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Stakeholder Management and Sustainability of Borehole Water-Funded Projects by Non-Governmental Organizations in Makueni County, Kenya

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Abstract

Makueni County, situated in Kenya's arid and semi-arid region, continues to face chronic water scarcity that significantly undermines community livelihoods and well-being. Non-Governmental Organizations (NGOs) have made substantial investments in borehole water projects to provide sustainable access to safe and clean water. Despite these interventions, the long-term sustainability of several water projects has been compromised by weaknesses in stakeholder management, including inadequate community ownership, poor maintenance culture, and insufficient institutional support. This study investigated the effect of stakeholder management on the sustainability of NGO-funded borehole water projects in Makueni County. The study was anchored on Institutional Theory, Resource Dependency Theory, and Stakeholder Theory. A descriptive research design was employed. The target population comprised participants across ten borehole water projects in Makueni County, from which a sample of 92 respondents was drawn using stratified random sampling. Semi-structured questionnaires were used to collect primary data. Instrument reliability was assessed through Cronbach's alpha coefficient, with all constructs returning values above 0.7. Data were analyzed using SPSS version 22, yielding both descriptive and inferential statistics. The findings revealed that stakeholder identification ($\beta = 0.446$, $p = 0.001$), stakeholder communication ($\beta = 0.243$, $p = 0.001$), stakeholder involvement ($\beta = 0.308$, $p = 0.001$), and stakeholder empowerment ($\beta = 0.444$, $p = 0.001$) each had a statistically significant and positive effect on the sustainability of borehole water projects. The combined model explained 75.9% of variance in project sustainability (Adjusted $R^2 = 0.759$; $F = 66.49$; $p = 0.000$). The study recommends that NGOs and county authorities develop structured stakeholder identification frameworks, implement formal communication strategies, adopt participatory project management approaches, and invest in stakeholder capacity-building programs to enhance the long-term sustainability of water infrastructure projects.

Keywords; *Stakeholders management, sustainability, borehole water-funded projects, non-governmental organizations.*

1.0 Introduction

The effective execution of projects spanning various sectors and industries stands as a pivotal element influencing the advancement and prosperity of numerous nations (Hira & Busumtwi-Sam, 2021). The incorporation of sustainability has emerged as a critical concern in development

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practice, representing an important shift toward responsible and enduring project outcomes (Mavi *et al.*, 2021). Water is an essential resource for life, yet its scarcity and unequal distribution present a significant global challenge. According to the United Nations, over 2 billion people worldwide lack access to clean and safe drinking water, while approximately 4.2 billion lack safe sanitation services (UN, 2023).

In Sub-Saharan Africa, similar challenges persist. In Ghana, for instance, 75% of water-related development projects have been reported as unsustainable (Gbahabo & Ajuwon, 2017). Kenya faces unique challenges related to water resource management, exacerbated by a rising population, uneven socio-economic conditions, and climate-related variability (Mulwa *et al.*, 2021). Non-governmental organizations (NGOs) are instrumental in addressing water scarcity and building community resilience, contributing approximately Ksh. 80 billion annually to the Kenyan GDP (GoK, 2022).

Makueni County, located in Kenya's arid and semi-arid region, faces numerous challenges in implementing and sustaining borehole water projects, exacerbated by erratic rainfall patterns and limited access to water sources (Gevera *et al.*, 2020). Many NGO borehole water projects in Makueni have become inoperable over time due to poor stakeholder management, insufficient funding, and lack of maintenance focus (Masombe & Omwenga, 2020). Data shows that 30% of projects in Makueni County have been initiated but have failed to deliver intended benefits, while 25–30% are rendered non-functional within the first three years of completion (Mulei & Gachengo, 2021; Kimani, 2025).

Stakeholder management is essential for enhancing stakeholder relationships and ensuring successful project implementation (Nguyen & Mohamed, 2020). Cvijović *et al.* (2021) identified stakeholder management, open communication, and ethical practices as critical factors contributing to project sustainability. Despite the growing body of literature on stakeholder management, most studies have focused on single components of stakeholder management and have been conducted in westernized contexts or sectors such as healthcare, road construction, and IT (Budayan, Okudan & Dikmen, 2020; Demirkesen & Reinhardt, 2021). There is, therefore, a contextual and conceptual gap regarding the combined effect of multiple stakeholder management dimensions on the sustainability of NGO-funded borehole water projects in Kenya's arid and semi-arid regions.

The current study sought to address this gap by investigating the effects of stakeholder identification, communication, involvement, and empowerment on the sustainability of borehole water-funded projects by NGOs in Makueni County. The study was guided by the following research questions:

- i. How effective are stakeholder identification strategies on sustainability of borehole water-funded projects by non-governmental organizations in Makueni County?
- ii. What is the impact of stakeholder communication strategies on sustainability of borehole water-funded projects by non-governmental organizations in Makueni County?
- iii. To what extent does stakeholder involvement affect sustainability of borehole water-funded projects by non-governmental organizations in Makueni County?
- iv. What is the impact of stakeholder empowerment on sustainability of borehole water-funded projects by non-governmental organizations in Makueni County?

2.1 Literature Review

2.1.1 Theoretical Review

The study adopted three theoretical frameworks: Institutional Theory, Resource Dependency Theory, and Stakeholder Theory. Institutional Theory, developed by Meyer and Rowan (1977), argues that organizations must conform to institutional norms and regulations to achieve legitimacy and survival. For NGOs implementing borehole water projects in Makueni County, compliance with government regulations, donor requirements, and community expectations is critical for project legitimacy and sustainability (DiMaggio & Powell, 1983). The theory provides a framework for understanding how institutional pressures shape stakeholder engagement strategies and project governance structures.

Resource Dependency Theory (RDT), founded by Pfeffer and Salancik (1978), provides insights into how organizations manage their reliance on external resources to ensure survival. NGOs in Makueni County rely on diverse external resources, including financial assistance from donors, technical expertise from government agencies, and community support. RDT emphasizes the importance of building strong partnerships, maintaining transparent communication channels, and demonstrating accountability in project management to secure continued access to critical resources (Ayeb-Karlsson et al., 2020).

Stakeholder Theory, developed by Freeman (1984), underscores the need for decision-makers to account for the interests of all stakeholders rather than focusing solely on shareholders. The theory advocates for meaningful stakeholder identification, communication, involvement, and empowerment as strategies to build trust and promote mutually beneficial relationships (Parmar et al., 2010). In the context of borehole water projects, Stakeholder Theory provides a comprehensive framework for analyzing how effective stakeholder management can promote long-term project sustainability.

2.2 Empirical Review and Hypothesis Development

2.2.1 Stakeholder Identification and Sustainability

Villazón *et al.* (2020) examined the relationship between stakeholder identification and project performance in Spain, finding that properly identifying stakeholders is instrumental in promoting project sustainability, as it helps refine preliminary information and align project strategic goals. Budayan, Okudan and Dikmen (2020) similarly found in Turkey that thorough stakeholder identification during feasibility assessment is critical for preventing budget overruns, project delays, and costly maintenance. Miombe (2024) studied water projects in Kisii County, Kenya, and found that traditional stakeholder mapping techniques including stakeholder matrices and social network analysis were widely used by NGOs to identify key stakeholders. Based on this evidence, the study hypothesized:

H1: Stakeholder identification has a significant positive effect on sustainability of borehole water-funded projects by NGOs in Makueni County.

2.2.2 Stakeholder Communication and Sustainability

Mutu (2023) found that NGOs in Kirinyaga County effectively used both traditional and modern communication channels, including community meetings and mobile applications, to improve stakeholder engagement and support sustainable management of water resources. Mwando (2021)

established that poor stakeholder communication negatively affected the performance of private construction projects in Nairobi. Naqvi and Aziz (2018) demonstrated a strong link between effective stakeholder communication and successful project performance across 70 IT projects. These findings support the hypothesis that:

H2: Stakeholder communication has a significant positive effect on sustainability of borehole water-funded projects by NGOs in Makueni County.

2.2.3 Stakeholder Involvement and Sustainability

Demirkesen and Reinhardt (2021) found that engaging local communities during project planning significantly influences project outcomes in government-led projects in Poland. Shaukat et al. (2022) demonstrated that stakeholder involvement plays an important moderating role between sustainable project management and successful project completion. Zaman et al. (2023) established that stakeholder involvement in monitoring and evaluation has a positive impact on the effective implementation of water supply projects. Consequently, the study proposed:

H3: Stakeholder involvement has a significant positive effect on sustainability of borehole water-funded projects by NGOs in Makueni County.

2.2.4 Stakeholder Empowerment and Sustainability

Meng, Xiu and Qian (2018) found that Public-Private Partnership risk management strategies effectively protect stakeholder interests and increase project benefits. Li et al. (2019) confirmed that community-driven approaches in China's urban stormwater management reduced flood risks and enhanced water quality outcomes. These findings support the proposition that empowering stakeholders through collaborations, risk control, and legitimacy-building enhances project sustainability. The study therefore hypothesized:

H4: Stakeholder empowerment has a significant positive effect on sustainability of borehole water-funded projects by NGOs in Makueni County.

3.0 Research and Methodology

3.1 Study Context and Population

The study was conducted in Makueni County, Kenya, focusing on ten NGO-funded borehole water projects. The target population comprised CEC of water, directors, NGO representatives, and community members associated with these projects. A sample of 92 respondents was selected using stratified random sampling to ensure proportionate representation of all respondent categories. The fieldwork was conducted between May and July 2025.

3.2 Research Design

The study employed a descriptive research design, which facilitated the collection of quantitative data and examination of patterns among variables (Saunders *et al.*, 2009). This design was appropriate because it enabled the researcher to describe the characteristics of stakeholder management practices and their relationship to project sustainability without experimental manipulation of variables (Siedlecki, 2020).

3.3 Data Collection and Analysis

Primary data were collected using semi-structured questionnaires administered through Google Forms. The questionnaire was piloted on three borehole projects Lungu Primary School Borehole, Katangini Borehole, and Kiaoni Borehole with nine respondents to assess validity and reliability. Instrument reliability was assessed using Cronbach's alpha coefficient, with acceptable reliability defined as $\alpha \geq 0.7$. Content and face validity were established through expert review and literature-based operationalization of constructs.

Data were analyzed using SPSS version 22. Descriptive statistics including means, standard deviations, and frequencies were computed for all study variables. Inferential analysis employed multiple regression to examine the collective and individual effects of stakeholder management dimensions on project sustainability. The reliability test results are presented in Table 1.

Table 1: Reliability Test Results

Variable	Cronbach's Alpha (α)	Interpretation
Stakeholder Identification	0.847	Reliable
Stakeholder Communication	0.831	Reliable
Stakeholder Involvement	0.819	Reliable
Stakeholder Empowerment	0.823	Reliable
Sustainability	0.812	Reliable

Source: Research Data (2026)

As shown in Table 1, all constructs returned Cronbach's alpha values above 0.80, confirming high internal consistency and reliability of the measurement instruments across all study variables.

4.0 Research Findings

4.1 Characteristics of Respondents

Of the 92 questionnaires distributed, 84 were returned, representing a response rate of 91.3%. The majority of respondents were female (54.8%) while males constituted 45.2%. In terms of age, 31% were aged 36–45 years, and 29.8% were aged 26–35 years. Educationally, 59.5% held secondary school qualifications, 15.5% had bachelor's degrees, 14.3% had diplomas, and 4.7% held master's degrees or higher. The majority of respondents (85.7%) were community members, followed by NGO representatives (11.9%), with CEC water and directors each representing 1.2%.

4.2 Stakeholder Identification

Table 2 presents the descriptive statistics for stakeholder identification and its relationship to project sustainability.

Table 2: Stakeholder Identification Descriptive Statistics

Statement	Mean	Std. Deviation
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All relevant stakeholders with vested interests have been recognized	4.29	0.504
Distinct attributes of each stakeholder have been clearly understood	4.20	0.832
Stakeholder needs and expectations were determined prior to project commencement	3.67	0.972
Research was carried out prior to the project's initiation	3.57	0.880
Community input is integrated when developing solutions for borehole water needs	3.16	1.424
Community has actively participated in addressing borehole water challenges	3.57	1.288
Aggregate Score	3.74	0.983

Source: Research Data (2026)

The aggregate mean for stakeholder identification was 3.74 (SD = 0.983), indicating that respondents agreed to a moderate extent that proper stakeholder identification had been practiced in the borehole water projects. The highest-rated item was the recognition of all relevant stakeholders (M = 4.29, SD = 0.504), reflecting a broad consensus that key actors were identified. These findings align with Villazón *et al.* (2020) and Budayan *et al.* (2020), who emphasized the centrality of early stakeholder identification in ensuring project performance and sustainability.

4.3 Stakeholder Communication

Table 3 presents the descriptive statistics for stakeholder communication.

Table 3: Stakeholder Communication Descriptive Statistics

Statement	Mean	Std. Deviation
Improving stakeholder communication aids in accessing decision-making processes	4.12	0.548
Clear communication results in stakeholders eager to collaborate on project needs	4.00	0.445
Clear communication ensures stakeholders receive information tailored to their needs	3.98	1.265
Ongoing feedback opportunities allow stakeholders to contribute their expertise	3.79	1.403

Stakeholder communication fosters positive attitudes toward the project	3.70	0.426
Community input is integrated in developing solutions for project requirements	3.67	1.647
Aggregate Score	3.88	0.956

Source: Research Data (2026)

The aggregate mean for stakeholder communication was 3.88 (SD = 0.956), indicating strong agreement that communication practices positively influenced project sustainability. The highest-rated item emphasized that improved communication aids stakeholder access to decision-making (M = 4.12, SD = 0.548). These results are consistent with Mutu (2023) and Mwando (2021), who found that effective communication promotes transparency, reduces conflicts, and enhances coordination in water projects.

4.4 Stakeholder Involvement

Table 4 presents the descriptive statistics for stakeholder involvement.

Table 4: Stakeholder Involvement Descriptive Statistics

Statement	Mean	Std. Deviation
Involvement fosters mutual understanding and encourages proactive participation	4.11	1.169
Involvement leads to empowerment and shared responsibility for the project	3.74	1.281
Involvement fosters trust through a platform for stakeholders to express concerns	3.48	1.471
Involvement increases trust levels among all participants	3.37	1.161
Involvement encourages transparency and project accountability	3.35	1.369
Aggregate Score	3.61	1.290

Source: Research Data (2026)

The aggregate mean for stakeholder involvement was 3.61 (SD = 1.290). Respondents most strongly agreed that involvement fosters mutual understanding and proactive participation (M = 4.11, SD = 1.169). These findings concur with Shaukat et al. (2022) and Zaman et al. (2023), who found that active stakeholder involvement promotes project ownership, improves monitoring, and supports long-term sustainability.

4.5 Stakeholder Empowerment

Table 5 presents the descriptive statistics for stakeholder empowerment.

Table 5: Stakeholder Empowerment Descriptive Statistics

Statement	Mean	Std. Deviation
Empowerment encourages transparency and ensures project accountability	3.97	1.084
Empowerment increases trust levels among all participants	3.76	0.936
Empowerment fosters mutual understanding and proactive participation	3.60	1.426
Empowerment leads to a sense of shared responsibility for the project	3.50	1.102
Empowerment fosters a trust culture for stakeholders to express concerns	2.99	1.251
Aggregate Score	3.56	1.160

Source: Research Data (2026)

The aggregate mean for stakeholder empowerment was 3.56 (SD = 1.160). Respondents agreed that empowerment most strongly encourages transparency and project accountability (M = 3.97, SD = 1.084). These findings are supported by Meng *et al.* (2018) and Li *et al.* (2019), who established that empowerment strategies effectively reduce project risks and protect stakeholder interests, thereby enhancing project benefits and sustainability.

4.6 Sustainability Outcomes

Table 6 presents the descriptive statistics for project sustainability.

Table 6: Project Sustainability Descriptive Statistics

Statement	Mean	Std. Deviation
The borehole water projects are acceptable to the clients	4.40	0.840
Community has been able to improve living standards due to borehole projects	3.44	0.693
Borehole water projects met expectations of all stakeholders	3.34	0.693

Projects have changed social lives of community members in Makueni	3.31	0.799
Projects have changed the economic status of community members	3.12	1.063
The environment has changed due to borehole water projects	3.10	1.055
Aggregate Score	3.45	0.857

Source: Research Data (2026)

The overall mean for project sustainability was 3.45 (SD = 0.857). The highest-rated item was client acceptability of borehole water projects (M = 4.40, SD = 0.840), indicating strong community acceptance. However, environmental change showed the least agreement (M = 3.10, SD = 1.055), suggesting that environmental sustainability outcomes require more deliberate attention in project design.

4.7. Regression Analysis

To test the hypotheses, multiple regression analysis was conducted. Table 7 presents the model summary.

Table 7: Model Summary

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	0.878	0.771	0.759	0.598

Predictors: (Constant), Stakeholder Identification, Communication, Involvement, Empowerment

The model summary indicates an Adjusted R² of 0.759, meaning the four stakeholder management dimensions collectively explain 75.9% of the variance in borehole water project sustainability. The remaining 24.1% is attributable to factors outside the model.

Table 8: Analysis of Variance (ANOVA)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.776	4	0.1928	66.49	.000
Residual	0.229	79	0.0029		
Total	1.000	83			

Dependent Variable: Sustainability

The ANOVA results (F = 66.49, p = 0.000) confirm that the regression model is statistically significant, indicating that stakeholder identification, communication, involvement, and

empowerment jointly have a significant effect on the sustainability of borehole water projects in Makueni County.

Table 9: Regression Coefficients

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	1.023	0.356		2.871	0.005
Stakeholder Identification	0.446	0.077	0.515	5.819	0.001
Stakeholder Communication	0.243	0.063	0.338	3.878	0.001
Stakeholder Involvement	0.308	0.066	0.434	4.665	0.001
Stakeholder Empowerment	0.444	0.073	0.423	4.235	0.001

Source: Research Data (2026) * $p < 0.05$

Table 9 presents the regression coefficients. The results indicate that all four dimensions of stakeholder management exert a statistically significant positive effect on project sustainability. Stakeholder identification had the strongest effect ($\beta = 0.446$, $p = 0.001$), followed by stakeholder empowerment ($\beta = 0.444$, $p = 0.001$), stakeholder involvement ($\beta = 0.308$, $p = 0.001$), and stakeholder communication ($\beta = 0.243$, $p = 0.001$). The regression equation is expressed as:

$$Y = 1.023 + 0.446X_1 + 0.243X_2 + 0.308X_3 + 0.444X_4 + \varepsilon$$

Where Y = Sustainability; X_1 = Stakeholder Identification; X_2 = Stakeholder Communication; X_3 = Stakeholder Involvement; X_4 = Stakeholder Empowerment; ε = Error term.

All four hypotheses are therefore supported. H1, H2, H3, and H4 are each confirmed at the $p < 0.05$ level of significance.

5.0 Discussions and Implications

The study set out to examine the effect of stakeholder management on the sustainability of NGO-funded borehole water projects in Makueni County. The results are discussed in relation to the four study objectives.

With respect to the first objective, the findings confirm that stakeholder identification significantly enhances project sustainability ($\beta = 0.446$, $p = 0.001$). The descriptive results further indicate a moderate-to-high level of stakeholder identification practice ($M = 3.74$). This implies that when NGOs properly recognize and classify stakeholders based on power, interest, and network, they improve accountability, align project goals with community expectations, and reduce conflicts during implementation. These findings are consistent with Villazón *et al.* (2020) and Budayan *et al.* (2020), who demonstrated that comprehensive stakeholder identification is foundational to achieving superior project outcomes.

The second objective established that stakeholder communication has a positive and significant effect on sustainability ($\beta = 0.243$, $p = 0.001$). The aggregate mean of 3.88 reflects strong adherence to communication practices among the NGOs studied. Effective communication, encompassing role clarity, urgency, and proximity, fosters transparency, strengthens relationships among stakeholders, and enhances trust and cooperation. These findings corroborate Mutu (2023),

who established that NGOs using both traditional and digital communication channels significantly improved stakeholder engagement and water resource management sustainability.

Regarding the third objective, stakeholder involvement emerged as a strong predictor of sustainability ($\beta = 0.308$, $p = 0.001$). Active participation of stakeholders in decision-making, labor provision, and project evaluation creates a sense of community ownership and shared responsibility. This motivates communities to support and maintain borehole water projects, thereby improving long-term functionality. The results align with Shaukat *et al.* (2022) and Zaman *et al.* (2023), who found that meaningful stakeholder participation is critical for project success and sustainability.

On the fourth objective, stakeholder empowerment demonstrated a significant positive effect on sustainability ($\beta = 0.444$, $p = 0.001$). Empowering stakeholders through collaborations, risk control, and legitimacy-building increases their confidence, builds capacity, and supports long-term project continuity. These findings are supported by Meng *et al.* (2018), who found that structured risk management strategies protecting stakeholder interests significantly enhanced project benefits.

The practical implications of these findings are significant for NGOs, county governments, and other stakeholders in Makueni and similar arid and semi-arid settings. The results demonstrate that sustainability is not solely a function of capital investment or technical infrastructure, but is deeply embedded in social processes of engagement, communication, and empowerment. NGOs that invest equally in stakeholder management processes alongside physical infrastructure are more likely to achieve durable, community-owned water solutions.

6.0 Conclusion

The study addressed four objectives concerning the effects of stakeholder management on the sustainability of NGO-funded borehole water projects in Makueni County, Kenya. The findings lead to several conclusions. First, stakeholder identification significantly enhances project sustainability by ensuring all relevant actors are recognized, classified, and incorporated into project planning from the outset. Second, stakeholder communication improves sustainability through timely, role-specific, and proximity-sensitive information sharing that fosters transparency and stakeholder confidence. Third, stakeholder involvement promotes long-term project sustainability by encouraging inclusive decision-making, labor contribution, and participatory evaluation, which generate community ownership and accountability. Fourth, stakeholder empowerment contributes to sustainability by building stakeholder capacity, enabling collaborative risk management, and reinforcing project legitimacy.

The overall model explained 75.9% of variance in project sustainability, confirming that the integrated practice of stakeholder management is a robust predictor of long-term water project outcomes in the Kenyan arid and semi-arid context. The study recommends that NGOs and county authorities develop structured stakeholder identification frameworks, formalize communication strategies, adopt participatory project management approaches, and invest in capacity-building programs. Future research should examine factors beyond stakeholder management, adopt longitudinal research designs, and extend the scope to other project types and counties in Kenya to enhance generalizability.

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