustainability problem. Although the County Government of Embu has stated its commitment to enhancing the sustainability of water projects it has implemented in Mbeere South and North sub-counties, there has been a lack of progress in implementing sustainability measures. This has led to significant challenges in sustaining water projects. Despite the County Government's efforts to improve sustainability, there has been a lack of progress in implementing sustainability measures, raising concerns about the long-term viability of water projects already in place. Against this background, the present study sought to investigate the influence of project management capabilities and sustainability of water projects funded by the Embu County Government, Kenya. The study sought to determine the influence of resource allocation, stakeholder participation, management commitment, and digital inclusion on the sustainability of water projects funded by the Embu County Government, Kenya. The resource-based view, stakeholder theory, agency theory, and the technology acceptance model were used to underpin the study. A descriptive survey research design was adopted targeting 6 water projects with a target population of 167 project administrators, members of committees from these projects, local leaders, and operating staff from water projects being implemented by Embu County. The sample size of 100 respondents determined scientifically will be selected through stratified random sampling. Primary data was gathered using a structured questionnaire that will have undergone pilot testing. The findings established that that resource allocation ($\beta=0.171$: $p<0.05$) and management commitment ($\beta=0.466$; $p<0.05$) significantly influenced sustainability of water projects. Furthermore, the results recognized that digital inclusion ($\beta=0.323$; $p<0.05$) have a significant impact on sustainability of water projects. Finally, stakeholder participation ($\beta=0.064$; $p>0.05$) does not influence significantly on sustainability of water projects. The study concludes that appropriate resources deployment during project management is critical in ensuring that project is completed with the quality that was intended. Similarly, project management team must involve all the stakeholders for successful implementation of the project. Furthermore, management commitment and sustainability of water projects are intertwined together and hence staff training, competitive reward and career progression is critical in successful project performance. Finally, digital inclusion is important during project management because it enables personnel in information sharing, data analytics as well as communication. The study recommends that project management need to deploy the right equipment and resources for effective project execution. Moreover, project managers need to engage all stakeholders in project development. Furthermore, management commitment in water projects is demonstrated through staff training for improved service delivery. Finally, for digital inclusion to be successful county governments ought to invest more on infrastructural development related to information technology.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The sustainability of water projects has been heralded as a key pillar of the larger Sustainable Development Goals (SDGs) and it has attracted significant attention among scholars (Caparrós-Martínez, Rueda-Lópe, Milán-García & de-Pablo-Valenciano, 2020). Sustainable water projects are those initiated and managed to fully contribute towards the objectives of society now as well as in the future (Yu, Wang, Liu, Olsson, and Wang (2018). Accessibility to clean and safe water as a dimension of sustainability of water projects has remained a challenge in developed and developing countries around the world. According to World Bank reports, an estimated 2 billion people around the world do not have access to clean water (World Bank, 2020).

Literature indicates that the sustainability of water projects is strongly hinged on project management capabilities (Plattfaut, 2022). According to Alghail, Yao, Abbas, and Baashar (2022), the main reason for unsustainable projects is a lack of a clear understanding of project management capabilities and how they can result in the sustainability of the initiated projects. This situation is worsened by limited and inconclusive empirical evidence linking project management capabilities and sustainability, particularly in the content of water projects (Alghail et al., 2022). Evidence from Pakistan indicates that for projects to remain sustainable, the role of project management capabilities like top management commitment, allocation of adequate resources, and stakeholder participation are so instrumental (Irfan, Hassan & Hassan, 2019).

According to Hermano, Martin-Cruz, and Pajares (2022), project management capabilities do not influence project sustainability directly but do so indirectly by driving the performance of organizations implementing the projects. An observation made by Nørbjerg, Nielsen, and Stouby-Persson (2017) was that managerial capability like a high level of commitment by those in management contributes to project sustainability. In China, Zhang, Yang, Liao, and Chen (2020) argued that project management capability is a competence that is needed to drive the sustainability of projects an organization has implemented.

In Kenya, Omanwa, and Muchai (2020), 25-30% of fully completed water facilities and points are rendered dysfunctional after 3 years of their completion. This implies that the sustainability of water projects in Kenya is a great concern. The sustainability of water projects is hinged on project management capabilities. However, literature linking project management capability and sustainability in Kenya is so scanty and segregated. Few of the literature like that of Chepkemoi (2020) used project management skills to be equivalent to project management capability.

1.1.1 Sustainability of Projects

The concept of sustainability is strongly linked to the United Nations' efforts to realize SDGs. Sustainability has long been defined and recognized as the ability to attain own goals without the need to compromise the degree to which generations in the future may be able to attain their own needs (Salas- Zapata & Ortiz- Muñoz, 2019). It is the ability to maintain the prevailing conditions for ever-lasting benefits in the future. There are three key pillars of sustainability: environment, social and economic aspects (Purvis, Mao & Robinson, 2019). The environmental pillars concern the need to protect the surrounding against pollution and degradation. The social pillar concerns the society at large while the economic pillar concerns the generation of profits without compromising how future generations will survive (Holmberg & Sandbrook, 2019).

Sustainable water projects are those with the ability to achieve performance requirements in the long run (Kativhu, Madzivanyika, Nunu, Macherera & Chinyama, 2022). Such projects are characterized by some attributes as being committed to attaining service expectations and a continued flow of benefits for a very long time (Kamau & Mungai, 2019). There are quite several indicators of project sustainability that include the reliability of the output, cost-effectiveness, and replicability of the project. According to Rutto (2017), sustainable water projects are those that cause no or little harm to the surrounding so that the future generation may also enjoy the same. Within the sustainability discourse, environment destruction arises when a given water facility is not properly fenced and protected so that water does not experience contamination (Masombe & Omwenga, 2020).

Thus, a sustainable water project ensures there is adequate and reliable water supply with the benefits of clean and safe water being realized on a continued basis by the

end users. Kamau and Mungai (2019) provided several proxies for measuring the sustainability of water projects. These include quality of water, realization of the objectives and goals of the project, and provision of capacity building to end users. Masombe and Omwenga (2020) adopted reliability, cost sharing for management and operation, community ownership, replicability, number of beneficiaries, and water sources.

1.1.2 Project Management Capabilities

Project management capabilities (PMCs) refer to behaviors, methods, tools as well as processes that are needed for the effective delivery of projects in an organization. According to Plattfaut (2022), the main PMCs required for exceptional delivery of the project include resource allocation, stakeholder participation, management commitment, and digital inclusion and this will be adopted in the proposed study. Resource allocation is the process of assigning the assets in an organization to various units for the successful delivery of the projects (Waititu, 2022). Resources can cover people, finances, technologies, and relevant materials as well as time. Resource allocation enables an organization to efficiently schedule and assigns assets to tasks performed in projects (Ronoh & Kirui, 2020).

Stakeholder participation is an important management capability that supports the delivery of projects. Stakeholder participation creates a sense of ownership by the beneficiaries once the project has been completed (Uwamariya, Safari & Kengere, 2021). Most projects have committees that should be allowed to participate in a project by passing resolutions that should be adhered to in a project organization (Ngare & Cheluget, 2019). Stakeholder participation also seeks to ensure the project managers comply with the established rules like those by the donors (Masika, 2020). This can allow the project to progress in a way that it can be able to meet its objectives. Another important role played by stakeholder participation is that it promotes accountability (Cvijović, Obradović & Todorović, 2021).

Management commitment is an important capability that supports and improves decision-making processes in projects. The top management team of any project has an array of activities like decision making, formulation of goals and objectives, and providing training to staff implementing the project on a day-to-day basis (Memon, Rasli, Dahri & Hermilinda-Abas, 2022). Top management commitment can also be

demonstrated by the skills and competence of those in leadership (Leksono, Siagian & Oei, (2020). Management commitment aims at ensuring that the vision and mission of the project organization are realized. Committed top managers will exert more effort with excellent leadership to motivate staff to meet the goals of a project (Sanusi & Johl, 2021).

Digital inclusion is a capability that allows managers to allow project staff to have access to and utilize the latest technologies in their operations. The changing landscapes have resulted in significant transformations and technology has emerged as a priority for project managers to ensure project sustainability (Alhassan & Adam, 2021). Digital inclusion makes it easier to carry out operations and decision-making is also fast and efficient. A digitally inclusive project team is instrumental to project sustainability. Digital inclusion can support faster information sharing, data analytics, and the overall communication of an organization. When information can easily flow between employees in an organization; it becomes easy to make decisions. To realize digital inclusion, efforts should be made by those in management to remove any possible resistance to change (Wambugu, 2016).

1.1.3 Water Projects Funded by Embu County Government, Kenya

Embu County Government became operational in 2013 after the promulgation of the new constitution that ushered in devolution in Kenya. The main sources of drinking water in Embu County include pans, well, springs as well as boreholes, piped water, dams, and rivers (Kinyua, 2015). There are six key rivers in the County whose origin can be traced to Mount Kenya. An estimated 30.1% of the entire population in Embu obtain water from these rivers, 35 % use piped water while wells are used by 21% of the population respectively (Omanwa & Muchai, 2020). Of the total number of Constituencies in Embu County, only Manyatta has the highest number of residents with accessibility to improved and clean water sources as a result of water projects that Embu County has implemented. In sub-counties like Mbeere South and North, residents encounter a lot of difficulties in accessing water for farming as well as for domestic purposes and this has raised concerns about the sustainability of water projects funded by the County Government of Kenya. Residents in these sub-counties are therefore forced to access water from major towns which are then ferried (Ireri, 2018) raising further concerns about the sustainability of the water projects that the County government of Embu has implemented.

Six major water projects have been funded and completed by the Embu County Government (appendix IV). Compared with a population of 608,599 (KNBS, 2019), these water projects funded by the County Government of Embu are inadequate and have failed to meet water demand by residents in the County especially those in Mbeere South and North sub-counties (Omanwa & Muchai, 2020) thus heightening further concerns about their sustainability. To meet the water demand deficit, a significant portion of residents are forced to rely on unsafe and contaminated water from rivers and seven forks dams as opposed to heavy reliance on water projects that the County government of Embu has implemented to promote sustainability. This has exposed most of the residents in Embu County to frequent crocodile attacks resulting in deaths at some point (Omanwa & Muchai, 2020) and this provides an implication that the water projects that the county has implemented are not sustainable at all. Thus, in the quest to promote the sustainability of water projects for residents in Embu County, the present study seeks to propose a model that incorporates and recognizes the central played by project management capabilities.

1.2 Statement of the Problem

Despite being a pillar in the realization of Vision 2030, access to clean and improved water as a component of the sustainability of water projects has remained a challenge in Embu and Kenya at large. While the 2010 Constitution of Kenya and the United Nations recognize access to safe water as a measure of the sustainability of water projects as a right for every citizen, this has not materialized in Embu County (WASREB, 2019). Currently, Embu County has completely implemented six water projects that are so limited to meet the demand of over 600,000 people raising sustainability concerns. This has forced residents in Embu County to rely on unsafe and contaminated water from such sources as rivers and unprotected dams exposing them to health and safety risks (Ireri, 2018) and this means that the water projects being implemented by the County government of Embu are not sustainable at all. The ever-increasing population growth in Embu with limited water projects initiated and funded by the County has resulted in a water sustainability problem (Omanwa & Muchai, 2020). Although the County Government of Embu has indicated the need to drill more bore halls and set up more dams as a way of demonstrating its commitment towards enhancing the sustainability of the water projects it has implemented especially in Mbeere South and North sub-counties, no progress had been made to put

this into practice (Omanwa & Muchai, 2020) raising further concerns on the sustainability of the water projects that are being implemented.

The existing studies include Irfan et al. (2019) who focused on Pakistan to predict the implication of project management capabilities on the success of projects. The study observed that project management capabilities like stakeholder participation and resource allocation significantly contribute to the success of the project. However, "project success" is conceptually distinct from "project sustainability." Hermano, Martin-Cruz, and Pajares (2022) analyzed project management dynamic capabilities and their implication on the ability of the firm to perform. It emerged that project management dynamic capabilities have no direct influence on performance at the firm level. Nørbjerg et al. (2017) focused on dynamic capabilities and their implication on project management and a positive nexus was registered.

The aforementioned studies create gaps as some like Irfan et al. (2019 focused on project success that is conceptually different from sustainability. Other studies like Nørbjerg et al. (2017) covered dynamic capabilities that are broad as compared to the specific project management capabilities. Studies on project management capabilities concerning project sustainability are scanty and segregated. In Embu County, water sustainability challenges persist due to inadequate digital inclusion, limited management commitment, insufficient stakeholder engagement, and ineffective resource allocation, within the water projects in the County. To address the water shortage and improve the livelihood of residents in Embu County, Kenya, a study must be conducted to establish the influence of project management capabilities and the sustainability of water projects funded by the Embu County government.

1.3 Objectives of the Study

The study had general and specific objectives as discussed below:

1.3.1 General Objective

The general objective of the study was to investigate the influence of project management capabilities and sustainability of water projects funded by Embu County government, Kenya

1.3.2 Specific Objectives

The study was guided by the following specific objectives:

i. To establish the effect of resource allocation and sustainability of water projects funded by the Embu County government, Kenya
ii. To determine the influence of stakeholder participation and sustainability of water projects funded by the Embu County government, Kenya
iii. To evaluate the role of management commitment and sustainability of water projects funded by the Embu County government, Kenya
iv. To examine the relevancy of digital inclusion and sustainability of water projects funded by the Embu County government, Kenya

1.4 Research Questions

The study sought answers to the following research questions:

i. What is the effect of resource allocation and sustainability of water projects funded by the Embu County government, Kenya?
ii. Does stakeholder participation influence the sustainability of water projects funded by the Embu County government, Kenya?
iii. How does management commitment influence the sustainability of water projects funded by the Embu County government, Kenya?
iv. To what extent does digital inclusion affect the sustainability of water projects funded by the Embu County government, Kenya?

1.5 Significance of the Study

The study results will inform practitioners involved in water projects on how to incorporate project management capabilities to ensure sustainable project outcomes. Secondly, the study will inform policy makers in both county and national government dealing with water projects on project management capabilities in the conceptualization, design, and implementation of projects. Finally, the study will be useful to academicians in two folds. Firstly, it will contribute to the existing empirical literature on project management capabilities and project sustainability. Secondly, the study will provide a conceptual framework and insights into theories that can be used in studies in other areas.

1.6 Scope of the Study

The study focused on project management capabilities on sustainability. The specific aspects of project management capabilities that will be studied in the study will include resource allocation, stakeholder participation, management commitment as

well as digital inclusion as they influence project sustainability. The study will specifically focus on water projects that are funded by the County Government of Embu in Kenya. The study will specifically focus on six water projects implemented by the County Government of Embu. Among these, three projects have been completed, while the other three are ongoing. The completed projects were finalized between 2018 and 2021, and their sustainability was assessed based on their ability to consistently provide clean and safe water while meeting the needs of the local population over time. For the ongoing projects, the study assessed whether project management capabilities influencing sustainability have been integrated into their planning and implementation. The study was executed in June 2023 using information from primary sources to be gathered through the questionnaire.

1.7 Limitations of the Study

The study encountered respondents who seemed to be unwilling to share information freely on account that the same might be used to intimidate and blackmail them. This was likely to affect the quality of the responses that will be shared by the participants. However, to counter this limitation, each questionnaire was accompanied by a letter of introduction that sought to state the purpose of the study as being for academics.

1.8 Organization of the Study

The proposal is organized into five chapters. The background information, problem statement, objectives, research questions, significance, and scope are detailed in the first chapter. The second chapter covers a review of theories and past empirical studies, knowledge gaps, and the conceptual framework. In the third chapter, the focus is on the research design, target population, sample and sampling technique, data collection instrument and procedures as well as the analysis. Ethical issues to be considered are also covered in this chapter. Chapter four provides for analysis of data and subsequent discussions. Chapter five documents the summary conclusion and study recommendations

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section of the proposal covers theoretical literature related to quality management practices and project performance. It will further explore major gaps that arise from the review as a guide and springboard to the current study.

2.2 Theoretical Review

The study was guided by the resource-based view, stakeholder theory, agency theory, and the technology acceptance model.

2.2.1 Resource-Based View

The proponent of this theory was Barney (1991) and it places more emphasis on resources in an organization and how they shape the competitive landscape. The theory argues that the primary source of competitive advantage in a project organization is the resource bundles that are in place. Barney (1991) argues that for resources to help the project organization to remain competitive, they ought to be rare and heterogeneous besides being immobile. These qualities and attributes provide a limitation when competitors try to imitate these resources.

The key strength of RBV lies in its ability to be conceptualized theoretically thus making it easier to be tested empirically. A review of the literature gives several elements of this theory that include competitive advantage, capabilities, resources as well as the need to perform (Karim, Nahar & Demirbag, 2022). The argument and assumption of the theory is that performance and thus a competitive position of a project organization can be enhanced and strengthened by the effective utilization of resources and capabilities that are rare and valuable. Capabilities as well as resources are important constructs that shape and predict performance at a project level (Ika & Pinto, 2022).

Capabilities are the abilities of project organizations to ensure adequate resources have been deployed to meet the required goals. According to Ronoh and Kirui (2020), RBV is of great essence in the field of project management since it allows project managers to allocate the available resources in units to support operations. Through the effective allocation of resources, the theory implies that project

organizations may leverage the same to remain competitive and thus attain long-term sustainability.The relevance of RBV to this study lies in its focus on resource allocation as a critical project management capability. Ronoh and Kirui (2020) highlight that RBV is essential in project management as it guides project managers in optimizing the allocation of resources to achieve project goals. In the study, RBV supports the first objective, which seeks to establish the implication of resource allocation as a project management capability on the sustainability of water projects. It provides a theoretical lens for understanding how effective resource management contributes to project sustainability by ensuring that resources are not only available but also deployed efficiently to meet both immediate and long-term needs.

2.2.2 Stakeholder Theory

Proposed by Freeman (1994), stakeholder theory argues that every legitimate person or group participating in the activities of an organization, does so to obtain benefits and that the priority of the interests of all legitimate stakeholders is not self-evident. This implies that stakeholder theory aims to outline how management can satisfy the interests of stakeholders in a given organizational entity. Generally, stakeholders are defined by their interests and all stakeholder interests are considered to be intrinsically valuable. Freeman, Phillips, and Sisodia (2020) note that stakeholder theory is managerial in that it recommends attitudes, structures, and practices and requires that simultaneous attention be given to the interests of all legitimate stakeholders.

Critics of the stakeholder theory point to the observation that the theory is mainly based on philosophy and not so much truth. Donaldson and Preston (1995) also asserted that although through stakeholder analysis, businesses can grow faster, it was evident that not all stakeholders have an equal say in the profitability or even loss of the organization. This weakens the stakeholder theory in a way since it negates the whole basis of involvement of more than just the management running an organization (Cvijović, Obradović & Todorović, 2021).

This theory is needed by project managers so that they can effectively manage projects in highly challenging, turbulent, and complex surroundings. This is because it helps in giving an ethical, effective, efficient, and practical approach to the management of projects (Derakhshan, Turner & Mancini, 2019). Sound and effective stakeholder management are critical for any project to meet its goals formulated at the

establishment. A project with a good stakeholder management plan should seek to ensure that each of the stakeholders' interests has been taken good care of (Ajmal, Khan & Al-Yafei, 2020). Effective stakeholder management requires project managers to reconcile the interests and needs of each stakeholder in the project organization (Pedrini & Ferri, 2019).

The main essence of stakeholder management is the creation of methods that help in the management of varied groups and relations. An important step is for an organization to have a clear understanding of the stakeholders and the best way to ensure they have been strategically managed (Nederhand & Klijn, 2019). This theory is found relevant to the present study that seeks to predict the implication of stakeholder participation on the sustainability of water projects. Hence, the theory is used to underpin the second objective of the study.

2.2.3 Agency Theory

The proponents of this theory include Alchian and Demsetz (1972) and Jensen and Meckling (1976). It suggests that an organization can be viewed as a nexus of contracts between resource holders in which one entity (principal) is in a position to make decisions that impact the other entity (agents). This agency relationship arises whenever one or more individuals, called principals, hire one or more other individuals, called agents, to perform some service and then delegate decision-making authority to the agents. The existence of an agency relationship normally gives rise to agency costs, which are expenses incurred to sustain an effective agency relationship (Nobanee & Abraham, 2017). This is very applicable in learning institutions where the government owns the institutions, they finance dictating how much returns they expect from the institutions with the performance of the projects that are taken as the key measure of how effective the relationship remains.

The key criticism of agency theory is that there is a conflict of interest in the implementation of the theory in that the needs or wishes, as well as thought plans of the agent, can never be similar to that of the principal (Dong, Karhade, Rai & Xu, 2021). This is however neutralized at times by the internalization of the agent as a family of the organization to which the principal seconds the agent. The cost of running an agency is also very complicated and might not be commensurate with the proceeds of expected organization returns (Shogren & Raley, 2022). In line with this

agency theory, the relationship between two people in a contract is characterized by the self-interests of each of the parties. At the same time, the owners of the project and the contractors do delegates tasks to their project managers.

Four parties take part in a project even when it has not been initiated: the owner, contractors, project manager, and donor. The main assumption made is that all these parties would work as a team to actualize the project goals. However, this is not the case as an inherent conflict of interest arises. Besides possible conflict of interests between the parties, there is another possibility that one person in the contract is better informed compared to the rest of the parties. These results in a situation referred to as information asymmetry (Bjurstrøm, 2020).

In a project, the assumption made is that the involved parties will share key information in the realization of project targets like quality, cost, and time. However, the self-interested behavior of these parties will imply that sharing of information for the effective execution of the project would not be evident (Shogren & Raley, 2022). The present study seeks to establish the role of management commitment to the sustainability of water projects. Project managers are viewed as agents who are require remaining committed and realizing the goals of the project organization. Lack of commitment from managers according to this theory may result in a conflict of interest in the project. Hence, the theory is used to support objective three.

2.2.4 Technology Acceptance Model

The proponent of this theory was Davis (1986) and its essence is to explain and predict how some specific types of digital technologies can be adopted and used by staff in a project organization. Through this theory, an understanding of the key issues that inform people to adopt digital technologies is brought out and understood. It argues that the behavior of those intending to adopt and use a given technology, their attitudes, perceptions on use, and ease of use will influence how they decide to use digital technologies. Besides these factors, the role of external indicators in the choice to adopt and use digital technologies is also appraised by this theory (Davis, 1986). The components of the theory and the interaction in each of them are summarized in Figure 2.2

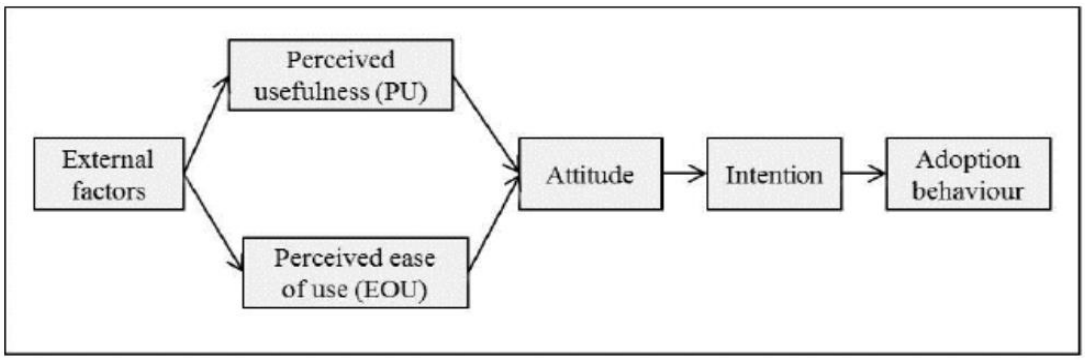

Figure 2.1: Technology Acceptance Theory

Source: Davis (1986)

Thus, from this theory, the actual behavior of an individual is informed by the behavioral intention that is influenced by subjective norms as well as attitude at an individual level. These norms as well as attitudes are then shaped by other factors like beliefs (Hsu, Liu, Tsou & Chen, 2019). According to Ajzen (1985), three faiths shape and influence behavior: control, subjective and behavioral faith. Behavior is shaped by factors within the environment that an individual decides to adopt technology that may not have some influence on. Thus, efforts should be made to have consideration of the extent to which an individual would have control over his/her behavior (Ritz, Wolf & McQuitty, 2019). The relevance of this theory to the study is that it will support the fourth objective of digital inclusion. From, this theory, it can be inferred that successful digital inclusion as a project management capability is strongly hinged on PU and PEU mediated by external issues in the environment.

2.3 Empirical Review

The past empirical studies are reviewed in the subsequent sections. The review of literature focuses on resource allocation and sustainability of water projects as well as stakeholder participation and sustainability of water projects. It also dwells on management commitment and sustainability of water projects and digital inclusion and sustainability of water projects. At the end of this review, the studies are critiqued to point out possible gaps that will be filled by the proposed study...

2.3.1 Resource Allocation and Sustainability of Water Projects

Waititu (2022) did a study whose focus was on resource allocation and its position on the ability of the monitoring and evaluation (M&E) system to perform. The study adopted the case of World Vision. The specific aspects of resources covered include

people, finances, technologies as well as materials. In total, 9 child protection projects were targeted and information was gathered as supported by the questionnaire. It was shown from the analysis that the allocation of people, materials, technologies, and finances significantly contributes to the performance of the M&E system. While the study is relevant, its focus was on M&E systems rather than project sustainability, leaving a gap in understanding resource allocation's direct effect on sustainability outcomes.

Ronoh and Kirui (2020) focused on the scheduling of resources and their link with the performance of construction projects of residential houses in Nairobi. Sampling of the participants was done through a simple random method and the design was a survey. Information was gathered with the aid of the questionnaire. In total, 79 residential constructions were covered. From the analysis, it emerged that efficient and effective allocation of project equipment leads to success in the completion of the project. This study focuses on construction projects and does not address the unique challenges faced by water projects, limiting its applicability to the current study.

Sadiq (2019) assessed resource allocation strategy and its role as far as performance boards heading water services in Kenya were concerned. The specific aspects of resource allocation covered include staff development, financial resources, infrastructural development, and technological resources. The adopted design was descriptive and correlational. From the analysis, it was observed that the strategy of allocation of resources and the performance of the projects are significantly connected. Although relevant, the study examined performance rather than sustainability, which is a broader and longer-term outcome.

Kwesiga and Mulyungi (2018) did an appraisal of resource allocation and its implication for the performance of projects relating to agriculture within the Rwandan context. The study borrowed evidence from One Acre. The adopted design was descriptive in nature and information was gathered aided by a questionnaire. It emerged from analysis that the effective allocation of resources is a significant predictor of how projects perform. The study focuses on agricultural projects, leaving a contextual gap in understanding water projects' sustainability. These existing studies primarily focus on resource allocation's impact on performance rather than

sustainability, especially in water projects. The current study addresses this gap by examining the role of resource allocation in sustaining water projects.

2.3.2 Stakeholder Participation and Sustainability of Water Projects

Uwamariya, Safari, and Kengere (2021) analyzed stakeholder participation and the role it plays as far as the sustainability of the project is concerned. The inquiry was done in Kicukiro with a focus on Deaf Donor Funded Project. Leveraging descriptive design, 246 participants were targeted and 152 were sampled purposively. Information was obtained in its primary form guided by the questionnaire. It was shown that the participation of stakeholders and the sustainability of the project are linked with each other significantly. The study focused on donor-funded projects in a sector, which may not directly translate to government-funded water projects.

Masika (2020) focused on stakeholder participation and the sustainability of health projects in Uganda. The aspects of stakeholder participation that were covered include passive, interactive, functional, and optimum participation. The embraced design of the study was correlational. Although the targeted participants were 255, 153 were sampled and included in the inquiry. The inquiry shared that functional participation was evident through the formation of interest groups. The study being from a different sector limits direct applicability to water projects.

Habumuremyi and Tarus (2021) studied the implication of stakeholder participation on project sustainability. The specific focus of the inquiry was on community-based projects within the context of Rwanda. The adopted design was descriptive and the sample consisted of 401 respondents. It emerged from there was interactive as well as passive participation and this directly impacted the sustainability of the projects. It emerged that stakeholder participation as a construct brings every person in the project into the decision-making process. As such, stakeholder participation was highly recommended for the sustainability of projects to be realized.

Nzomo and Gachengo (2021) analyzed stakeholder participation and its implication on the sustainability of water projects within Machakos. Participatory theory provided anchorage to the study and the adopted design was descriptive. The participants covered managers of the projects, members of water committees, and elders at the community level. The leaders of the community were selected to represent the beneficiaries of the project. It was observed from the analysis that

stakeholder participation has a direct and significant implication on the sustainability of the project. While the study is contextually relevant, its findings are localized, necessitating broader generalization. These studies emphasize stakeholder participation's general role but lack specificity regarding water projects' sustainability, especially under county governments' initiatives.

2.3.3 Management Commitment and Sustainability of Water Projects

Memon, Rasli, Dahri, and Hermilinda-Abas (2022) did an investigation of the commitment of those in top management and its importance on the performance of the environment within the context of Pakistan. In total, 222 key informants were allowed to participate in the inquiry. It was observed from the analysis that the commitment of the top managers enhances the performance of the environment. The study pointed out that the commitment of the top managers supports the training of employees to equip them with sound skills and knowledge so that they can perform their duties effectively. The study does not address sustainability directly, but focuses on environmental performance.

Sanusi and Johl (2021) analyzed top management commitment and its role in the implementation of risk management in projects. The methodology adopted was a narrative technique that entailed the review of the literature. The review of the literature revolved around bringing out the critical essence derived from the high commitment of those in top management positions. The review was guided and supported by information from existing articles and publications. It was shown that management commitment is demonstrated through job automation and proper communication. It was further noted that top managers have the responsibility of guiding, directing, and controlling the activities aimed at meeting the project goals of an organization. The study's findings are not indursty-specific, and its narrative technique cannot be empirically validated.

Leksono, Siagian, and Oei (2020) examined top management commitment and its role in operational performance. Information was obtained from firms operating in Java classified as medium and large entities. In total, 55 participants were included in the study. It emerged from analysis that highly committed top managers enhance the operational performance of an entity. The implication of the commitment of those in

management positions on performance is a direct one. This means that any effort demonstrated by managers to remain committed would enhance performance.

Karanja, Kahuthia, and Muraguri (2020) conducted an analysis whose focus was on the commitment of those in senior management and how it impacts the performance of schools that are owned by churches. The adopted design was descriptive and a total of 192 participants were targeted and included in the inquiry. Information was sought from primary sources guided by a questionnaire. The analysis was that those in senior positions empowered their staff, and provided training and better rewards to enhance their performance. The study's focus on schools limits its transferability of findings to water projects. While management commitment is widely recognized as crucial for project success, its direct impact on sustainability, particularly in water projects, remains underexplored.

2.3.4 Digital Inclusion and Sustainability of Water Projects

Marnewick and Marnewick (2022) did a study whose focus was on digitalization and how it affects project management. By adopting desk research methodology, the study pointed out that with the rapid advancement of digital technologies and the huge volume of information that the same can handle, projects have increasingly been compelled to adopt new technologies that transform how activities and operations are done. It was shown that most of the project managers have resorted to the adoption of agile approaches to enhance operations. Alhassan and Adam (2021) analyzed digital inclusion and access to technologies as they influence the quality of living. The paper relied on information from secondary sources that was gathered from 121 countries in the year 2018. The structural equation model was embraced as an analytical tool to bring out results. It was documented that at a global level, digital inclusion and high access to technologies go a long to improving the quality of life. The study does not specify focus on water projects or sustainability.

Kozarkiewicz (2020) did a study on digital transformation and its implication on processes in the management of projects. To conclude, the inquiry was an empirical analysis with project managers being the respondents. It was shown that digital transformation has significantly and positively enhanced how the project management processes. Feise and Graf-von-Hatzfeldt (2019) did a study on digitalization and its implication for management of the project teams. The focus of the study was on

medium-sized technology-related firms. The analysis resulted in the development of a framework that described digitalization and its influence on innovation. It was shown that digitalization supported and enhanced virtual teams and that it resulted in collaboration and communication.

Bajwa and Deichmann (2018) were keen to analyze digitalization and its implication on project management. The study was informed by the TAM theoretical foundation. The design embraced was a quantitative survey. The validity of the tool was determined and gauged through computation and appropriate interpretation of Cronbach Alpha. It emerged from analysis that PU and PEU shape and predicts the intent to utilize and hence the acceptance of digital technologies like cloud-based tools for managing projects.

Wambugu (2016) adopted Kiambu County as the point of reference and exclusively covered its framework towards digital inclusion. The essence of the study was to propose a framework that when adopted would promote digital inclusion. In actualization of this objective, a descriptive survey design was adopted where respondents were drawn from rural areas to have an understanding of the key causes of the digital divide. Both document analysis and questionnaire were adopted in this inquiry. It emerged from analysis that the digital gap in access to the material was closing in the studied region; there was a wide gap in accessibility to skills, use, and utilization. In the adopted framework for adoption, it was suggested that social, human capital development and infrastructure as well as government are key dimensions that enhance digital inclusion. The study focuses on closing the digital divide rather than creating a direct link to project sustainability. Most studies emphasize digital inclusion's general impact on project management, leaving its specific role in the sustainability of water projects underexplored.

2.4 Summary of Literature and Gaps

The chapter has reviewed several studies including Waititu (2022) who focused on the ability of the monitoring and evaluation (M&E) system to perform as the dependent variable. Ronoh and Kirui (2020) focused on the scheduling of resources as the independent variable while resource allocation will be central as one of the objective independent variables in the present study. Sadiq (2019) focused on performance boards heading water services in Kenya while sustainability is central in the proposed

study. Uwamariya, Safari, and Kengere (2021) used a case of Deaf Donor Funded Project while water projects will be central in the present study. Masika (2020) focused on health projects in Uganda while the focus of the proposed study is on water projects in Kenya. Habumuremyi and Tarus (2021) did a study in Rwanda while the proposed study will be in Kenya. Memon, Rasli, Dahri, and Hermilinda-Abas (2022) did an investigation in Pakistan and not in Kenya. Sanusi and Johl (2021) used the implementation of risk management in projects as the dependent variable. Leksono, Siagian, and Oei (2020) focused on operational performance as the dependent variable. Karanja, Kahuthia, and Muraguri (2020) used school performance as the dependent variable while project sustainability will be of main focus in the proposed study. Alhassan and Adam (2021) linked digital inclusion with quality of living, unlike the proposed study that does the same with the sustainability of water projects. Wambugu (2016) aimed at proposing a framework for digital inclusion, unlike the proposed study that relates digital inclusion to the sustainability of water projects. Table 2.1 is a summary of the gaps.

Table 2.1: Summary of Literature and Gaps

Author	Study	Key finding	Research Gap	The focus of the present study
Waititu (2022).	Resource allocation and its position on the ability of the monitoring and evaluation (M&E) system to perform.	Allocation of people, materials, technologies, and finances significantly contributes towards the performance of the M&E system.	The study focused on the performanc e of an M&E system as the dependent variable.	Sustainability of water projects funded by Embu County government; Kenya will be the dependent variable.
Memon, Rasli, Dahri and Hermilinda-Abas (2022).	The commitment of those in top management and its importance on the performance of the environment.	The commitment of the top managers supports the training of employees to equip them with sound skills and knowledge so that they can perform their duties effectively.	The study was done in Pakistan focusing on environmen tal performanc e as the dependent variable.	The proposed study is to be done in Embu with a focus on the sustainability of water projects.
Uwamariya, Safari and Kengere (2021).	Stakeholder participation and the role it plays as far as the sustainability of the project is concerned.	Participation of stakeholders and the sustainability of the project are linked with each other significantly.	Deaf Donor Funded Project. was used as a point of reference.	Water projects funded by the Embu County government; Kenya will be central to the proposed study.
Habumuremy i and Tarus (2021).	The implication of stakeholder participation in project sustainability.	Stakeholder participation as a construct brings every person in the project into the decision-making process	The study was done in the context of Rwanda.	The present study will be done in Embu.
Alhassan and Adam (2021).	Digital inclusion and access to	At a global level, digital inclusion and	The study creates a methodolog	The present study will be empirical involving desk

	technologies as they influence the quality of living.	high access to technologies go a long to improving the quality of life.	ical gap by focusing on the desk review methodology.	review and field work to collect data and carry out analysis.
Ronoh and Kirui (2020)	Scheduling of resources and its link with the performance of construction projects of residential houses in Nairobi.	Efficient and effective allocation of project equipment leads to success in the completion of the project.	Resource scheduling was used as the independent objective variable.	The present study will focus on resource allocation as one of the independent objective variables.
Leksono, Siagian and Oei (2020)	An examination of top management commitment and its role in operational performance.	Highly committed top managers enhance the operational performance of an entity.	The study used operational performance as the dependent variable.	sustainability of water projects funded by Embu County government; Kenya will be the dependent variable.
Wambugu (2016)	Adopted Kiambu County as the point of reference and exclusively covered its framework for digital inclusion.	The digital gap in access to the material was closing in the studied region; there was a wide gap in accessibility to skills, use, and utilization.	The study merely focused on coming up with a model to support the adoption of digital inclusion in Kiambu.	The present study will go deeper and critically asses how digital inclusion in the context of project management can enhance the sustainability of water projects.

Source: Author (2023)

2.5 Conceptual Framework

A conceptual framework is a tool that is used to illustrate the variables of the study. It helps in demonstrating the relationship between the study variables. It is also used to present the indicators for each variable that are used to construct the research instrument. Figure 2.2 is the conceptual framework that was used to guide the study:

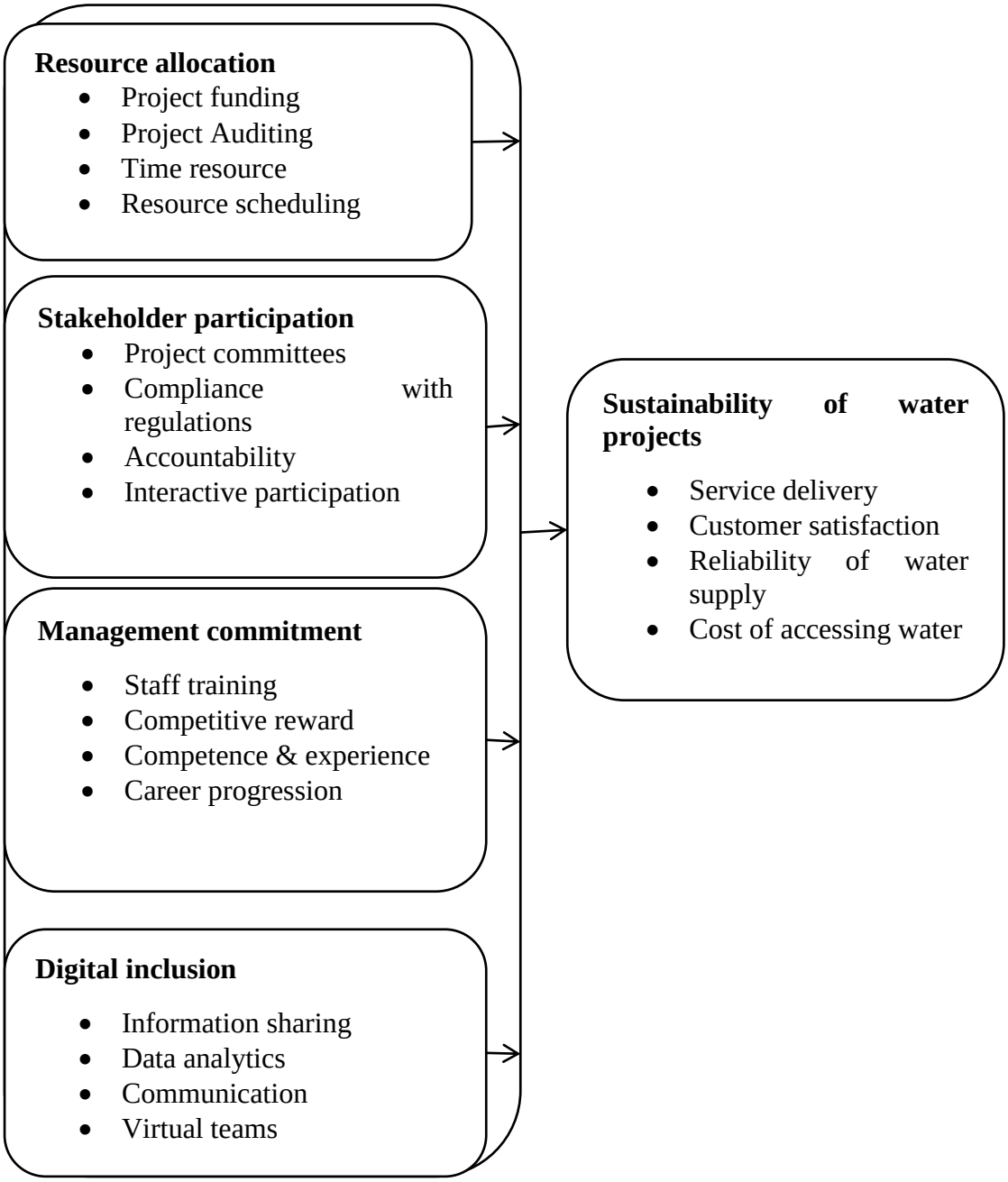

Figure 2.2: Conceptual Framework

Source: Author (2023).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design and methodology applied in addressing the research problem and the objectives mentioned in chapter one. The chapter comprises the following sections: research design which will be a descriptive survey, empirical model, operationalization and measurements of variables, target population of the study, data collection instruments, data collection procedure, validity and reliability, data analysis, and research ethical considerations.

3.2 Research Design

The descriptive survey research design was used in this study. According to Liamputtong (2019), descriptive research design attempts to gather facts from a population to establish the existing status of the respondents regarding the variables. Descriptive research involves description, recording, analysis, and interpretation of processes and phenomena focusing on adequate interpretation of facts. A descriptive research design is suitable where the study involves describing the characteristics of study variables at a particular place in time and has the advantage of describing, explaining, and validating research findings, and can integrate both quantitative and qualitative methods of data collection (Bougie & Sekaran, 2019). The choice of descriptive research design is also in line with the recommendations of Harris, Holyfield, Jones, Ellis, and Neal (2019) that descriptive research design is a scientific method that involves observing and describing the behavior of subjects under study without influencing them in any way as will be the case with variables in this study. The choice of a descriptive survey design aligns with the study objectives, which aim to examine how resource allocation, stakeholder participation, management commitment, and digital inclusion influence the sustainability of water projects funded by Embu County Government. The design enables the study to capture the characteristics and perceptions of stakeholders (project managers, members of committees, local leaders, and Operating staff as well as community leaders) as they relate to the study variables.

3.3 Target Population

A population refers to all the elements that meet the sample criteria for inclusion in a given study (Strijker, Bosworth & Bouter, 2020). The target population is the aggregate of cases about which the researcher would like to make generalizations (Dźwigoł, 2019). The target population was 6 completed water projects funded by the County Government of Embu (appendix IV) and they formed the unit of analysis. This study targeted 167 project managers, members of committees, local leaders, and Operating staff as well as community leaders from Embu County that formed the unit of observation. The distribution of respondents across the six water projects is as shown in Table 3.1

Table 3.1: Target Respondent Population

Category	Respondent Population	Percentage
Project administrators	49	29
Members from water committees	53	32
Operating staff	37	22
Local leader	28	17
Total	**167**	**100**

3.4 Sample Size and Sampling Techniques

3.4.1 Sampling Technique

The sampling technique is a specific method that is used to select a sample of respondents from the entire target population (Eden & Nielsen, 2020). The desire for an efficient technique of estimating sample size has been driven by the ever-growing necessity for a representative statistical sample in empirical research. Krejcie & Morgan (1970) created a table for calculating sample size for a specific population of respondents as a means of filling in the existing gap. This research therefore employed Krejcie & Morgan's (1970) table to determine the sample size. In this regard, the sample size was 100 respondents. After this, proportional sampling was applied to obtain samples per stratum. The results were as tributed as follows:

Table 3.2: Sampling Technique

Category	Population	Sample size	Percentage
Project administrators	49	25	25
Members from water committees	53	30	30
Operating staff	37	25	25
Local Leaders	28	20	20
Total	**167**	**100**	**100**

3.5 Data Collection Instrument

This study relied on primary data that was collected using a self-administered questionnaire that will be semi-structured. Thanem and Knights (2019) noted that a large amount of information can be collected within a short period through questionnaires. Studies have also shown that questionnaires are useful tools for data collection since they are easier to administer and analyze (Fellows & Liu, 2021). The questionnaire consisted of six sections designed to address the objectives of the study the sections were: Section A: Back Ground Information, Section B: Resource Allocation, Section C: Stakeholder Participation, Section D: Management Commitment, Section E: Digital Inclusion, Section F: Sustainability of water projects Questionnaires were administered through drop and pick later method. Three research assistants were hired and trained in advance to help administer questionnaires to respondents.

3.5.1 Pilot Testing

A pilot test is a min study that is conducted before the actual one and it aims to identify and rectify any inconsistencies and challenges likely to be encountered by respondents as they share their responses. The questionnaire was pilot tested among 5 respondents who were purposively selected from Embu Water and Sanitation Company. The reason for picking on this company is because it had initiated water projects and also it was to reduce biases.

3.5.2 Validity of the Research Instrument

Validity is the extent to which a study tool measures an item that it is designed to measure (Ghauri, Grønhaug & Strange, 2020). The study was test for content and construct validity by engaging a supervisor and two experts in the field of project planning and management. They reviewed the contents of the questionnaire and check against the constructs in the conceptual framework and the reviewed literature to

ensure there is consistency. Any suggestions raised was inputted on the final copy of the questionnaire before proceeding to the field to gather data.

3.5.3 Reliability of the Research Instrument

Reliability is the accuracy and consistency of the study tool in its measurement of an underlying issue (Rose, McKinley & Baffoe-Djan, 2019). The duly filled-in questionnaire from the pilot study were used to compute values of Cronbach Alpha Coefficients that was then be interpreted taking the figure 0.7 as the threshold (Nielsen, Eden & Verbeke, 2020).

3.6 Data Analysis and Presentation

Data analysis involves the processing of the gathered raw information so that meaningful insights can be drawn (McKinley & Rose, 2019). The collected data was analysed through SPSS version 26 supported by means and standard deviations as descriptive statistics and correlation and regression as inferential statistics. The reason for selecting means and standard deviations is because they are the most adopted measures of central tendency and dispersion for describing the variables. They are also good at analysing the Likert-based questionnaire that the questionnaire will be designed with. OLS is appropriate for this study because; It minimizes the sum of squared residuals, ensuring an efficient estimation of regression coefficients, and it assumes linearity between dependent and independent variables, aligning with the study's objective of determining the linear relationship between sustainability of water projects and the predictors (resource allocation, stakeholder participation, management commitment, and digital inclusion). The ordinary least square (OLS) regression model to be adopted for analysis took the following form:

$$\mathbf{Y= \beta_0+ \beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon}$$

Where Y= sustainability of water projects

B_0 = Constant

β_1, β_2, β_3 and β_4 are Coefficients

ε = error term

X_1= resource allocation

X_2= stakeholder participation

X_3= management commitment

X_4= digital inclusion

3.6.1 Diagnostic Tests

The study tested for normality, multicollinearity, and Heteroscedasticity Test as discussed in subsequent sections:

3.6.1.1 Multicollinearity Test

Multicollinearity is a situation that arises whenever the independent variables of the inquiry are highly correlated with each other (Liamputtong, 2019). This study ascertaiedn this condition by computation and appropriate interpretation of the values of Variance of Inflation Factors (VIF). As observed by Bougie and Sekaran (2019), such values within the range of 1-10 show evidence of the absence of this assumption.

3.6.1.2 Normality Test

Effective execution of regression analysis is strongly hinged on the fact that the data should have a normal distribution and hence the need to conduct normality tests (Harris, Holyfield, Jones, Ellis & Neal, 2019). In this regard, the P-P plots were used to test for normality.

3.7 Ethical Considerations

Ethical considerations play a vital role in all research studies. To ensure the ethical conduct of the study, permission to carry out the research was obtained from the Graduate School of Kenyatta University. A research permit was also be obtained from NACOSTI before the commencement of data collection. Additionally, the respondents were given questionnaires with a cover letter that will explain the ethical considerations of this study and an appeal for them to participate freely and honestly. Further, the researcher ensured that the questionnaire does not contain items that can reveal the identities of the respondents. Finally, the respondents were assured that all the information provided were used for academic purposes only.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

Data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense, and recap, and evaluate data. The most critical phase of any research is the data analysis. Data analysis condenses gathered information. It entails the analysis of acquired data using logical and analytical reasoning to spot trends, correlations, or patterns. This section entails descriptive and inferential analysis in order to provide conclusions on the direction of research.

4.1.1 Response Rate

In most studies, data representativeness and response rate are invariably correlated. It describes how well the sample selected for the questionnaire research contrasts with the target population. To ascertain whether the data were sufficiently representative, the returned sampling rate is calculated. 100 questionnaires were sent out 85 filled questionnaires were received. The response rate for the research is shown in Table 4.1.

Table 4. 1: Response Rate

Category	Sample size	Returned sample	% response
Project Administrators	25	22	88
Members from water committees	30	24	80
Operating staff	25	23	92
Local Leaders	20	16	80
Total	**100**	**85**	**85**

The results indicate that the overall response rate for the study is 85%. This shows that the data collected was representative of the sample. According to Fincham (2008) a high response rate results in more accurate and high-quality data. This suggests that the likelihood that respondents will provide accurate information depends on how simple the survey is to complete. Additionally, a high response rate indicates a more representative sample, consequently having fewer respondents drop out in the middle of the survey indicates the outcomes will be closer to the aimed goals.

4.1.2 Reliability of the Research Instrument

The internal reliability of the instrument was analysed using Cronbachs' alpha. The findings are presented in table 4.2.

Table 4.2: Reliability Analysis

Variable	No. of Items	Cronbach's' Alpha	Verdict
Resource Allocation	5	0.759	Reliable
Stakeholder Participation	5	0.707	Reliable
Management Commitment	5	0.800	Reliable
Digital Inclusion	5	0.892	Reliable
Sustainability of Water Projects	4	0.775	Reliable

According to table, all the variables loaded above the threshold value of 0.7. This suggested that the instrument had internal reliability.

4.2 Back Ground Information

The basic information relating to the respondents were analysed. These include gender, level of education, work experience and job category.

4.2.1 Crosstabulation between Gender and Respondent Category

The job specialization of the respondents was stratified as follows and analysed by comparing their proportions with gender. Respondents were classified as those in supervisory, representatives from the committees related to water management as well as those in active operation staff. The finding is presented in Table 4.3.

Table 4.3: Gender and Respondent category Crosstabulation

		Respondent category				
		Project Administrators	Members from water committees	Operating staff	Local Leaders	Total
Male	Count	13	13	15	8	49
	% of Total	15.3%	15.3%	17.6%	9.4%	57.6%
Female	Count	9	11	8	8	36
	% of Total	10.6%	12.9%	9.4%	9.4%	42.4%
	Count	22	24	23	16	85
	% of Total	**25.9%**	**28.2%**	**27.1%**	**18.8%**	**100.0%**

The study found that 25.9% of the participants were project supervisors. Out of this proportion, 15.3% were males while 10.6% were females. Furthermore, it was established that 28.2% of respondents were members from water committees. Specifically, 15.3% and 12.9% were males and females respectively. Finally, 27.1% and 18.8% were the operating staff and local leadership that were sampled. Olivetti and Petrongolo (2016) report a rapid decline in the gender gap in labour market between male and females. This encouraging development is brought about by the decline in gender discrimination in jobs and workplaces. More particular, women are

now less likely to be excluded from professions with low pay and minimal skill requirements because of the relative advancement of women in schooling.

4.2.2 Crosstabulation between Gender and Level of Education Category

The significant rise in female academic success has been one of most dramatic developments in education over the last two or three decades. The analysis of gender and level of academic achievement is presented in Table 4.4.

Table 4.4: A comparison between Gender and level of education

		Level of Education				
		Certificate	**Diploma**	**Degree**	**Masters**	**Total**
Male	Count	5	16	26	2	49
	% of Total	5.9%	18.8%	30.6%	2.4%	57.6%
Female	Count	6	10	13	7	36
	% of Total	7.1%	11.8%	15.3%	8.2%	42.4%
	Count	11	26	39	9	85
	% of Total	**12.9%**	**30.6%**	**45.9%**	**10.6%**	**100.0%**

The study of gender and education encompasses gender differences in educational outcomes such as achievement, attainment, and experiences within the education system The analysis of the educational level showed that 45.9% of the participants had graduated with bachelor's degrees in which 30.6% and 15.3% were males and females respectively. It was noted that 30.6% and 12.9% were diploma and certificate graduates. Furthermore 10.6% of the participants were graduates in different master programs. This data shows that respondents had technical knowledge and skills concerning the nature of the problem under investigation. DiPrete and Buchmann (2013) contend that during the past 50 years, women have made significant advancements in terms of educational attainment relative to men. In developed nations today, the number of years a person spends in school varies little between genders, and in some places, women spend even longer in school. In some circumstances, the intersectionality of sex and other factors determines gender norms and expectations and results in educational marginalization.

4.2.3 Work Experience

The number of years respondents had spent in their areas of operation was analysed using descriptive statistics.

Table 4.5: Work Experience

	Frequency	Percent
Less than 3 years	16	18.8
4-7 years	38	44.7
5-8 years	31	36.5
Total	**85**	**100.0**

According to the data on job experience, the majority of respondents (44.7%) had up to 7 years of work experience. Additionally, the data revealed that 36.5% and 18.8% of respondents, respectively, had 5-8 years and less than 3 years of experience. This finding suggests that the sampled respondents were extremely knowledgeable about issues pertaining to the long-term viability of water projects in the research area. Fouad (2022) contends that when designing the research study, it is essential to incorporate the respondent's experience. In addition to benefiting the participants, providing an uncomplicated (as much as we can) and interesting experience for the respondents increases the caliber of the responses you will obtain.

4.3 Descriptive Analysis

Descriptive analytics is employed normally in order to find patterns and linkages. Hence both historical and current information are used in this procedure. In his section, percentage, averages and standard deviation were utilized.

4.3.1 Resource Allocation and Sustainability of Water Projects

The first objective for the study was to establish the effect of resource allocation and sustainability of water projects funded by Embu County government, Kenya. The results are presented as follows in table 4.6.

Table 4.6: Resource Allocation and Sustainability of Water Projects

Statement	SD	D	N	A	SA	Mean	SD
The adequate funds from Embu County government has improved service delivery of water projects	18%	19%	14%	21%	28%	3.23	1.48
Regular audits have improved reliability of water supply of the water projects funded by Embu County government	4%	42%	13%	27%	14%	3.05	1.18
Adequate time allocated for staff of water projects funded by Embu County government has improved service delivery	9%	38%	16%	21%	15%	2.95	1.26
Physical material scheduling based on priorities has reduced costs incurred by beneficiaries to access services from the water projects funded by Embu County government	9%	21%	19%	24%	27%	3.37	1.33
Time resource scheduling has allowed staff working in water projects funded by Embu County government to enhance achieve customer satisfaction	13%	25%	12%	31%	20%	3.20	1.36

Resource allocation is crucial to project management because it enables organizations to plan and get equipped to implement projects. In this current project, it was evident that 37% of the participants disagreed that the adequate funds from Embu County government has improved service delivery of water projects. This shows that when funds are inadequate, water projects may suffer its ultimate completion. This finding is consistent with Gashuga's (2016) assertion that budgeting, fund-raising, fund allocation, and fund-control need to receive more attention as part of the transition from managing projects. The discussion leads to the conclusion that budgeting, fund raising, money management, and money allocation are crucial to the project's success.

Project auditing aids in locating reoccurring flaws and other repeated patterns in the primary projects, as well as project execution monitoring and control. According to the findings, it was observed that 46% of the respondents disagreed that regular audits have improved reliability of water supply of the water projects funded by Embu County government. Furthermore, 38% of respondents disagreed that time resource scheduling has allowed staff working in water projects funded by Embu County government to enhance achieve customer satisfaction Given its ability to cut costs, time, and waste from a project or project management process, project auditing is crucial. This result is in line with that of Einhorn, Marnewick, and Meredith (2019), who underline that one can audit their project management process to detect non-value-added processes that drive up costs or waste time and resources. As a result, a variety of methods are needed for the business case to be used effectively. According

to the literature, many of the processes are rarely followed even when senior managers are aware of the requirement.

It is impossible to overstate the significance of scheduling in project management. Up to 47% of the respondents disagreed that adequate time allocated for staff of water projects funded by Embu County government has improved service delivery. This result agrees with that of Ronoh and Kirui (2020) who focused on scheduling of resources and its link with performance of construction projects of residential houses in Nairobi. Sampling of the participants was done through simple random method and the design was survey. Information was gathered with aid of the questionnaire. In total, 79 residential constructions were covered. From the analysis, it emerged that efficient and effective allocation of project equipment led to success in completion of the project.

Effective execution and streamlining of the fundamental strategic aspects are necessary to optimize firm performance. It was noted that 51% agreed that physical material scheduling based on priorities has reduced costs incurred by beneficiaries to access services from the water projects funded by Embu County government. This agrees with that of Sadiq (2019) who established that the performance of water services boards was positively impacted by strategic financial resources, strategic infrastructure development, and strategic technological deployment. The report advises the water services board to make sure their organization has the proper resources and that they are properly deployed for the correct purpose and at the right time. To ensure that all decisions on the allocation of resources are carefully considered and that there is a monitoring mechanism in place for all allocations, the management of the water services board must impose strict accountability standards on its employees. Additionally, this would guarantee that all decisions about resource allocation suit the organization's best interests.

4.3.2 Stakeholder Participation and Sustainability of Water Projects

The second objective of the study was to determine the influence of stakeholder participation and sustainability of water projects funded by Embu County government, Kenya. The finding is shown in Table 4.7.

Table 4.7: Stakeholder Participation and Sustainability of Water Projects

Statement	SD	D	N	A	SA	Mean	SD
Participation of stakeholders through committees has enhanced the service delivery of the water projects funded by Embu County government	9%	24%	24%	36%	7%	3.08	1.12
Stakeholders of the water projects funded by Embu County government advocate for compliance with regulations to minimize costs of access water by beneficiaries	13%	22%	21%	22%	21%	3.16	1.34
Stakeholder participation in water projects funded by Embu County government has improved accountability by enhancing service delivery	15%	20%	24%	15%	26%	3.16	1.41
Interactive participation of stakeholders in water projects funded by Embu County government has led to an improvement in customer satisfaction	8%	26%	19%	32%	15%	3.20	1.22
Interactive participation has allowed stakeholders to take part in planning of water projects funded by Embu County to ensure there is reliable water supply to beneficiaries	21%	13%	20%	29%	16%	3.07	1.39

An important aspect of project sustainability is stakeholder participation. For any project to be successful, communication with the project's external stakeholders is essential. The results indicates that 43% of the respondents agreed that participation of stakeholders through committees has enhanced the service delivery of the water projects funded by Embu County government. Furthermore, 47% reported that interactive participation of stakeholders in water projects funded by Embu County government has led to an improvement in customer satisfaction. This shows that stakeholder involvement through committees as well as interactive participation could impact sustainability of water projects. This result is in line with that of Pretty (2015) who asserts that stakeholder participation involves participation as a contribution to the implementation of a project with control over assets and decision-making. In a contribution of beneficial resources, external distributors have assumed their role of instructing participants the options for their problems, and then the interest contributes in terms of sources to preserve project operations.

The two most important determining variables that impact positive project performance are compliance and accountability. In this study, 43% of the respondents agreed that stakeholders of the water projects funded by Embu County government advocate for compliance with regulations to minimize costs of access water by beneficiaries. This is an initiative that will help the recipients get access to freshwater. In addition to this, a section of the forming 41% of the participants agreed that

stakeholder participation in water projects funded by Embu County government has improved accountability by enhancing service delivery. This viewpoint is consistent with that of Nzomo and Gachengo (2021), who underline that the involvement of stakeholders improves the sustainability of water projects. The study suggests involving stakeholders in project planning, design, implementation, finance, and management in order to sustain water initiatives.

Engagement in a project by a community result in an enhancement of its capacity, preparing it to carry out and oversee development projects in an effective and efficient manner. In the current study, 45% of respondents affirmed that interactive participation has allowed stakeholders to take part in planning of water projects funded by Embu County to ensure there is reliable water supply to beneficiaries. This result is consistent with research by Habumuremyi and Tarus (2021), who looked at the impact of stakeholder involvement on project sustainability. According to their assessment, the projects' sustainability was directly impacted by both active and passive participation. It became clear that the concept of stakeholder engagement involves everyone involved in the project in the decision-making process. Stakeholder involvement was therefore strongly advised in order for initiatives to be achieved sustainably.

4.3.3 Management Commitment and Sustainability of Water Projects

The third objective of the study was to evaluate the role of management commitment and sustainability of water projects funded by Embu County government, Kenya. Table 4.8 sows the findings of the analysis.

Table 4.8: Management Commitment and Sustainability of Water Projects

Statement	SD	D	N	A	SA	Mean	SD
Management commitment in water projects funded by Embu County government is demonstrated through staff training for improved service delivery	16%	16%	24%	29%	14%	3.08	1.30
Competitive reward provided to staff of water projects funded by Embu County government has resulted to reliable water supply to beneficiaries	13%	25%	21%	27%	14%	3.04	1.27
Existence of competent staff has enhanced service delivery of the water projects funded by Embu County government	11%	22%	13%	29%	25%	3.35	1.35
Availability of experienced staff has improved customer satisfaction of the water projects funded by Embu County government	19%	21%	12%	31%	18%	3.07	1.41
Clear promotion opportunities have motivated staff working in water projects funded by Embu County government to improve service delivery	15%	25%	22%	13%	25%	3.07	1.41

Project management is thought to be founded on two pillars: employee development and customer satisfaction. The results showed that 43% reported that management commitment in water projects funded by Embu County government is demonstrated through staff training for improved service delivery. Similarly, 49% reported that the availability of experienced staff has improved customer satisfaction of the water projects funded by Embu County government. This suggests that employees' performance will improve when they receive training on particular aspects of their job. The results are in line with those of Mpofu and Hlatywayo (2014), who note that better, more effective service delivery by municipal employees is possible if they receive high-quality training and development in programs that are overseen by facilitators who also produce high-quality work. Additionally, when employee performance is continuously supervised and assessed, these improvements are maintained.

Employee engagement is identified as the major contributor to harmony in the workplace. According to the findings, 54% reported that existence of competent staff has enhanced service delivery of the water projects funded by Embu County government. The results are in line with those of Rodriguez and Walters (2017) who found that providing employees with training and career development opportunities can help them work toward and maintain improved performance. Training quickens

the pace at which customers receive services, improves the accuracy of standards, and boosts organizational effectiveness. Additionally, it boosts employee passion and motivates them to put up more effort. As a result, their competency rises, which boosts business efficiency and profitability. Similarly, employee development also focusses on their skills and attitudes. This study supports Kaboré et al. (2022), who underline the necessity of digital interventions' sustainability for the maintenance of high-quality programs, particularly in low- and middle-income nations. All stakeholders should be informed, from planning to scaling up, by taking into account potential barriers and facilitators for the sustainability of digital project interventions. Additionally, combining facilitators and managing barriers effectively at the government level with the involvement of all stakeholders would be suitable.

Employee performance can be enhanced through reward strategies that can be adopted in a firm. The results of the current study revealed that 41% observed that competitive reward provided to staff of water projects funded by Embu County government has resulted to reliable water supply to beneficiaries. However, 40% disagreed that clear promotion opportunities have motivated staff working in water projects funded by Embu County government to improve service delivery. This finding is consistent with that of Ngumbao and Muturi (2018), who claim that motivated personnel contribute to an organization's success by being more productive and eager to provide services. To be effective, managers must be aware of the factors that drive workers in the context of the jobs they hold. Many firms do not have well-defined and clearly worded employee engagement and involvement policies. Giving employees flexibility in decision-making is referred to as ultra-vires, whereas implementing rewards/monetary incentive measures is seen as a cost burden.

4.3.4 Relevancy of Digital inclusion and Sustainability of Water Projects

The fourth objective was to examine the relevancy of digital inclusion and sustainability of water projects funded by Embu County government, Kenya. Each item was analysed through percentages, means and standard deviation.

Table 4.9: Relevancy of Digital inclusion and Sustainability of Water Projects

Statement	SD	D	N	A	SA	Men	SD
Digitalization has allowed information sharing for improved service delivery in water projects funded by Embu County government	14%	32%	21%	8%	25%	2.97	1.40
Application of data analytics has allowed water projects funded by Embu County government to ensure there is reliable water supply to beneficiaries	11%	16%	22%	31%	20%	3.32	1.26
Digital inclusion has facilitated communication to improve service delivery of the water projects funded by Embu County	22%	11%	18%	28%	21%	3.15	1.45
Virtual teams resulting from digital inclusion has improved service delivery in water projects funded by Embu County government	6%	38%	11%	28%	18%	3.14	1.26
Collaboration due to virtue teams has improved service delivery in water projects funded by Embu County government	7%	39%	9%	31%	14%	3.05	1.24

Digital inclusion aims to ensure all individuals in the company can participate in and gain from the digital economy. The results 46% of respondents disagreed that digitalization has allowed information sharing for improved service delivery in water projects funded by Embu County government. Similarly, 51% reported that application of data analytics has allowed water projects funded by Embu County government to ensure there is reliable water supply to beneficiaries. This finding is consistent with that of Erturk and Purdon (2022), who claim that ensuring everyone has access to computer technology is a necessary step toward participating in the rapidly expanding online information society. Cost is one barrier to digital inclusion for governments with smaller revenue.

Delivering high-quality products and services is the primary goal of project management. However, the current study found that 46% of respondents were in agreement that virtue teams' collaboration improved service delivery in water projects supported by the Embu County government. Similarly, 45% of participants were happy that service delivery in water projects financed by the government of Embu County had improved as a result of virtual teams created through digital inclusion. This finding is in line with that of Alam and Imran (2015), who stress that despite the availability of digital technology, its poor uptake still poses a serious problem. One of the biggest obstacles to using digital technologies is digital illiteracy.

It will be crucial to encourage the creation of digital public goods, including education on using digital media for socioeconomic development, in order to address

the capacity gaps that exacerbate the digital divide. Finally, 49% of participants agreed that digital inclusion has facilitated communication to improve service delivery of the water projects funded by Embu County

4.3.5 Sustainability of Water Projects

The sustainability of water projects was analysed in terms of service delivery, customer satisfaction, reliability of water supply, cost of accessing water. Similarly, percentages, means and standard deviation were computed.

Table 4.10: Sustainability of Water Projects

Statement	SD	D	N	A	SA	Mean	SD
There is efficient service delivery among water projects funded by Embu County government	14%	21%	12%	34%	19%	3.22	1.35
Customers are satisfied with services from the water projects funded by Embu County government	20%	15%	16%	25%	24%	3.16	1.46
There reliable water supply from the water projects funded by Embu County government	9%	28%	16%	33%	13%	3.11	1.22
The water projects funded by Embu County government has reduced the costs incurred by beneficiaries to access water	15%	21%	19%	22%	22%	3.15	1.39

Individual well-being and advancement depend on having access to clean water and sanitary facilities. The results shows that 53% were convinced that there was efficient service delivery among water projects funded by Embu County government. However, 35% did not agree with the statement. This conclusion is in line with that made by Alghail, Yao, Abbas, and Baashar (2022), who claim that the primary cause of unsustainable projects is a lack of understanding of project management capabilities and how they might lead to sustainability of the begun projects. The fact that there is little and conflicting empirical evidence connecting project management skills and sustainability, particularly in the context of water projects, makes the situation worse.

It has been established that progress in the economy and society are centred around water. In this current research, it was established that 49% of participants assert that customers are satisfied with services from the water projects funded by Embu County government. Finally, 46% of the participants respondent that their reliable water supply from the water projects funded by Embu County government. There was 44% of the participants who also responded that the water projects funded by Embu County government has reduced the costs incurred by beneficiaries to access water.

This finding is consistent with the findings of Gottipati and Nanduri (2014), who discovered that the reliability of a water supply system is determined by its equitable effectiveness A water distribution system is considered reliable if it endures an estimated level of failure, including pressure surges. In the water works landscape, the three determinants of system reliability are quantity of water delivered at the right pressure and time, quality, and affluence.

4.4 Inferential Analysis

Quantitative analysis is a technique used to draw conclusions regarding the relationships between variables. In accordance with the samples that are evaluated, users might deduce or conclude trends regarding a wider population. Essentially, it uses data from a sample to draw conclusions about a wider population or group.

4.4.1 Pearson Correlations

In this research, measurement of relationship was analysed using Pearson correlations. The main objective in Pearson correlation is to establish the nature and significant relationship that exists between project management capabilities and sustainability of water projects. The test of significance was run at 0.05 alpha.

Table 4.11: Pearson Correlation

		Sustainability of Water Projects	X1	X2	X3	X4
Resource Allocation	Pearson Correlation	.479**	1			
	Sig. (2-tailed)	.000				
	N	85	85			
Stakeholder Participation	Pearson Correlation	.593**	.248*	1		
	Sig. (2-tailed)	.000	.022			
	N	85	85	85		
Management Commitment	Pearson Correlation	.829**	.385**	.646**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	85	85	85	85	
Digital Inclusion	Pearson Correlation	.788**	.348**	.576**	.792**	1
	Sig. (2-tailed)	.000	.001	.000	.000	
	N	85	85	85	85	85

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Key: Y= Sustainability of Water Projects; X1= Resource Allocation; X2= Stakeholder Participation; X3= Management Commitment; X4= Digital Inclusion

The findings showed that resource allocation significantly correlates with sustainability of water projects ($r=0.479^{**}$; $p<0.05$). This suggests that that when more resources are allocated sustainability of water projects can be realized. Moreover, it was observed that stakeholder participation has a significant relationship with sustainability of water projects ($r=0.593^{**}$; $p<0.05$). Finally, management commitment had a statistically significant impact on sustainability ($r=0.829^{**}$; $p<0.05$) while digital inclusion variable similarly had a statistically significant impact on sustainability of water projects ($r=0.788^{**}$; $p<0.05$).

4.4.2 Regression Analysis

The technique of linear regression is used to project the value of one variable depending on another variable's value. A regression analysis is typically performed to estimate the effect of one or more explanatory variables on the dependent variable. The outcomes are shown in the following tables.

4.4.3 Model Summary

It is believed that when performing regression analysis, a model summary is consistently generated. The model summary displays the model's name, model type, and model formula. It indicates the strength of the association between the model's parameters and the dependent variable.

Table 4.12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872[a]	.761	.749	.52793

a. Predictors: (Constant), Digital Inclusion, Resource Allocation, Stakeholder Participation, Management Commitment

The model summary stipulates that the 74.9% in the sustainability of water projects can be explained statistically using resource allocation, stakeholder participation, management commitment and digital inclusion.

4.4.4 ANOVA

In linear regression analysis, Analysis of Variance (ANOVA) is a set of calculations that provides information about levels of variability within a regression model and serves as the foundation for significance tests. The results are shown in Table 4.13.

Table 4. 13: ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	70.898	4	17.724	63.596	.000[b]
Residual	22.296	80	.279		
Total	93.194	84			

a. Dependent Variable: Sustainability of Water Projects

b. Predictors: (Constant), Digital Inclusion, Resource Allocation, Stakeholder Participation, Management Commitment

The ANOVA statistics revealed that the model is significant at 005 alpha, Adjst. R-square=0.749, F (4,80) =63.596. This validates the significance of the selected variables in predicting sustainability of water projects.

4.4.5 Coefficients

Regression coefficients represent the mean change in the response variable for one unit of change in the predictor variable while holding the other predictor variables constant in the model. This statistical control provided by regression is significant because it separates the role of one variable in the model from all of the others. Table 4.14 displays the results.

Table 4.14: Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-.154	.258		-.597	.552		
Resource Allocation	.190	.066	.171	2.882	.005	.847	1.181
Stakeholder Participation	.076	.086	.064	.883	.380	.571	1.750
Management Commitment	.487	.103	.466	4.732	.000	.308	3.247
Digital Inclusion	.305	.086	.323	3.556	.001	.363	2.752

a. Dependent Variable: Sustainability of Water Projects

The findings established that resource allocation significantly influenced sustainability of water projects (β=0.171: p<0.05). This finding is consistent with the findings of Riziki, Atera, and Juma (2019) who concluded that community resource mobilization skills significantly influenced the sustainability of community water projects in Kenya, implying that community resource mobilization skills truly facilitate the efficient and effective operation of community water projects.

The findings established that stakeholder participation influence sustainability of water projects (β=0.064; p>0.05). This finding is consistent with the findings of Onziru and Kimutai (2022), who determine that stakeholder participation in location identification, determining the viability and feasibility of initiatives during the selection stage, and building projects in accordance with stakeholder policy are all important for sustainability. The report suggests that all projects done by the Kenyan government be developed in response to community needs or expectations; enhanced grassroots participation in deciding the site of water projects.

Thirdly, the results recognized that management commitment have a significant impact on sustainability of water projects (β=0.466; p<0.05). This conclusion coincides with Muendo and Nyang'au's (2023) finding that the amount of stakeholder participation in water projects was low, affecting the project's sustainability. Furthermore, the participation of stakeholders significantly improved the sustainability of rural community-based water projects. The water project has strengthened relationships between the local community and government or non-governmental organizations. There were inadequate technical skills to oversee the project, as well as human resources to ensure the initiative's long-term viability. The use of technology in the administration of water projects was relatively low, threatening the viability of water projects.

Finally, the results established that digital inclusion significantly influenced sustainability of water projects (β=0.323; p<0.05). This finding is consistent with that of Yator and Kwasira (2020), who determined in their study that technological variables had an immediate impact on the successful completion of water projects. As a result, the study suggests that county governments use technology in water accessibility among citizens because the cost of applying technologies to access water is minimal and will benefit the community.

4.4.6 Overall Model Equation

The following model equation was developed as follows:

$$\mathbf{Y= \beta_0+ \beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon}$$

$$\textbf{Sustainability of Water Project} = -0.154 + (0.171xResource\ Allocation) + (0.064xStakeholder\ Participation) + (0.466xManagementCommitment) + 0.323xDigitalInclusion)$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The emphasis of this section is to make a succinct statement of summary that captures the key findings of the study. The study sought to determine the influence of resource allocation, stakeholder participation, management commitment and digital inclusion on sustainability of water projects funded by Embu County government, Kenya.

5.2 Summary

5.2.1 Resource Allocation and Sustainability of Water Projects

Resource allocation is crucial to project management because it enables organizations to plan and get equipped to implement projects. In this current project, it was evident that majority of participants however disagreed that the adequate funds from Embu County government has improved service delivery of water projects. This shows that when funds are inadequate, water projects may suffer its ultimate completion. Therefore, budgeting, fund-raising, fund allocation, and fund-control need to receive more attention as part of the transition from managing projects.

Project auditing aids in locating reoccurring flaws and other repeated patterns in the primary projects, as well as project execution monitoring and control. According to the findings, it was observed that a section of the respondents disagreed that regular audits have improved reliability of water supply of the water projects funded by Embu County government. Given its ability to cut costs, time, and waste from a project or project management process, project auditing is crucial. As a result, a variety of methods are needed for the business case to be used effectively. According to the literature, many of the processes are rarely followed even when senior managers are aware of the requirement.

It is impossible to overstate the significance of scheduling in project management. Up to a huge proportion of the respondents disagreed that adequate time allocated for staff of water projects funded by Embu County government has improved service delivery. From the analysis, it emerged that efficient and effective allocation of project equipment lead to success in completion of the project.

Effective execution and streamlining of the fundamental strategic aspects are necessary to optimize firm performance. It was noted that majority of participants

agreed that physical material scheduling based on priorities has reduced costs incurred by beneficiaries to access services from the water projects funded by Embu County government. To ensure that all decisions on the allocation of resources are carefully considered and that there is a monitoring mechanism in place for all allocations, the management of the water services board must impose strict accountability standards on its employees. Additionally, this would guarantee that all decisions about resource allocation suit the organization's best interests.

5.2.2 Stakeholder Participation and Sustainability of Water Projects

Stakeholder participation is widely acknowledged as a critical factor for project sustainability. However, the findings in this study indicate that stakeholder participation has an insignificant statistical effect on the sustainability of water projects funded by the County Government of Embu. Despite this, qualitative insights from respondents highlighted the potential value of stakeholder engagement in enhancing project outcomes.

The results revealed mixed perspectives: while some respondents noted improvements in customer satisfaction and service delivery due to stakeholder participation through committees, others expressed scepticism about its tangible impact on sustainability metrics. Specifically, the quantitative analysis did not establish a strong correlation between stakeholder participation and the overall sustainability of water projects.

Key qualitative observations include: Compliance and Accountability: Stakeholders advocated for adherence to regulations, which has reportedly reduced the cost of water access and improved accountability mechanisms. Enhanced service delivery was also linked to the presence of participatory committees. Interactive Participation**:** Some respondents acknowledged that involvement in project planning and decision-making processes has strengthened the reliability of water supply.

While the study found that interactive participation contributes to aspects like capacity building and better oversight, these findings were more anecdotal than statistically significant. To address this gap, the study recommends a structured framework for stakeholder involvement, emphasizing their active role in project planning, design, implementation, financing, and management to potentially enhance sustainability outcomes.

The disconnect between the statistical insignificance of stakeholder participation and the perceived benefits underscores the need for more targeted strategies to maximize its impact. Future initiatives should focus on optimizing stakeholder roles in decision-making and governance to ensure that their involvement translates into measurable improvements in sustainability.

5.2.3 Management Commitment and Sustainability of Water Projects

Project management is thought to be founded on two pillars: employee development and customer satisfaction. The results showed that management commitment in water projects funded by Embu County government is demonstrated through staff training for improved service delivery. Similarly, the results indicated that availability of experienced staff has improved customer satisfaction of the water projects funded by Embu County government. This suggests that employees' performance will improve when they receive training on particular aspects of their job. Additionally, when employee performance is continuously supervised and assessed, these improvements are maintained.

Employee engagement is identified as the major contributor to harmony in the workplace. According to the findings, a section reported that existence of competent staff has enhanced service delivery of the water projects funded by Embu County government. Training quickens the pace at which customers receive services, improves the accuracy of standards, and boosts organizational effectiveness. Additionally, it boosts employee passion and motivates them to put up more effort. As a result, their competency rises, which boosts business efficiency and profitability.

Employee performance can be enhanced through reward strategies that can be adopted in a firm. The results of the current study revealed that competitive reward provided to staff of water projects funded by Embu County government has resulted to reliable water supply to beneficiaries. However, some participants disagreed that clear promotion opportunities have motivated staff working in water projects funded by Embu County government to improve service delivery. Giving employees flexibility in decision-making is referred to as ultra-vires, whereas implementing rewards/monetary incentive measures is seen as a cost burden.

Finally, employee development also focusses on their skills and attitudes. It was established that over half of respondents affirmed that the existence of competent staff

has enhanced service delivery of the water projects funded by Embu County government. All stakeholders should be informed, from planning to scaling up, by taking into account potential barriers and facilitators for the sustainability of digital project interventions.

5.2.4 Digital Inclusion and Sustainability of Water Projects

Digital inclusion aims to ensure all individuals in the company can participate in and gain from the digital economy. The results established that a section of respondents disagreed that digitalization has allowed information sharing for improved service delivery in water projects funded by Embu County government. Similarly, over half aver that application of data analytics has allowed water projects funded by Embu County government to ensure there is reliable water supply to beneficiaries. Cost is one barrier to digital inclusion for governments with smaller revenue.

Delivering high-quality products and services is the primary goal of project management. However, the current study found that section of respondents was not convinced that virtue teams' collaboration improved service delivery in water projects supported by the Embu County government. Similarly, some participants were sceptical that service delivery in water projects financed by the government of Embu County had improved because of virtual teams created through digital inclusion. Finally, some of participants agreed that digital inclusion has facilitated communication to improve service delivery of the water projects funded by Embu County

5.3 Conclusion

The study concludes that appropriate resources deployment during project management is critical in ensuring that project is completed with the quality that was intended. Similarly, stakeholder participation is fundamental factor during project development. Specifically, project management must involve all the stakeholders for successful implementation of the project. Thirdly, it was observed that management commitment and sustainability of water projects are intertwined together and hence staff training, competitive reward and career progression is critical in successful project performance. Finally, digital inclusion is important during project management because it enables personnel in information sharing, data analytics as well as communication.

5.4 Recommendation of the Study

The study recommends that:

Resource allocation is crucial to project management because it enables organizations to plan and get equipped to implement projects. In this regard, project management need to deploy the right equipment and resources for effective project execution.

Stakeholder participation is fundamental factor during project development. Therefore, project managers need to engage all stakeholders in project development.

Management commitment in water projects is demonstrated through staff training for improved service delivery. Therefore, employee development ought to be the primary focus of organizations' management. This enhances productivity and boosts organizations performance.

Cost is one barrier to digital inclusion for governments with smaller revenue. Therefore, for digital inclusion to be successful county governments ought to invest more on infrastructural development related to information technology.

5.5 Suggestions for Further Research

For future research, it would be valuable to explore different forms of stakeholder participation, as this study found no significant effect on sustainability. Additionally, examining how risk management strategies impact the sustainability of water projects could offer insights into mitigating potential project risks. Future studies could also focus on the role of digital inclusion in enhancing water project management, exploring how digital tools improve communication and operations. Longitudinal studies on water projects' long-term sustainability would help track ongoing success factors, while comparing projects across different regions could identify best practices for sustainable outcomes. Research on the impact of risk management competencies on organizational performance could be conducted. This is because risk management assists in the proactive identification and control of risks and weaknesses that could have a detrimental impact on the firm.

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APPENDICES

Appendix I: Research Questionnaire

Dear Respondent

Ref: Participation in a Research Study

I am a post graduate student at the Kenyatta University. I am currently undertaking a research study in partial requirement for the completion of a degree of Masters of Arts in Project Planning and Management. This is part of an exploratory study that will assess the influence of project management capabilities on sustainability of water projects funded by Embu County government, Kenya. Enclosed here is a copy of my research questionnaire which I kindly request you to take a little of your time to fill in. The purpose of this questionnaire is to collect data on project management capabilities and sustainability of water projects funded by Embu County government, Kenya. Rest assured that all responses to this questionnaire will be treated with utmost confidentiality. Responses will only be reported in grouped figures and percentages; no individual will be identified once all interviews are completed and the data have been processed. Thank you very much for your participation and enormous effort in helping in this study.

Yours sincerely

SECTION A: BACK GROUND INFORMATION

Kindly respond by way of ticking (x) across each of the questions provided below:

1. Kindly indicate your gender

Male ( ) Female ()

2. What is your highest level of education?

Certificate ( ) Diploma ( ) Degree ( ) Masters and above ( )

3. How long have you been a resident of Embu County?

Less than 3 years ( ) 4-7 years ( ) 5-8 years ( ) 9 years and above ( )

SECTION B: RESOURCE ALLOCATION

4. Below are several statements on resource allocation. Kindly indicate the extent of your agreement with each of these statements using a scale of 1-5, where 1-strongly disagree and 5-strongly agree.

Statements on Resource allocation	**1**	**2**	**3**	**4**	**5**
Adequate funds from the Embu County government have improved the service delivery of water projects					
Regular audits have improved the reliability of water supply from water projects funded by the Embu County government					
Adequate time allocated to the staff of water projects funded by the Embu County government has improved service delivery					
Physical material scheduling based on priorities has reduced costs incurred by beneficiaries to access services from the water projects funded by the Embu County government,					
Time resource scheduling has allowed staff working on water projects funded by the Embu County government to achieve customer satisfaction					

5. In what other ways does resource allocation affect the sustainability of water projects funded by the Embu County government, Kenya?

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SECTION C: STAKEHOLDER PARTICIPATION

6. Below are several statements on stakeholder participation. Kindly indicate the extent of your agreement with each of these statements using a scale of 1-5, where 1-strongly disagree and 5-strongly agree.

Statements on Stakeholder participation	**1**	**2**	**3**	**4**	**5**
Participation of stakeholders through committees has enhanced the service delivery of the water projects funded by the Embu County government					
Stakeholders of the water projects funded by the Embu County government advocate for compliance with regulations to minimize costs incurred by beneficiaries to access the water by beneficiaries					
Stakeholder participation in water projects funded by the Embu County government has improved accountability by enhancing service delivery					
Interactive participation of stakeholders in water projects funded by the Embu County government has led to an improvement in customer satisfaction					
Interactive participation has allowed stakeholders to take part in the planning of water projects funded by Embu County to ensure there is a reliable water supply to beneficiaries					

7. In what other ways does stakeholder participation affect the sustainability of water projects funded by the Embu County government, Kenya?

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SECTION D: MANAGEMENT COMMITMENT

8. Below are several statements on management commitment. Kindly indicate the extent of your agreement with each of these statements using a scale of 1-5, where 1-strongly disagree and 5-strongly agree.

Statements on Management Commitment	**1**	**2**	**3**	**4**	**5**
Management commitment to water projects funded by the Embu County government is demonstrated through staff training for improved service delivery					
Competitive reward provided to staff of water projects funded by the Embu County government has resulted in a reliable water supply to beneficiaries					
The existence of competent staff has enhanced service delivery of the water projects funded by the Embu County government					
The availability of experienced staff has improved customer satisfaction with the water projects funded by the Embu County government					
Clear promotion opportunities have motivated staff working in water projects funded by the Embu County government to improve service delivery					

9. In what other ways does management commitment affect the sustainability of water projects funded by the Embu County government, Kenya?

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SECTION E: DIGITAL INCLUSION

10. Below are several statements on digital inclusion. Kindly indicate the extent of your agreement with each of these statements using a scale of 1-5, where 1-strongly disagree and 5-strongly agree.

Statements on Digital inclusion	**1**	**2**	**3**	**4**	**5**
Digitalization has allowed information sharing for improved service delivery in water projects funded by the Embu County government					
The application of data analytics has allowed staff working on water projects funded by the Embu County government to ensure there is a reliable water supply to beneficiaries					
Digital inclusion has facilitated communication to improve service delivery of the water projects funded by Embu County					
Virtual teams resulting from digital inclusion have improved service delivery in water projects funded by the Embu County government					
Collaboration due to virtue teams has improved service delivery in water projects funded by the Embu County government					

11. In what other ways does digital inclusion affect the sustainability of water projects funded by the Embu County government, Kenya?

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SECTION F: SUSTAINABILITY OF WATER PROJECTS

12. Below are several statements on the Sustainability of water projects. Kindly indicate the extent of your agreement with each of these statements using a scale of 1-5, where 1-strongly disagree and 5-strongly agree.

Statements on the Sustainability of water projects	**1**	**2**	**3**	**4**	**5**
There is efficient service delivery among water projects funded by the Embu County government					
Customers are satisfied with services from the water projects funded by Embu County government h					
There reliable water supply from the water projects funded by the Embu County government					
The water projects funded by the Embu County government have reduced the costs incurred by beneficiaries to access water					

THANK YOU

Appendix II: Water Projects Funded by the County Government of Embu

1. Itabua-Muthatari Community Water Project
2. Rupingazi-Weru water project
3. Borehole project at New Site area in Kiambere
4. Gitinangugu Dam water project in Mavuria
5. Kangondo Dam water project in Kiambere
6. Kimuthia Water Supply in Runyenjes Sub-County

Appendix III: Research Approval Letter

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Dean, Graduate School

DATE: 25th September, 2023

TO: Martin Mbogo
C/o Management Science Dept.

REF: D53/EMB/PT/27429/2018

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting of 13th September, 2023 approved your Research Project Proposal for the M.B.A Degree Entitled, **"Project Management Capabilities and Sustainability of Water Projects Funded by Embu County Government, Kenya".**

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

ANNBELL MWANIKI
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Management Science Department.

Supervisors:

1. Dr. Josphat Kyalo
C/o Department of Management Science
Kenyatta University

Appendix IV: Research Authorization Letter

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: D53/ EMB/PT/27429/2018

DATE: 25th September, 2023

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MARTIN MBOGO – REG. NO. D53/EMB/PT/27429/2018

I write to introduce Mr. Martin Mbogo who is a Postgraduate Student of this University. He is registered for M.B.A degree programme in the Department of Management Science.

Mr. Mbogo intends to conduct research for a M.B.A Project Proposal entitled, "Project Management Capabilities and Sustainability of Water Projects Funded by Embu County Government, Kenya".

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

JL/nn

Appendix V: NACOSTI License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 254119

Date of Issue: 28/September/2023

RESEARCH LICENSE

This is to Certify that Mr.. Martin Gitonga Mbogo of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Embu on the topic: PROJECT MANAGEMENT CAPABILITIES AND SUSTAINABILITY OF WATER PROJECTS FUNDED BY EMBU COUNTY GOVERNMENT, KENYA for the period ending : 28/September/2024.

License No: NACOSTI/P/23/30104

254119

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditions