Stakeholder Participation and the Sustainability of Community-Based Water Borehole Projects in Mavoko Constituency, Machakos County, Kenya

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ABSTRACT

Stakeholder participation is crucial for the success of sustainable development policies and community-based projects. This study assessed the impact of stakeholder participation on the sustainability of water borehole projects in Mavoko Constituency, where many initiatives faced challenges once international donor funding ended. Specifically, the research examined the effects of social inclusion, the significance of stakeholder engagement, and the relationship between planning and the sustainability of community-based water projects in Mavoko Constituency, Machakos County. Guided by resource dependence theory, the study employed a descriptive survey design. To select questionnaire respondents, a systematic random sampling procedure was utilized. The research targeted 1,230 individuals involved in 20 community-based water projects and selected a sample of 302 respondents using Taro Yamane's formula. Data collection tools included questionnaires, with data analyzed using SPSS version 25.0 for both descriptive and inferential statistics. Descriptive statistics provided frequency and percentage summaries, while inferential statistics, including binomial logistic regression and correlation analysis, explored the relationships between stakeholder participation and project sustainability. The findings revealed that enhanced social inclusion increased the likelihood of project sustainability by approximately 5.6 times, stakeholder engagement improved sustainability odds by nearly 4.8 times, and effective planning contributed to a 3.6-fold increase in the likelihood of achieving high sustainability levels. These results underscore the need for a more strategic approach to stakeholder participation for practitioners and policymakers. The study concludes that social inclusion, stakeholder engagement, and planning each have a statistically significant positive impact on the sustainability of community-based water projects. To further enhance sustainability, the study recommends integrating comprehensive social inclusion strategies to ensure equal participation opportunities for all community segments, including women and youth. Additionally, strengthening stakeholder engagement by securing consistent financial and material support and improving resource management practices is crucial. Regular training and knowledge-sharing initiatives should also be implemented to build stakeholder capacity and create a supportive environment for successful project implementation. These findings are significant as they offer actionable insights for policymakers and practitioners, emphasizing the critical role of strategic stakeholder participation in enhancing the sustainability of community-based water projects.

Keywords: Community Development, Project Management Practices, Resource Dependence, Stakeholder Participation, Water Project Sustainability

1. INTRODUCTION

Clean and dependable sources of water are of high respect in the sustenance of human life; however, access to such sources is even of higher concern. Water is extremely important for the maintenance of life. The health of a human being, economic development, as well as that of the environment, depends on clean and dependable sources of water. In some parts of the world, more especially in Kenya as a developing country, access to safe water is a major challenge, especially in rural and urban areas. Water is indispensable in the sustenance of life. Access to clean and dependable sources of water proves to be very important for human health, economic development as well as environmental sustainability. It is quite a challenge for developing countries like Kenya, where rural and urban areas are greatly disadvantaged through lack of infrastructure. Among solutions that have been implemented is the community-based water project as a strategic approach. In the Mavoko Constituency of Machakos County, such initiatives place capable local communities in charge of their water resources and infrastructure thereby leading to better access and management.

However, in the UK, as per Fonseca et al. (2019), the sustainability of these projects depends on key factors. For instance, social inclusion ensures that everybody in the community, irrespective of gender or socio-economic status, participates in making decisions; this will result in collective ownership and support. On the other hand, sustainability for some time with reference to community-based water projects depends on very many factors

including social inclusion and stakeholder engagement and planning. The factors determine the extent to which the programs will be successful in the long run.. Water projects should meet the diversified needs of the people they serve and the population as a whole by Social inclusion, or the active involvement of all members of the community "irrespective of gender, age, ethnicity, religion, disability, or any other form of social classification" (Fonseca et al., 2019) is critical to ensuring that a water project benefits everyone who is part of a community and not just the user.

In Greece, effective planning requires governments, as stated by Tzanakakis et al. (2020), to ensure that comprehensive planning processes build service systems on which sustainable community water supply projects rest. The success of community-based water projects is directly imputed to the effectiveness of comprehensive planning, wherein the needs assessments and feasibility studies are well coordinated and carried out to an optimal degree, involving consultations at the community level. These need assessments underlie the details, as they have to provide the actual water-related problems in every community. The explanation of deficits and demands will lead to a good, clear, and relevant project objective that serves the most urgent requirements of the community directly. Feasibility studies then build on this by analyzing the technical, financial, and environmental aspects of potential solutions, ensuring that the proposed strategies are both viable and sustainable in the long term. These studies help in refining project objectives and selecting the most appropriate methods for achieving them. Lastly, community consultations ensure that the voices and insights of local residents are incorporated into the planning process. By engaging the community, project planners can align the goals and strategies with local priorities and cultural considerations, fostering a sense of ownership and commitment to the project's success. Together, these components work synergistically to identify well-defined project goals and effective strategies that are tailored to the specific needs and conditions of the community.

Similarly, projects in Bolivia involve community-based organizations in rainwater harvesting, small irrigation systems, and watershed management, which foster local water autonomy (Molle & Floch, 2018). Projects where sustainable future success relies upon community involvement, social inclusion, and local knowledge empower these citizens to be in control of what they've already known how to manage and what to use effectively over time. In Brazil, community-based efforts to reduce access challenges occur with rural initiatives and in marginalized areas. The most common one is the Programa Um Milhão de Cisternas (One Million Cisterns Program), which empowers communities to develop more sustainable forms of access through rainwater harvesting for daily use, agriculture, and livestock (Marinho et al., 2015). Projects such as these require sustainability through community involvement, technical training, and socio-mobilization to ensure they're used in daily life.

In Ghana, community oriented approaches appear to be quite effective in increasing the access to water and sanitation services with focus on the disadvantaged areas of the region. Community participation in building and maintaining the water facilities was reportedly stimulated by both the Community Water and Sanitation Agency (CWSA), and Community-Led Total Sanitation (CLTS) (Bello et al., 2017). Communal involvement, communication for behavior change, and de-centralized decision-making processes are through such initiatives strengthened as people learn how to meet their water needs more effectively while promoting sanitation and the environment. Likewise, in South Africa, where the main water supply is from Lesotho, community-based water initiatives have been effective in addressing water equity and inclusivity challenges in rural areas. Such communities were supported to develop their community water supply systems by various organizations including Community Water Supply and Sanitation Agencies (Nkhata et al., 2020). Such efforts emphasize participatory planning, capacity enhancement and gender based strategies to improve water service delivery which is equitable, sustainable and responsive to local context. This viewpoint demonstrates the importance of the communities' involvement and empowerment in the tackling of provisions of water facilities in the African countries. Sustainable solutions can be sought and implemented with the collaboration between ND communities such as communities, governments, and other stakeholders in such a manner that all people are able to access clean and sufficient sources of water which will lead to improved health, economic growth, and positive environmental impact to other parts of the continent.

In Tanzania, similarly, position paper puts forth that the stakeholders, including local authorities, Non-Governmental Organizations (NGOs) and private sector partners, have been decisive in leveraging resources and expertise for the effective sourcing and management of water projects. There is also a way of managing the projects in which proper planning which involves needs assessment and feasibility studies, has been in safeguarding that the projects are executed in an efficient and effective way that does allow for changes in the environment (Sigalla et al., 2021). These pertinent issues have been noted as having far-reaching impacts regarding the sustainability of most water based projects in Kenya and other Third World countries: their viability. Through collective approaches such as these, communities are able to assume greater responsibility for projects, resulting in project sustainability. Furthermore, approaches of this nature can help to address structural inequalities that underlie the access to water resources on a more equitable basis.

Another factor considered important for determining the sustainability of the projects is stakeholder engagement in the water projects. Stakeholders such as community members, local authorities, NGOs, and private

sector actors have interests in the water projects and possess useful resources, competence, and assistance to offer (Sigalla et al., 2021). Such engagement will be significant in mobilizing the stakeholders in the project and in mobilizing more resources in to the project, thus increasing the life span of the project.

Further Tzanakakis et al. (2020) argues that particular attention should be devoted to continuous M& E inspections given that these are important in the determination of project status, in spotting the weak links in the project, and in changing strategies and improving practices as appropriate which enhances the projects sustainability in the long run. Unfortunately, the problem of providing clean water still exists. World Health Organization (WHO) and United Nations Children's Fund (UNICEF) in a 2021 report noted that over 2.2billion people do not have access to safely managed drinking water and overuse of clean water remains a common practice. This situation is discouraging and calls for strategies that will exploit the available harsh circumstantially. Such harsh realities have seen an increase of water projects designed and executed by communities themselves. However, Community-based projects are estimated to benefit around two million individuals in Kenya, as noted by Mwaura et al. (2021). The country has enacted several laws and regulations that have significantly enhanced stakeholder participation in decision-making processes. The 2010 Kenyan Constitution requires public involvement in all areas of governance, including environmental decision-making, and acknowledges this right (Republic of Kenya, 2010). Furthermore, Kenya has implemented policies aimed at ensuring public engagement in environmental assessments and decision-making, with the National Environment Management Authority playing a crucial role. However, several factors could hinder the effectiveness of these policies, such as insufficient funding, poor implementation, a lack of awareness among stakeholders regarding their participatory rights, and societal or cultural obstacles that limit meaningful stakeholder engagement.

1.1 Statement of the Problem

In the Mavoko Constituency of Machakos County, the sustainability of community-based water projects poses a substantial challenge. According to the Ministry of Water and Sanitation (2023), approximately 40% of the thirty initiatives launched over the past five years are either non-functional or have stagnated. This high failure rate adversely impacts local communities, limiting access to clean water and jeopardizing public health, economic productivity and overall social well-being. Contributing factors to these failures may include inadequate funding, poor financial management, operational inefficiencies and insufficient community involvement. Furthermore, current literature underscores significant gaps in understanding the effectiveness of strategies designed to enhance sustainability and stakeholder participation in these initiatives. While various policies and interventions have been implemented, their effects on project outcomes remain inadequately evaluated. The absence of detailed case studies that specifically address the unique challenges in Mavoko further complicates the understanding of the factors influencing project success or failure. However, this lack of evaluation is critical because it leaves communities vulnerable to ongoing issues related to water access and sustainability. Although progress is sought, the complexity of these dynamics cannot be overlooked. This study sought to investigate and analyze the particular causes behind the non-functionality and stagnation of water projects in Mavoko. It offers insights that could enhance the design, implementation and management of future community-based water initiatives. However, by addressing these gaps, the research intends to inform policy and practice (because) it ultimately strives for equitable access to clean and dependable water sources for all residents in the constituency. Although challenges exist, this effort is crucial for sustainable development.

1.2 Research Objectives

The specific objectives were:

i. Determine the effect of social inclusion on sustainability of community -based water projects in Mavoko Constituency, Machakos County
ii. Assess the implication of stakeholder engagement on sustainability of community- based water projects in Mavoko Constituency, Machakos County
iii. Examine the relationship between planning and sustainability of community -based water projects in Mavoko Constituency, Machakos County

11. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Resource Dependence Theory

Resource dependence theory was put forward by Pfeffer and Salancik (1970).The theory suggests that it is essential for organizations to manage their relationships with a stakeholder, including suppliers, competitors, customers, and other organizations that help in operations. The theory assumes that organizations have limited

resources and are interdependent. Therefore, they have to rely on each other to survive by obtaining resources from other organizations. It also suggests that they must manage the relationships to ensure that the resources are continuously obtained. Dependence on the external organization leads to failure once support is withdrawn.

Resource development theory can be used to assess the effects to stakeholder participation in decision-making and community development operations. The theory suggests that organizations and communities face barriers to stakeholder involvement in decision-making. The barriers include power imbalance, limited resource access, and economic constraints (Frynas & Yamahaki, 2016). The theory can be employed to examine how external factors influence stakeholder participation. Specifically, it guided the present study by identifying and analyzing various external elements, such as economic constraints, policy changes, and environmental conditions that affect stakeholder engagement in community-based water projects. This analysis provided insights into how these external factors shape the dynamics of stakeholder involvement and contribute to the overall sustainability of the projects. Resource dependence theory is a limitation since it does not account for the internal dynamics that influence stakeholder participation. It also assumes that community-based organizations cannot develop strategies that will impact the involvement of external organizations.

2.2 Empirical Review

2.2.1 Social Inclusivity

Adewale et al. (2021) examined the dynamics of social inclusion and stakeholder engagement within community development initiatives situated in rural Nigeria. Their findings highlighted the crucial role of inclusive decision-making processes, which are essential for empowering communities and enhancing stakeholder participation, ultimately contributing to project sustainability. However, the study revealed methodological gaps; this was largely attributable to an overreliance on qualitative methods, alongside a notable lack of transparency regarding researcher positionality. Moreover, there existed a significant absence of comparative analyses with analogous projects in different regions. This suggests a pressing need for more extensive comparative studies that could illuminate the complexities of social inclusion across various contexts.

Dos Santos et al. (2020) explored the concepts of social inclusion and stakeholder engagement in initiatives aimed at sustainable development within northern rural communities in Angola. Their research highlighted the significance of inclusive practices such as community-driven decision-making in fostering project success and enhancing community ownership. However, methodological limitations were present: a reliance on qualitative methods and insufficient consideration of alternative perspectives within the community. Although these findings provide valuable insights, there was a noticeable lack of comparative analyses with similar projects in different regions. This gap indicates a pressing need for further research to examine the varying dynamics of social inclusion across diverse contexts.

Water scarcity continues to pose a significant challenge in rural Kenya; areas such as Mavoko Constituency are particularly affected. Community-based water projects (CBWPs) present a potential remedy; however, their enduring success is contingent upon sustainable management practices (Muigua, 2021). Social inclusion stands out as an essential element, especially regarding the participation of women, youth and other historically marginalized groups in the processes of project planning, decision-making and implementation. Research conducted throughout sub-Saharan Africa reveals a compelling connection between social inclusion and a community's sense of ownership over CBWPs (Njuguna & Nyaga, 2018). Inclusive methodologies that empower every community member to engage actively in decision-making cultivate a collective accountability for the project's outcomes. This sense of ownership, therefore, leads to an increased willingness to invest resources, labor and expertise, which ultimately enhances long-term maintenance and sustainability (Gizachew & Biresaw, 2022).

2.2.2 Stakeholder Engagement

Mensah et al. (2020) examined the engagement of stakeholders and its influence on their participation in agricultural development initiatives in Kumasi, Ghana. This research underscored the significance of inclusive stakeholder engagement processes, which can foster ownership and commitment among various stakeholder groups. However, methodological deficiencies were noted, particularly a dependence on qualitative methods and insufficient attention to power dynamics in stakeholder interactions. Although the study provided some insights, there was a limited examination of contradictions or alternative viewpoints, suggesting a necessity for more nuanced analyses that could better capture the complexities inherent in stakeholder engagement processes.

In Tanzania, a study conducted by Mushi et al. (2018) examined the engagement of stakeholders and its impact on their involvement in education reform initiatives. The results highlighted the importance of stakeholder engagement in fostering accountability, transparency and sustainability in educational efforts. However, some methodological limitations were noted such as a deficiency in robust sampling strategies and the triangulation of data

sources was limited. This raises concerns, because there was a notable lack of research that explored contradictions or alternative perspectives within stakeholder interactions. Although the findings are significant, they suggest a pressing need for more thorough analyses to improve our understanding of the dynamics influencing stakeholders' participation behaviors and attitudes.

Kilonzo and George (2017) assert that effective stakeholder engagement in community projects involves various components: information sharing, organizing community meetings and supplying both financial and material resources. They highlight the significance of human resource contributions such as labor, skills and expertise alongside the recruitment of volunteers. However, although this framework presents a thorough perspective on stakeholder engagement, it fails to critically assess the potential limitations and challenges that may arise within these processes. For example, the effectiveness of these engagement strategies can be affected by factors like power imbalances among stakeholders and differing levels of commitment, which remain inadequately addressed in their analysis. This oversight raises important questions about the overall efficacy of the proposed strategies.

2.2.3 Planning

Nsereko et al. (2021) explored the effects of planning on stakeholder engagement within healthcare development initiatives in Uganda. Their findings emphasized the critical role that strategic planning plays: it not only encourages stakeholder involvement but also enhances overall project outcomes. The planning processes were directly associated with increased stakeholder participation, improved resource allocation and heightened accountability in various projects. However, despite the valuable insights provided, the study displayed certain methodological limitations; notably, it lacked a longitudinal perspective and failed to adequately address the complexities of power dynamics in stakeholder interactions. Although the research established a strong foundation, there was a clear deficiency in examining potential contradictions or alternative viewpoints, which suggests a pressing need for further studies to elucidate the diverse factors that impact the interplay between planning and stakeholder dynamics.

Mwangi (2018) noted that for any development project in a community to be sustainable, there is a need for an enhanced planning process coupled with stakeholders' abilities and skills. It involves developing and strengthening the skills, abilities, and processes communities need to adapt and thrive in the face of a fast-changing world through planning. Research has shown that certain community characteristics influence their ability to build capacity and create social capital (San Cristóbal et al., 2018). Varral (2020) asserts that knowing the community, who will be the beneficiaries of any development initiative, is critical to building support. Planning is a key approach used by development organs to ensure the sustainability of development projects (Havugimana, 2018).

Planning as an approach to community development builds independence. It can be a 'means to an end' with the key goal being enabling the community to take over a project of an 'end' with the key goal being to enable parties ranging from individuals to government officers to work together to solve common problems (Gibson, 2019). Planning requires a deep analysis of existing capacity, identifying needed capacity, and designing appropriate measures to fill the capacity gap. Thus according to Gibson (2019), this can take various dimensions, including human resources, social resources, and financial capacity. The financial capacity will include knowledge of resources and opportunities. The human resources dimension will include issues such as motivation of individuals and teams, skill development, development of relational abilities, and trust within the project team and community, in general, to ensure equitable benefiting from the project.

III. METHODOLOGY

3.1Research Design

The research design for the study was descriptive survey design. Mugenda and Mugenda (2009) stated that this design allows the researcher to use both qualitative and quantitative methodologies to collect detailed data about phenomena. Simultaneously, the design ascertains and documents the current state of affairs while endeavoring to characterize variables like potential behavior, attitudes, values, and attributes of a certain group being studied. This approach (which is widely accepted) is considered suitable because it allows the researcher to gather extensive qualitative and quantitative data regarding the effects of stakeholders' participation on the sustainability of community-based water projects. Specifically, the study utilized questionnaires for quantitative data collection; however, interview guides were employed for qualitative data collection. This dual methodology ensures a comprehensive understanding of the research problem, although some limitations may arise. Thus, the findings could be more nuanced than they appear at first glance.

3.2 Study Site

This study was done in Mavoko Constituency in Machakos County. Machakos is County number seventeen among the forty-seven counties in Kenya, Mavoko Constituency covers four divisions that is; Mlolongo/ Katani,

Mavoko, Lukenya and Kinanie/ Mathatani. The county borders Nairobi County to the west, Kitui County to the east, Makueni County to the south and Kirinyaga County to the North West. Mavoko falls in Athi- River Sub County and it covers an area of approximately 963 square kilometers with a population estimate of 244,259 inhabitants which is predicted to increase to 593,182 residents by the year 2030. Since Mavoko is very close to Nairobi it has been growing in terms of Industries that provide job opportunities for the residents.

The climate in the area is semi-arid meaning the community members go for very long periods without rain hence they are forced to rely on water from Mavoko Water and Sewerage Company (MAVWASCO) and community boreholes. Mavoko Constituency was selected as the ideal research site due to its recurring challenges with borehole water projects ceasing operations post-project closure. This trend presents a pressing need to investigate methods for enhancing project sustainability, particularly to facilitate community development effectively. The specific context of the constituency makes it a pertinent case study for understanding the complexities surrounding water project sustainability.

3.3 Target Population and Sampling Techniques

The Machakos County Government Office has reported that there are twenty community-based water projects in the Mavoko constituency with 1,230 members who in this study were the target population. These are people who actively participate in the 20 community-based water projects.

To determine the study's sample size, the Yumane (1967) formula was employed, resulting in a sample of 302 respondents. The Department of Water Services provided a comprehensive list of members involved in community-based water projects, forming the sampling frame. To select respondents, a systematic random sampling procedure was utilized.

3.4 Data Analysis and Presentation

The interview schedules and questionnaires functioned as the primary instruments for data collection in this project. The statistical package for the social sciences (SPSS version 25.0) was utilized to analyze the data derived from the questionnaires, focusing on both descriptive and inferential analyses. The calculation of percentages created vital constituents of descriptive statistical analysis. In order to ascertain the effect of stakeholder participation on the sustainability of community-based water projects in Mavoko Constituency, inferential statistical analysis was conducted. This employed a binomial logistic regression model and correlation analysis as diagnostic tests for the relationships among the independent variables. Although this is significant, because the dependent variable in the questionnaire is binary (sustainability: low extent or high extent), the binomial regression model is particularly applicable. However, it is crucial to acknowledge that, while the analysis provides valuable insights, the interpretation of results must be approached with caution.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics

4.1.1 Social Inclusivity and Sustainability of Community -Based Water Projects

The study looked into the effect of social inclusivity on the sustainability of these projects by using four specific items. Participants responded with "yes" or "no" to indicate their views on various aspects of social inclusion. The summarized results are shown in Table 1.

Table 1

Social Inclusivity

Statement	Yes	No
Gender balance is observed in stakeholders' participation in community-based water-project in Mavoko	45%	55%
Stakeholders' participation is devoid of religious-based or ethnic-based discrimination.	56.4%	43.6%
Citizens are involved in the projects without ethnic-based discrimination.	61.5%	38.5%
Women and youth are given equal opportunity in public service.	38.5%	61.5%

Table 1 shows that less than half of the respondents (45%) contend that there exists a gender balance in stakeholder participation; however, the majority (55%) perceives an absence of gender inclusivity. This suggests that gender balance remains a considerable issue within these projects. The significance of gender inclusivity is further highlighted by Agarwal (2018), who asserts that achieving gender balance in community initiatives results in more equitable and sustainable outcomes. Because there are no active measures to rectify this imbalance, the overall effectiveness and fairness of these projects could be undermined. Although the perception of fairness in stakeholder

participation is somewhat more optimistic regarding religious and ethnic discrimination, a majority (56.4%) believes that stakeholder involvement is devoid of such biases. This indicates a relatively favorable perspective on inclusivity in these particular domains.

However, the fact that almost (44%) of respondents continues to perceive some degree of discrimination suggests that these issues cannot be wholly dismissed. As noted by Kabeer (2016), overcoming both overt and subtle forms of discrimination is essential for fostering an inclusive environment. This environment encourages broad-based participation and support, although it may be challenging to achieve due to various underlying factors. The prevailing perception surrounding ethnic inclusivity is noteworthy, as a significant 61.5% of respondents concur that the projects do not engage in ethnic-based discrimination. This represents a commendable trend, particularly because ethnic inclusivity is essential for fostering cohesion and ensuring the success of community-based initiatives. However, the issue is not entirely resolved; 38.5% of participants still contend that ethnic discrimination is prevalent, which could potentially erode trust and hinder cooperation among various stakeholders.

Conversely, the least agreement surfaced in relation to the assertion about equal opportunities for women and youth in public service. Only 38.5% of respondents confirmed that such opportunities exist, while a majority 61.5% expressed disagreement. According to Cornwall and Rivas (2015), the exclusion of women and youth from positions of leadership and decision-making not only perpetuates inequality but also diminishes the overall impact of community development initiatives. Although there are encouraging signs regarding ethnic inclusivity and the absence of discrimination, concerns about gender balance and the availability of equal opportunities for women and youth persist.

The issues at hand necessitate addressing to enhance the social inclusivity and overall sustainability of community-based water projects. Efforts to promote gender equality and youth involvement can significantly improve both the effectiveness and fairness of these initiatives. However, this is not merely a matter of good intentions; it is essential for their long-term success. Although challenges exist, the benefits of inclusivity cannot be overlooked, because they pave the way for a more equitable future. Thus, attention must be paid to these factors, but action is equally important to realize the desired outcomes.

4.1.2 Stakeholder Engagement and Sustainability of Community -Based Water Projects

This part of the study examined how stakeholder engagement impacts the sustainability of community-based water projects. Respondents answered "yes" or "no" to various statements related to stakeholder involvement. The summarized results are shown in Table 2.

Table 2

Stakeholder Engagement

Statement	Yes	No
The stakeholders provide human resource capital to the projects	44.9%	55.1%
Community is involved in providing financial and material capital	36.7%	63.3%
There is adequate donor funding to the projects	31.8%	68.2%
Financial and human resources are properly managed to increase project outcomes	42.5%	57.5%

Table 2 shows that roughly 44.9% of respondents assert that stakeholders play a role in contributing human resources to these projects; however, a significant 55.1% believe that these contributions fall short of what is necessary. This result supports Bryson's (2018) comprehensions, which propose that whereas stakeholder engagement regularly entails considerable human resource investment, various practical challenges and limitations often hinder the effectiveness of such contributions. Bryson also underscores the pivotal role that stakeholder involvement plays; yet, he points out that, in reality, situations often do not meet the ideal standards of engagement. The survey indicates that only 36.7% of respondents view the community as actively participating in the provision of financial and material resources, while a considerable 63.3% express disagreement. This finding echoes Mumba et al. (2019), who examined the recurring impediments to community involvement, especially regarding financial contributions, which can negatively impact the sustainability of development projects. He observed that strong (community) engagement is crucial for obtaining vital resources and ensuring the sustainability of initiatives driven by the community. However, this involvement can often be challenging, because it requires consistent participation from diverse groups. Although many recognize its importance, some may overlook the effort needed to maintain such engagement.

A significant majority (68.2%) of participants view donor funding as inadequate for their projects, while only 31.8% consider it sufficient. This concern is backed by the World Bank (2015), which identifies the struggle to secure adequate donor support as a major obstacle to the success and sustainability of community initiatives. Limited funding can profoundly restrict project capabilities and long-term results. Regarding the management of financial and human resources, 42.5% of respondents believe that resources are managed effectively to improve project outcomes;

however, 57.5% disagree, highlighting concerns about resource management. Turner and Müller (2015) stress that effective management of both financial and human resources are crucial for achieving successful project outcomes. This study sheds light on several important issues related to stakeholder engagement in community-based water projects. Addressing these gaps which are often overlooked has the potential to enhance stakeholder engagement essential for the sustainability and success of vital community projects. However, this process necessitates careful planning. Although it may be argued that resources are limited, prioritizing these initiatives is crucial: investing in stakeholder collaboration is vital. Because of their positive impact, this could contribute to a more resilient community framework. Nevertheless, it is important to not overlook the challenges involved, but rather to confront them head on.

4.1.3 Planning and Sustainability of Community -Based Water Projects

This part of the study examined how planning affects the sustainability of community-based water projects. Respondents answered "yes" or "no" to various statements related to planning. The summarized results are shown in Table 3.

Table 3

Planning

Statement	Yes	No
Training of stakeholders on water project is conducted on regular basis	34.4%	65.6%
Stakeholders' management skills are enhanced through regular workshops	66.2%	33.8%
There is constant and timely knowledge sharing on matters projects in Mavoko	41.4%	58.6%
The government has created an enabling environment for projects sustainability	41.1%	58.9%

The results in Table 3 reveal respondents' perceptions of how planning influences the sustainability of community-based water projects in Mavoko Constituency. The analysis highlights both the strengths and gaps in the planning process, which are critical to the sustainability of these projects. Thirty-four point four percent of respondents indicated (that training for stakeholders on water projects is conducted regularly); however, a significant majority (sixty-five point six percent) felt that such training is inadequate. This finding is troubling: regular training is essential for equipping stakeholders with the skills and knowledge necessary to manage and sustain community-based projects effectively. Although many recognize the importance of training, it appears that the current offerings do not meet the community's needs (because this is the case, a reevaluation may be necessary). Recent studies emphasize that continuous education and skill development are key to building the capacity of communities to sustain such initiatives (Adams et al., 2021).

A more positive finding is that 66.2% of respondents agreed that stakeholders' management skills are enhanced through regular workshops. This implies that there are coordinated efforts to enhance the managerial capabilities of individuals engaged in the projects, which is vital for their long-term viability. Effective workshops and training sessions are recognized for empowering stakeholders; they improve their capacity to take ownership of projects and manage them effectively (Baker & DuPont, 2020). However, the findings reveal that knowledge sharing is not consistently implemented, with merely 41.4% of respondents confirming that there is regular and timely dissemination of project related information, while 58.6% expressed disagreement. The lack of effective knowledge sharing can significantly impede the exchange of vital information among stakeholders, potentially jeopardizing the sustainability of these initiatives.

Recent studies highlight the importance of knowledge sharing in promoting collaboration and ongoing improvement within community-based projects (Lee & Puranam, 2019). In relation to government involvement, 41.1% of respondents assert that the government has fostered an enabling environment for the sustainability of these projects; however, 58.9% disagree. This discrepancy suggests that there may be deficiencies in government support or policies that are critical for bolstering the sustainability of community-based water projects. Although these findings are revealing, they also indicate a pressing need for further investigation into the underlying issues. It has been suggested that robust government support is a key factor in the success and sustainability of such initiatives, particularly in resource-limited settings (Garcia & Rivera, 2022). The findings suggest that, although efforts to enhance management skills are evident, significant challenges persist (in the realms of stakeholder training, knowledge sharing and government support). Addressing these gaps could, however, lead to a substantial improvement in the sustainability of community-based water projects in Mavoko Constituency. Strengthening stakeholder training initiatives is crucial; improving knowledge-sharing mechanisms is necessary and enhancing government support could provide (a more robust foundation) for the long-term success of these initiatives. This is essential because the effectiveness of such projects hinges on multiple interrelated factors.

4.1.4 Sustainability of Community- Based Borehole Water Projects

This part of the study examined the extent at which stakeholders' participation has enhanced sustainability of community- based water projects. Respondents answered "low extent " or " high extent " to various statements related to Sustainability of community- based borehole water projects. The summarized results are shown in Table 4.

Table 4

Sustainability of Community- Based Borehole Water Projects

Statement	High extent	Low extent
The stakeholders' participation has enhanced the continuation of projects	64.1%	35.9%
Stakeholders' participation has created employment opportunities	52.5%	47.5%
There are improved standards of living	39.4%	60.6%
Due to stakeholders' participation, there has been successful water projects in the area	53.4%	46.6%

The data presented in Table 4 underscores the sustainability of community-based borehole water projects within Mavoko Constituency. The analysis emphasizes the degree to which such participation has facilitated the continuation of projects, the generation of employment opportunities, the enhancement of living standards and the overall efficacy of water initiatives in the region. A substantial majority of respondents 64.1% reported that stakeholder participation has significantly bolstered the continuation of these community-based borehole water projects. This indicates that engaging stakeholders during the planning, execution and maintenance phases of these initiatives has been crucial for ensuring their long-term viability. Ochieng and Shisia (2023) agree with these results, proposing that active stakeholder involvement is a vital determinant of project sustainability, specifically in community-oriented efforts. Additionally, more than half of the respondents (52.5%) assert that stakeholder participation has resulted in the creation of employment opportunities. This implies that these projects not only offer essential water resources (which are vital) but also serve a crucial function in invigorating the local economy by creating employment opportunities. However, the sustained success of these initiatives may hinge on ongoing stakeholder engagement; the challenges encountered can be complex and multifaceted.

Research supports the idea that community-based initiatives can function as catalysts for economic development, particularly when local stakeholders are actively involved (Mburu & Mutuku, 2022). However, only 39.4% of respondents believe that stakeholder participation has significantly improved living standards, with a majority (60.6%) expressing that the impact has been limited. Although the potential is there, this discrepancy raises questions about the effectiveness of engagement strategies. This finding suggests that, although the projects may be sustainable, their broader socio-economic benefits are not fully realized. Studies indicate that the sustainability of community-based projects is often correlated with improvements in living standards (this is significant) because these outcomes depend heavily on the effective distribution of resources and benefits. However, there are challenges; effective distribution can be hindered by various factors. Thus, understanding these dynamics is crucial for maximizing the impact of such initiatives (Kariuki & Ngugi, 2021). In terms of overall project success, 53.4% of respondents contend that stakeholder participation has contributed to successful water projects in the area, while 46.6% do not concur with this perspective. This divided opinion highlights the mixed outcomes of these initiatives, wherein some projects may thrive due to active stakeholder engagement, but others might struggle because of various challenges, including inadequate resources or insufficient governmental support.

Research indicates that the success of such projects often hinges on a multitude of factors, including (but not limited to) stakeholder involvement, resource availability and effective management (Mwangi & Kamau, 2022). The findings suggest that stakeholder participation has generally yielded a positive impact on the sustainability and continuation of community-based borehole water projects in Mavoko Constituency. However, the mixed outcomes related to the improvement of living standards (and overall project success) imply that there remains considerable room for enhancement in maximizing the socio-economic benefits of these initiatives. Although enhancing stakeholder engagement strategies is essential, addressing the barriers to broader socio-economic gains is equally important; this could further bolster the sustainability and effectiveness of these projects. But, one must consider the complexities involved, as they often dictate the success of such endeavors. Therefore, careful planning and execution are paramount.

4.2 Inferential Studies

4.2.1 Parameter Estimates on the Effect of Stakeholders' Participation and Sustainability

In this study the dependent variable which is sustainability of community -based water projects had two nominal categories of (high extent and low extent). The binomial logistic analysis was used to fit the model as shown below in Table 5

Table 5

Model Parameter Estimates on the Effect of Stakeholders' Participation and Sustainability

	B	df	Sig.	Exp(B)
Social inclusion	1.721	1	.005	5.590
Stakeholder engagement	1.574	1	.017	4.826
Planning	1.289	1	.014	3. 629
Constant	1.085	1	.001	2.959

Table 5 illustrates that social inclusion has a significantly positive effect on the sustainability of community-based water initiatives. This is demonstrated by a coefficient (B) of 1.721 and a p-value of .005. The odds ratio (Exp(B)), which is noted at 5.590, indicates that projects that prioritize social inclusion are nearly 5.6 times more likely to achieve higher levels of sustainability when compared to those that overlook this vital component. However, it is crucial to consider the broader implications of these findings: while the data appears compelling, it provokes inquiries regarding the mechanisms that underpin this relationship, particularly because the context can differ greatly.

Thus, although the figures are clear, further examination is necessary to comprehensively grasp the dynamics involved. This finding aligns with the assertions made by Mwangi and Njuguna (2023), who argued that inclusive practices are crucial for the long-term success of community efforts. Practically speaking, this suggests that fostering an inclusive environment wherein all stakeholders have a voice can significantly enhance project sustainability, because it integrates diverse perspectives into the decision-making processes. It is, however, crucial to acknowledge that while these findings possess considerable significance, they also require further exploration into the complex dynamics of community engagement. Stakeholder involvement demonstrates a notably positive impact on sustainability, as evidenced by a coefficient of 1.574 (with a p-value of .017). The odds ratio of 4.826 implies that heightened levels of stakeholder participation significantly increase the probability of achieving elevated sustainability standards by nearly 4.8 times. This conclusion corroborates the assertions made by Kariuki and Mugo (2022), who argued that active stakeholder participation is essential for the success and sustainability of community initiatives. To enhance project outcomes, it is imperative to consistently engage stakeholders throughout the project lifecycle planning, implementation and evaluation because this approach not only utilizes stakeholder feedback but also fosters a deeper sense of ownership and commitment within the community. Nonetheless, one must recognize the potential obstacles that may arise in maintaining this engagement, particularly because conflicting interests can occasionally impede collaboration.

Planning (which has a coefficient of 1.289 and a p-value of .014) exerts a considerable positive influence on sustainability; however, the odds ratio of 3.629 implies that well-planned initiatives are approximately 3.6 times more likely to achieve high levels of sustainability in comparison to those characterized by less effective planning. Wambua and Mutua (2021) underscore the essential function of thorough planning in facilitating project success. Effective planning encompasses not only appropriate resource allocation and risk management, but also the explicit delineation of stakeholder roles. This suggests that project managers must dedicate substantial time and resources to comprehensive planning in order to foresee challenges resulting in more seamless project execution and, ultimately, improved sustainability outcomes. Ultimately, the model's constant, which has a coefficient of 1.085 with a p-value of .001, is noteworthy. The odds ratio of 2.959 indicates that even in the absence of social inclusion, stakeholder engagement and planning, other factors (that are not addressed within this study) could still contribute to the sustainability of community-based water projects, although this remains a domain ripe for further investigation. This indicates the complexity of sustainability, which may be influenced by additional variables such as environmental conditions, funding availability, and government support. Future studies should explore these factors to provide a more comprehensive understanding of what drives the sustainability of community initiatives.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

The study unveiled several pivotal insights concerning social inclusion, stakeholder engagement and planning within community-based water projects. Although efforts to mitigate religious and ethnic discrimination have yielded some progress, substantial challenges persist in achieving gender balance and ensuring adequate representation of women and youth. Targeted actions are crucial for fostering inclusivity and ensuring that every segment of the community can engage comprehensively.

Stakeholder engagement has been recognized as a pivotal element in maintaining project sustainability; this is especially significant because contributions whether in the form of human resources, financial backing, or materials have demonstrated a positive impact on project results. However, challenges such as inadequate donor funding and

deficiencies in resource management pose threats to long-term viability. Addressing these shortcomings is essential for the success of stakeholder-driven initiatives; but it demands a collaborative effort from all parties involved.

Planning has become an essential factor in various initiatives. Regular training, management skill workshops and knowledge-sharing activities significantly contribute to sustainability efforts. However, the implementation of these activities has often been inconsistent; additionally, a lack of government support further complicates the planning process. Strengthening these areas is necessary for the enduring success of community-based water projects. Although challenges exist, addressing them is crucial because this will ultimately result in more effective outcomes.

5.2 Recommendations

The research underscores the necessity for enhanced resource mobilization especially in terms of financial and human resources. In order to elevate stakeholder engagement, it is vital to formulate comprehensive strategies that encompass local fundraising initiatives, pursue partnerships with private sector entities and advocate for augmented government support. Transparency in resource utilization is paramount for fostering trust among stakeholders; this, in turn, ensures their ongoing support. Maintaining stakeholder interest and participation is essential for the success of water projects. Regular engagement through workshops, community meetings and feedback sessions should be prioritized. However, recognizing and rewarding contributions from stakeholders can serve as motivation, reinforcing their commitment to the projects. Although challenges may arise, it is crucial to address them proactively to cultivate a productive collaborative environment.

The study highlights the crucial role of continuous training for stakeholders engaged in water projects. To remedy the identified deficiencies, it is advisable that a systematic and ongoing training program be instituted. This program should concentrate on improving project management abilities, financial oversight and technical proficiency in water resource management. Regular capacity-building workshops are essential, as they will ensure that stakeholders possess the requisite skills to manage projects effectively.

The exchange of knowledge and best practices is vital for the ongoing enhancement of community-based water initiatives. It is suggested that platforms such as online forums, newsletters and regular community meetings be established to promote knowledge sharing among stakeholders. However, collaboration among various water projects within the region should also be encouraged because it allows for resource pooling and the sharing of valuable experiences. Although challenges may arise, the collective effort will ultimately lead to greater success.

The government's role in creating an enabling environment for the sustainability of water projects is crucial. It is recommended that local and national governments provide more robust support, including technical assistance, funding, and favorable policies that encourage the growth and sustainability of community-based water initiatives. Policymakers should work closely with communities to ensure that policies are responsive to their needs and challenges.

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