# COMMUNITY PARTICIPATION AND SUSTAINABILITY OF RURAL WATER PROJECTS: A CASE OF SIAYA-BONDO WATER PROJECT IN SIAYA COUNTY, KENYA

**BY**

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## DECLARATION

This research project report is my original work and has not been presented for award in any University.

Signed:

Date 10/18/2023

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This Research project report has been submitted for examination with my approval as the University supervisor.

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **ASAL** | Arid and Semi-arid lands |
| **BWR** | Basic Water Requirement |
| **DDS** | Diocesan Development Services |
| **GDI** | Governance Development International |
| **HDR** | Human Development Reports |
| **HRBA** | Human Rights Based Approach |
| **SDGs** | Sustainable Development goals |
| **MRPW** | Microfinance for Rural Piped Water services |
| **NGO** | Non- Governmental Organizations |
| **O&M** | Operation and Maintenance |
| **RWS** | Rural Water Supply |
| **SPSS** | Statistical Percentage for Social Sciences |
| **UNCED** | United Nations Conference on Environment and Development |
| **UNDF** | United Nations Development Fund |
| **UNICEF** | United Nations Children Fund |
| **USAID** | United States Agency on international Development |
| **VLOM** | Village Level Operation and Maintenance |
| **WEDS** | Water Engineering and Development Centre |
| **WHO** | World Health Organization |
| **WSP-AF** | Water Sanitation Program-African Region |
| **WWD** | World Water Development |

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## DEDICATION

This work is sincerely dedicated to all African women and children who walk long distances searching for clean water and live each day, hoping that tomorrow will be better.

## ABSTRACT

Beneficiaries are integrated into various project management cycle stages throughout the different phases. Despite Siaya County's situation, community participation doesn't guarantee sustainability. The purpose of the study was to investigate the impact of participatory needs assessment on sustainability, as well as to analyze how participatory planning affects sustainability, assess the impact of participatory implementation on sustainability, and examine the influence of participatory monitoring and evaluation on sustainability in rural water projects of Siaya-Bondo water projects in Siaya County, Kenya. Based on Community participation theory, the study was carried out. From a population of 250, a sample of 152 was chosen using a sample random sampling technique. Using questionnaires, interview schedules, and observation guides, data was collected and described quantitatively using mean scores, frequencies, and standard deviations. To test reliability, piloting was conducted on the questionnaire. Against mean score of 3.210 and standard deviation of 0.649, needs analysis saw a standard deviation of 0.619 and improved mean score to 4.071. Participatory needs analysis has a positive effect on sustainability. Compared to sustainability, participatory planning had a higher mean score (3.913) and standard deviation (0.786). The influence of participatory planning on sustainability has been established. Against a mean score of 3.210 and standard deviation of 0.649, participatory implementation had a mean score of 3.677 and standard deviation of 0.746. Through participatory implementation, sustainability was improved. Against a mean score of 3.210 by sustainability, which was 0.649 standard deviation, participatory monitoring and evaluation did better with 3.285 mean score composites and 0.646 standard deviation. Monitoring and evaluation have no effect on the long-term sustainability of Siaya-Bondo community water project in Siaya County, Kenya. Beneficiaries should be included in the following: needs assessment, planning, implementation, and participatory monitoring and evaluation of community projects.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Across the globe, a significant disparity exists in terms of the level of engagement and sustainability observed in rural water projects. Chambers (1997) asserts that the primary stakeholders, who are predominantly impoverished and directly impacted by the project, have limited involvement in major project preparations and selection, with outside stakeholders assuming a more prominent role in these processes. During the implementation phase, external professionals such as engineers, technicians, or donor organizations often ask local individuals to manage and maintain project schemes. However, these individuals are often not adequately trained or made aware of the necessary skills and knowledge required for sustainable operation, leading to project failure. According to Kumar (2002), participation plays a crucial role in ensuring the sustainability of development practices, particularly in rural water projects. As a result, it is imperative that project management prioritizes the inclusion of participation in these initiatives. Hence, it is imperative to take into account the involvement of the major beneficiaries of the project during the implementation phase and throughout the entire project management cycle (Tripathi, 2021).

The ongoing growth of the world population has led to an intensification of demands placed on water services. Chitonge (2015) posits that there is an anticipated doubling of global population growth by the year 2030. This projected increase is likely to exacerbate the challenges faced by nations with a significant proportion of their population living below the poverty threshold, such as Africa. According to this reasoning, global governments endeavour to engage communities in rural water projects with the aim of improving their overall quality of life. The community, being a main stakeholder, assumes a crucial role in determining the aims and priorities of water service efforts, so ensuring their appropriateness and relevance. Hence, it is imperative to ensure the involvement of all relevant parties in the process of developing projects, rather of solely focusing on the immediate recipients of the initiative (Jansz, 2011). In order to promote more involvement and long-term viability of rural initiatives, governments, particularly in Africa, often adopt a strategy of decentralizing the delivery of fundamental social

services such as healthcare, education, community water supply, and sewage systems (Dovi, 2007). Community members possess a keen understanding of the challenges they encounter and possess the necessary insight to effectively articulate their perceived demands across the various phases of project development.

## 1.2 Research Problem

Although stakeholder participation is crucial to the long-term success of water projects in Kenya, there is still work to be done to ensure their sustainability. Acknowledged for a considerable period of time, community development has been seen as a valuable undertaking by Nyandemo and Kongere (2010). Not fully appreciated is the importance of stakeholder participation in water sustainability initiatives. An absence of clear project development explanation could be contributed to an oversight in precision outlined by Laah et al., (2014). While the Kenyan government and community groups have been working to increase community engagement, more needs to be done to improve stakeholder involvement in water provision.

The lack of active participation from individuals in the Siaya-Bondo water project during the development process frequently results in a dearth of ownership and long-term viability of development endeavors. The lack of sufficient resources often leads to a decline in community engagement with projects, resulting in an increased reliance on government resources (Aupe, 2019). The presence of a significant gap raises a number of inquiries that remain unresolved in order to achieve the sustainability of projects through the facilitation of effective participation. These inquiries encompass stakeholder involvement in several stages such as project design, finance, execution, and monitoring/evaluation (Ochieng' & Sakwa, 2018).

As Kenya has a decentralized system of governance, improving local participation in planning and executing is critical. Examining the Siaya-Bondo Water Project in Siaya County, Kenya, the study looked at the degree to which communities are involved in such initiatives and their long-term viability.

### 1.3 Research Specific Objectives

The following specific objective guided the study;

i. To determine the influence of participatory needs assessment on the sustainability of the Siaya-Bondo water project in Siaya County, Kenya
ii. To assess how participatory planning influences the sustainability of the Siaya-Bondo water project in Siaya County, Kenya
iii. To establish the influence of participatory implementation on the sustainability of Siaya-Bondo water projects in Siaya County, Kenya
iv. To evaluate how participatory monitoring and evaluation influence the sustainability of the Siaya-Bondo water project in Siaya County, Kenya

#### 1.3.1 Research Questions

The research questions were:

i. How does participatory needs assessment influence the sustainability of the Siaya-Bondo water project in Siaya County, Kenya?
ii. How does participatory planning influence the sustainability of the Siaya-Bondo water project in Siaya County, Kenya?
iii. How does participatory implementation influence the sustainability of the Siaya-Bondo Water project in Siaya County, Kenya?
iv. How does participatory M&E influence the sustainability of the Siaya-Bondo water project in Siaya County, Kenya?

### 1.4 Value of the Study

The study held considerable importance for the Siaya County Government as it sought to establish effective engagement with water project institutions through the formulation of policies for the management of such projects. This study aims to provide insights into the prioritisation of water supply over investment in water and sanitation systems in developing economies, highlighting the significant economic and social advantages that result from such prioritisation. The degradation of water infrastructure systems

throughout the county will persist unless a significant increase in restoration efforts is undertaken.

This study aims to enhance stakeholder engagement in the processes of project financing, planning, and budgeting. Primary consumers of water include key stakeholders, such as farmers, who possess the ability to halt the water management process at any given time, particularly when they are excluded from the budgetary decision-making process. This study holds significance for politicians and academics alike, since policymakers can utilize the study's recommendations to construct a proficient framework for engaging community members in various projects. The researchers will utilize the results of the study to contribute to the existing body of empirical literature, thereby informing future studies. The project's stakeholders residing within the designated area of influence will also perceive the project as significant, since they will receive advice through recommendations on optimal methods of engagement to ensure the long-term viability of the project.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This chapter covers the literature review and theoretical review, which entails the applicable theories, the empirical review, the conceptual framework and the literature review summary.

## 2.2 Theoretical Review

The theory of community participation demonstrates the efficacy and pertinence of the engagement of local residents in various undertakings. While there has been significant global support for community involvement in projects, it is imperative to acknowledge the challenges associated with participatory development approaches. According to Hugo & Thompson (1995), the engagement of beneficiaries in the planning process poses significant challenges and incurs high costs. Additionally, the authors note that planners and policymakers frequently exhibit a tendency to selectively listen to information that aligns with their preconceived notions, disregarding more complex perspectives and testimony. The resolution of these difficulties pertaining to participation necessitates a comprehensive examination of participation from a wider vantage point, wherein the advantages and disadvantages are carefully evaluated. A fully participatory initiative would require a longer duration to achieve its objectives; nevertheless, the outcomes in terms of community empowerment would be substantial. According to Mgulo and Kamazima (2022), it is crucial for implementing agencies to recognize the significance of empowering individuals in order to foster their productivity as responsible members of society. They argue that social advantages have greater importance than physical benefits.

A theory refers to a systematic framework of explanations or principles developed to elucidate a collection of facts or phenomena, particularly one that has undergone rigorous testing or is widely accepted and may be employed to make predictions about natural phenomena. Speculations serve as systematic tools for the purpose of understanding, elucidating, and formulating predictions regarding a particular subject matter. A formal hypothesis possesses grammatical structure and holds significance when it is endowed

with a semantic component by applying it to various entities, such as the realities and connections found within the actual historical world as it unfolds. This study relied on the theoretical frameworks of the partner hypothesis and the modernization hypothesis as proposed by Mgulo and Kamazima (2022). This study will be based on the theoretical framework of Community Participation theory, as proposed by Bernstein (2011).

### 2.2.1 Community Participation (CP) Theory

The community must be involved in the delivery of water services under the demand-responsive model. Vohland and Barry (2009) developed this idea, and proponents claim it may be a practical alternative strategy for improving disadvantaged groups' access to water (Anderson, 2016). Thus, the community involvement theory incorporates the demand-responsive method as a viable substitute for guaranteeing the long-term profitability of water projects. Throughout the 1960s, especially in schemes that received funding from outside donors, the ideology of the Communist Party (CP) grew significantly throughout Africa. The idea that community involvement is a recent phenomenon is disputed, according to Alabaster (2010), since it was seen in pre-colonial Africa when locals worked together to carry out different local development activities. It has been noted that communities in Tanzania have worked together to complete a variety of tasks, including the building of roads, schools, and community health centers. These initiatives have been completed by using their own resources, including labour and materials (Njoh, 2011).

Similar events took place in Kenya during Jaramogi Oginga Odinga's leadership and during the presidency of the late Jomo Kenyatta. In this context, numerous communities popularized the Swahili word "harambee," which refers to the act of working together to accomplish developmental goals. This was done under the guise of encouraging a feeling of community engagement. The premise of the community engagement hypothesis is that both local and federal governments have failed miserably to properly manage community initiatives. Additionally, it emphasises the need of making the best use of scarce resources, such water and land, for the benefit of communities (Wisser et al., 2010). Particularly when used to include stakeholders in development projects for the water

services sector in Africa, collaborative planning (CP) has shown to be effective in achieving great project results.

### 2.2.2 The Theory of Resources Dependency

Previous scholars have advocated for the significance of inter-organizational power in relation to strategy and structure (Thompson, 1967). However, the theory of resource dependency introduced a comprehensive inventory of organizational reactions to interdependence, which may potentially contribute to empirical research. The fundamental notion can be succinctly encapsulated by guidance provided to senior executives: Select the gadget with the least restrictive nature for managing relationships with exchange partners, which will enable you to reduce uncertainty and reliance while maximizing your autonomy. The idea delineates a spectrum of approaches, ranging from those that impose minimal restrictions to those that impose the most stringent limitations. If the state of reliance arises as a result of relying only on a single supply, then the identification and sustenance of alternative sources emerges as a clear and straightforward solution.

There will be more constraints if new tactics need more communication and coordination with other parties. Joining a professional organisation or organisation is the simplest solution among these choices. Establishing an alliance or entering into a joint venture with the organisation imposing the limitation is one possible, though perhaps more restricted, course of action. When many organizations get together to coordinate their efforts and pool their resources in order to achieve a shared goal, they form an alliance (Yin & Davis, 2007). Joint R&D agreements, licensing and franchise pacts, shared manufacturing and marketing deals, minority investments, and stock swaps are just a few examples of the many possible structures for such partnerships.

Women's representation on corporate boards is consistent with the results predicted by resource dependence theory, according to research by Hillman et al. (2009). In particular, companies that face challenges with legitimacy, businesses that operate in sectors with a disproportionately large number of female employees, and organizations with ties to other organizations that feature a majority of women on their boards are more likely to

increase the number of women on their boards. Therefore, the constraints that organizations face are reflected in the composition of corporate boards, lending credence to the idea that boards are purposefully staffed to reduce risk. Instead of establishing assumptions about the bounds of human life, Resource-Dependency Theory (Gill & Picou, 1998; Oliver-Smith, 1996) lays emphasis on the investigation of cultural and economic links. Thus, indigenous subsistence-based knowledge provides a different kind of discourse. The scope of resource management issues is broadened when traditional cultural elements are included into the impact assessment framework. The resource-dependency hypothesis, in contrast to the discourse of competing scientific experts, recognizes the value of divergent epistemological perspectives as equal contributors to a mutually beneficial network of discourse (Borja-Vega et al., 2017).

Risks and exposures to cultural and economic resources are the focus of the theoretical framework of resource dependence theory. Resource dependence theory is expanded upon by looking at the economic and cultural relationships between communities that rely on renewable resources and the biophysical environment (Gill & Picou, 1998). Both economic security and quality of life are seriously jeopardized when resource contamination is present. Resource loss spirals pose a serious risk to those who make a living from the responsible harvesting of natural resources. Resource-dependency theory is a theoretical framework that expands the conversation about modern environmental degradation to include traditional ethnic knowledge and economic harvesters as important participants.

### 2.3 Sustainability of Rural Water Project

The issue of water project sustainability has garnered growing attention among scholars and development practitioners due to the escalating shortage of water resources and the persistent shortcomings observed in numerous water projects implemented in developing nations. The lack of robust local institutions is indicated by the alleged unsustainability of water projects, which hinders the creation of an enabling environment. The study posits that in order for water resource projects to achieve sustainability, the presence of a locally established institution is important to support efficient oversight and administration.

As per the World Commission on Environment and Development (WCED) in 1987, sustainable development refers to a transformative process that seeks to achieve a state of equilibrium in the utilisation of resources, the trajectory of technological advancement, the allocation of investments, and the evolution of institutions. This harmonious alignment aims to enhance the ability to meet the current and future aspirations and requirements of individuals. Sustainable development is a normative construct that encompasses criteria for evaluation and conduct to be upheld as the human collective and society endeavour to meet their requirements for survival and welfare.

## 2.4 Community Participation

On a global scale Community involvement is regarded as a social phenomenon in which distinct groups with common needs, typically residing within a certain geographic region, actively engage in the process of identifying their needs, making decisions, and establishing methods to address them (Laah et al., 2014). The provision of sufficient and appropriate infrastructure is an essential prerequisite for achieving quick economic development (Borja-Vega et al., 2017). The provision of essential amenities, such as water supply, waste management, sewage disposal, housing, and power, significantly impact the overall health, well-being, and overall quality of life of persons within a given society. The health status of rural populations is influenced by various factors, such as the quality of drinking water, the style of housing, environmental sanitation, personal cleanliness, dietary status, and levels of literacy.

The Siaya-Bondo Water Supply and Sanitation Project aims to provide water supply services to a population of 201,258 individuals and sanitation services to a population of 51,060 individuals by the year 2040. The origin of the information may be traced back to Sidindi Malanga, a locality located in Gem Constituency, which is within Siaya County. The implementation of the project was carried out by the Lake Victoria South Water Works Development Agency (LVSWWDA), with funding provided by the African Development Bank and the Government of Kenya. This initiative was part of the Small Towns Rural Water Supply and Sanitation Project, which incurred a total expenditure of Ksh 2.4 billion. The primary objective of the project is to provide services to the regions

of Yala, Siaya, Kogello, Bondo, and their surrounding areas. The project involved the restoration of the preexisting water infrastructure in Sidindi Malanga, as well as the implementation of novel water delivery systems and sanitation measures in Bondo and Siaya towns. The commencement of construction activities took place on the 2nd of November, 2013, with considerable completion being achieved in December of 2018. An additional aspect of the water supply project involved the provision and installation of five hydro turbines and two electric pumps. This also included the laying of a new DN450 raw water main, measuring 305 meters in length, beside the old main. Furthermore, the project encompassed the construction of a water treatment facility capable of processing 12,000 cubic meters per day, among other tasks.

Rural communities across the nation commonly demonstrate pronounced levels of poverty, inadequate health conditions, and limited access to education, mostly stemming from varied degrees of physical, social, and political isolation. Regrettably, these rural regions have historically endured neglect and insufficient attention from policymakers and authorities. Taiwo (2018) posits that the aforementioned neglect has resulted in a phenomenon known as rural-urban mobility, hence engendering challenges for both urban and rural regions. However, it is imperative that the current crisis be addressed promptly, as its continuation poses a significant threat to the progress of the nation. Hence, it is imperative to prioritize rural development as a means to ease the hardships faced by the predominant rural population across the globe. Anyanwu (2014) posits that since the earliest eras of human history and community formation, men have endeavored to enhance their lives by employing self-help as a means of reaching this objective. Within the framework of socio-economic challenges faced by undeveloped nations, the concept of self-reliance holds significance primarily in its implication of the necessity for the entire internal social structure to achieve self-sufficiency. This entails the pursuit of emancipation from external control and exploitation.

According to Apollo (2014), Western nations recognized that relying solely on the initiatives and resources of rural populations was insufficient. Nevertheless, the implementation of deliberate interventions by external entities, including local, national, and international organizations, will stimulate the establishment of equitable development

patterns. Water is often regarded as a natural endowment that holds significant importance within households due to its indispensable role in several essential activities such as drinking, cooking, cleaning, agricultural endeavours, and other related tasks. Consequently, it may be inferred that water holds significant importance inside all communities.

Schouten and Moriarty (2016) assert that a significant number of communities in Nigeria, particularly those residing in rural regions, are in dire need of access to sources of drinkable water. The individual additionally disclosed that a significant portion of rural communities rely on bodies of water such as streams, ponds, and rivers, which frequently serve as habitats for waterborne illnesses such as Guinea worm and river blindness. The aforementioned phenomenon has a detrimental impact on the well-being of those residing in rural areas, hence significantly impeding their capacity to engage in productive activities. Hence, it may be inferred that the provision of sufficient deep wells, pipe-borne water, or boreholes is vital for enhancing the socio-economic well-being of individuals residing in rural areas. The matter of infrastructure facilities is of significant interest to both Nigerians and citizens of other developing nations, since it directly impacts the potential for increasing agricultural output and other production activities. It is a well acknowledged truth that the assessment of development includes not only the conventional indicators of per capita income, but also other measures such as the one mentioned by Akinbile (2006).

Several Nigerian administrations have implemented multiple water initiatives in an effort to deter the phenomenon of rural-urban migration, which has resulted in a decline in the agricultural workforce. Given the paramount importance of ensuring the sustainability of project benefits in all development endeavors, it becomes imperative to evaluate the degree to which resources allocated to water projects can be deemed valuable based on their perceived sustainability. The reason for this disparity is attributed to the fact that the government is responsible for conceptualizing and formulating initiatives, whereas rural communities tend to generate a limited number of projects aimed at fulfilling their perceived requirements (Williams et al., 2012). These projects are undertaken by rural residents either alone or in partnership with governmental entities. The incorporation of

sustainability is an essential element in the execution of every project. The subject region lacks research on participation in water projects since the transition from a top-down to a bottom-up approach to development. On the contrary, water is an indispensable resource for humanity. The findings of this study will provide valuable insights for policymakers in formulating strategies to effectively implement sustainable initiatives. The achievement of sustainable rural development goals can be facilitated through the implementation of water projects that prioritise long-term viability.

### 2.4.1 Participatory Needs Assessment and Sustainability of Rural Water Project

A study conducted by Isham and Kahkonen (2001) examined the impact of participatory needs assessment on the sustainability of water projects in Indonesia, India, and Sri Lanka. The findings of this analysis revealed a positive correlation between increased community involvement and improved water supply. Additionally, the study highlighted that the implementation of well-designed community-based water services resulted in enhanced health outcomes. According to Krippendorff (2013), an examination of USAID initiatives revealed that the inclusion of participatory features enhanced the overall efficacy of the projects, particularly in terms of fostering collective action and capacity building.

The concept of community involvement and participation posits that by engaging in decision-making processes from the first stages of project design to implementation and eventual handover, communities can be empowered to effectively plan, manage, operate, and sustain their water facilities in the long run. Numerous projects have successfully attained a certain degree of community engagement in this undertaking. Nevertheless, within the realm of these endeavours, there are persistent issues pertaining to the concept of sustainability. Hence, it may be imperative to conduct a more comprehensive examination of the dynamics within the community in order to get insight into the individuals who embody various perspectives and the diverse features of role differentiation prevalent within a particular community. It may be imperative to inquire about the appropriate stakeholders, decision-making authorities, and the delineation of water-related responsibilities. As illustrated by a research conducted in Ghana, it was observed that communities with a higher proportion of female members in the Water,

Sanitation, and Hygiene (WASH) Committee had a greater likelihood of possessing a well-operating water supply system (Marks et al., 2014).

According to Whittington (2008), community management committees in numerous nations lack enough legal recognition. According to Brikke et al. (2003), individuals in question are susceptible to several challenges, including material, financial, contractual, and legal issues. These challenges ultimately hinder their ability to maintain and sustain services. Communities, though, exhibit variations in attitudes and capacities, hence precluding the generalization of any one region or country's communities to encompass all communities universally. Differences in poverty levels within communities play a significant role in determining their capacity to both request and afford various services. The presence of low literacy levels in rural areas of Kenya has the potential to damage the capacity of communities to sustain complex institutions. Additional issues, such as the availability and cost-effectiveness of spare parts, play a significant role in exacerbating the difficulties faced by communities in up keeping their facilities. The presence of low levels of literacy within a community also carries implications for the acquisition of appropriate skills necessary for the maintenance of equipment and facilities within said community or its surrounding area.

Successful water projects are highly valued for their sustainability by both direct and indirect beneficiaries. Ensuring complete community involvement in different initiatives remains an uphill battle even today in many developing nations like Kenya. The role that community engagement plays in ensuring long-term viability of water-related projects within Kwanza sub-county, Trans-Nzoia County was investigated in the study conducted by Achieno and Mwangangi (2018). In Kwanza Sub-county, Trans-Nzoia County the investigation applied an illustrative survey technique and aimed at a target group of 32,181 households. It was demonstrated by the results that numerous projects were ended early prior to finishing their fifth year due to a lack of adequate involvement from the community in all phases of the project such as conception, finance handling, execution and monitoring.

With the use of Sekaran's (2002) strategy for figuring out sample size, we reached an outcome of 380 houses as a part of our sampling. The houses were chosen through a method of random sampling. For this investigation, information was gathered using a questionnaire. Pilot testing for the questionnaire was done in thirty-eight households within the neighboring constituency of Kiminini. By ensuring experts scrutinized the polls, the examiner took steps to secure and boost their legitimacy. When calculating the precision of an instrument, we apply the split-half technique. The data was analyzed using both descriptive and inferential statistical techniques. The inferential evaluation resulted in Pearson's correlation coefficients, but frequencies, proportions, mean values and standard deviations were produced by the descriptive analysis. We used tables with values of frequencies and percentages to exhibit the discoveries.

The scientist carefully followed all ethical guidelines, including respecting subjects' privacy and making sure no damage was done while creating a pleasant environment, in order to get their informed permission. The long-term success of water projects is significantly positively correlated with the project development phases, as shown by the Spearman's rho (r) score of 0.761. A p-value from the statistical analysis of less than 0.001 adds further evidence to this relationship. A 95% confidence level (CL) increases the reliability of these outcomes. The correlation coefficient between project funding and sustainability in water projects, as measured by Spearman's rank ($r = 0.709$, p 0.000, CL = 95%), was shown to be considerably and strongly positive. The findings showed a weak but statistically significant positive correlation (Spearman's rho, $r = 0.373$, $p = 0.061$, CL=95%) between project execution and water project endurance. Spearman's Rho showed that project lifespan and monitoring/evaluation of water projects had a moderately good correlation ($r = 0.496$, $p = 0.010$ & CL = 95%). For better results, governments and other development organisations should take the initiative to allow people to participate more actively at every level of the process, from planning to financing to project implementation to project evaluation.

### 2.4.2 Participatory Planning and Sustainability of Rural Water Projects

According to Anderson and Ostrom (2018), the concept of participatory planning and sustainability serves as a means to an end, as it facilitates an empowerment process

whereby project beneficiaries assume responsibility for devising, executing, and upholding actions that promote long-term project sustainability. The pursuit of personal growth can be regarded as an intrinsic objective, encompassing a process of acquiring aptitudes, information, and practical understanding in order to assume increased accountability for one's own advancement. According to Banerjee and Morella (2011), the success of participatory techniques is heavily reliant on the active participation and cooperation of individuals involved. The absence of specific participatory methods involving individuals has been a contributing factor to the stagnation or failure of numerous development efforts.

There will inevitably be times when poor project management will threaten the project's success. According to Alabaster (2010), the success and longevity of community efforts are heavily dependent on cultural factors. Losses connected with projects that may turn out to be unproductive or failed ventures may be greatly reduced if the alignment between a project and the cultural norms and preferences of the local people is determined early on. It is important to include community members in project management from the beginning (by forming local committees) and all the way through completion (Alabaster, 2010). If this is not achieved, the external donors' development interventions may not be able to sustain the required level of development activity if the cash or help from donor agencies is removed. As a result, including relevant parties is prioritised. Chitonge (2015) argues that for the government or the financial institution to allow for stakeholder participation and empowerment, they must first give up some of their power, authority, and control over the process. People's capacity to monitor and regulate local processes improves as their autonomy increases.

The approach thereby amplifies the level of irritation that could potentially be associated with a particular facet of the development project. The author argues that the process of participatory planning and sustainability involves the identification of the project's requirements. This step involves individuals engaging in the process of determining their perceived needs and subsequently prioritizing them. When stakeholders are actively involved in this process, there is a higher likelihood that they will take ownership of the process and subsequently manage it in an effective manner. During this phase,

stakeholders engage in the process of identifying and prioritising the fundamental issues, as well as their underlying causes and subsequent impacts (Nyandemo & Kongere, 2010). After the identification of the problem, parties engage in thorough discussions before reaching a consensus. Following a thorough and objective examination, a potential solution is formulated by establishing a cause-effect link, which subsequently initiates the planning process.

### 2.3.3 Participatory M&E and Sustainability of Rural Water Projects

To determine if it might enhance the long-term sustainability of rural water systems, PM&E was analyzed in the Nuu Division of Mwingi East District. Determining correlations, the indicators of the two variables were examined. The success of rural living is, above all else, influenced by three key factors: demographics, infrastructure, and local climate. Key to the research was understanding the connections between PM&E and sustained rural water initiatives. In this analysis, some of the indicators used for PM&E were participation in planning, accountability, learning, target setting, and adaptability. Alternative measures of sustainability in rural water projects are based on system dependability, human development, institution capacity, cost sharing, and unit costs. By means of descriptive survey research, this study was conducted. As per Gleick (2013), quantitative and qualitative data gathering were needed.

In the first stage, water facilities in the Nuu Division were selected using a proportionate sampling method. This technique of sampling was used to create statistically significant clusters of water treatment plants with comparable features. The second step included selecting water users using a simple sample procedure at the water distribution hub. The project sustainability and the predictor variable are positively correlated, according to the regression analysis. With the exception of action-oriented learning, all independent variables showed modest, positive, and statistically significant Pearson's Correlation Coefficients when tested for correlation. According to the coefficient of determination, even the best case scenario for project management and evaluation (PM&E) has only a 50% effect on the sustainability of rural water projects. Kativhu et al. (2018) estimate that numerous confounding factors account for around half of the contribution. Appropriate incentives, adequate skills and resources, protocols for operating and maintaining water

systems, effective inter-organizational links, and suitable technology are all examples of such aspects.

A single criterion could be incorporated into programmatic design along with providing the right incentives, enough skills and resources, the right processes for operating and maintaining water systems, effective organizational relationships, and suitable technology, according to study recommendations. It is crucial to inform residents in rural areas about the legal framework governing women's participation in positions of public leadership. A model has been created to make it easier to include these issues within the context of rural water delivery. Our knowledge of action-oriented learning in the context of sustainability will be advanced by a thorough investigation that includes other techniques and instruments, which is what is suggested for future research. The definition of a shareholder is often up for debate. An intriguing research subject would be to look at the best procedures for documenting both good and bad learning events. It is feasible to research how participatory monitoring and assessment influences the viability of rural water projects. For this investigation, information from clients' residences could be required. In addition to the advantages of action-oriented learning, the findings of this study demonstrate a strong relationship between the predictor factors and the dependent variables (Kativhu et al., 2018).

The Tanzanian government is looking for help to complete national water projects and guarantee that 90% of the population has access to safe drinking water by 2025. Participatory monitoring and evaluation (PM&E), which is essential to the success of community-based water projects, is still in its infancy, despite the fact that many of these programmes fail to achieve their stated goals. In order to gather information for his investigation of the effectiveness of Participatory Monitoring and Evaluation (PM&E) in accomplishing the goals of community-based water projects, Kabote (2020) used a sequential exploratory research approach. A random selection of 120 consumers of water resources in government and non-governmental organisation (NGOs) funded projects was made. It was found that women made up 53.3% of the sample's water consumers. Focus group discussions (FGDs) and key informant interviews were used to collect the qualitative data. Descriptive statistics were collected using the SPSS statistical software.

The Kruskal-Wallis H test was used to assess the median differences across the projects, and the qualitative data underwent content analysis. With the exception of capacity development, the majority of participants (51.7%) believed that community-based water activities had successfully achieved their goals. Adesida and Okunlola (2015) state that as compared to government-sponsored efforts, programmes backed by NGOs have shown much higher levels of success.

In addition, it has been shown that the goals of water projects may be efficiently achieved via the application of Participatory Monitoring and Evaluation (PM&E). At the 0.05 level of significance, there is a significant difference in opinions between the low, medium, and high levels of PM&E's efficacy. With regards to NGOs' assistance for water projects, the majority of respondents rated a high degree of effectiveness. With the exception of capacity development, the paper concludes that PM&E achieved the goals of the projects. Therefore, it is recommended that more be done to strengthen community capacity so that community-based water projects may be managed effectively. The policy issue calls for intensive work over the whole project lifecycle (Keeble et al., 2003). Examining how community involvement affects the sustainability of rural water projects is the focus of this descriptive research study. Siaya County, Kenya, and its Siaya-Bondo water project are the specific targets of this research.

### 2.4.4 Participatory implementation and sustainability of rural water projects

In Mulala Division, Makueni County, Ochelle (2012) conducted study on the factors influencing the sustainability and participatory execution of water projects. The study discovered that the degree of community involvement throughout the whole process—including the conception, design, execution, operation, and maintenance of the water project—has a major impact on the long-term viability of communal water efforts. This influences the level of local support for water infrastructure projects. The local community must be included at every step of a project's lifetime (Gicheru, 2012). According to Oakley and Marsden (2007), project success depends on a community participation strategy in project management. Using this strategy, community members take personal responsibility for their well-being and contribute significantly to the project.

In the subject of development, community involvement is a dynamic process that gives individuals who stand to gain from initiatives a voice in determining their course and seeing them through to completion. When a community takes ownership of a project, it implies that its members are responsible for its success before, during, and beyond the project's designated lifetime. A participatory method was used in Mulwa's (2004) study to explore and evaluate the many factors that have an influence on the implementation and sustainability of rural water projects. 250 individuals who participated in one of the five water schemes and profited from it were examined. One of the main aims of the study, according to Bell and Morse (2013), was to ascertain if and how participatory implementation affects the long-term viability of water distribution systems.

The study's conclusions suggest that implementing community management is crucial for guaranteeing project ownership and security, and thus, project sustainability. Any water initiatives must thus carefully analyze and handle this aspect. Tafara (2013) studied the community of Mtito Andei in Kenya's Kibwezi Sub-County to determine the elements that impact the viability of community-based water projects there. The results show that the application of participatory methodologies has a major impact on the long-term effectiveness of rural community-based water projects. Technical know-how, resource management, establishing a reliable monitoring and evaluation system, business acumen, strong leadership, accurate project scheduling and budgeting, risk assessment and management, and prior experience in related endeavors were all found to be essential for the success of implementation. Project monitoring is a crucial management discipline that ensures that work is finished on schedule and according to plan. The monitoring and evaluation process should include input from the beneficiaries, who should also have a role in the metrics that will be used to measure success. Evaluations are beneficial management tools for pinpointing issue areas and developing remediation plans. Ochelle's (2012) study in Mulala Division of Makueni County intended to identify the elements that influence the longevity of community water projects. The study revealed that managers of water projects need to spend more time establishing precise goals and putting in place comprehensive methods for monitoring development.

The study's findings indicate that a lot of the community's water projects failed as a consequence of poor design and implementation. In order to guarantee the projects' long-term performance, the study advises include skilled locals in the monitoring and supervision of technical employees throughout project execution. Gatari et al.'s (2016) study set out to ascertain how participatory implementation practices influenced the long-term viability of water projects in Rwanda's Muhanga District. Participatory measures were found to be crucial in maintaining the sustainability of the water projects, including project monitoring and assessment, the creation of capable project teams, and the development of efficient communication systems (Beyne, 2012).

Adesida and Okunlola (2015) used community engagement and project sustainability to examine the feasibility of rural water projects in Vihiga County. The present research examines the topic at hand with rigorous methodological consideration. The sample size for the research, which used a descriptive survey approach, was 163 individuals. The participants were chosen at random from 15 different community water centers, totaling 85 people. We employed questionnaires with closed-ended questions for this investigation. The reliability and validity of the instruments were evaluated using the findings of the pilot research. For both a descriptive and an inferential analysis of the data, SPSS version 21 of the Statistical Package for the Social Sciences (SPSS) was employed. The results were then presented using several statistical metrics, including frequency, percentage, mean, standard deviation, and Pearson Product Moment Coefficients (PPMC). We discovered a clear positive relationship between community participation, participatory implementation, and long-term sustainability when analyzing data from rural community-based water initiatives. The use of technology and the provision of post-implementation support, however, were only sporadic predictors of the long-term viability of water projects in rural areas. This work contributes fresh and valuable information to the existing body of knowledge, methodologies, and problem-solving strategies. Any water project that is built must include the locals in the stages of identification, planning, execution, and closure. Kativhu et al. (2018) recommend holding cooperative discussions on developing procedures for safeguarding water infrastructure and resolving disputes as well as regular stakeholder participation meetings,

empowerment workshops for local residents, and trainings for water management committees.

## 2.5 Conceptual Frameworks

**Independent variable**

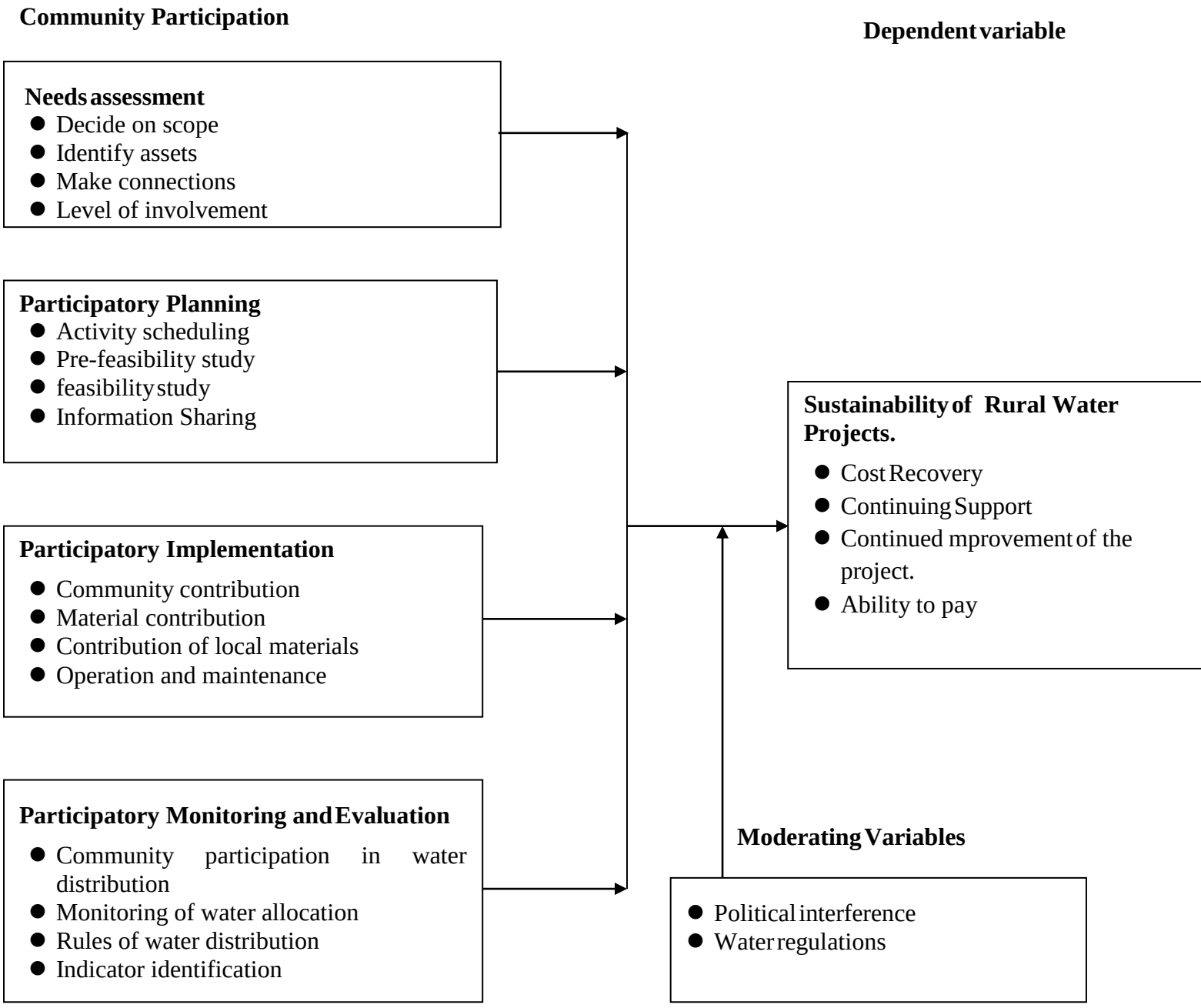


**Figure 2.1: Conceptual Framework**

Participatory needs assessment was measured by deciding on scope, identifying assets, making connections and level of involvement. Participatory planning was measured through activity scheduling, pre-feasibility study, feasibility study and information sharing. Participatory implementation was measured by community contribution, material contribution, the contribution of local materials and operations and maintenance. Participatory monitoring and evaluation were measured by monitoring water allocation, water distribution rules, and indicator identification. Therefore, the sustainability of community water projects was the dependent variable measured through cost recovery, continuing support, continued project improvement, and the ability to pay.

## 2.6 Summary of the Literature Review

The primary subjects of the literature review in this chapter, which is based on contemporary secondary sources, are the research variables, theoretical reviews, and conceptual framework that underpin the study. Several academics claim that the literature under consideration has significantly emphasized the advantages of community engagement and community project management methods. Some of the project management techniques that have been identified include financial management, community organization and planning, leadership, community members' commitment to sustain their projects through contributions to operations and maintenance, the presence of technically competent water operators, and effective leadership. The paucity of sustainable projects may be due to inadequate usage of pertinent approaches, claim the study's authors (Basu et al., 2021).

Community engagement encompasses the capacity and inclination of communities to assume ownership, exert influence, and decide the character of a project throughout its existence in order to guarantee long-lasting effects. The literature review on community engagement has uncovered a number of indicators, including community participation in decision-making, community contribution, representation, responsibility, social concerns, and informed choice. It has also been shown that most developing nations still need to increase community engagement in water project initiatives, particularly in rural regions. Enhancing technical capability may be accomplished by creating specialist training and

educational programmes for project managers, people of the community, and the whole project team. The inquiry also uncovered many evaluation techniques for sustainability studies, together with their advantages and disadvantages. Achieno and Mwangangi (2018) found that there are few studies that have been done locally that examine the assessment and sustainability of community water projects after they have been implemented.

Research on the sustainability of water projects has shown, according to Ngetich's (2009) study, that the majority of these projects need good performance in order to achieve long-term profitability. Further investigation on the impact of project site on the sustainability of water projects was therefore advised. Beyene (2012) found that the majority of water projects saw a decline in performance quickly after getting no more outside money. The author suggested doing more study into the factors influencing the viability of comparable programmes in rural areas of other African countries in order to generalize the findings. Additionally, Chukwuma (2016) emphasized the need of additional research in this area.

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1 Introduction

The research technique employed in this study is delineated. The selected methodology for this study is a quantitative research strategy, specifically utilizing a descriptive survey research design. The research technique encompasses several key components, including the research design, the targeted demographic, the sample size, and the sampling method employed. Furthermore, this study includes an examination of data collection instruments, as well as an assessment of their validity and reliability. In addition, this study encompasses several components such as instrument piloting, data collection processes, data analysis techniques, operationalization of study variables, and ethical issues.

## 3.2 Research Design

According to Kothari and Garg (2019), the study design includes the conceptual framework, which directs research and serves as a road map for gathering, measuring, and analyzing data. According to Sileyew's (2019) results, the research design makes use of a tried-and-true framework for obtaining and analysing data, which successfully strikes a compromise between the data's alignment with the study's goals and the effectiveness of the processes used. A descriptive survey research approach was used for this investigation. A survey is intended to collect information from a population in respect to one or more criteria, according to Mugenda & Mugenda (2012). The proposed technique is often recognised as the most successful one for social scientists and educators looking to gather first-hand information in order to describe a population that is too large to be directly examined. Thus, it was determined that the chosen research methodology was appropriate for the study because it aimed to accurately portray the characteristics of the target population and because the target population was large enough to allow for the investigation of community involvement and the sustainability of rural water projects. The Siaya-Bondo Water Project, which is located in Kenya's Siaya County, is the subject of the current research.

### 3.3 Population

According to Mugenda & Mugenda (2003), the population in a research study refers to the collective of individuals, events, or organizations that a researcher focuses on. The study aimed to target a population of 250 beneficiaries who were involved in five water projects located in Siaya County. Based on a report pertaining to Siaya County in the year 2020. There exist a total of five water supply projects. The Siaya-Bondo water project was chosen as the focus of this study from a selection of five projects, mostly due to the significant level of community participation. The beneficiaries of the projects within the entire area exhibit a collective adherence to shared beliefs and values, which in turn influence their operational and managerial approaches towards their own water projects. The majority of individuals hailing from Siaya County encounter similar challenges pertaining to inadequate water supply and absence of potable water. The primary factor contributing to this phenomenon is the imperative for increased sustainability in water supply initiatives. Hence, the researchers opted to select this specific target group as a result of the water project challenges encountered in Siaya County.

### 3.4 Sample Design

The sampling methodology delineates the dimensions of the sample size for the research, together with the identification of the sampling unit, sampling frame, and the procedures employed for sampling. The term "sampling frame" pertains to a comprehensive roster of all units within a population, from which the sample was selected. As stated by Rukayya (2016), an optimal sample is one that meets the requirements for efficacy, representativeness, reliability, and flexibility. The Siaya-Bondo Water Project of 2018 was chosen as the subject of investigation. The study utilized a sample size of 152 participants, which was drawn from a target population consisting of 250 individuals.

#### 3.4.1 Sampling Procedure

The identification of the sample was accomplished by the utilization of the following procedures. The utilization of the stratified sampling approach was justified due to the homogeneity of the population being studied, specifically consisting of a single ethnic group (Moreo, 1996). The chosen methodology was deemed appropriate due to its ability to yield more accurate estimations and provide an equitable opportunity for all projects to

be selected. Subsequently, the researcher employed a straightforward random sample technique to ascertain the individuals from the community who would be interviewed.

**Table 3.1: Sampling Design**

| Constituency | Target Population | The proportion of community members in the population | Sample size |
|---|---|---|---|
| Alego Usonga | 101 | 0.404 | 61 |
| Gem | 55 | 0.22 | 34 |
| Bondo | 78 | 0.312 | 47 |
| Rarienda | 16 | 0.064 | 10 |
| **Total** | **250** | **1.000** | **152** |

The total persons were involved on the basis on which judgment was made. Siaya -Bondo Water Project 2020 was chosen from the total projects from Alego Usonga 61, Gem Constituency 34, Bondo Consistency 47 and Rarienda 10. The researcher used Krejcie-Morgan- sample size table in April 2016 to get a sample size 152.

### 3.5 Data Collection

A questionnaire is a research instrument including a set of inquiries and supplementary prompts employed to gather data from participants (Mugenda & Mugenda, 2012). Questionnaires were deemed appropriate tools for the study due to their ability to efficiently and expeditiously contact a large number of respondents. Given the implementation of the drop and collected later methodology in the study, participants were afforded ample time to respond to the inquiries without experiencing any sudden increase in pressure. The utilization of questionnaires provided a sense of confidentiality since participants were not obligated to disclose their identities on the survey instrument. The questions were partitioned into two distinct portions. Section A provided both personal and general information. On the other hand, Section B aimed to explore the ethical considerations associated with the research, as evidenced by the content of the questionnaires. The study employed data gathering instruments including questionnaires, interview schedules, and observation guides.

### 3.6 Data Analysis

In this section how data was analyzed is explained.

### 3.6.1 Diagnostic Tests

The pilot study involved a sample size of 16 participants who were selected from Siaya County. However, it is important to note that these respondents were sourced from a water project other than the Siaya-Bondo community water project. The purpose of this study was to assess the validity and reliability of the instruments employed in the data collection procedure. The rationale for conducting pre-testing was to enhance the precision and suitability of the research design and apparatus. According to Saunders et al. (2009), the significance of field guiding cannot be overstated. It is inevitable to encounter certain queries that are misunderstood or interpreted differently by individuals, as well as situations where uncertainty arises regarding the next steps to be taken, and inquiries that ultimately do not provide useful information. According to Cooper and Schindler (2010), the primary purpose of conducting a pilot test is to identify any flaws in the design and implementation of a study, as well as to serve as a means of collecting preliminary data for a probability sample. According to Sekaran (2002), pilot tests play a crucial role in assessing the reliability of instruments and the validity of a study.

### 3.6.2 Validity of the Instrument

The purpose of the piloting procedure was to evaluate the reliability and validity of the study's instruments. The purpose of the piloting phase was to evaluate the final instruments' usability and clarity before they were used for the actual data collection. Prior to the start of data collection, pre-testing was done to look for any possible defects or restrictions in the study equipment. The researchers did a thorough analysis of the body of knowledge on content validation studies and provided reliable statistical information drawn from studies that used the instrument and were published. This made it easier to judge if the instrument was suitable for the research. In order to assess the instrument's suitability and clarity, the researcher also asked the supervisor for their opinion. Following consultation, the researchers reviewed the survey review tools that were provided and made the required changes to the research instrument by either removing certain questions or altering them in response to the comments made. A supervisor was utilized by the researcher to evaluate the document's legitimacy.

Implementing randomization, which successfully accounted for the possible effects of auxiliary factors, further guaranteed the validity of the investigation. By using a random selection procedure, items from the target population were used to create the final sample. Because randomization is effective at ensuring that the sample chosen is representative of the target population, its use was considered suitable. The procedure of having the research instrument's content evaluated by professionals and peers further proved the validity of the tool. The questionnaire questions were improved as a result of this review to better fit the study's objectives. The surveys underwent a thorough examination procedure by two Project administrators who were chosen using a random sample technique in order to assure the objectivity of the content. The administrators were responsible with assessing the poll's announcements for their relevance, significance, absence of animosity, and clarity.

### 3.6.3 Reliability of the instrument

The researcher used the split-half method in this study to evaluate the validity of the research instrument. The objects were divided into two parts by classifying them according to their odd and even appearances. The correlation between the true halves of the questionnaire was then calculated using the individual's product-moment coefficient of correlation (r). Therefore, the capacity to consistently replicate outcomes may be thought of as dependability. Cronbach's alpha was used to assess the reliability of the questionnaire. To assess a measure's overall dependability, the analysis of variance method was used. Cronbach's alpha is described by Saunders et al. (2009) as a statistical tool for evaluating the internal consistency of replies across a set of questions or scale items that are intended to collectively evaluate a certain construct or scale. The indicator has an alpha coefficient with a range of 0 to 1. Values of 0.7 or above show that the scale's questions are likely to accurately evaluate the desired information.

### 3.6.3 Data Collection Procedures

Kothari and Garg (2019) assert that the data gathering technique encompasses a delineation of the sequential steps and requisite actions for the efficient execution of research. After successfully developing and presenting the study proposal to the panel of

assessors at the University of Nairobi, the necessary research permit was subsequently sought from The National Council of Science and Technology. This permit granted the ability to commence data collection for the research project. The researcher obtained the necessary permit and thereafter presented it to the pertinent stakeholders in order to gather the required research data. With the necessary authorization, the researcher commenced the process of data collecting by enlisting the assistance of research assistants and afterwards preparing for the study project. In the study, the researcher employed an interview schedule and observation guide as data collection instruments.

### 3.7 Operationalization of the Variables

Based on the conceptual framework of the study, which is shown in Table 3.2, the operationalization of the variables is discussed. The table shows the study's independent factors. Needs assessment, Planning, implementation, Monitoring and Evaluation.

**Table 3.2: Operationalization of Variables**

| Variable | Nature | Indicator | Measurement |
|---|---|---|---|
| Needs assessment | Independent | • Decision on the scope.<br>• Identify assets<br>• Make connections<br>• Level of involvement data. | Ordinal scale |
| Planning | Independent | • Activity scheduling<br>• Pre-feasibility study<br>• Feasibility study<br>• Information Sharing | Ordinal scale |
| Implementation | Independent | • Community contribution<br>• Material contribution<br>• Contribution of local materials<br>• Operations and maintenance | Ordinal scale |
| Monitoring and Evaluation | Independent | • Community Participation in Water Distribution Making<br>• Monitoring of water allocation<br>• Rules of water distributions<br>• Indicator identification | Ordinal scale |

### 3.8. Ethical Considerations

In his work, Resnik (2011) enumerates several justifications for researchers to uphold ethical principles. Norms play a crucial role in facilitating research aims, which encompass the advancement of knowledge, the commitment to refrain from falsifying or misrepresenting study findings, the promotion of truth, and the avoidance of errors. This is due to the fact that conducting research typically necessitates substantial collaboration and coordination among individuals from many disciplines and institutions. Ethical norms serve to foster a climate of trust, promote individual and collective responsibility, ensure accountability, cultivate mutual respect, and uphold principles of justice. Numerous ethical principles in the realm of research, such as regulations pertaining to interpersonal associations, copyright and patent protocols, data dissemination requirements, and peer evaluation processes, serve the purpose of safeguarding intellectual property rights while fostering collaborative endeavors. Ethical norms serve the dual purpose of ensuring researcher accountability and influencing public opinion.

The level of support and financial backing for research is often influenced by individuals' inclination, which is shaped by their belief in the quality and integrity of the research. Furthermore, numerous study norms uphold various criteria pertaining to the research's significance in relation to moral and social values. These include but are not limited to human rights, social responsibility, adherence to legal regulations, and considerations for health and safety. Ethical transgressions in research might provide adverse consequences for several stakeholders, encompassing human and animal subjects, students, and the general public. William M.K (2006) identified several ethical considerations, namely informed consent, secrecy, and anonymity. Due to the significant relevance of ethical considerations across multiple domains, the researcher refrained from appropriating the work of others, ensuring that any incorporated material is duly acknowledged through proper quotation and citation. This study adhered to the principles of copyright and patenting, ensuring that all relevant components were duly acknowledged and respected. Furthermore, stringent measures were taken to prevent any instances of copying.

During the duration of the research project, the identities of the participants were kept anonymous, and strict measures were taken to ensure the confidentiality of any collected data, preventing its disclosure to any unauthorized individuals. The researcher implemented measures to assure the comprehensive protection of human subjects, guaranteeing that the study methodology was devoid of any potential harm, cruelty, or coercion. Furthermore, the researcher fulfilled their commitment to communicate the study results with all participants as initially promised.

# CHAPTER FOUR: DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

## 4.1 Introduction

This chapter presents the study findings which have been divided into thematic areas according to the study objectives. The themes include; Sustainability of rural Water Projects, Participatory Needs Analysis, participatory Planning, Participatory Implementation and Participatory Monitoring and Evaluation.

## 4.2 Questionnaire Return Rate

From a target population of 250 beneficiaries of the Siaya-Bondo Rural water projects dispersed across the Alego-Usonga, Gem, Bondo, and Rarieda sub-counties of Siaya County, Kenya, questionnaires were distributed to a sample of 152 respondents at random. 144 of the 152 questionnaires that were provided were filled out and returned. Table 4.1 displays the distribution of questionnaires and the accompanying % return rate.

**Table 4.1: Questionnaire Return Rate**

| S/No. | Name of Constituency | Number of questionnaires completed | Percentage rate of return per constituency |
|---|---|---|---|
| 1. | Alego Usonga | 59 | 98.33 |
| 2. | Gem | 28 | 93.33 |
| 3. | Bondo | 47 | 92.16 |
| 4. | Rarienda | 10 | 90.91 |
| **Total** | | **144** | **93.68** |

Table 3 presents the distribution of questionnaire return rate among project beneficiaries in the water projects throughout the four constituencies. In the region of Alego Usonga, the total number of occurrences was recorded as 59, which accounts for 98.33% of the total. Similarly, in the region of Gem, there were 28 occurrences, representing 93.33% of the total. The Bondo region saw a voter turnout of 47 individuals, representing a percentage of 92.16%. Similarly, the Rarieda constituency witnessed a participation rate of 10 individuals, accounting for 90.91% of the eligible voters. The response rate for the disseminated questionnaires was 144, which corresponds to a percentage of 93.69%. The study's realised questionnaire return rate closely aligned with the findings of Adeneji

(2011), who reported a return rate of 94% in his study on participative management of project execution through direct labour. The present study's findings above the threshold suggested by Nachmias and Nachmias (2005), who proposed that a return rate of 75% in social science research is sufficiently high to provide dependable analysis for generalization. The acquired questionnaire return rate of 93.68% in the study suggests that it was sufficiently high to yield reliable statistical data for generalizing the impact of community engagement on the sustainability of the Siaya Bondo water project in Siaya County, Kenya.

### 4.3 General information about Respondents

In this part, we analysed the information that respondents supplied on rural water projects in their districts. Understanding the effect of these variables on the influence of community engagement on the sustainability of water projects in Siaya County, Kenya, required this data.

#### 4.3.1 Distribution of Respondents by water project per Constituency

To establish whether or not respondents who provided the data for analysis were normally distributed, across the water projects in all the sub-counties, they were asked to indicate the constituency their water project was located. This information was important because the water projects were spread across five sub-counties in Siaya County, Kenya and no single water project was preferred for the study during sampling. The distribution of respondents in the water projects across the sub-counties is as shown in table 4.2

**Table 4.2: Distribution of Respondents in projects per Constituency**

| S/No | Name of sub-county | Frequency | Percentage of responses |
|---|---|---|---|
| 1. | Alego Usonga | 59 | 40.97 |
| 2. | Gem | 28 | 19.44 |
| 3. | Bondo | 47 | 32.65 |
| 4. | Rarienda | 10 | 6.944 |
| **Total** | | **144** | **100** |

From Bondo, there were 47(32.65%) of the 144 respondents. Accordingly, the frequency distribution of respondents in the sample size determined the percentages of those in each

water scheme. According to Ndou (2012), while examining beneficiary participation in agricultural development projects in South Africa, it was discovered that a sample size distributed based on the proportion of subjects within the population yielded results that were consistent with the proportion of respondents across the various water projects in the four sub-counties. A statistically significant and representative sample was used to draw conclusions about the impact of community engagement on the long-term success of water initiatives in Siaya County, Kenya.

### 4.3.2 Distribution of Respondents by Gender

This section sought to determine the gender of the respondents in order to determine the distribution of males and females in the study. The selection of the respondents was based on the registered project beneficiaries and therefore no gender was preferred to another. Understanding the gender distribution was important because it helped to create understanding on how it determined sustainability of Siaya-Bondo water projects in Siaya County Kenya. The distribution of respondents by gender is shown in table 4.3.

**Table 4.3: Distribution of Respondents by Gender**

| Gender | Frequency | Percentage |
|---|---|---|
| Males | 78 | 54.17 |
| Females | 66 | 45.83 |
| Total | 144 | 100 |

Of the total sample size of 144, 54.14 percent were males and 45.83 percent were females, as determined by the study's results. According to the statistics, men respondents somewhat outnumber female respondents. This indicates that men were overrepresented among those who participated in the water projects. However, the findings of this study contradict the results obtained by Van der Berg (2013) in his research conducted in South Africa, where a distribution of 71% females and 29.0% males was seen. Despite this, however Marks, Komives and Davis (2014) in Ghana found a distribution of 61.0% females to 39.0% males. This means that cases of more females than male project beneficiaries also exist is water projects. In Siaya-Bondo water projects, there were

more males than females because of their involvement in operations and maintenance activities of the water infrastructure as one project beneficiary stated;

*"Here Males control access to land and most of the resources therein. Water being a critical resource for our livelihood, it is only obvious that the presence of males as heads of households dominate."*

Observation revealed that decision making processes in the water projects across the four sub-counties was male dominated when head count confirmed that in the majority of homes, the males represented the households in the water project related matters. This means that sustainability of Siaya-Bondo water project depend more on the males through their involvement in decision making.

### 4.3.3 Distribution of Respondents by Age Group

Participants were asked to self-identify by year of birth. Although age was not a factor in determining who would be interviewed, it was nonetheless significant because beneficiaries' level of involvement in the water project was contingent on their ability to make and contribute to important decisions as they got older. Table 4.4 displays the breakdown of responders by age range.

**Table 4.4: Distribution of Respondents by Age Group**

| Age group | Frequency | Percentage |
|---|---|---|
| 21-25 | 8 | 5.56 |
| 26-30 | 7 | 4.86 |
| 31-35 | 20 | 13.89 |
| 36-40 | 23 | 15.97 |
| 41-45 | 22 | 15.28 |
| 46-50 | 18 | 12.5 |
| 51-55 | 23 | 15.97 |
| >55 | 23 | 15.97 |
| Total | 144 | 100 |

Results indicated that out of 144 respondents who participated in the study, 8(5.56%) were between 21-25 years, 7(4.86%) were between 26-30 years, 20(13.89%) were between 31-35 years, 23(15.97%) were between 36-40 years, 22(15.28 %.) were between

41-45 years,18(12.50 %.) were between 46-50 years, 23(15.97%) were between 51-55 years and 23(15.97%) were above 55 years. The distribution shows that majority of respondents 98(68.06% were below 50 years of age compared to those above 50 years of age who constituted 46(31.94%). The mean age for the water beneficiaries in the Siaya-Bondo water project was 42.74 years implying that the distribution was skewed towards beneficiaries below 50 years. This finding agrees with findings in a study by Langat, Oduor and Chepkwony (2021) which established that distribution of respondents' ages in water projects in Narok, Kenya had 70% respondents below 50 years while those above 51 years of age were 30% with a mean age of 43.29 years. Similarly, findings by Marks, Komives and Davis (2014) in a similar project showed that a sample 200 respondents produced a mean age of 43 years. This means that most rural based water projects have beneficiaries whose mean age is skewed towards 40s.

However, Van der Berg (2013) while studying smallholder irrigation project in South Africa established that respondents' age was skewed towards the elderly above 51 years' age with a mean of 61.33 years. Since the older project beneficiaries' ability to effectively undertake communal manual work, it means that in Siaya-Bondo water projects majority on project beneficiaries participated in the project as one member stated;

> *"….the majority of project beneficiaries participate in operations and maintenance work which is largely physical in nature……."*

This observation explains why more males than females were involvement in Siaya-Bondo water project. This means that reliance on the female beneficiaries in project activities may not guarantee sustainability of in Siaya-Bondo water project in Siaya County, Kenya.

### 4.3.4 Distribution of Respondents by level of Education

The responders were prompted to list their greatest degree of schooling. Because project planning and execution need conceptual skills, their degree of schooling was crucial.

Basic education, primary, secondary, middle level college, and university education were the several categories for educational attainment. Table 4.5 displays the distribution of respondents according to educational attainment.

**Table 4.5: Distribution of respondents by Level of Education**

| Level of education | Frequency | Percentage |
|---|---|---|
| No basic education | 3 | 2.08 |
| Primary | 24 | 16.67 |
| Secondary | 78 | 54.17 |
| Tertiary education | 29 | 20.14 |
| University | 10 | 6.94 |
| **Total** | **144** | **100** |

Results showed that out of 144 respondents in the study, 3(2.08%) had no basic education, 24 (16.67%) had attained only Primary education, 78 (54.17%) had attained Secondary education, 29 (20.14%) had attained Middle level college education while 10(6.94 %) had attained University education. The distribution showed a near normal mesokutic distribution with about half of respondents indicating that they had attained secondary education. This result is consistent with what Oduor (2018) found in a research, which showed that the distribution of respondents by educational attainment in smallholder irrigation projects in Busia County, Kenya, was normally distributed. Both studies revealed that the majority of respondents had at least a secondary education, making them qualified to take part in project planning and the creation of water usage regulations, both of which are essential for the sustainability of community water projects.

Interviews showed that respondents with tertiary and some with secondary education had higher conceptual and analytical skills that is critical for participatory monitoring and evaluation of planned activities. This observation concurred with what Alam *et* al. (2013) established when he showed that project beneficiaries with higher education were more involved in project work than those without formal education; the consequence of which is that the higher the education the project beneficiaries the more sustainable a project is likely to be. This result suggests a probable link between the conceptual abilities of project beneficiaries and their level of involvement in the project, as well as the sustainability of water projects. As a result, the sustainability of the Siaya-

Bondo water projects in Siaya County, Kenya, is influenced by the amount of community engagement, which in turn is influenced by their level of education.

### 4.3.5 Distribution of Respondents' years of participation in the water project

Respondents were asked to indicate the length of time in years they had benefited from Siaya-Bondo water distribution. This information was important to the study because the number of years of individual member participation had a bearing on beneficiary contribution to sustainability of Siaya-Bondo water project. In addition, the number of years of water distribution by beneficiaries can be used to gauge their involvement through payment of water tariffs. Distribution of respondents' years of participation in water project is shown on table 4.6.

**Table 4.6: Distribution of Respondents' years of participation in the water project.**

| Years of involvement in the water project | Frequency | Percentage |
|---|---|---|
| ≤2.9 | 62 | 43.1 |
| 3.0-5.0 | 37 | 25.69 |
| 6.0-8.9 | 18 | 12.5 |
| ≥9.0 | 27 | 18.75 |
| **Total** | **144** | **100** |

Results indicated that out of 144 respondents who participated in the study 62(43.1%) had less than 2.9 years of water distribution experience in the project, 37(25.69%), had between 3.0-5.9 years of water distribution experience, 18(12.5%) had between 6.0-8.9 years of experience and 27(18.75%) had more than 9 years of water distribution experience. The distribution of the years the respondents had participated in the water project was skewed toward less than 5 years of water distribution experience. This means that majority of project beneficiaries had been active members of the project for a period less than 5 years.

This finding was confirmed through interviews when one project beneficiary contented that;

> *".....the number of years of water distribution has a bearing on sustainability of the water project because not*

*until more members joined the community water project that water tariffs collected covered all our operations and maintenance expenses costs."*

Document analysis based on GIZ/KfW (2016) feasibility study report for the Nzoia River Multipurpose water project for Kakamega, Bungoma and Siaya Counties recommend that Internal Rate of Return for the project is seven (7) years. This means that a water project needs up to 7 year of water distribution in order to break even and realize returns on investment. These finding are however at variance with a study by Langat, Oduor and Chepkwony (2021) in which they showed that Water Projects in Narok County realized internal rate of return in a period of less than 5 years. This means that some projects attain sustainability in a shorter period.

### 4.4.1 Sustainability of Rural Water Projects

The sustainability of the Siaya-Bondorural water project is examined in this part via an examination of descriptive data. This research looks at how community involvement influences the sustainability of water projects in Siaya-Bondo. The magnitude of this impact was determined by considering 20 distinct elements. The researchers in this study set out to determine how community involvement affects the sustainability of water projects in Siaya County, Kenya over the long run. After doing the analysis, the results were shown in Table 4.7.

**Table 4.7: Sustainability of Rural water project**

| No | Item | n | SA | A | N | D | SD | Mean score | Std. dev. |
|---|---|---|---|---|---|---|---|---|---|
| **5a1** | Meeting water demands | **144** | 30 (20.83%) | 33 (22.92%) | 47 (32.64%) | 22 (15.28%) | 12 (8.33%) | 3.265 | 0.551 |
| **5a2** | Continuous water flow | **144** | 28 (19.44%) | 31 (21.53%) | 30 (20.83%) | 36 (25.00%) | 16 (11.11%) | 2.590 | 0.532 |
| **5a3** | Fee-based distribution | **144** | 38 (26.39%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 10 (6.94%) | 4.515 | 0.462 |
| **5a4** | Affordable charges | **144** | 44 (30.56%) | 36 (25.00%) | 30 (20.83%) | 30 (12.50%) | *16 (11.11%)* | *4.355* | 0.503 |
| **3a5** | Covers operational costs | **144** | 33 (22.92%) | 33 (22.92%) | 45 (31.25%) | 23 (15.97%) | 10 (6.95%) | 3.437 | 0.486 |
| **Cost Recovery** | | **144** | **35 (24.31%)** | **33 (22.92** | **38 (26.38%)** | **26 (18.06%)** | **12 (8.33%)** | **3.632** | **0.507** |
| **5b1** | Good infrastructure | 144 | 13 (9.03%) | 34 23.61%) | 28 (19.44%) | 33 22.92%) | 35 (24.31%) | 2.627 | 0.502 |
| **5b2** | Timely repairs | 144 | 24 (16.67%) | 30 (20.83%) | 31 (21.53%) | 38 (26.39%) | 21 (14.58%) | 2.448 | 0.433 |
| **5b3** | Routine maintenance | 144 | 29 | 36 | 28 | 35 | 16 | 2.690 | 0.571 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | (20.14%) | (25.00%) | (19.44%) | (24.31%) | (11.11%) | | |
| **5b4** | 144 | 34 | 35 | 44 | 22 | 9 | 3.481 | 0.875 |
| Trained staff | | (23.61%) | (24.31%) | (30.56%) | (15.28%) | (6.25%) | | |
| **5b5** | 144 | 34 | 32 | 46 | 23 | 7 | 2.366 | 0.980 |
| Satisfactory operation | | (23.61%) | (22.22%) | (31.94%) | (15.97%) | (4.86%) | | |
| **Continuing support** | **144** | **14** | **35** | **44** | **37** | **14** | **2.722** | **0.672** |
| | | **(9.72%)** | **(24.31%)** | **(30.56%)** | **(25.69%)** | **(9.72%)** | | |
| **5c1** | 144 | 31 | 32 | 44 | 25 | 12 | 3.582 | 0.906 |
| Timely salaries | | (21.53%) | (22.22%) | (30.56%) | (17.36%) | (8.33%) | | |
| **5c2** | 144 | 30 | 33 | 45 | 23 | 13 | 3.429 | 0.838 |
| Electricity expenses | | (20.83%) | (22.92%) | (31.25%) | (15.97%) | (9.03%) | | |
| **5c3** | 144 | 24 | 30 | 34 | 38 | 18 | 2.433 | 0.811 |
| Treatment chemicals | | (16.67%) | (20.83%) | (23.61%) | (26.39%) | (12.50%) | | |
| **5c4** | 144 | 23 | 29 | 34 | 39 | 19 | 3.440 | 0.814 |
| Licenses and tariffs | | (15.97%) | (20.14%) | (23.61%) | (27.08%) | (13.19%) | | |
| **5c5** | 144 | 30 | 32 | 44 | 25 | 13 | 3.593 | 0.780 |
| Community payments | | (20.83%) | (22.22%) | (30.56%) | (17.36%) | (9.03%) | | |
| **Continued improvement of the project** | **144** | **30** | **33** | **47** | **22** | **12** | **3.295** | **0.830** |
| | | **(20.83%)** | **(22.92%)** | **(32.64%)** | **(15.28%)** | **(8.33%)** | | |
| **5d1** | 144 | 44 | 40 | 20 | 21 | 19 | 4.838 | 0.527 |
| Mandatory payments | | (30.56%) | (27.78%) | (13.89%) | (14.58%) | (13.19%) | | |
| **5d2** | 144 | 45 | 47 | 21 | 20 | 11 | 4.811 | 0.562 |
| Payment dependence | | (31.25%) | (32.64%) | (14.58%) | (13.89%) | (7.64%) | | |
| **5d3** | 144 | 35 | 34 | 45 | 20 | 10 | 3.814 | 0.722 |
| Community willingness | | (24.31%) | (23.61%) | (31.25%) | (13.89%) | (6.94%) | | |
| **5d4** | 144 | 12 | 35 | 44 | 37 | 16 | 2.780 | 0.525 |
| Regular payments | | (8.33%) | (24.31%) | (30.56%) | (25.69%) | (11.11%) | | |
| **5d5** | 144 | 30 | 33 | 49 | 22 | 10 | 3.216 | 0.593 |
| Voluntary payment | | (20.83%) | (22.92%) | (34.03%) | (15.28%) | (6.94%) | | |
| **Ability to pay** | **144** | **40** | **34** | **45** | **15** | **10** | **3.892** | **0.586** |
| | | **(27.78%)** | **(23.61%)** | **(31.25%)** | **(10.42%)** | **(6.94%)** | | |
| **Composite for sustainability of water projects** | **144** | **45** | **34** | **44** | **25** | **11** | **3.210** | **0.649** |
| | | **(31.25%)** | **(23.61%)** | **(30.56%)** | **(17.36%)** | **(7.64%)** | | |

Table 9 reveals that 144 people answered questions on the water project's feasibility. Assessing whether the project has the infrastructure to meet the increasing water needs was item 5a1. A mean score of 3.265 with a standard deviation of 0.551 was obtained from the answer, which showed that 30 (20.83%) highly agreed, 33 (22.92%) agreed, 47 (32.64%) were neutral, 22 (15.28%) disagreed, and 12 (8.33%) severely disagreed. The aforementioned response indicates that participants had reservations about the project's decision to include steps aimed at curbing the increasing demand for water. The purpose of item 5a2 was to evaluate the project's effectiveness in ensuring a steady and continuous supply of water. A mean score of 2.590 and a standard deviation of 0.532 were obtained from the replies, which showed that 28 (19.44%) highly agreed, 31 (21.53%) agreed, 30 (2083%) were neutral, 36 (25.00%) disagreed, and 16 (11.11%) severely disagreed. The project's capacity to consistently provide a steady supply of water on a regular basis did not sit well with the responders.

The purpose of item 5a3 was to ascertain whether water costs were reasonable. The findings indicated that, of the respondents, 44 (30.56%) strongly agreed, 36 (25.00%) agreed, 30 (20.83%) were neutral, 30 (20.83%) disagreed, and 16 (11.11%) disagreed significantly. This resulted in a mean score of 4.3.55 with a standard deviation of 0.503. This indicates that most respondents thought water was reasonably priced. Item 5a4 investigated whether imposed fees compensated for operating expenses and 33 (22.92%) strongly agreed. A mean score of 3.437 with a standard deviation of 0.486 was obtained from 33(22.92%) who agreed, 45(31.25%) who were indifferent, 23(15.97%) who disagreed, and 10(6.95%) who disagreed severely. This indicates that the respondents were unsure about the affordability of the water rates. The mean score for cost recovery was 3.632, with a standard deviation of 0.507. This indicates that cost recovery was seen as successful by all respondents.

The purpose of item 5b1 was to assess the overall state of the water distribution infrastructure. The results indicated that, of the respondents, 13 (9.03%) strongly agreed, 34 (23.61%) agreed, 28 (19.44%) disagreed, and 35 (24.31%) strongly disagreed. These results yielded a mean score of 2.627 and a standard deviation of 0.502. This suggests that the respondents were unsure about the state of the water distribution system. Question 5b2 asked if timely repairs were made, and 24 (16.67%) highly agreed. There were 20.83 percent who agreed, 21.53 percent who were indecisive, 38.39 percent who disagreed, and 21.58 percent who strongly disagreed, yielding a mean score of 2.448 with a standard deviation of 0.433. This suggests that a majority of respondents did not agree that repairs were made on time.

The purpose of item 5b3 was to determine if regular maintenance was carried out. The findings indicated that, with a mean score of 3.481 and a standard deviation of 0.875, 29(20.14%) strongly agreed, 36(25.00%) agreed, 28(19.44%) were unsure, 35(24.31% disagreed, and 16(11.11%) severely disagreed. This indicates that they were unsure about the efficacy of regular maintenance. With a mean score of 3.481 and a standard deviation of 0.890, the responses to item 5b5, which asked if project workers had received satisfactory training, were as follows: 34 (23.61%) strongly agreed, 35 (24.31%) agreed, 44 (30.56%) were uncertain, 22 (15.28%) disagreed, and 9 (6.25%) severely disagreed.

This suggests that they were unsure about the satisfactory training of the project crew. The mean score for continuing support was 2.722, with a 0.67 standard deviation. This indicates that it was unclear whether the ongoing assistance was ineffective.

In answer to the question in item 5c1 about whether project staff members were paid on time, 31 respondents (21.53%) highly agreed, 32 agreed (22.22%), 44 (30.56%) were unsure, 25 disagreed (17.36%), and 12 severely disagreed (8.33%). This resulted in a mean score of 3.582 and a standard deviation of 0.906. This indicated that they were unsure about whether employees were paid on time. With a mean score of 3.429 and a standard deviation of 0.838, the respondents to item 5c2, which asked if the project incurred electrical expenditures, were 30 (20.83%) who highly agreed, 33 (22.92%) who agreed, 45 (31.25%) who were unsure, 23 (15.97%) who disagreed, and 13 (9.03%) who severely disagreed. This indicated that they were unsure whether the project included any electrical costs. Item 5c3 looked to see whether the water that was provided had undergone chemical treatment. A mean score of 3.440 and a standard deviation of 0.811 were obtained, with 24 (16.67%) highly agreeing, 30 (20.83%) agreeing, 34 (23.61) unsure, 39 (27.08%) disagreeing, and 19 (13.19%) severely disagreeing. This suggests that they were unsure whether the water was chemically treated or not.

With a mean score of 3.440 and a standard deviation of 0.814, the results of item 5c4, which attempted to determine whether water licences and tariffs were incurred by the project, showed that 23 (15.97%) strongly agreed, 29 (20.14%) agreed, 34 (23.61%) were undecided, 39 (27.08%) disagreed, and 19 (13.19%) strongly disagreed. This indicated that they were not clear whether the project had to pay for water licences and prices. The purpose of item 5c5 was to determine the effectiveness of community payment for water services. The findings indicated that, with a mean score of 3.593 and a standard deviation of 0.780, 30(20.83%) highly agreed, 32(22.22%) agreed, 44(30.56%) unsure, 25(17.36%) disagreed, and 13(9.03%) severely disagreed. This indicated that they were unsure about the efficacy of community funding for water services. The project's continuous improvement received a mean score of 3.295 with a standard deviation of 0.83. This suggests that it was unclear whether the project was still being improved.

With a mean score of 4.838 and a standard deviation of 0.527, the responses to item 5d1, which asked if the project required water payment, were as follows: 44(30.56%) strongly agreed, 40(27.78%) agreed, 20(13.89%) were unsure, 21(14.58%) disagreed, and 19(13.19%) severely disagreed. This indicated that they were in full agreement that the project required water payments. With a mean score of 4.811 and a standard deviation of 0.562, the respondents to item 5d2 (which asked if the project was reliant on water payment) were 45 (30.56%) highly agreeing, 47 (32.64%) agreeing, 21 (14.58%) unsure, 20 (13.89%) disagreeing, and 11 (7.64%) severely disagreeing. This indicated that they were in agreement that the project required payment for water. Item 5d3 asked whether the community was prepared to pay for water; with a mean score of 3.8 and a standard deviation of 0.722, 35(24.31%) highly agreed, 34(23.61%) agreed, 45(31.25%) unsure, 20(13.89%) disagreed, and 11(7.64%) severely disagreed. This indicates that they both felt that the community was prepared to pay for water.

A mean score of 2.780 and a standard deviation of 0.593 were obtained for item 5d4, which evaluated whether regular payment for water used was provided. Of the respondents, 12 (8.33%) strongly disagreed, 35 (24.31%) agreed, 44 (30.56%) were unsure, 37 (25.69%) disagreed, and 16 (11.11%) severely disagreed. This indicated that most people were unsure about whether regular payment for the water consumed was received. Thirty (20.83%) highly agreed, thirty (22.92%) agreed, forty-nine (34.03%) were unsure, twenty-two (15.28%) disagreed, and ten (6.94%) strongly disagreed with the assessment of whether or not water payment was voluntary (item 5d5). This resulted in a mean score of 3.216 and a standard deviation of 0.593. This indicated that they were unsure about the voluntary nature of the water payment. With a mean score of 3.892 and a standard deviation of 0.586, capacity to pay overall indicated that project beneficiaries could afford water. The water project's overall sustainability score was 3.210, with a 0.69 standard deviation. This suggests that it wasn't clear if the community water project was going to be viable.

### 4.4.2 Participatory Needs Analysis and Sustainability of Rural Water Projects

This section looks at how participatory needs assessment affected the sustainability of the Siaya-Bondo community water project using descriptive statistics. Using a set of twenty

items, the effect of participatory requirements assessment on the sustainability of water projects was investigated. The Siaya-Bondo community water project's sustainability was examined, and the results are shown in Table 4.8.

**Table 4.8: Participatory Needs Assessment and Sustainability of Rural water project**

| No | Item | SA | SA | A | N | D | SD | Mean score | Std. dev. |
|---|---|---|---|---|---|---|---|---|---|
| **6a1** | Stakeholders informed: | 144 | 35 (24.31%) | 36 (25.00%) | 28 (19.44%) | 30 (20.83%) | 15 (10.42%) | 3.458 | 0.724 |
| **6a2** | Project info made public | 144 | 35 (24.31%) | 35 (24.31%) | 29 (20.14%) | 29 (20.14%) | 16 (11.11%) | 3.452 | 0.990 |
| **6a3** | Beneficiaries' meetings | 144 | 36 (25.00%) | 35 (24.31%) | 29 (20.14%) | 29 (20.14%) | 16 (11.11%) | 3.474 | 0.493 |
| **6a4** | Size determined collaboratively | 144 | 41 (28.47%) | 35 (24.31%) | 24 (16.67%) | 29 (20.14%) | 15 (10.42%) | 3.791 | 0.627 |
| **6a5** | Stakeholders informed | 144 | 39 (27.08%) | 40 (27.78%) | 26 (18.06%) | 26 (18.06%) | 13 (9.03%) | 3.672 | 0.704 |
| **Decision on the scope** | | **144** | **37 (25.69%)** | **36 (25.00%)** | **27 (18.45%)** | **29 (20.14%)** | **15 (10.42%)** | **3.600** | **0.703** |
| **6b1** | Community attends meetings | 144 | 35 (24.31%) | 36 (25.00%) | 28 (19.44%) | 30 (20.83%) | 15 (10.42%) | 3.492 | 0.861 |
| **6b2** | Beneficiaries influence assets | 144 | 34 (23.61%) | 35 (24.31%) | 27 (18.75%) | 30 (20.83%) | 15 (10.42%) | 3.456 | 0.866 |
| **6b3** | Community controls investments | 144 | 35 (24.31%) | 36 (25.00%) | 29 (20.14%) | 28 (20.14%) | 17 (11.81%) | 3.406 | 0.829 |
| **6b4** | Committee reflects wishes | 144 | 37 (25.69%) | 38 (26.39%) | 27 (18.75%) | 27 (18.75%) | 15 (10.42%) | 3. 567 | 0.943 |
| **6b5** | Beneficiaries consulted on actions | 144 | 29 (20.14%) | 30 (20.83%) | 40 (27.78%) | 26 (18.06%) | 19 (13.19%) | 3.448 | 0.838 |
| **Identify assets** | | **144** | **34 (23.61%)** | **35 (24.31%)** | **31 (21.53%)** | **28 (19.44%)** | **16 (11.11%)** | **3.451** | **0.867** |
| **6c1** | Informed about project | 144 | 35 (24.31%) | 37 (25.69%) | 44 (30.56%) | 19 (13.19%) | 9 (6.25%) | 4.634 | 0.831 |
| **6c2** | Participated in planning | 144 | 33 (22.92%) | 35 (24.31%) | 39 (27.78%) | 20 (13.89%) | 16 (11.115%) | 4.2840 | 0.618 |
| **6c3** | Influence on initiation | 144 | 38 (26.39%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 10 (6.94%) | 4.440 | 0.573 |
| **6c4** | Satisfactory participation | 144 | 34 (23.61%) | 35 (24.31%) | 44 (30.56%) | 22 (15.28%) | 9 (6.25%) | 4.478 | 0.850 |
| **6c5** | Beneficiary-approved decisions | 144 | 38 (26.39%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 10 (6.94%) | 4.440 | 0.538 |
| **Project initiation** | | **144** | **36 (25.00%)** | **36 (25.00%)** | **41 (28.47%)** | **20 (13.89%)** | **11 (7.64%)** | **4.439** | **0.682** |
| **6d1** | Project team's ownership | 144 | 29 (20.14%) | 36 (25.00%) | 28 (19.44%) | 35 (24.31%) | 16 (11.11%) | 2.634 | 0.519 |
| **6d2** | Community involved early | 144 | 33 (22.92%) | 35 (24.31%) | 39 (27.78%) | 20 (13.89%) | 16 (11.115%) | 4.280 | 0.324 |
| **6d3** | Community's input in meetings | 144 | 39 (27.03%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 9 (6.25%) | 4.522 | 0.629 |
| **6d4** | Consultation in study | 144 | 38 (26.39%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 10 (6.94%) | 4.440 | 0.838 |
| **6d5** | Satisfaction with | 144 | 34 | 35 | 44 | 22 | 9 | 4.478 | 0.785 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| involvement | | (23.61%) | (24.31%) | (30.56%) | (15.28%) | (6.25%) | | |
| **Level of involvement** | **144** | **35** | **36** | **38** | **23** | **12** | **4.071** | **0.619** |
| | | **(24.31%)** | **(25.00%)** | **(26.39%)** | **(15.92%)** | **(8.33%)** | | |
| **Composite for needs assessment** | | **36** | **36** | **35** | **25** | **12** | **3.890** | **0.718** |
| | | **(25.00%)** | **(25.00%)** | **(24.31%)** | **(24.31%)** | **(8.33%)** | | |

Table 10 shows that 144 respondents took part in the questions about. Item 6a1 sought to assess whether stakeholders were informed about the community water project and results showed that 35(24.31%) strongly agreed, 36(25.00%) agreed, 28(19.44%) were neutral, 30(20.83%) disagreed while 15(10.42%) strongly disagreed stakeholders were informed about the community water project. In answer to the question on item 6a2—whether project information was made public—35(24.31%) highly agreed, 35(24.31%) agreed, 29(20.14%) disagreed, and 16(11.11%) strongly disagreed. This resulted in a mean score of 3.452 with a standard deviation of 0.990. Thus, the majority of respondents were in agreement about whether project information was disclosed to the public. In order to ascertain if beneficiaries took part in meetings, item 6ac was completed. The findings, which had a mean score of 3.474 and a standard deviation of 0.627, revealed that 36(25.00%) strongly agreed, 35(24.31%) agreed, 29(20.14%) disagreed, and 16(11.11%) severely disagreed. This suggested that most respondents were in agreement that beneficiaries attended meetings.

In order to assess whether the project site was decided upon collaboratively, item 6a4 was used. The results indicated that 41 respondents (28.47%) strongly agreed, 35 agreed (24.31%), 24 were undecided, 29920.14%) disagreed, and 15 strongly disagreed. This resulted in a mean score of 3.791 with a standard deviation of 0.627. This suggests that the majority of respondents agreed that the project location was chosen via collaboration. Item 6a5 sought to determine whether stakeholders were informed about the project plans and the results showed that 39(27.08%) strongly agreed, 40(27.78%) agreed, 26(18.06%) were neutral, 26(18.06%) disagreed while 13(9.03%) strongly disagreed. With a mean score of 3.600 and a standard deviation of 0.703, the water project's scope decision was made via participation in the process.

The purpose of item 6b1 was to ascertain if the community routinely attended meetings. The findings, with a mean score of 3.492 and a standard deviation of 0.861, revealed that 35(24.31%) strongly agreed, 36(25.00%) agreed, 28(19.44%) were neutral, 30(20.83%)

disagreed, and 15(10.42%) severely disagreed. This suggested that most respondents believed that the community routinely attended meetings. The purpose of item 6b2 was to determine whether beneficiaries had an impact on the project assets. The findings indicated that, with a mean score of 3.436 and a standard deviation of 0.866, 34(23.61%) highly agreed, 35(24.31%) agreed, 27(18.75%) were undecided, 30(20.83%) disagreed, and 15(10.42%) severely disagreed. This indicated that the majority of participants agreed that project assets were impacted by recipients. The purpose of item 6b3 was to ascertain if community controlled project investments. The findings indicated that, with a mean score of 3.046 and a standard deviation of 0.829, 35(24.31%) highly agreed, 36(25.00%) agreed, 29(20.14%) neutral, 28(2014%) disagreed, and 17(11.81%) severely disagreed. data suggested that the majority agreed that project investments were managed by the community.

A mean score of 3.567 and a standard deviation of 0.943 were obtained from the responses to item 6b4, which asked whether committee views were taken into consideration during planning. Of the respondents, 37(25.69%) strongly agreed, 38(26.39%) agreed, 27(18.75%) disagreed, and 15(10.42%) strongly disagreed. This suggested that the majority of respondents believed that planning took the committee's opinions into account. The purpose of item 6b5 was to ascertain if beneficiaries were contacted on a frequent basis. The findings revealed that, with a mean score of 3.448 and a standard deviation of 0.831, 29(20.14%) strongly agreed, 30(20.83%) agreed, 40(27.78%) were indecisive, 26(18.06%) disagreed, and 19(13.19%) severely disagreed. this indicated that those surveyed were in agreement that beneficiaries were routinely consulted. With a mean score of 3.451 and a standard deviation of 0.867 for project asset identification, it seemed likely that beneficiaries were active in the consolidation of community project assets.

When it came to the question of whether beneficiaries were routinely informed about the project plans, respondents to item 6c1 gave a mean score of 4.634 and a standard deviation of 0.618. Of those who responded, 35(24.31%) strongly agreed, 37(25.69) agreed, 44(30.56%) were undecided, 19(13.19%) disagreed, and 9(6.25%) strongly disagreed. This suggested that the majority of respondents firmly believed that

beneficiaries were kept up to date on project plans on a regular basis. Item 6c2 asked if beneficiaries took part in project planning; the answers indicated that, with a mean score of 4.284 and a standard deviation of 0.618, 33(22.92%) highly agreed, 35(24.31%) agreed, 21(27.78%) were neutral, 20(13.89%) disagreed, and 16(11.11%) severely disagreed. This indicated that beneficiaries' involvement in project planning was highly approved upon by respondents. The purpose of item 6c3 was to ascertain whether beneficiaries were involved in the start of the project. The results indicated that, with a mean score of 4.440 and a standard deviation of 0.538, 38 (26.39%) strongly agreed, 36 (25.00%) agreed, 40 (27.78%) were neutral, 20 (13.89%) disagreed, and 10 (6.94%) strongly disagreed. This suggested that participants' involvement in project planning was highly approved upon by respondents. Item 6c4 sought to determine whether there was satisfactory participation by all stakeholders and the results showed that 34(23.61%) strongly agreed, 35(25.00%) agreed, 44(30.56%) were undecided, 22(15.28%) disagreed while 9(6.25%) strongly disagreed giving a mean score of 4.478 and standard deviation of 0.538. This indicated that the vast majority of participants firmly believed that beneficiaries took involved in project design. Item 6c5 asked recipients whether they approved of the choices made in the project. The answers indicated that, with a mean score of 4.440 and a standard deviation of 0.538, 38(26.39%) strongly disagreed, 36(25.00%) agreed, 40(27.78%) were neutral, 20 disagreed, and 10(6.94%) significantly disagreed. This indicated that the vast majority of respondents firmly believed that project recipients accepted choices made. The mean score for project commencement was 4.439, with a standard deviation of 0.682. This indicated that the responders took part in the start of the project.

The purpose of item 6d1 was to determine if project teams had a feeling of ownership. From the responses, it was determined that, with a mean score of 2.63 and a standard deviation of 0.519, 29 (20.14%) strongly agreed, 36 (25.00%) agreed, 28 (19.44%) were neutral, 35 (24.31%) disagreed, and 16 (11.11%) severely disagreed. This indicated that most respondents were unsure about the feeling of ownership that project teams experienced. The purpose of item 6d2 was to ascertain whether the community was involved in the project at an early enough stage. The results indicated that, with a mean

score of 4.280 and a standard deviation of 0.328, 33(22.92%) strongly agreed, 35(24.31%) agreed, 39(27.78%) were undecided, 20(13.89%) disagreed, and 16911.11%) strongly disagreed. This indicated that the majority of respondents believed the community was sufficiently engaged in the project from the beginning. In response to the question in item 6d3 about whether community input was taken into account during planning meetings, 39 respondents (27.03%) strongly agreed, 36 agreed (25.00%), 40 were undecided, 20 disagreed (13.89%), and 10 strongly disagreed (6.25%). This resulted in a mean score of 4.522 and a standard deviation of 0.629. This indicated that the majority of respondents believed that community opinion was taken into account at planning sessions.

In response to item 6d4, which asked whether there had been community consultations during the project study, 38 respondents (26.39%) strongly agreed, 36 respondents (25.00%) agreed, 40 respondents (27.78%) were unsure, 20 respondents (13.89%) disagreed, and 9 respondents (6.25%) strongly disagreed. This resulted in a mean score of 4.440 and a standard deviation of 0.838. This indicated that the vast majority of respondents firmly believed that community discussions occurred during the project research.

The purpose of item 6d5 was to ascertain whether the community's involvement in the project planning led to satisfaction. The findings indicated that, of those who responded, 34 (23.61%) strongly agreed, 35 (24.31%) agreed, 44 (30.56%) were undecided, 22 (15.28%) disagreed, and 9 (6.25%) strongly disagreed. This resulted in a mean score of 4.478 and a standard deviation of 0.785. This indicated that a high percentage of respondents felt that the community gained pleasure from being involved in the project planning. The standard deviation was 0.619 and the mean score was 4.071 for the degree of participation. This indicated that the community was actively engaged in the water project. The requirements assessment composite score was 3.890, with a standard deviation of 0.718, suggesting that the community was involved in the project's needs assessment. The viability of the Siaya-Bondo rural water project was in doubt due to a lack of openness. Although the respondents were not sure whether Siaya-Bondo rural water project was sustainable despite actively participating in the needs assessment,

interview revealed that the project was sustainable as one of the community member ably assured;

> *"…the rural water project has been able to operate and maintain Its water supply infrastructure through the revenues generated by the Tariffs from water consumption……"*

This observation supported by findings of a study by Vandesypen, Keita, Coulibaly, Raes, and Jamin, (2007) who showed that continued utilization of water increased revenue which is used for operations and maintenance. This means that cost recovery of rural water project is the basis for sustainability of water projects. This finding is supported by the secondary data in the Siaya-Bondo rural water project which indicated that the project was able to pay for all its financial obligation through internally generated funds.

### 4.4.3 Participatory planning and sustainability of rural water project

In this section, descriptive statistics was used to analyze the influence of participatory planning on sustainability of Siaya-Bondo rural water project. The influence of participatory planning on sustainability of water projects was analyzed using 20 items. Items on participatory planning of Siaya-Bondo rural water project were analyzed and results presented as shown in Table 4.9.

**Table 4.9: Participatory Planning and Sustainability of Rural Water Projects**

| No | Item | n | SA | A | N | D | SD | Mean score | Std. dev. |
|---|---|---|---|---|---|---|---|---|---|
| **7a1** | Community not involved | 144 | 16 (11.11%) | 36 (25.00%) | 38 (26.38%) | 38 (26.38%) | 16 (11.11%) | 2.69 | 0.563 |
| **7a2** | Importance of involvement | 144 | 36 (25.00%) | 40 (27.78%) | 28 (19.44%) | 26 (17.36%) | 14 (9.72%) | 3.62 | 0.794 |
| **7a3** | Consultative meetings used | 144 | 37 (25.69%) | 43 (29.86%) | 24 (18.06%) | 21 (14.58%) | 14 (9.72%) | 4.02 | 0.861 |
| **7a4** | Reflecting community views | 144 | 37 (25.69%) | 40 (27.78%) | 27 (18.75%) | 25 (17.36%) | 15 (10.42%) | 3.60 | 0.796 |
| **7a5** | Satisfactory scheduling | 144 | 36 (25.00%) | 33 (22.91%) | 26 (18.06%) | 32 (22.22%) | 16 (11.11%) | 3.76 | 0.765 |
| **Activity scheduling** | | **144** | **32 (22.22%)** | **38 (26.38%)** | **29 (20.14%)** | **29 (20.14%)** | **16 (11.11%)** | **3.478** | **0.756** |
| **7b1** | Pre-feasibility study | 144 | 36 (25.00%) | 41 (28.47%) | 24 (18.06%) | 23 (17.36%) | 15 (10.41%) | 3.97 | 0.769 |
| **7b2** | Community awareness | 144 | 38 (26.39%) | 33 (22.92%) | 26 (18.06%) | 33 (26.39%) | 16 (11.11%) | 3.77 | 0.848 |
| **7b3** | Initial views sought | 144 | 37 | 42 | 24 | 22 | 14 | 4.07 | 0.676 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (25.69%) | (29.17%) | (18.06%) | (15.28%) | (9.72%) | | |
| **7b4** | Beneficiary involvement | 144 | 36 | 43 | 24 | 21 | 15 | 3.91 | 0.734 |
| | | | (25.00%) | (29.86%) | (18.06%) | (14.58%) | (10.41%) | | |
| **7b5** | Willing participation | 144 | 42 | 40 | 24 | 20 | 18 | 3.84 | 0.754 |
| | | | (29.17%) | (27.78%) | (16.67%) | (13.89%) | (12.50%) | | |
| **Prefeasibility study** | | | **38** | **41** | **25** | **24** | **16** | **3.912** | **0.804** |
| | | | **(26.39%)** | **(28.47%)** | **(17.36%)** | **(16.67%)** | **11.11%)** | | |
| **7c1** | Beneficiary Participation | 144 | 24 | 29 | 42 | 31 | 18 | 3.37 | 0.856 |
| | | | (16.67%) | (20.14%) | (29.16%) | (21.539%) | (12.50%) | | |
| **7c2** | Community Mobilization | 144 | 38 | 36 | 40 | 20 | 10 | 4.35 | 0.799 |
| | | | (26.39%) | (25.00%) | (27.78%) | (13.89%) | (6.94%) | | |
| **7c3** | Willing Views Sharing | 144 | 38 | 36 | 40 | 20 | 10 | 4.41 | 0.703 |
| | | | (26.39%) | (25.00%) | (27.78%) | (13.89%) | (6.94%) | | |
| **7c4** | Infrastructure Involvement | 144 | 41 | 32 | 39 | 20 | 12 | 4.35 | 0.736 |
| | | | (28.47%) | (20.83%) | (27.08%) | (13.89%) | (8.33%) | | |
| **7c5** | Beneficiary Input Considered | 144 | 39 | 36 | 40 | 20 | 9 | 4.33 | 0.878 |
| | | | (27.08%) | (25.00%) | (27.78%) | (13.89%) | (6.25%) | | |
| **Feasibility study** | | **144** | **36** | **34** | **40** | **22** | **12** | **4.262** | **0.794** |
| | | | **(25.00%)** | **(23.61%)** | **(27.78%)** | **(15.28%)** | **(8.33%)** | | |
| **7d1** | Regular Project Updates | 144 | 35 | 41 | 24 | 23 | 16 | 4.03 | 0.819 |
| | | | (24.31%) | (28.47%) | (18.06%) | (15.97%) | (11.11%) | | |
| **7d2** | Community Communication | 144 | 31 | 30 | 49 | 19 | 15 | 4.17 | 0.877 |
| | | | (31.53%) | (20.83%) | (34.03%) | (13.19%) | (10.42%) | | |
| **7d3** | Enhancing Understanding | 144 | 37 | 42 | 24 | 22 | 14 | 4.07 | 0.717 |
| | | | (25.69%) | (29.17%) | (18.06%) | (15.28%) | (9.72%) | | |
| **7d4** | Decision-Making Improvement | 144 | 38 | 30 | 40 | 20 | 16 | 4.26 | 0.743 |
| | | | (26.39%) | (20.83%) | (27.78%) | (13.89%) | (11.11%) | | |
| **7d5** | Activity Contribution | 144 | 23 | 29 | 34 | 39 | 19 | 3.440 | 0.788 |
| | | | (15.97%) | (20.14%) | (23.61%) | (27.08%) | (13.19%) | | |
| **Information sharing** | | **144** | **33** | **34** | **35** | **25** | **17** | **4.002** | **0.789** |
| | | | **(22.92%)** | **(23.61%)** | **(24.31%)** | **(17.36%)** | **(11.81%)** | | |
| **Composite mean for planning** | | **144** | **35** | **37** | **32** | **25** | **15** | **3.913** | **0.786** |
| | | | **(24.31%)** | **(25.69%)** | **(22.22%)** | **(17.36%)** | **(10.42%)** | | |

As shown by Table 4.9, 144 participants fulfilled the study's inclusion criteria. In answer to item 7a1, which asked if the community was not included in the planning process, 16(11.11%) highly agreed, 36(25.00%) agreed, 38(26.38%) disagreed, and 16 strongly disagreed, yielding a mean score of 2.69 with a standard deviation of 0.563. This suggested that most respondents were unsure about the involvement of the community. The community's level of significance for their engagement in planning was evaluated by item 7a2. Of those who responded, 36 (25.00%) strongly agreed, 40 (27.78%) agreed, 28 (19.44%) were unsure, 26 disagreed, and 14 (9.72%) gave the item a mean score of 3.62 with a standard deviation of 0.794. This indicated that the majority of respondents believed that community members' participation in planning was important. The purpose of item 7a3 was to determine whether beneficiaries took part in consultative sessions. The findings indicated that, with a mean score of 4.02 and a standard deviation of 0.861, 37(25.69%) strongly agreed, 43(29.86%) agreed, 24(18.06%) were neutral, 21(14.58%)

disagreed, and 14(9.72%) severely disagreed. This suggested that the majority of respondents agreed that the beneficiaries took part in sessions for consultation.

In order to ascertain if community opinions were taken into consideration while making planning choices, item 7a4 was used. The findings indicated that, of the respondents, 37 (25.69%) highly agreed, 40 (27.78%) agreed, 27 (18.75%) were neutral, 25 (17.36%) disagreed, and 15 strongly agreed, with a mean score of 3.60 and a standard deviation of 0.796. This indicated that several respondents were unsure of whether community opinions were taken into account when making planning choices. In order to determine whether the beneficiaries were satisfied with the activity scheduling, item 7a5 asked respondents to rate their level of agreement. Of those who responded, 36 (25.00%) strongly agreed, 33 (22.91%) agreed, 26 (18.06%) were undecided, 32 (22.22%) disagreed, and 16 (11.11%) strongly disagreed. This resulted in a mean score of 3.760 and a standard deviation of 0.765. This suggested that the majority of respondents believed that recipients were satisfied with the way activity scheduling was done. The mean score for activity scheduling was 3.738, with a standard deviation of 0.765. This suggested that planning an activity included participation.

The purpose of item 7b1 was to ascertain whether the community had participated in pre-feasibility studies. The results indicated that, with a mean score of 3.970 and a standard deviation of 0.769, 36(25.00%) strongly agreed, 41(28.47%) agreed, 24(18.06%) were neutral, 23(17.36%) disagreed, and 15(10.41%) strongly disagreed. findings suggested that those surveyed agreed that pre-feasibility studies included the community. The purpose of item 7b2 was to ascertain community knowledge. The findings revealed that, with a mean score of 3.770 and a standard deviation of 0.848, 38(26.39%) strongly agreed, 33(22.92%) agreed, 26(18.06%) were indecisive, 33(26.39%) disagreed, and 16(11.11%) severely disagreed. This suggested that they were in agreement that community awareness efforts were made. In order to ascertain whether community opinions regarding the project were first sought, item 7b3 asked respondents to rate their agreement or disagreement. Of those who responded, 37 (25.69%) strongly agreed, 42 (29.17%) agreed, 24 (18.06%) were undecided, 22 (15.28%) disagreed, and 14 (9.72%) strongly disagreed. This resulted in a mean score of 4.070 with a standard deviation of

0.67. This indicated that the majority of respondents agreed that the project's community viewpoints were first solicited.

A mean score of 3.900 and a standard deviation of 0.734 were obtained from the responses to item 7b4, which asked if beneficiaries were engaged in project planning. Of those who responded, 36 (25.00%) highly agreed, 43 (29.86%) agreed, 24 (18.06%) were unsure, 21 (14.58%) disagreed, and 15 (10.41%) strongly agreed. This indicated that most respondents were in agreement that beneficiaries had a role in project planning. The purpose of item 7b5 was to find out if beneficiaries were willing to participate in feasibility. The results indicated that, with a mean score of 3.840 and a standard deviation of 0.754, 42(29.17%) strongly agreed, 40(27.78%) agreed, 24(16.67%) were neutral, 20(13.89%) disagreed, and 18(12.50%) strongly disagreed. This indicated that participants in the pre-feasibility agreed that beneficiaries were willing to participate. The pre-feasibility score was 3.912 on average, with a 0.754 standard deviation. This suggested that the community water project was feasible and participative.

In order to determine whether beneficiaries effectively participated in regular project updates during prefeasibility, item 7c1 was used. The results indicated that, with a mean score of 3.37 and a standard deviation of 0.856, 24 (16.67%) strongly agreed, 29 (20.14%) agreed, 42 (29.16%) were undecided, 31 (21.53%) disagreed, and 18 (12.50%) strongly disagreed. This suggested that most respondents were unsure about beneficiaries' actual participation in ongoing project updates. The purpose of item 7c2 was to determine if community mobilisation was participatory. The findings indicated that, with a mean score of 4.35 and a standard deviation of 0.799, 38926.39% highly agreed, 36(25.00%) agreed, 40(27.78%) were uncertain, 20(13.89%) disagreed, and 10(6.94%) strongly disagreed. It was clear from this that respondents thought community mobilisation was a collaborative process. A mean score of 4.41 and a standard deviation of 0.703 were obtained for item 7c3, which evaluated whether the opinions of the beneficiaries were taken into consideration during the feasibility study. Of the respondents, 38 (26.39%) strongly agreed, 36 (25.00%) agreed, 40 (27.78%) were undecided, 20 (13.89%) disagreed, and 9 (6.25%) strongly disagreed. This indicated that a high percentage of

respondents thought the feasibility study took the opinions of the beneficiaries into account.

In order to determine whether the infrastructure's viability was investigated through participation, item 7c4 was used. The results showed that 41 respondents (28.39%) strongly agreed, 32 agreed (20.83%), 40 were undecided, 20 disagreed (13.89%), and 9 strongly disagreed (6.25%), yielding a mean score of 4.33 and a standard deviation of 0.736. This indicated that a high percentage of respondents felt that participation was involved in the infrastructure's viability. In response to the question "Was beneficiary input taken into consideration?" on item 7c5, 39 respondents (27.08%) strongly agreed, 36 agreed (25.00%), 40 were undecided, 20 disagreed (13.89%), and 6.25% strongly disagreed. With a mean score of 4.33 and a standard deviation of 0.878, the respondents strongly agreed that beneficiary input was taken into consideration. The feasibility study received a mean score of 0.794 and 4.262. This indicated that a collaborative approach was employed when determining feasibility.

With a mean score of 4.03 and a standard deviation of 0.819, the results of item 7d1, which asked whether the project teams shared regular updates on their work, showed that 35(24.31%) strongly agreed, 41(28.47%) agreed, 24(18.06%) were undecided, 23(15.97%) disagreed, and 16(11.11%) strongly disagreed. This indicated that respondents were in agreement with the project teams' frequent sharing of project updates. In order to determine whether there were clear channels of communication, item 7d2 was used. The results indicated that, with a mean score of 4.03 and a standard deviation of 0.819, 31(21.53%) strongly agreed, 30(20.83%) agreed, 49(34.03%) were undecided, 19(13.19%) disagreed, and 15(1042%) strongly disagreed. This indicated that those surveyed believed that there were distinct routes for communication. In order to determine whether communication between the project teams improved communication, item 7d3 was used. The results showed that, with a mean score of 4.07 and a standard deviation of 0.717, 37 (25.69%) strongly agreed, 42 (29.17%) agreed, 24 (18.06%) were undecided, 22 (15.28%) disagreed, and 14 (9.72%) strongly disagreed. This indicated that the respondents were in agreement that the project teams' communication improved communication.

The purpose of item 7d4 was to determine if communication improved decision making. The findings indicated that, with a mean score of 4.26 and a standard deviation of.0743, 38% (26.69%) highly agreed, 30 (20.83%) agreed, 40 (27.78%) were indecisive, 20 (13.89%) disagreed, and 16 (11.11%) severely disagreed. This indicated that a high percentage of respondents thought that communication improved decision-making. A mean score of 3.440 with a standard deviation of 0.788 was obtained for item 7d5, which attempted to determine whether ideas contributed by stakeholders enhanced feasibility study. Of the responses, 23 (15.97%) strongly disagreed, 29 (20.14%) agreed, 34 (23.61%) were undecided, 39 (27.08%) disagreed, and 19 (13.19%) strongly disagreed. This suggested that the participants agreed that the suggestions made by the stakeholders improved the feasibility study. With a mean score of 0.789, information sharing received a mean score of 4.002. This indicated that a participative approach was used to conduct the feasibility study. The planning composite had a standard deviation of 0.789 and a score of 3.913. This indicated that planning was done with participation.

This view was supported by the interview results when one community member confirmed that;

> *"……the initial study to determine the viability of the project was organized in such a way that project beneficiaries took the central role in determining what they wanted as a community…."*

This meant that decision by the community to identify the project of their choice contributed to the success of the project. This view is supported by pre-feasibility study and feasibility Interview also showed that planning was undertaken in every phase of the project development and also during the operation and maintenance stage of the water distribution as was stated by one of the project beneficiaries;

> *"At all the key stakeholders were deliberately involved at every stage of Planning; and this included the community leadership. This deliberate effort made the beneficiaries gain confidence in the decisions made. This created a sense of ownership among community members and therefore made it easy for the water project committee to manage the water distribution with ease"*

This insight is significant because it highlights the critical role that community involvement plays in maintaining support for project management even after external financing is no longer available. This observation is consistent with those made by Ondrik (2012), who showed that thorough beneficiary discussions aided project teams and local leaders in getting project approval as well as promoted beneficiary acceptance of the initiative. This result is in line with that of Dlamini (2013), who found that project beneficiaries who took part in the approval of local initiatives felt more a part of the process than those who were not. They felt that their ideas and opinions were taken into account, which strengthened their sense of ownership. Community participation made the Siaya-Bondo community water project in Siaya County, Kenya, more viable.

Interviews confirmed that information dissemination was critical in building trust between the project teams and the beneficiaries as one community member pointed out that,

> *"....during the planning process, we were regularly briefed by the team designing the project. These consultations greatly helped in building trust among us and also between the project team and us despite hardly understanding much about the project plans....."*

These thoughts align with the findings of McCallum (2018), who noted that the decision-centered paradigm is a problem-solving approach to planning that imposes varying degrees of obligation on others and involves principles of inclusivity, reciprocity, and empowerment. The aforementioned assertion is corroborated by Ondrik's (2012) research, which demonstrated that thorough conversations between project sponsors and beneficiaries facilitated the project teams and primary beneficiaries in ensuring project stability prior to expanding their membership. This implies that despite the technical nature of project planning, which may pose challenges for community comprehension, the act of consulting and informing the community about the planned activities served to validate and enhance their involvement. Lee-Kelly and Sankey (2008) presented a contrasting viewpoint by asserting that the provision of information during the project planning phase does not have a significant impact on

fostering a sense of ownership among project participants. Nevertheless, despite the aforementioned divergence, the findings of the study indicate that the implementation of participatory planning in the Siaya-Bondo community water project has a significant impact on its sustainability within Siaya County, Kenya.

### 4.4.4 Participatory Implementation and Sustainability of Rural Water Projects

In this section, the application of descriptive statistics was employed to examine the impact of participatory implementation on the sustainability of the Siaya-Bondo water project. The impact of participatory implementation on the sustainability of water projects within the community was assessed through the utilization of a set of 20 elements. The analysis of the components related to the participatory execution of the Siaya-Bondo rural water project was conducted, and the findings are provided in Table 4.10.

| No | Item | n | SA | A | N | D | SD | Mean Score | Std. dev. |
|---|---|---|---|---|---|---|---|---|---|
| **8a1** | Land contributed | 144 | 35 (24.31%) | 41 (28.47%) | 24 (18.06%) | 23 (15.97%) | 16 (11.11%) | 3.91 | 0.897 |
| **8a2** | Water tank land | 144 | 39 (27.08%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 9 (6.25%) | 4.30 | 0.788 |
| **8a3** | My land for pipes | 144 | 35 (24.31%) | 41 (28.47%) | 24 (18.06%) | 23 (15.97%) | 16 (11.11%) | 4.05 | 0.614 |
| **8a4** | Satisfactory project site | 144 | 36 (25.00%) | 41 (28.47%) | 24 (18.06%) | 23 (17.36%) | 15 (10.41%) | 3.97 | 0.877 |
| **8a5** | Community land success | 144 | 37 (25.69%) | 40 (27.78%) | 27 (18.75%) | 25 (17.36%) | 15 (10.42%) | 3.66 | 0.802 |
| **Community contributions** | | **144** | **36 (25.00%)** | **41 (28.47%)** | **28 (19.44%)** | **24 (16.67%)** | **15 (10.42%)** | **3.978** | **0.796** |
| **8b1** | Community Involvement | 144 | 24 (16.67%) | 29 (20.14%) | 35 (24.31%) | 38 (26.39%) | 18 (12.50%) | 3.43 | 0.768 |
| **8b2** | Beneficiary Materials | 144 | 38 (26.39%) | 41 (28.47%) | 25 (17.36%) | 24 (16.67%) | 16 11.11%) | 3.90 | 0.751 |
| **8b3** | Local Equipment Success | 144 | 35 (24.31%) | 41 (28.47%) | 24 (18.06%) | 23 (15.97%) | 16 (11.11%) | 4.00 | 0.876 |
| **8b4** | Project Maintenance Support | 144 | 31 (31.53%) | 30 (20.83%) | 49 (34.03%) | 19 (13.19%) | 15 (10.42%) | 4.15 | 0.850 |
| **8b5** | Raw Equipment Satisfaction | 144 | 42 | 40 | 24 | 20 | 18 | 3.78 | 0.890 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (29.17%) | (27.78%) | (16.67%) | (13.89%) | (12.50%) | | |
| **Equipment and tools** | | **144** | **35 (24.31%)** | **36 (25.00%)** | **31 (21.53%)** | **25 (17.36%)** | **17 (11.81%)** | **3.852** | **0.827** |
| **8c1** | Sand, gravel, stones | 144 | 29 (20.14%) | 36 (25.00%) | 28 (19.44%) | 35 (24.31%) | 16 (11.11%) | 2.77 | 0.660 |
| **8c2** | Fencing poles | 144 | =-pojb | 30 (20.83%) | 34 (23.61%) | 38 (26.39%) | 18 (12.50%) | 2.32 | 0.964 |
| **8c3** | Mandatory materials | 144 | 30 (20.83) | 28 (19.44%) | 34 (23.61%) | 30 (20.83%) | 18 (12.50%) | 2.98 | 0.549 |
| **8c4** | Project success | 144 | 24 (16.67%) | 30 (20.83%) | 34 (23.61%) | 38 (26.39%) | 18 (12.50%) | 3.29 | 0.599 |
| **8c5** | Satisfactory stages | 144 | 30 (20.83) | 30 (20.83%) | 34 (23.61%) | 32 (22.22%) | 18 (12.50%) | 2.98 | 0.698 |
| **Contribution of locally available materials** | | **144** | **27 (18.75%)** | **31 (21.53%)** | **33 (22.92%)** | **35 (24.31%)** | **18 (12.5%)** | **2.862** | **0.694** |
| **8d1** | Community Consultation | 144 | 31 (31.53%) | 30 (20.83%) | 49 (34.03%) | 19 (13.19%) | 15 (10.42%) | 4.17 | 0.769 |
| **8d2** | Team Incorporation | 144 | 40 (27.78%) | 37 (25.69%) | 40 (27.78%) | 19 (13.19%) | 8 (5.56%) | 4.64 | 0.618 |
| **8d3** | Community Views | 144 | 29 (20.14%) | 30 (20.83%) | 40 (27.78%) | 26 (18.06%) | 19 (13.19%) | 3.42 | 0.679 |
| **8d4** | Improved Implementation | 144 | 39 (27.08%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 9 (6.25%) | 4.30 | 0.971 |
| **8d5** | Satisfactory Involvement | 144 | 29 (20.14%) | 30 (20.83%) | 40 (27.78%) | 26 (18.06%) | 19 (13.19%) | 3.42 | 0.898 |
| **Operations and Maintenance** | | **144** | **33 (22.92%)** | **33 (22.92%)** | **42 29.17%)** | **22 (15.28%)** | **14 (9.72%)** | **4.018** | **0.787** |
| **Composite mean for implementation** | | **144** | **33 (22.92%)** | **35 (24.31%)** | **33 (22.92%)** | **27 (23.67%)** | **16 (11.11%)** | **3.678** | **0.776** |

**Table 4.10: Participatory Implementation and Sustainability of Rural Water Projects**

As shown in Table 12, all 144 study participants answered the questions on the rural water project's sustainability and participatory implementation. The response to item 8a1, which asked whether project beneficiaries had contributed land for the project's establishment, revealed that 35 respondents (24.31%) strongly agreed, 41 respondents (28.47%) agreed, 24 respondents (18.06%) were unsure, 23 respondents (15.97%) disagreed, and 16 respondents (11.11%) strongly disagreed. This resulted in a mean score of 3.91 and a standard deviation of 0.897. This indicated that most respondents were in agreement that project beneficiaries gave land in order for the project to be established. When asked whether recipients approved the installation of water tanks on their property, item 8a2 elicited the following responses: 39 (27.08%) strongly agreed, 36 (25.00%) agreed, 20 (13.89%) were unsure, and 9 (6.25%) strongly disapproved, with a mean score of 4.300 and 0.788. It was so clear from the majority of replies that beneficiary property was set aside for the construction of water tanks. When item 8a3 asked whether specific beneficiary land was used to install water pipes for the project, the results indicated that,

with a mean score of 4.050 and a standard deviation of 0.614, 35(24.31%) strongly agreed, 41(28.06%) agreed, 24(18.06%) were undecided, 23(17.36%) disagreed, and 15910.42%) strongly disagreed. This indicated that the respondents were in agreement that the project's water pipes were installed on specific beneficiary land.

The purpose of item 8a4 was to ascertain whether or not all stakeholders agreed on the project site. The response revealed that, with a mean score of 3.97 and a standard deviation of 0.877, 36(25.00%) strongly agreed, 41(28.47%) agreed, 24(18.06%) undecided, 23(17.36%) disagreed, and 15(10.42%) strongly disagreed. All stakeholders had agreed on the project location, which meant that. The purpose of item 8a5 was to ascertain if project teams may access private land. The findings indicated that, with a mean score of 3.66 and a standard deviation of 0.802, 37(25.69%) highly agreed, 40(27.78%) agreed, 27(18.75%) unsure, 25(17.36%) disagreed, and 15(10.41%) severely disagreed. This indicates that respondents were in agreement that project crews may access private property. With a mean score of 3.978 and a standard deviation of 0.796, the community's contribution to the project's execution was indicated.

The purpose of item 8b1 was to determine if the community had contributed. The findings indicated that, with a mean score of 3.43 and a standard deviation of 0.768, 24 (16.67%) highly agreed, 29 (20.14%) agreed, 35 (24.31%) were indecisive, 38 (26.39%) disagreed, and 18 (12.50%) severely disagreed. This indicated that the respondents thought there was a contribution from the community. In order to determine if the community contributed locally accessible resources, item 8b2 was used. The findings, which had a mean score of 4.000 and a standard deviation of 0.850, indicated that 38(26.39%) strongly agreed, 41(28.47%) agreed, 25(17.36%) were indecisive, 24(16.67) disagreed, and 16(11.11%) severely disagreed. This indicates that the participants agreed that the community provided locally sourced resources. The purpose of item 8b3 was to ascertain if the community contributed locally made equipment. The findings indicated that, with a mean score of 3.900 and a standard deviation of 0.751, 35(24.31%) highly agreed, 41(28.47%) agreed, 24(8.06%) neutral, 23(15.97%) disagreed, and 16(11.11%) severely disagreed. This indicated their agreement to have the community provide locally made equipment.

In order to ascertain if the project got maintenance assistance, item 8b4 was used. The findings, which had a mean score of 4.15 and a standard deviation of 0.850, revealed that 31 (21.53%) highly agreed, 30 (20.83%) agreed, 49 (34.03%) disagreed, and 15 (10.12) severely disagreed. This indicated that the majority of participants agreed that the project was supported for maintenance. In order to determine if beneficiaries were pleased with the equipment assistance, item 8b5 was used. The findings, which had a mean score of 3.78 and a standard deviation of 0.890, revealed that 42(29.17%) strongly agreed, 40(27.78%) agreed, 24(16.67%) neutral, 20(13.89%) disagreed, and 18(12.50%) severely disagreed. This suggested that the majority of responders agreed that the project had received equipment assistance. The mean score for tools and equipment was 3.852, with a standard deviation of 0.827. This meant that both the project's implementers and recipients contributed tools and equipment.

In order to ascertain if sand, aggregates, and boulders were readily accessible in the area, item 8c1 was used. The findings, which had a mean score of 2.77 and a standard deviation of 2.77, revealed that 29(2014%) highly agreed, 36925.00%) agreed, 28919.44%) disagreed, and 16(11.11%) strongly disagreed. This suggested that the respondents were unsure about the availability of sand, aggregates, and boulders in their area. The purpose of item 8c3 was to ascertain whether the contribution of locally available materials was required. The results, with a mean score of 2.98 and a standard deviation of 0.549, showed that 30(20.83%) strongly agreed, 28919.44%) agreed, 34(23.61%) were neutral, 38(26.39%) disagreed, and 18(12.50%) strongly disagreed. This suggested that most respondents were unsure about the need for locally accessible resources to be contributed. With a mean score of 2.98 and a standard deviation of 0.698, the responses to item 8c4, which asked if the project was successful, revealed that 24 (16.67%) highly agreed, 30 (20.83%) agreed, 34 (23.61%) neutral, 32 (22.22%) disagreed, and 18 (12.50%) severely disagreed. This indicated that the respondents were unsure about the project's level of success.

The purpose of item 8c5 was to ascertain if the project was implemented well. The answer had a mean score of 2.98 and a standard deviation of 0.694, with 30(20.83%) strongly agreeing, 30(20.83%) agreeing, 34(23.61%) neutral, 32(22.22%) disagreeing,

and 18(12.50%) strongly disagreeing. This suggested that the respondents weren't sure whether the project was implemented well. The mean score and standard deviation for the contribution of locally accessible resources were 2.862 and 0.694, respectively. This indicated that the community's contribution of locally accessible items was not felt.

The purpose of item 8d1 was to ascertain whether the community was consulted. The findings indicated that, with a mean score of 4.17 and a standard deviation of 0.769, 31(21.53%) highly agreed, 30(20.83%) agreed, 49(34.03%) neutral, 19(13.19%) disagreed, and 15(10.42%) severely disagreed. this indicated that participants felt the community was consulted. In order to determine whether the project teams had taken into account the opinions of important stakeholders, item 5d2 was used. The results, which had a mean score of 4.64 and a standard deviation of 0.618, showed that 40 (27.78%) strongly agreed, 37 (25.69%) agreed, 40 (27.48%) neutral, 19 (13.19%) disagreed, and 8 (5.56%) strongly disagreed. This suggested that participants firmly agreed that project teams should take the opinions of important stakeholders into account. With a mean score of 3.42 and a standard deviation of 0.679, the results of item 8d3, which asked whether community views were necessary for operations and maintenance, revealed that 29(20.14%) strongly disagreed, 30(20.83%) agreed, 40(27.78%) were undecided, 26(18.06%) disagreed, and 19(13.19%) strongly disagreed. This indicated that the participants agreed that community opinions were necessary for operations and upkeep.

The purpose of item 8d4 was to ascertain whether stakeholder consultation improved project implementation. The results indicated that, with a mean score of 3.800 and a standard deviation of 0.971, 39 (27.08%) strongly agreed, 36 (25.00%) agreed, 40 (27.78%) were undecided, 26 (18.06%) disagreed, and 19 (13.19%) strongly disagreed. This indicated that respondents agreed that stakeholder interaction enhanced project execution. In order to determine whether community involvement in project implementation was satisfactory, item 8d5 was used. The results indicated that, with a mean score of 3.62 and a standard deviation of 0.898, 29 (20.14%) strongly agreed, 40 (27.78%) agreed, 30 (20.83%) neutral, 26 (18.06%) disagreed, and 19 (19.19%) strongly disagreed. Thus, it was determined that respondents thought the level of community engagement in the project's execution was adequate. With a mean score of 4.018 and a

standard deviation of 0.787, operations and maintenance were indicated to be participative. The community project was carried out in a participative way, as shown by the composite mean of 3.678 and standard deviation of 0776 for the project's execution.

Interviews similarly confirmed that both the project teams and project beneficiaries agreed that conversion of project inputs into outputs was the fulfilment of their sense of ownership as ably expressed by a committee members when he noted that,

> *"....project ownership is evident when we take charge of the implementation process by contributing our own labour in building the project....."*

This assertion is consistent with the findings of Marks, Komives, and Davis (2014), who hypothesized that project beneficiaries' perceptions of project ownership are influenced by the work contributions they make. Therefore, it is crucial to create a strategy that balances community participation in project execution with their capacity to utilise water resources properly. This result is in line with that of Wandera, Naku, and Afrane (2013), who discovered that just 22% of Ejisu project respondents felt a feeling of ownership while 78% did not. Similar results were seen in the Asotwe programme, where 21.2% of participants and 78.8% of project supervisors expressed a sense of ownership. This result conflicts with that of Marks and Davis (2012), who showed that farmers who contributed personally to the project's execution showed a larger sense of ownership than those who did not.

The research's findings therefore suggest that the creation of a sense of ownership is significantly influenced by the community's participation in project implementation. The conclusions reached by Wandera, Naku, and Afrane (2013), Marks, Komives, and Davis (2014), and Marks and Davis (2012) are supported by these findings. This suggests that there is strong evidence to substantiate the idea that beneficiaries' participation in the implementation of water projects has a big influence on their long-term viability, as is the case with the Siaya-Bondo rural water project in Siaya County, Kenya.

### 4.4.5 Participatory Monitoring and Evaluation and Sustainability of Rural Water Projects

In this section, the application of descriptive statistics was employed to examine the impact of participatory monitoring and assessment on the long-term viability of the Siaya-Bondo community water project. This study examines the influence of participatory monitoring and evaluation on the sustainability of rural water projects through the utilization of a set of 20 items. The analysis of the items pertaining to participatory monitoring and evaluation of the Siaya-Bondo rural water project was conducted, and the findings are provided in Table 4.11.

**Table 4.11. Participatory Monitoring and Evaluation and Sustainability of Rural Water Projects**

| No | Item | n | SA | A | N | D | SD | Mean score | Std. dev. |
|---|---|---|---|---|---|---|---|---|---|
| **9a1** | Community involvement in water distribution | 144 | 38 (26.39%) | 36 (25.00%) | 40 (27.78%) | 20 (13.89%) | 10 (6.94%) | 4.56 | 0.762 |
| **9a2** | Project committees represent beneficiaries | 144 | 30 (20.83) | 32 (222.22%) | 34 (23.61%) | 30 (20.83%) | 18 (12.50%) | 3.06 | 0.670 |
| **9a3** | Equitable water distribution | **144** | 37 (25.69%) | 40 (27.78%) | 27 (18.75%) | 25 (17.36%) | 15 (10.42%) | 3.69 | 0.762 |
| **9a4** | System maintenance and operation | 144 | 38 (26.39%) | 41 (28.47%) | 25 (17.36%) | 24 (16.67%) | 16 11.11%) | 3.91 | 0.784 |
| **9a5** | Effective distribution supervision | 144 | 30 (20.83) | 34 (23.61%) | 36 (25.00%) | 28 (19.44%) | 16 (11.11%) | 3.16 | 0.875 |
| **Monitoring of water allocation** | | 144 | **35 (24.31%)** | **37 (25.69%)** | **32 (22.22%)** | **25 (17.36%)** | **15 (10.42%)** | **3.674** | **0.771** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **9b1** | Equitable distribution | 144 | 24 (16.67%) | 30 (20.83%) | 34 (23.61%) | 38 (26.39%) | 18 (12.50%) | 2.410 | 0.849 |
| **9b2** | Compliance assurance | 144 | 24 (16.67%) | 32 (22.22%) | 34 (23.61%) | 38 (26.38%) | 16 (11.11%) | 2.444 | 0.472 |
| **9b3** | Community agreement | 144 | 31 (21.53%) | 32 (22.22%) | 34 (23.61%) | 30 (20.83%) | 14 (9.72%) | 3.560 | 0.446 |
| **9b4** | Non-compliance penalties | 144 | 36 (25.00%) | 41 (28.47%) | 28 (19.44%) | 24 (16.67%) | 15 (10.42%) | 3.008 | 0.591 |
| **9b5** | Generally followed | 144 | 26 (18.06%) | 31 (21.53%) | 34 (23.61%) | 37 (25.69%) | 16 (11.11%) | 2.459 | 0.659 |
| **Rules of water distribution** | | 144 | **28 (19.44%)** | **33 (22.92%)** | **33 (22.92%)** | **34 (23.61%)** | **16 (11.11%)** | **2.776** | **0.603** |
| **9c1** | Cash contribution for spare parts | 144 | 30 (20.83%) | 33 (22.92%) | 45 (31.25%) | 23 (15.97%) | 13 (9.03%) | 3.534 | 0.844 |
| **9c2** | Cash for storage tank replacement | 144 | 28 (19.44%) | 31 (21.53%) | 30 (20.83%) | 36 (25.00%) | 16 (11.11%) | 2.511 | 0.513 |
| **9c3** | Beneficiaries' 5-year cost coverage | 144 | 28 (19.44%) | 29 (20.14%) | 42 (29.16%) | 27 (18.75%) | 18 (12.50%) | 3.388 | 0.506 |
| **9c4** | Satisfactory cash contribution | 144 | 29 (20.14%) | 31 (21.53%) | 36 (25.00%) | 30 (20.83%) | 15 (10.42%) | 3.537 | 0.480 |
| **9c5** | Mandatory pre-project cash | 144 | 28 (19.44%) | 31 (21.53%) | 30 (20.83%) | 36 (25.00%) | 16 (11.11%) | 2.560 | 0.479 |
| **Indicator identification** | | 144 | **30 (20.83%)** | **31 (21.53%)** | **37 (25.69%)** | **30 (20.83%)** | **16 (11.11%)** | **3.106** | **0.564** |
| **Composite for Monitoring and Evaluation** | | **144** | **31 (21.53%)** | **34 (23.61%)** | **34 (23.61%)** | **30 (20.83%)** | **15 (10.42%)** | **3.185** | **0.646** |

Table 4.10 displays the replies to questions on the rural water project's long-term sustainability, monitoring, and assessment that were submitted by all 144 participants in the research. The purpose of item 9a1 was to determine the effectiveness of community involvement in the distribution of water. The results indicated that, with a mean score of 4.560 and a standard deviation of 0.762, 38 (26.39%) strongly agreed, 36 (25.00%) agreed, 40 (27.78%) were unsure, 20 (13.89%) disagreed, and 10 (6.94%) strongly disagreed. This suggested that a high percentage of respondents thought community engagement in water distribution was successful. Project committee representation was evaluated using item 9a2, and the results indicated that thirty (20.83%) strongly agreed, thirty (22.22%) agreed, thirty (34.61%) disagreed, and thirty (12.50%) strongly disagreed, yielding a mean score of 3.06 and a standard deviation of 0.670. This suggested that they were unsure about the project committees' ability to represent the interests of the community. A mean score of 3.69 and a standard deviation of 0.762 were obtained for item 9a3, which assessed whether there was an equal distribution of water. Of those who responded, 37 (25.69%) highly agreed, 40 (27.78%) agreed, 27 (18.75%) were indecisive, 25 (17.36%) disagreed, and 15 (10.42%) severely disagreed. This indicated that the respondents were in agreement with the equal distribution of water.

With a mean score of 3.91 and a standard deviation of 0.784, the results of item 9a4, which examined community participation in water system maintenance and operations, revealed that 38(26.39%) strongly agreed, 41(28.47%) agreed, 25(17.36%) were neutral, 24(16.67%) disagreed, and 16(11.11%) strongly disagreed. This suggested that they believed that community members should be involved in the upkeep and management of the water system. In order to determine whether there was a fair distribution of water to beneficiaries, item 9a5 was used. The results indicated that, with a mean score of 3.16 and a standard deviation of 0.875, 30 (20.83%) strongly agreed, 34 (23.61%) agreed, 36 (25.00%) were undecided, 28 (19.44%) disagreed, and 16 (11.11%) strongly disagreed. This suggested that they were unsure about the fairness of the water distribution to the recipients. The results of the water allocation monitoring showed that participatory water monitoring was carried out, with a mean score of 3.674 and a standard deviation of 0771.

The purpose of item 9b1 was to determine whether or not an equitable distribution of water was ensured throughout the year. The results indicated that, with a mean score of 2.410 and a standard deviation of 0.849, 24 (16.67%) strongly agreed, 30 (20.83%) agreed, 34 (23.61%) neutral, 38 (26.39%) disagreed, and 18 (12.50%) strongly disagreed. This indicated that they didn't think the year-round equal distribution of water was guaranteed. The purpose of item 9b2 was to ascertain whether water allocation compliance was guaranteed. The findings indicated that, with a mean score of 2.444 and a standard deviation of 0.472, 24 (16.67%) highly agreed, 32 (22.22%) agreed, 34 (23.61%) neutral, 38 (26.39%) disagreed, and 16 (11.11%) severely disagreed. This suggested that the majority did not feel that water allocation compliance was guaranteed. In order to determine if there was community consensus about water allocation, 9b3 was used. The results indicated that, of the respondents, 31 (21.53%) highly agreed, 32 (22.22%) agreed, 34 (20.83%) disagreed, and 14 (9.72%) severely disagreed. This resulted in a mean score of 3.560 and a standard deviation of 0.446. This suggested that they were unsure whether the community had reached a consensus over the distribution of water.

The purpose of item 9b4 was to determine the effectiveness of the penalties for noncompliance with water allocation. The response, with a mean score of 3008 and

standard deviation of 0.591, revealed that 36(25.00%) strongly agreed, 41(28.47%) agreed, 28(19.44%) neutral, 24(16.67%) disagreed, and 15(10.42%) strongly disagreed. This suggested that they were unsure about the efficacy of the consequences for violating the water allotment. In order to determine whether the community was adhering to the water allocation rules, item 9b5 was used. The results showed that 26 respondents (18.06%) strongly agreed, 31 respondents (21.53%) agreed, 34 respondents (23.61%) disagreed, and 16 respondents (11.11%) strongly disagreed, resulting in a mean score of 2.459 and a standard deviation of 0.603. This suggested that the respondents were unsure about the efficacy of the consequences for violating the water allotment. With a mean score of 2.776 and a standard deviation of 0,603, the water distribution regulations' effectiveness was not well understood by the beneficiaries.

The purpose of item 9c1 was to determine whether community contributions paid for the project's replacement of spare parts. The results indicated that, with a mean score of 3.534 and a standard deviation of 0.844, 30 (20.83%) strongly agreed, 33 (22.92%) agreed, 45 (31.25%) neutral, 23 (15.97%) disagreed, and 13 (9.03%) strongly disagreed. This suggested that the respondents agreed that replacement spare parts were funded by community donations. The purpose of item 9c2 was to ascertain whether cost recovery for the project investment was achievable. The results indicated that, with a mean score of 2.511 and a standard deviation of 0.506, 28 (19.44%) strongly agreed, 31 (21.53%) agreed, 30 (20.83%) were neutral, 36 (25.00%) disagreed, and 16 (11.11%) strongly disagreed. This indicated that the respondents didn't think it was possible to return the project investment's costs. The purpose of item 9c3 was to determine whether five years was sufficient for cost recovery. The responses indicated that, with a mean score of 3.388 and a standard deviation of 0.506, 28 (19.44%) strongly agreed, 29 (20.14%) agreed, 42 (29.16%) indifferent, and 27 (18.75%) disagreed. This suggested that the respondents were uncertain about their ability to repay project investment costs.

The purpose of item 9c4 was to ascertain whether beneficiaries of pre-project contributions were adequate. The response revealed that, with a mean score of 3.537 and a standard deviation of 0.479, 29 (20.14%) strongly agreed, 31 (21.53%) agreed, 36 (25.00%) neutral, 30 (20.83%) disagreed, and 15 (10.42%) strongly disagreed. This

suggested that the majority of respondents thought the beneficiaries of pre-project donations were sufficient. In order to determine if the required pre-project contribution was enforced, item 9c5 was used. The findings indicated that, of the respondents, 28 (19.44%) strongly agreed, 31 (21.54%) agreed, 30 (20.83%) disagreed, and 16 (11.11%) severely disagreed, yielding a mean score of 2.560 and a standard deviation of 0.479. This indicated that the respondents did not believe that pre-project contributions were required to be made. The M&E indicators showed a mean score of 3.06 and a standard deviation of 0.564, suggesting that it was unclear whether the community had complied with all requirements. With a standard deviation of 0.646 and a composite score of 3.185 for M&E, it was suggested that community engagement was mediocre.

During the interview a member of the project stated that:

> "*Community involvement in monitoring and evaluation is critical to the success of water distribution which in turn is essential for the sustainability of the community water project……"*

Ndou (2012) also found that project ownership increased when water consumption rules were followed. This conclusion is consistent with his findings. This conclusion is consistent with the work of Khwaja (2004), who showed that water committees' control of water allocation management significantly affects water projects' viability over the long run. That means the water project will be more sustainable in the future thanks to the efforts of the water committee. Conclusions may be drawn about the importance of monitoring and evaluation methods to the long-term viability of the Siaya-Bondo rural water project in Kenya's Siaya County.

# CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

This chapter provides a comprehensive overview of the research findings, draws appropriate conclusions based on the analysis, and offers recommendations for future actions or more investigations. The reported findings encompassed the four study objectives, from which conclusions were derived based on the findings and led by the

four research objectives. The examination of contributions to the existing body of knowledge was conducted, resulting in the formulation of recommendations and ideas for future research endeavors.

## 5.2 Summary of Findings

The study findings were summarized using descriptive statistical analysis, which involved presenting the replies on the Likert scale in the following manner. The scale used to measure agreement or disagreement in this study is as follows: Strongly Disagree (SD) is defined as a value between 1 and 1.8, Disagree (D) is defined as a value between 1.8 and 2.6, Neutral (N) is defined as a value between 2.6 and 3.4, Agree (A) is defined as a value between 3.4 and 4.2, and Strongly Agree (SA) is defined as a value between 4.2 and 5.0. The scale provided a consistent interval of 0.8 units. The analysis and interpretation of results acquired through the use of the Likert scale adhered to the weighting criterion for data replies. The conclusions of the study were prepared by summarizing the information obtained from the interviews, as well as including the secondary data collected from the project documentation.

### 5.2.1 Participatory Needs Analysis and Sustainability of Rural Water Projects

The average score for the scope determination was 3.600 and the standard deviation was 0.703. This indicates that a group effort was put into deciding the project's parameters. Asset identification in projects had a mean score of 3.451 and a standard deviation of 0.867. The community's input was considered thoroughly throughout the whole of the project's asset management. The average score for the project kickoff stage was 4.455, with a standard deviation of 0.682. This shows that residents took part in the process of identifying potential projects. Participants in the requirements analysis research got a mean score of 4.071 and a standard deviation of 0.619. Similar to the mean score of 3.210 and standard deviation of 0.649 for water project sustainability. Participatory needs analysis' effect on the long-term viability of the Siaya-Bondo Rural water project in Kenya's Siaya County was not made clear. Despite this finding, the interviews showed that the beneficiaries were convinced that early-on decision-making regarding the project's scope and the identification of assets were crucial factors in ensuring the rural

water project's long-term viability. Documentation for the project led to the same conclusions. It follows that the Siaya-Bondo rural water project in Siaya County, Kenya benefited greatly from the use of participatory needs analysis.

### 5.2.2 Participatory Planning and Sustainability of Rural Water Projects

The mean score on the activity scheduling task was 3.478, with a standard deviation of 0.756. This suggests that the participants had doubts about the efficiency of the project's timetable. Prefeasibility study results showed an average score of 3.912 and a standard deviation of 0.7562. This shows that locals participated in the study's preliminary stages. The mean score from the feasibility analysis was 4.262, with the standard deviation being 0.794. This shows that there was a concerted effort to conduct feasibility studies by the local community. There was a mean score of 4.002 and a standard deviation of 0.789 for open communication. This suggests that knowledge was being actively shared throughout the group.

Standard deviation was 0.786, meaning that the mean score was 3.913. Similarly, the mean score for community water project sustainability was 3.210, with a standard deviation of 0.649. To what extent participatory planning contributed to the long-term viability of the Siaya-Bondo rural water project in Siaya County, Kenya, was not made clear. Despite these results, interviews showed that those who would most benefit from the rural water project had a firm belief in its long-term viability. Document analysis revealed a similar pattern: beneficiaries' participation in the water project's pre-feasibility research and feasibility study inspired unshakeable faith in the community and spurred their participation in planning. As a result, it is reasonable to assume that the Siaya-Bondo rural water project in Siaya County, Kenya, has benefited greatly from the use of participatory planning.

### 5.2.3 Participatory Implementation and Sustainability of Rural Water Projects

In terms of community involvement, the mean score was 3.978 and the standard deviation was 0.796. Evidence suggests that community participation is crucial to a project's success. There was a standard variation of 0.827 points in the mean rating of the

beneficiaries' tools and equipment for the project. Inclusion of equipment and tools supplied by project beneficiaries had a key influence in aiding the effective execution of the project. We calculated a mean value of 2.862 and a standard deviation of 0.694 for the effect of locally accessible resources. The degree to which locally obtained materials had a part in the completion of the project is unclear, and hence leads to this uncertainty. There was a 4.018 mean and a 0.787 s.d. in the sphere of operations and maintenance. All things considered, it seems that the majority of respondents are in favour of including the local community into O&M tasks.

The average composite score for participatory implementation was 3.67 out of a possible 5, with a standard deviation of 0.74. In a similar vein, the mean score (3.210) and standard deviation (0.649) were calculated for the long-term viability of rural water infrastructure projects. Participatory implementation's effect on the long-term viability of the Siaya-Bondo rural water project in Kenya's Siaya County remains unclear. Despite this finding, the interviews showed that those who benefited from the project believed that it took into account the interests of the community since it took into account local requirements and carefully identified and assessed the project's stakeholders. According to the documented steps taken during installation, appropriate technologies were used. From this, we can deduce that the Siaya-Bondo water project in Siaya County, Kenya benefited from the use of participatory implementation methodologies for its long-term sustainability.

### 5.2.4 Participatory Monitoring and Evaluation and Sustainability of Rural Water Projects

There was a mean score of 3.674 and a standard deviation of 0.771 for the monitoring of water allocation. According to the findings, many respondents agreed that water committees provided credible evidence of successful supervision of water distribution. The distribution rules for water had a mean score of 2.776 and a standard deviation of 0.604. This suggests that many people in the neighborhood had doubts about the efficiency of water distribution restrictions. For indication recognition, we got a mean score of 3.106 and a standard deviation of 0.564. That means it's not wise to use people's

contributions to the project's execution as a barometer of the project's viability. Standard deviation of monitoring and evaluation scores was determined to be 0.646, with an average of 3.285. A similar analysis found that rural water project sustainability scores averaged 3.210, with a standard deviation of 0.649.

For the Siaya-Bondo rural water project in Siaya County, Kenya, it is unclear how much of an effect participatory monitoring and assessment has had on the project's long-term viability. In a similar line, interviews have corroborated the perspective held by project beneficiaries that participatory monitoring and evaluation was not the only factor in the success of the Rural water project. According to the documentation analysis, it is unclear how project managers made decisions based on the results of the participatory monitoring and evaluation procedures. Similarly, information on the openness of the monitoring process was lacking. Therefore, it can be concluded that the Siaya-Bondo rural water project in Siaya County, Kenya, was not significantly impacted by the adoption of participatory monitoring and evaluation.

### 5.3 Contribution to the Body of Knowledge

The objective of this study was to investigate the impact of community involvement on the sustainable development of rural water initiatives in Siaya County, Kenya. Table 5.1 provides a clear demonstration of how this research contributes to our comprehension of the sustained feasibility of rural water projects in Siaya County.

**Table 5.1: Contribution to the Body of Knowledge**

| Objectives | Contribution to knowledge |
|---|---|
| Objective 1 | Participatory needs assessment has influence on the sustainability of rural water projects |
| Objective 2 | Participatory planning has influence on sustainability of rural water projects |
| Objective 3 | Participatory implementation has influence on sustainability of rural water projects |
| Objective 4 | Participatory monitoring and evaluation has no influence on sustainability of rural water projects |

## 5.4. Recommendations of the study

The findings of the study will be found to be statistically worthy for theory and practice to a number of stakeholders. The following highlights provide several recommendations to the primary and secondary stakeholders;

For policy making- the water sector institutions and organizations especially the National and County governments through its ministry of Water Sanitation and Irrigation should formulate suitable policies that integrate participatory water use by beneficiary communities in its programmes and projects. These policies will enable the beneficiaries to acquire necessary water use skills before implementing water projects. This means that for any sponsored projects it will be mandatory for participatory skills to be acquired before commencement of the projects.

For practice - the beneficiaries of the rural water projects and other beneficiaries in general need to embrace operations and maintenance skills before they commence with their projects. They need to acquire the necessary water infrastructure skills and make them part of their normal practices.

For theory and scientific studies- researchers need to use the scientific findings from the current study to enrich their future studies. The study findings will form suitable secondary data that they can use to enrich their thesis and research projects.

### 5.5 Suggestions for future studies

The researcher identified certain gaps and suggestions in the current study in which future studies can be anchored upon. Future researchers can focus on other types of water projects to ascertain the findings obtained in this study, and additionally, this can be done in other geographical regions. Furthermore, communities benefiting from such projects in general can be used as the target population instead of delimiting the study to other demographics.

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# APPENDICES

## Appendix I: Questionnaire for Project Beneficiaries of Siaya-Bondo Water

### PART 1: INTRODUCTION

This questionnaire is intended to collect data on the influence of community participation on Sustainability of Siaya-Bondo water projects in Siaya County Kenya. Information collected will be used for academic purposes only and it is hoped that findings from this study will make significant contributions towards participatory design of community water projects in Kenya. The information collected will be handled with confidentiality and academic professionalism. Kindly fill in the information as directed in the various sections provided.

### PART 2: GENERAL INFORMATION ABOUT RESPONDENTS

1) Name of your water project……

{Please tick appropriately (√) in the space provided in the brackets} below.

Gender {Please tick your appropriate gender (√) in the space provided in the brackets [√] below. Male [ ] Female [ ]

2) Please tick the range within which your appropriate age falls in the bracket {please tick only one [√]}

21 – 25 Years [ ] 26 – 30 years [ ] 31 – 35 years [ ] 36 – 40 years [ ]

41 – 45 Years [ ] 46 – 50 years [ ] 51 – 55 years [ ] over 55 years [ ]

3) Please tick your highest level of education attained {Please tick one [√]}

No basic education [ ] Primary [ ] Secondary [ ] Tertiary [ ] University [ ]

4) For how many years have you practiced farming through irrigation ……

## PART 3: SPECIFIC NFORMATION

This section contains items on sustainability of community water projects. Please respond appropriately inserting a tick (√) against the value of the number you think best represents your answer given as; Strongly agree (SA) = 5, Agree(A) = 4, Neutral(N) =3, Disagree(D) = 2, Strongly disagree (SD) =1

| No. | Item | SA | A | N | D | SD |
|---|---|---|---|---|---|---|
| | **a. Cost Recovery** | **5** | **4** | **3** | **2** | **1** |
| 1. | The project has the room to meet emerging water demands | | | | | |
| 2. | The project provides continuous flow of water on regular basis | | | | | |
| 3. | The project distributes water to the community at a fee | | | | | |
| 4. | The water fee charge to the consumers is affordable | | | | | |
| 5. | The water fee collected from consumers is enough to meet the cost of operations and maintenance | | | | | |
| | **b. Continuing support** | | | | | |
| 1. | The water pipes and tanks are always in good working condition | | | | | |
| 2. | The project has capacity to carry out major repairs on time | | | | | |
| 3. | The project always performs routine maintenance on time | | | | | |
| 4. | The current project staff has the required training to discharge their duties | | | | | |
| 5. | satisfaction with<br>operation and maintenance of the water points<br>satisfaction with<br>operation and maintenance of the water points<br>The project performs satisfactory operation and maintenance of water points | | | | | |
| | **c. Continued improvement of the project** | | | | | |
| 1. | Water project is able to pay workers' salaries on time. | | | | | |
| 2. | Water project is able to pay electricity utility expenses on time | | | | | |
| 3. | Water project is able to pay for treatment chemicals on time | | | | | |
| 4. | Water project is able to pay the required licenses and tariffs on time | | | | | |
| 5. | Community members are able to continue paying for services provided by water project | | | | | |
| | d. **Ability to pay** | | | | | |
| 1. | It is mandatory for all community members to pay for the water supply | | | | | |
| 2. | Operations and maintenance of this water project depends on their ability to pay for water. | | | | | |
| 3. | Community is willing to pay for water they are allocated. | | | | | |
| 4. | Payment for water by the community members is made on regular basis. | | | | | |
| 5. | Payment of water is done only by those members willing to pay for it. | | | | | |
| **Mean score** | | | | | | |

## SECTION B: NEEDS ASSESSMENT

This section requires you to answer questions on community participation in project needs assessment making, contributions in meetings and in choice of project representatives. Please show how you agree with the following statements by inserting a tick (√) circling the number you think applies to your answer as Strongly agree (SA) = 5, Agree(A) = 4, Neutral(N) =3, Disagree(D) = 2, Strongly disagree (SD) =1

| No. | Item | SA | A | N | D | SD |
|---|---|---|---|---|---|---|
| | **a. Decision on the scope** | **5** | **4** | **3** | **2** | **1** |
| 1. | Community members were informed about major decisions influencing community water project | | | | | |
| 2. | All stakeholders were provided with the crucial information regarding the project plans | | | | | |
| 3. | All documents containing project information were made public to all members | | | | | |
| 4. | Project beneficiaries holds regular meetings every year | | | | | |
| 5. | Project beneficiaries were involved in determining the size of the project | | | | | |
| | **b. Identify assets** | | | | | |
| 1. | Community members attended meetings of community water project | | | | | |
| 2. | Beneficiaries contributed to the decisions of the project assets | | | | | |
| 3. | Community members have control over major decisions on project investments | | | | | |
| 4. | Decisions made by the project committee reflect the wishes of the beneficiaries | | | | | |
| 5. | Project beneficiaries are consulted on every action taken on assets of the project | | | | | |
| | **c. Project initiation** | | | | | |
| 1. | I was informed of the plans to initiate/revive the project | | | | | |
| 2. | I took part in planning of water project | | | | | |
| 3. | My contributions influence project initiation | | | | | |
| 4. | Community participation in action initiation was satisfactory | | | | | |
| 5. | Project beneficiaries approved all decisions on community water projects before they are implemented | | | | | |
| | **d. Level of involvement** | | | | | |
| **1.** | During the needs assessment the project team viewed the project as their own and never consulted anyone else. | | | | | |
| **2.** | From the onset, the project team involved community in the initial study. | | | | | |
| **3.** | The project team held meetings in which the community aired their views during the needs assessment | | | | | |
| **4.** | The community was consulted before decisions in the study was made. | | | | | |
| **5.** | I'm satisfied with the level of my own involvement in the needs analysis study. | | | | | |
| **Mean score** | | | | | | |

## SECTION C: PLANNING BY COMMUNITY

This section requires you to answer questions on the influence of community participation in planning in terms of providing data feasibility studies, and project design. Please show how you agree with the following statements by circling the number you think applies to your answer.

Strongly agree (SA)= 5, Agree(A)=4, Neutral(N)=3, Disagree(D)=2, Strongly disagree (SD)=1

| No. | Item | SA | A | N | D | SD |
|---|---|---|---|---|---|---|
| | **a. Activity scheduling** | **5** | **4** | **3** | **2** | **1** |
| 1. | When organizing project activities to be carried out, the project team did not include the community. | | | | | |
| 2. | It is critical to involve the community in the planning of project activities. | | | | | |
| 3. | Regular consultative meetings were held to involve the community in planned activities. | | | | | |
| 4. | Planned project activities reflected community views. | | | | | |
| 5. | The level of community participation in activity planning was satisfactory. | | | | | |
| | **b. Prefeasibility study** | | | | | |
| 1. | I participated in prefeasibility study | | | | | |
| 2. | Majority of community members knew about the initial project study | | | | | |
| 3. | Community members' views were sought in the initial stages | | | | | |
| 4. | The project team mobilized beneficiaries to contribute in providing the views about the project | | | | | |
| 5. | Beneficiaries willingly participated in providing views about the water project was evident | | | | | |
| | **c. feasibility study** | | | | | |
| 1. | Project beneficiaries took part in the follow-up study on the project | | | | | |
| 2. | I assisted to mobilize community in airing their views | | | | | |
| 3. | Project beneficiaries willingly participated in giving their views | | | | | |
| 4. | I participated in laying project pipes and machineries | | | | | |
| 5. | The views of the project beneficiaries were taken into considerations | | | | | |
| **d. information sharing** | | | | | | |
| **1.** | The project team regularly shared information on project plans with community. | | | | | |
| **2.** | Sharing of information with the community was done on a regular basis. | | | | | |
| **3.** | Sharing of project information greatly enhanced the community understanding on the work to be undertaken. | | | | | |
| **4.** | The information shared improved the community's decision making abilities about the project. | | | | | |
| **5.** | Shared information on planned activities significantly contributed towards project implementation. | | | | | |
| | | | | | | |

## SECTION D: IMPLEMENTATION BY COMMUNITY

This section contains items on influence of community participation in implementation on sustainability. Please show how you agree with the following statements by circling the number you think applies to your answer. Strongly agree (SA)= 5, Agree(A)=4, Neutral(N)=3, Disagree(D)=2, Strongly disagree (DS)=1

| No. | Item | SA | A | N | D | SD |
|---|---|---|---|---|---|---|
| | **a. Community contributions** | **5** | **4** | **3** | **2** | **1** |
| 1. | Community contributed their land for construction of the water project | | | | | |
| 2. | Community provided land for constructing water storage tanks | | | | | |
| 3. | I have allowed community water project to construct water pipes through my own land | | | | | |
| 4. | The land where the project is located can serve the project satisfactorily | | | | | |
| 5. | Contribution of land by the community significantly contributed to project success | | | | | |
| | **b. equipment and tools** | | | | | |
| 1. | Some of the equipment used during construction of the water project were contributed by the community members | | | | | |
| 2. | It was mandatory for project beneficiaries to mobilize their own materials for the construction before implementation | | | | | |
| 3. | Contribution of local equipment significantly resulted in project success | | | | | |
| 4. | Local equipment significantly help in project operation and maintenance | | | | | |
| 5. | Contribution of locally available raw equipment was satisfactory during all project stages | | | | | |
| | **c. Contribution of locally available materials** | | | | | |
| 1. | Community member contributed sand, gravel and stones for constructing the project | | | | | |
| 2. | The community contributed poles for fencing the project's site | | | | | |
| 3. | It was mandatory for project beneficiaries to contribute local raw materials for the project during implementation | | | | | |
| 4. | Contribution of local raw materials significantly resulted in project success | | | | | |
| 5. | Contribution of locally available raw materials was satisfactory during all project stages | | | | | |
| **Mean score** | | | | | | |
| | **d. Operations and Maintenance** | | | | | |
| **1.** | Supervision of project implementation was undertaken in consultation with the community. | | | | | |
| **2.** | Supervision of project activities involved incorporation of Community representatives into the supervisory team. | | | | | |
| **3.** | Community's views were incorporated into those of the project teams. | | | | | |
| **4.** | Involvement of community members in supervision greatly improved project implementation process. | | | | | |
| **5.** | The level of community involvement in supervision of implementation activities was satisfactory. | | | | | |
| **Means Score** | | | | | | |

## SECTION E: PARTICIPATORY MONITORING AND EVALUATION BY COMMUNITY

This section contains items on influence of community participation in participatory monitoring and evaluation through decision making, benchmarking, and identification of indicators on sustainability of water projects. Please show how you agree with the following statements by circling the number you think applies to your answer. Strongly agree (SA) = 5, Agree (A) = 4, Neutral (N) =3, Disagree (D) =2, strongly disagree (DS) =1

| No. | Item | SA | A | N | D | SD |
|---|---|---|---|---|---|---|
| | **a. Monitoring of water allocation** | **5** | **4** | **3** | **2** | **1** |
| 1. | Community participates in water distribution to project beneficiaries | | | | | |
| 2. | Project water committees acts on behalf of all project beneficiaries on water distribution | | | | | |
| 3. | Water committees always ensures equitable water distribution in the entire water scheme. | | | | | |
| 4. | Water committees operates and maintains the systems on regular basis. | | | | | |
| 5. | Water committees effectively supervises water distribution. | | | | | |
| | **b. Rules of water distribution** | | | | | |
| 1. | Rules of water use ensures equitable in its distribution. | | | | | |
| 2. | Rules of water use ensure compliance to equity in its distribution. | | | | | |
| 3. | All community members agree with rules of water use. | | | | | |
| 4. | Rules of water use have penalties for non-compliance with water distribution. | | | | | |
| 5. | Community usually complies with rules of water distribution. | | | | | |
| | **c. Indicator identification** | | | | | |
| 1. | I contributed cash to purchase projects spare parts | | | | | |
| 2. | I contributed cash towards replacement of project's storage tanks | | | | | |
| 3. | Project beneficiaries are able to meet project's replacement costs over the next 5 years | | | | | |
| 4. | Beneficiaries contribution of cash towards replacement costs was satisfactorily | | | | | |
| 5. | Prior to project implementation it was mandatory that community contribute cash towards replacement finance | | | | | |
| **Mean score** | | | | | | |

## Appendix 2: Interview Schedule

Interview Guide for Focus Group Discussion on Community Participation and sustainability of Siaya –Bondo Water Project in Siaya county, Kenya.

**FOCUS GROUP DISCUSSION INTERVIEW GUIDE**

**Introduction**

The purpose for this interview schedule is to collect data for analysis to determine the effects of community participation on sustainability of Siaya-Bondo water Project in Siaya county. The information gathered will be treated confidentially and professionally.

Please respond as honestly as possible to the questions listed below in this schedule

| | QUESTIONS | RESPONSES | | INSTRUCTIONS |
|---|---|---|---|---|
| **1.0** | **INTRODUCTION** | | | |
| 1.1 | DATE | | | DD/MM/YY |
| 1.2 | VENUE OF FGD | Constituency | Tick [√] appropriately | |
| | | Alego | | |
| | | Gem | | |
| | | Bondo | | |
| | | Rarieda | | |
| 1.3 | Name of the water scheme Selected | | | |
| | No of participants | females | Total | |
| | Time of interview | | | |
| | Name of facilitator | | | |
| 2.0 | **OVERVIEW** | | | |
| 2.1 | When was the project founded? | | | |
| 2.2 | What is the mandate of the project? | List all responses | | |
| 2.3 | What does the project deal with? | | | |
| **3.0** | **Section A Cost Recovery** | | | |
| a | In your view, do you think the project has the capacity to meet the emerging water demands? | | | |
| b | Does the project provide continuous flow of water on a regular basis? Explain. | | | |

| | |
|---|---|
| c. | Do you feel the water fees collected from the consumers is affordable? |
| d | Do you think water fees collected from the consumers enough to meet the cost of operations and maintenance of the project?<br>**Take note of:**<br>Quotes, passionate comments, body language, head nods, physical excitements, eye |
| 3.2.1 | **2.Continuing support** |
| a. | Are the water pipes and tanks always in good working condition? |
| b. | Do you feel that the project have the capacity to carry out major repairs on time? |
| c. | In your opinion, do you think the project always perform routine maintenance on time? |
| d | Do you think the project staff has the required training to discharge their duties? |

| | |
|---|---|
| E | Do you feel the project performs satisfactory operations and maintenance of water |
| **4.0** | **Continued improvement of the project** |
| | How would you gauge the returns of the water project on the improvement of the community members?<br>**Take note of:**<br>Quotes, passionate comments, body language, head nodes, physical excitements, eye contacts |
| a. | Is the water project able to pay workers' salaries on time? |
| b. | Do you feel the water project is able to pay electricity utility expenses on time? |
| c. | In your opinion do feel water project is able to pay for treatment chemicals on time? |
| d | Is water project able to pay for the required license and tariffs on time? |
| e. | Do you think community members are able to continue paying for services provided by the water project? |
| **4.1** | **Ability to pay** |
| a. | Is it mandatory for all the community members to pay for the water supply? |
| b. | Does the operations and maintenance of this water project depend on the community ability to pay for the water supply? |
| c. | In your opinion do you feel the community is willing to pay for the water allocated for |
| d | Does payment of water by the community members done on a regular basis? |
| e | Does the payment of water done only by those members willing to pay for it? |
| | **SECTION B. NEEDS ASSESMENT** |
| | **1. Decision on the scope** |
| a. | Do you feel community members were informed about major decisions influencing the water project? |
| b. | Were all stakeholders provided with the crucial information regarding the projects plan? |
| c. | Do you think all documents containing project information were made public to all members? |
| d. | Do project beneficiaries hold regular meetings every year? |
| e | In your opinion, do you feel project beneficiaries were involved in determining the size of the project? |
| | SECTION C: PLANNING BY COMMUNITY<br>**1. Activity Scheduling** |
| a. | Did the project team involve the community when organizing project activities to be implemented? |
| b. | Do you think involvement of community members in scheduling project activities is important? |
| c. | Do you think community involvement in planned activities was done through regular consultative meeting? |
| d. | Do you feel planned project activities reflected community views? |

| | |
|---|---|
| e. | In your opinion do think community involvement in activity scheduling was satisfactory?<br>**Take note of:**<br>Quotes, passionate comments, body language, head nodes, physical excitements, eye |
| | **2. Pre-feasibility study** |
| a. | Did you participate in prefeasibility study? |
| b. | Do you think majority of the community members knew about the initial project study? |
| c. | Do you feel that community views were sought in the initial stages? |
| d | Did the project mobilize beneficiaries to contribute in providing views about the |
| e. | Do you think beneficiaries' willingness to participate in providing views about the water project was evident?<br>**Take note**<br>Quotes, passionate comments, body language, head nodes, physical excitements, eye contacts |
| | **3.Feasibility study** |
| a. | Do you think project beneficiaries took part in the follow –up study on the project? |
| b. | Did you assist to mobilize community in airing their views? |
| c. | Do you feel project beneficiaries willingly participated in giving their views? |
| d. | Did you participate in laying project pipes and machineries? |

**Appendix 3: Observation Schedule**

The researcher will make observations on the influence of community participation on sustainability of community water project;

1. Sustainability of community water project
   i. Evidence of cost recovery in the water project
   ii. Evidence of continuing support
   iii. Continued improvement in the water project
   iv. Evidence of environmental protection
2. Community participation
   i. Evidence of Participatory needs assessment
   ii. Evidence of participation on scope decision
   iii. Evidence of participatory asset identification
   iv. Evidence of community involvement on project initiation
   v. Evidence of community involvement in project activities
3. Participatory planning
   i. Evidence of collective activities scheduling
   ii. Evidence of collective prefeasibility study
   iii. Evidence of information sharing framework
4. Participatory implementation
   i. Evidence of community contributions
   ii. Evidence of equipment and tools contributed by the community
   iii. Evidence of locally available materials contributed by the community
   iv. Evidence of participatory operations and maintenance
5. Participatory Monitoring and Evaluation
   i. Evidence of collective monitoring of water allocations
   ii. Evidence of water distribution rules

Evidence of water collection revenue

## Appendix 4: Research Permit

REPUBLIC OF KENYA

**RESEARCH LICENSE**

## Appendix 5: Sample Size Determination Table

| N | S | N | S | N | S | N | S | N | S |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 10 | 100 | 80 | 280 | 162 | 800 | 260 | 2800 | 338 |
| 15 | 14 | 110 | 86 | 290 | 165 | 850 | 265 | 3000 | 341 |
| 20 | 19 | 120 | 92 | 300 | 169 | 900 | 269 | 3500 | 346 |
| 25 | 24 | 130 | 97 | 320 | 175 | 950 | 274 | 4000 | 351 |
| 30 | 28 | 140 | 103 | 340 | 181 | 1000 | 278 | 4500 | 354 |
| 35 | 32 | 150 | 108 | 360 | 186 | 1100 | 285 | 5000 | 357 |
| 40 | 36 | 160 | 113 | 380 | 191 | 1200 | 291 | 6000 | 361 |
| 45 | 36 | 170 | 118 | 400 | 196 | 1300 | 297 | 7000 | 364 |
| 50 | 44 | 180 | 123 | 420 | 201 | 1400 | 302 | 8000 | 367 |
| 55 | 48 | 190 | 127 | 440 | 205 | 1500 | 306 | 9000 | 368 |
| 60 | 52 | 200 | 132 | 460 | 210 | 1600 | 310 | 10000 | 370 |
| 65 | 56 | 210 | 136 | 480 | 214 | 1700 | 313 | 15000 | 375 |
| 70 | 59 | 220 | 140 | 500 | 217 | 1800 | 317 | 20000 | 377 |
| 75 | 63 | 230 | 144 | 550 | 226 | 1900 | 320 | 30000 | 379 |
| 90 | 73 | 260 | 155 | 700 | 248 | 2400 | 331 | 75000 | 382 |
| 95 | 76 | 270 | 159 | 750 | 254 | 2600 | 335 | 100000 | 384 |

Table1: Sample Population

**NOTE:** "N" is population size while "S" Is sample size

**Source:** Krejcie, & Morgan. "Determining Sample for Research Activities" Education and Physiological Measurement. 1970