

Roles of Women Engagement in Managing WASH Projects in Rural Areas: A Case Study of Mufindi District, Tanzania

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Abstract

Women's participation in managing Water, Sanitation, and Hygiene (WASH) projects is crucial for the sustainability and success of these initiatives, yet remains significantly limited, particularly in rural areas. This cross-sectional study, conducted with 163 participants, explores the challenges and opportunities surrounding women's roles in WASH project management, focusing on their participation, the influence of cultural practices, and the availability of capacity-building programs to support women's leadership. Findings show that while women engage in community outreach and planning, their leadership and decision-making roles are restricted by traditional gender roles and patriarchal norms. A lack of training programs further limits their leadership potential. Additionally, the study highlights a severe shortage of training programs aimed at empowering women to assume leadership roles in WASH management, particularly in rural areas where access to these resources is most limited. The study recommends gender-sensitive policies and expanded training initiatives to promote women's inclusion and leadership in WASH management, essential for achieving sustainable outcomes.

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1. Introduction

Water, Sanitation, and Hygiene (WASH) projects are essential for improving public health and living conditions, particularly in developing regions. Historically, advances in WASH infrastructure have significantly reduced waterborne diseases, enhancing the quality of life. The World Health Organization (WHO) reports that improvements in access to clean water and sanitation have reduced waterborne diseases by up to 50% in some areas (WHO, 2020). In Tanzania, ongoing government efforts, supported by international organizations, aim to address persistent challenges related to water supply and sanitation, particularly in rural districts like Mufindi.

Despite significant progress, substantial gaps remain in WASH access and management, especially in rural areas. In Mufindi District, the effectiveness of WASH projects is often hampered by geographical isolation, limited infrastructure, and socio-economic barriers. The United Nations Children's Fund (UNICEF) notes that while Tanzania has made strides in expanding WASH infrastructure, disparities in access between urban and rural areas are still significant, with rural regions like Mufindi facing more acute challenges (UNICEF, 2021). This disparity underscores the need for targeted research to understand and address the unique issues faced by these communities.

The importance of effective WASH management cannot be overstated. Proper WASH practices are closely linked to improved health outcomes, including a reduction in waterborne diseases and enhanced overall well-being. Research indicates that effective water management and sanitation improvements in rural Tanzania have led to a 35% decrease in diarrheal diseases among young children (International Water Association [IWA], 2019). Moreover, the role of women in managing these projects is particularly significant, as they are often responsible for water collection and sanitation management. Studies have shown that projects with substantial female participation tend to achieve better outcomes and higher sustainability rates (Harris, 2022).

Current literature reveals gaps in understanding the specific roles and challenges faced by women in managing WASH projects, particularly in rural settings. While the benefits of female involvement in WASH projects are documented, there is limited research on how women's roles are influenced by socio-economic and geographic factors. Existing studies often generalize the challenges faced by women without considering the nuanced differences across various regions (Smith, Brown, & Williams, 2023). Furthermore, the impact of women's involvement on the long-term sustainability of WASH projects remains underexplored. The Water Supply and Sanitation Collaborative Council (WSSCC) highlights that projects with significant female engagement have higher rates of sustainability, yet the specific mechanisms driving this success are not well understood (WSSCC, 2021).

Addressing these research gaps is critical for several reasons. Gaining a deeper understanding of the specific contributions and challenges of women in WASH project management can lead to more effective project designs and interventions tailored to their needs. This can enhance project outcomes and sustainability, making WASH initiatives more resilient and impactful. Additionally, this study can inform policy development, advocating for gender-inclusive approaches in WASH project planning and execution. By addressing these gaps, the study aims to contribute to broader development goals, including gender equality and women's empowerment, which are integral to sustainable development (United Nations Women [UN Women], 2022). This study seeks to offer a comprehensive analysis of the roles and challenges of women in managing WASH projects in Mufindi District, ultimately contributing to better health outcomes and enhanced living conditions in similar contexts.

2. Theoretical review

This study draws upon Social Capital Theory as the primary theoretical framework, developed by Robert Putnam in 1995, which emphasizes the importance of social networks, norms, and trust in shaping community and individual outcomes. Putnam (1995) defines social capital as the value derived from social relationships that foster cooperation and collective action. According to this theory, the strength of social capital within a community enhances its capacity for effective engagement in various activities, including development initiatives, by leveraging these networks and mutual trust to facilitate coordinated action.

In this study's context, Social Capital Theory is crucial for understanding how women's involvement in managing WASH (Water, Sanitation, and Hygiene) projects in Mufindi District is influenced by their social connections and the level of trust within their communities. Specifically, it explores how women's roles in planning, implementing, and monitoring WASH initiatives are shaped by their relationships within the community and the prevailing norms of trust and reciprocity. Key variables drawn from Social Capital Theory—social networks, community trust, and norms of reciprocity—serve as essential tools for analyzing women's engagement and participation in WASH management, highlighting how these factors support or hinder their involvement.

The strength of Social Capital Theory lies in its ability to provide a comprehensive framework for understanding how social relationships and community involvement impact project outcomes. It offers valuable insights into how social capital can enhance women's participation and effectiveness in WASH projects, thereby promoting project sustainability. By emphasizing social networks and trust, this theory offers a nuanced view of the social factors influencing women's engagement in development activities, illustrating the relational assets that support collective community goals and participation.

However, Social Capital Theory has limitations, particularly in its tendency to overlook structural inequalities and power imbalances that may exist within communities. This omission can affect the analysis of broader socio-economic and cultural factors that influence women's participation, as it may not fully capture the barriers women face due to entrenched gender norms and inequities. To address this limitation, this study incorporates Gender and Development Theory, which provides a focused examination of gender-specific barriers and opportunities within the context of WASH projects. By integrating Gender and Development Theory alongside Social Capital Theory, this analysis will be enhanced with a focus on the gendered dimensions and power dynamics that shape women's engagement in these community-driven projects, offering a more robust framework for understanding both relational and structural factors in women's participation.

3. Empirical literature review

The integration of women into WASH (Water, Sanitation, and Hygiene) project management has yielded promising results. Studies demonstrate that when women participate, projects tend to be more sustainable and responsive to community needs. A study by Smith et al. (2023) shows that women bring unique perspectives that contribute to more effective outcomes. This is echoed by the World Bank (2022), which reported that increased female participation enhances project efficiency and community ownership. The UNDP (2023) further emphasized that women's engagement in water management ensures that local needs are addressed, leading to greater project sustainability.

In Africa, particularly in rural areas, women's leadership in WASH projects is growing, though they still face significant barriers. Moyo and Moyo (2023) found that rural women encounter challenges such as

limited resources and training, which hinder their potential to assume leadership roles. Similarly, the African Development Bank (2021) highlighted systemic obstacles that impede full female participation in WASH management. In Mufindi District, a study by Mwangeka et al. (2024) revealed that while women are involved in WASH projects, they are often restricted to lower-level tasks, with few advancing to decision-making roles. This suggests a need for strategic interventions to promote women's leadership, which could enhance project effectiveness and sustainability (Tanzania National WASH Report, 2022).

Cultural practices also play a significant role in shaping women's participation in WASH projects. In many rural African communities, traditional gender roles dictate that women manage domestic water needs but are excluded from decision-making roles in WASH management. Burt et al. (2016) noted that these gender expectations reinforce inequality in public spaces. Cultural barriers, including the perception of traditional gender roles, limit women's leadership in WASH projects (Sperling & Winthrop, 2020). As a result, women, despite their knowledge of local water issues, are often excluded from key decision-making processes (Moser & Levy, 2019). However, when women are included in leadership roles, project outcomes improve. O'Hare and White (2022) found that women's participation in leadership roles leads to more effective management of water resources, as they bring valuable lived experiences to decision-making. Successful gender-sensitive initiatives have shown that empowering women and shifting harmful cultural norms can improve WASH project outcomes (Ahmed & van der Zee, 2021; Tilley et al., 2022).

Training programs are essential for increasing women's participation in WASH management. These initiatives help build women's capacity to take on leadership roles and contribute to project success. Malmberg-Calvo (2022) found that targeted training improves women's decision-making and management skills, resulting in more sustainable outcomes. However, rural areas like Mufindi District face challenges in accessing such training due to socio-cultural barriers and resource limitations (Budds & Hinojosa, 2016). Research by Wawire et al. (2023) shows that well-implemented training programs that reach grassroots levels improve women's skills in areas like financial management, community mobilization, and technical aspects of WASH projects. Mentorship and peer support within these programs are also crucial for fostering women's leadership capabilities (Becker et al., 2021). Addressing gaps in training programs and ensuring their accessibility are vital for enhancing women's participation in WASH management in Mufindi District.

4. Methodology

This study employed pragmatism as its research philosophy, incorporating both positivist and interpretivist elements to investigate women's involvement in WASH project management. Pragmatism encourages the use of mixed methods, which allow for the collection of both quantitative and qualitative data, resulting in a more comprehensive understanding of the research problem (Kothari, 2004; Creswell, 2014; Saunders et al., 2019).

A mixed methods approach was chosen for this study, combining the strengths of qualitative and quantitative approaches. While qualitative methods provide in-depth insights into participation levels and cultural factors, quantitative methods measure variables like women's involvement in WASH projects. This combination strengthens the analysis and interpretation of findings (Creswell, 2014). The study employed a descriptive research design to assess women's roles in WASH project management in Mufindi District, Tanzania. Mufindi's rural context, ongoing WASH projects, and socio-cultural dynamics make it an ideal site for examining the factors influencing women's participation (Kothari, 2004; Saunders,

Lewis, & Thornhill, 2019). This design allows for a detailed understanding of women’s contributions to WASH project outcomes in rural settings.

The study population is made up of a varied range of stakeholders who are involved in or affected by WASH projects in Mufindi District. It is made up of female project managers, field workers, community leaders, general community members, and stakeholders such as NGO representatives and government officials. This diverse demographic ensures a full understanding of women's participation in WASH projects. By include these various groups, the study may collect a wide range of thoughts and viewpoints, which are critical for determining the amount of involvement and overall influence of women in WASH project management.

The sample size for this study, the Yamane (1967) formula was utilized to ensure statistical representativeness from a finite population. The formula used is:

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

Whereby n is the Sample size, N is Population and e is the Marginal error which is 0.05

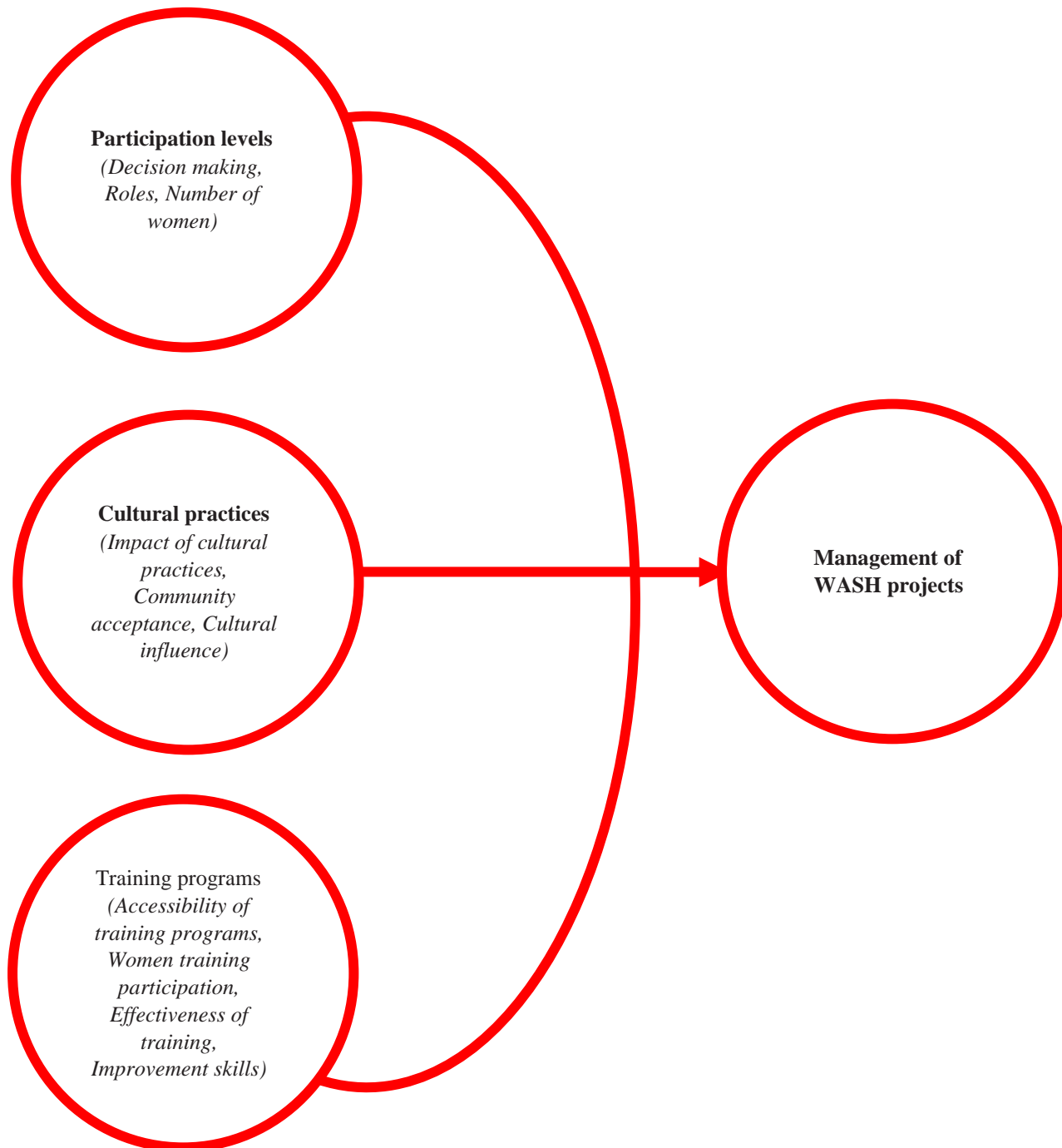
Table 1: Sample Size Distribution

Population Category	Population	Proportional Sample Size	% of respondents reached
Women Project Managers	5	3	60
Field Workers	30	18	60
Community Leaders	10	6	60
Community Members	220	130	59
Stakeholders (e.g., NGO Representatives, etc.)	10	6	60
Total	275	163	59.3

Source: Researcher, 2024

In this study on women's involvement in WASH project management, both quantitative and qualitative methodologies were used to acquire thorough data. Structured questionnaires are employed in surveys to collect quantitative data on women's involvement, positions, and training opportunities (Cresswell, 2014). Semi-structured interviews with key stakeholders provide qualitative insights into human experiences and attitudes, providing for greater freedom in investigating important themes (Kothari, 2004). This method ensures accurate and well-rounded results. Quantitative data from surveys were evaluated using statistical methods, especially descriptive statistics such as frequencies and percentages, to describe women's participation and impressions of WASH initiatives. This analysis will be facilitated by software such as SPSS or R (Saunders et al., 2019). To further comprehend participants' nuanced experiences, qualitative data from semi-structured interviews will be investigated using thematic analysis, which involves classifying the information into themes.

Figure 1: Conceptual Framework



Source: Authors' design (2024)

Reliability of the Study

To enhance reliability, the study ensured consistency in data collection by applying standardized methods across all participants. As indicated from Table 3 below the internal reliability of the questionnaire was determined using Cronbach's alpha value in SPSS statistics, the value of Cronbach alpha was 0.815 showing the internal consistent and hence it was reliable for data collection.

Table 2: Reliability

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.815	0.820	13

Source: Researcher, 2024

5. Results and Discussions

5.1 Roles played by women in managing WASH projects

The results presented in Table 2 sheds light on the diverse roles women assume in the management of WASH (Water, Sanitation, and Hygiene) projects, illustrating their broad involvement and significant contributions. Among the listed roles, community outreach emerges as the most frequent activity, with 20.6% of responses indicating that women actively participate in engaging with communities about WASH projects. This role encompasses 58.9% of cases, highlighting women's critical involvement in ensuring project awareness, education, and communication with community members. The prominent engagement in community outreach underscores women's role as essential connectors between the WASH projects and the broader community, helping to increase project reach and encourage community buy-in.

Table 2: Roles of Women in Managing WASH Projects

Roles	Responses		Percent of Cases
	Frequency	Percent	
Leadership positions	94	20.1%	57.7%
Decision making roles	85	18.2%	52.1%
Planning and organizing	63	13.5%	38.7%
Implementing of the project activities	23	4.9%	14.1%
Training and capacity building	57	12.2%	35.0%
Community outreaching	96	20.6%	58.9%
Maintaining of water and sanitation facilities	43	9.2%	26.4%
None	6	1.3%	3.7%
Total	467	100.0%	286.5%

Source: Researcher, 2024

Leadership positions also represent a significant area of women's participation, with 20.1% of responses indicating their involvement in such roles, covering 57.7% of cases. This suggests that women are not only active participants but also often take on leadership responsibilities within WASH projects. Their involvement in leadership can contribute to more inclusive decision-making processes that reflect the specific needs and perspectives of women and children, who are often disproportionately affected by water and sanitation issues. This finding supports the importance of empowering women in leadership positions to ensure the sustainability and effectiveness of WASH projects, as women leaders can advocate for community-relevant solutions.

Women are also notably involved in decision-making roles, comprising 18.2% of responses and impacting 52.1% of cases. Their active participation in decision-making suggests that women influence

crucial project choices, which can range from resource allocation to setting priorities for project activities. Involving women in decision-making is essential for aligning project goals with the community’s needs, as women often hold valuable insights into household-level water and sanitation challenges. Additionally, women’s participation in planning and organizing roles (13.5% of responses, 38.7% of cases) further emphasizes their organizational contribution to WASH projects, likely involving logistical aspects such as coordinating resources and scheduling activities. This involvement shows that women play an instrumental role in both strategic and operational facets of WASH project management.

Other roles, such as training and capacity building (12.2% of responses, 35.0% of cases) and maintaining water and sanitation facilities (9.2% of responses, 26.4% of cases), reflect women’s contributions to enhancing community skills and ensuring the upkeep of essential infrastructure. By engaging in training activities, women contribute to building local expertise and promoting knowledge-sharing within their communities, which can have lasting benefits for WASH project sustainability. Additionally, while fewer women are involved in the implementation of project activities (4.9% of responses, 14.1% of cases), their presence in this role still highlights their hands-on contributions. A small percentage (1.3%) of women reported having no involvement in WASH project roles, representing only 3.7% of cases. This suggests that the vast majority of women play some role in these projects, with many taking on multiple responsibilities, as indicated by the cumulative percentage of cases (286.5%). These findings collectively emphasize the multifaceted roles of women in WASH project management, revealing their essential contributions to various levels of project planning, execution, and community engagement.

5.2 Women representations in WASH project management

The data in Table 3 provides insights into the distribution of women’s representation in the management of WASH (Water, Sanitation, and Hygiene) projects. It shows that nearly half of the cases (47.9%) have 1-3 women represented, indicating that small numbers of women commonly hold roles within these projects. This prevalence suggests that while women are involved, they are often present in limited numbers, potentially reflecting structural or social limitations on broader female representation. A significant portion, 38.7% of cases, have 4-6 women in project management roles, indicating a notable, though still modest, involvement. The presence of multiple women within these projects likely contributes to a diversity of perspectives and skills, which can enhance the effectiveness of WASH projects, particularly when addressing community-wide water and sanitation issues that affect households.

Table 3: Number of Women representations in WASH project management

Number of Women	Frequency	Percent
0	8	4.9
1-3	78	47.9
4-6	63	38.7
Above 7	14	8.6
Total	163	100.0

Source: Researcher, 2024

Only 8.6% of projects have more than seven women represented in management roles, demonstrating that larger female representation is relatively rare in WASH project management. This finding may indicate challenges in achieving higher levels of female involvement in leadership, suggesting a need for

policies that encourage and support the inclusion of more women in project management roles to leverage their contributions effectively. A small portion of projects (4.9%) have no female representation at all, highlighting a gap in gender inclusivity within certain WASH projects. The lack of female involvement in these cases could mean that important insights related to women’s specific needs in water and sanitation are potentially overlooked. These results underscore the importance of encouraging broader female representation to ensure that WASH projects meet the needs of all community members comprehensively.

5.3 Extent of women engagement in WASH management meeting

Table 4 illustrates the extent of women’s engagement in WASH (Water, Sanitation, and Hygiene) project management meetings, showing that the majority of women (57.1%) participate passively, while 42.9% are actively engaged. Passive engagement may imply that these women attend meetings but have limited roles in contributing ideas, influencing decisions, or leading discussions. This suggests that although women are present, many may not fully participate in decision-making processes, potentially limiting the impact of their insights on project outcomes.

Table 4: Extent of Women engagement in WASH management meetings

Response	Frequency	Percent
Actively	70	42.9
Passively	93	57.1
Total	163	100.0

Source: Researcher, 2024

In contrast, 42.9% of women are actively engaged in management meetings, indicating a substantial level of involvement where women contribute more directly and meaningfully to discussions and decisions. Active engagement in management meetings is crucial, as it empowers women to influence project direction and address specific needs related to water and sanitation that might otherwise be overlooked. The disparity between active and passive engagement levels points to potential barriers, such as cultural norms or lack of confidence or support, that may limit women’s active participation. Addressing these barriers could increase women’s active involvement, thereby enhancing the inclusiveness and effectiveness of WASH project management. Overall, these findings highlight a need for initiatives that encourage and support women’s active engagement in WASH management meetings, which could lead to more comprehensive project planning and execution that benefits the entire community.

5.4 Extent of Women participation in WASH decision making

Table 5 details the extent of women's participation in decision-making within WASH (Water, Sanitation, and Hygiene) projects, revealing varying levels of involvement. Notably, 36.8% of women report that they “always” participate in decision-making, indicating that a substantial portion of women are consistently involved in shaping project outcomes. This regular engagement can lead to more inclusive and community-responsive decisions that reflect the needs and experiences of women in WASH matters. However, the largest group, at 38.7%, only “sometimes” participates in decision-making. This intermittent involvement suggests that while women are occasionally included in decision-making processes, their participation is not guaranteed. Such irregular engagement may limit their influence over continuous or long-term project strategies and diminish the consistency of their input.

Table 5: Extent of Women Participation in WASH decision Making

Response	Frequency	Percent
Always	60	36.8
Never	6	3.7
Rarely	34	20.9
Sometimes	63	38.7
Total	163	100.0

Source: Researcher, 2024

A significant 20.9% of women report “rarely” participating in decision-making, and 3.7% state they “never” participate. These findings indicate that a notable portion of women lack consistent or any involvement in critical project decisions, which can restrict the diversity of perspectives in decision-making processes and potentially overlook gender-specific insights related to water and sanitation. Overall, the data suggests that while many women are involved in decision-making, there is variability in the consistency of their participation. These results underscore the need for policies or interventions that encourage more consistent and inclusive engagement of women in WASH project decision-making, thereby promoting a more holistic approach that benefits all community members.

5.5 Extent of women participation in WASH project management

The results from Table 6 illustrate the extent of women's participation in WASH project management, as perceived by the respondents. A significant portion of respondents, 45.4% (74), agree that women are involved in WASH project management, while an additional 36.2% (59) strongly agree. Combined, this indicates that 81.6% of respondents believe women participate to some extent in managing WASH projects, reflecting a positive recognition of women's roles in these initiatives.

Table 6: Extent of women participation in WASH project management

Response	Frequency	Percent
Agree	74	45.4
Disagree	16	9.8
Neutral	12	7.4
Strongly Agree	59	36.2
Strongly disagree	2	1.2
Total	163	100.0

Source: Researcher, 2024

However, a smaller segment of the population holds differing views. 9.8% (16) of respondents disagree, and 1.2% (2) strongly disagree, suggesting that about 11% of the participants perceive limited or no participation of women in WASH project management. Additionally, 7.4% (12) of respondents remain neutral, indicating they neither agree nor disagree, possibly reflecting uncertainty or mixed perceptions about the extent of women's involvement. Overall, the majority of respondents acknowledge the presence of women in WASH project management, although a minority remains skeptical or neutral about the depth of their involvement. This suggests that while women are seen as participants, there may still be barriers or limitations to their full engagement, particularly in leadership roles.

5.6 Impact of Cultural Practices on WASH Project Management

Furthermore, as illustrated from Table 7 below the research sought to investigate cultural practices at Mufindi district which hinder women in managing WASH project at their communities. The study shows that traditional gender roles from majority of 36.8% respondents are the most significant cultural practices which hinder women in managing WASH projects then followed by 35% of respondents reveals that cultural norms hinder women. Also 32.5 % of respondents reveals that women can be hindered through social stigma in managing WASH projects, 29.5% of respondents reveals tribalism impact women and 22.7% of respondents reveals that education barriers limit women for opportunities. Less 6.7% of respondents reported that bad beliefs and patriarchal systems still hinder women in managing WASH project. These results of cultural practices show higher tendency of occurrence at the community, therefore it is essential for addressing gender inequality, cultural norms, educational barriers and improving support systems.

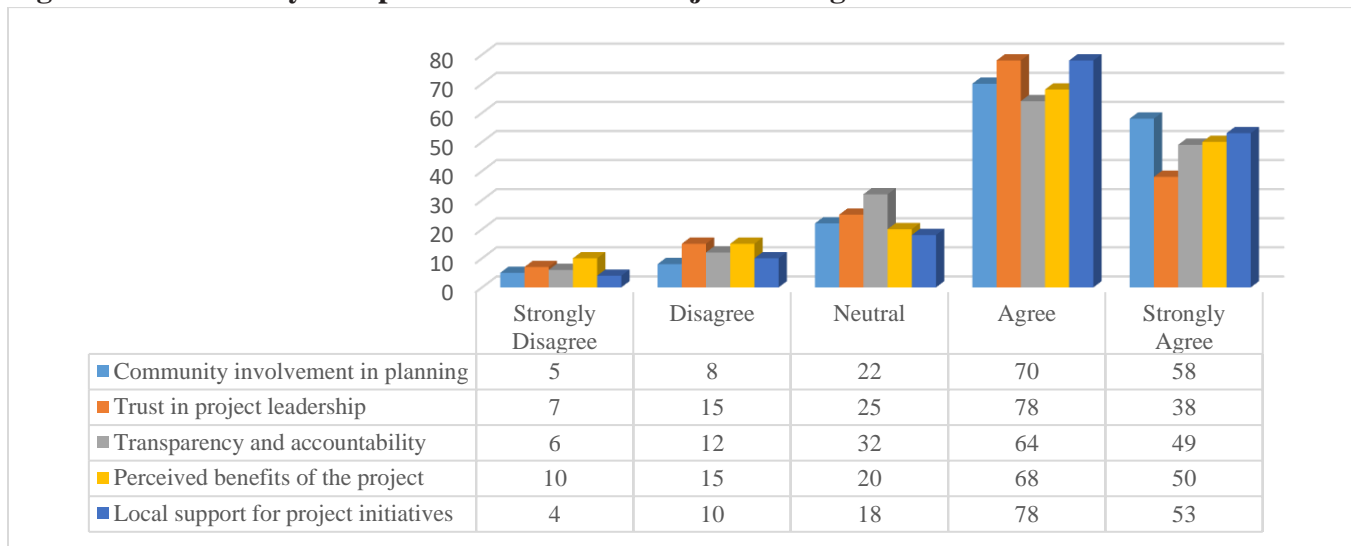
Table 7: Cultural Practices that Hinder Women

Variables	Responses		Percent of Cases
	N	Percent	
Bad beliefs	21	6.7%	12.9%
Traditional Gender Roles	60	19.2%	36.8%
Egocentrism	16	5.1%	9.8%
Social Stigma	53	16.9%	32.5%
Tribalism	48	15.3%	29.5%
Cultural norms	57	18.2%	35%
Educational Barriers	37	11.8%	22.7%
Patriarchal Systems	21	6.7%	12.9%
Total	313	100.0%	192.1%

5.7 Community Acceptance and WASH Project Management

The results in Figure 2 shows various factors related to community acceptance and their impact on the sustainability of WASH projects. The highest-rated factor, Local support for project initiatives, achieved a Relative Importance Index (RII) of 0.80, with 47.9% of respondents agreeing and 32.5% strongly agreeing. This strong support highlights the importance of community buy-in and local involvement in the success of WASH projects, suggesting that initiatives are more sustainable when the local population actively endorses and participates in them. Community involvement in planning follows closely with an RII of 0.79, where 42.9% agreed, and 35.6% strongly agreed. This finding underscores that including community members in the planning stages is key to building a sense of ownership and commitment to the project's objectives. When the community feels involved from the outset, they are more likely to support the project's goals and contribute to its long-term sustainability.

Figure 2: Community Acceptance and WASH Project Management



Source: Researcher, 2024

Transparency and accountability also ranked highly, with an RII of 0.76. A significant portion of respondents (39.3% agreed, and 30.1% strongly agreed) indicated that openness and clear communication are vital for building trust in WASH project management. This suggests that when project leaders are transparent and accountable, the community is more likely to trust and support the project, fostering a collaborative environment that benefits sustainability. Lastly, Perceived benefits of the project (RII = 0.75) and "Trust in project leadership" (RII = 0.74) are crucial factors, as respondents feel that projects need to clearly demonstrate benefits to gain ongoing support. The 47.9% who agreed and 23.3% who strongly agreed on trusting project leadership indicate that effective, trusted leaders can guide project success by aligning efforts with community values. These results collectively emphasize the importance of community engagement, transparency, and demonstrated benefits in ensuring the sustainability of WASH initiatives

5.8 Cultural Influence on Women’s Engagement in WASH Project Management

The results presented in Table 8 reveal key cultural factors influencing women’s engagement in WASH project management. Each factor demonstrates how community perceptions and cultural expectations either support or hinder women’s involvement, particularly in leadership and decision-making roles. The Acceptance of women in leadership roles shows an RII of 0.73, with 38.0% of respondents agreeing and 28.2% strongly agreeing. This suggests a moderate level of community acceptance toward women in leadership positions within WASH projects, though the relatively high percentages of neutral (21.5%) and disagree responses (12.3%) indicate lingering resistance. These findings imply that while some progress has been made toward accepting women in management roles, traditional views may still limit their authority or influence. Such cultural dynamics suggest that further community sensitization may be necessary to enhance the acceptance of women’s leadership in WASH project management.

Table 8: Cultural Influence on Women’s Engagement in WASH Project Management

Cultural Influence Factor	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Total Responses	RII
Acceptance of women in leadership roles	8 (4.9%)	12 (7.4%)	35 (21.5%)	62 (38.0%)	46 (28.2%)	163	0.73
Community trust in women’s decision-making	6 (3.7%)	10 (6.1%)	28 (17.2%)	75 (46.0%)	44 (27.0%)	163	0.76
Influence of patriarchal norms on leadership roles	7 (4.3%)	9 (5.5%)	30 (18.4%)	68 (41.7%)	49 (30.1%)	163	0.77
Expectation for women to prioritize family duties	15 (9.2%)	18 (11.0%)	25 (15.3%)	55 (33.7%)	50 (30.6%)	163	0.7
Acceptance of women as technical experts in WASH	5 (3.1%)	8 (4.9%)	22 (13.5%)	80 (49.1%)	48 (29.4%)	163	0.79

Source: Researcher,2024

The Community trust in women’s decision-making ranks higher, with an RII of 0.76, and strong agreement from 46.0% of respondents. This score indicates a relatively high level of trust within the community regarding women’s capability in making effective decisions for WASH projects. This community trust is vital for empowering women in leadership roles and ensuring their decisions are respected and supported. A higher level of trust suggests that communities are beginning to recognize the value of women's contributions in critical decision-making areas, which could lead to increased female participation in WASH management roles.

The Influence of patriarchal norms on leadership roles scores an RII of 0.77, with 41.7% agreeing and 30.1% strongly agreeing that patriarchal norms still play a significant role. This high score reveals that while women may be trusted in decision-making in specific instances, overarching patriarchal values may still impose limitations on their roles, particularly in leadership. The strong influence of these norms implies that despite the community’s growing trust in women’s decision-making, there are deep-rooted cultural barriers that may prevent women from achieving full authority. This finding aligns with broader research on cultural limitations for women in leadership roles, indicating that addressing these norms will require substantial cultural shifts and policy support.

The Expectation for women to prioritize family duties shows an RII of 0.70, with 33.7% of respondents agreeing and 30.6% strongly agreeing, indicating a moderate level of pressure on women to prioritize family responsibilities over professional roles. This cultural expectation can restrict women's availability and commitment to WASH project management, as they may face societal pressure to allocate more time to household duties rather than community or leadership activities. These dynamic highlights the need for supportive family policies and community awareness programs that promote the balance between family

and professional responsibilities, enabling women to participate fully in WASH management without cultural restrictions.

Finally, the Acceptance of women as technical experts in WASH ranks the highest among the factors, with an RII of 0.79 and strong agreement from 49.1% of respondents. This finding is promising, as it indicates that women are increasingly being recognized for their technical expertise in the WASH sector, which could encourage further skill-building and involvement in technical areas. High acceptance of women in technical roles could empower more women to seek specialized training, enhancing their contributions to WASH projects and ultimately improving project sustainability. However, the remaining neutral and disagree responses suggest that barriers to full technical acceptance persist, though the trend is positive.

These findings highlight that while there is growing acceptance of women in leadership and technical roles within WASH project management, cultural norms around family prioritization and patriarchal values still challenge women’s full engagement. Addressing these factors may require targeted community education and the promotion of gender-equitable policies to foster a supportive environment for women’s comprehensive involvement in WASH project management.

Table 9: Challenges Women Face in Managing WASH Project

Variables	Responses		Percent of Cases
	N	Percent	
Difficulty in balancing work and family	19	4.9%	11.7%
Limited professional development	39	10.0%	23.9%
Cultural norms and expectations	53	13.6%	32.5%
Male domination	52	13.3%	31.9%
Lack of Support Networks and Mentorship	25	6.4%	15.3%
Lack of Supportive policies	38	9.7%	23.3%
Gender Bias and Stereotype	55	14.1%	33.7%
Underrepresentation of leadership	63	16.2%	38.7%
Lack of trust to women	24	6.2%	14.7%
Limited knowledge of WASH practices	22	5.6%	13.5%
Total	390	100.0%	239.2%

Source: Researcher,2024

The results presented in Table 9 highlight the challenges that women face in managing Water, Sanitation, and Hygiene (WASH) projects. The total number of responses (390) indicates that multiple challenges were identified by respondents, as many women faced more than one issue. These challenges reflect broader socio-cultural and structural barriers that limit women's full participation and leadership in WASH project management. The most prominent challenge identified is the underrepresentation of women in leadership roles, with 63 responses, representing 16.2% of the total responses and 38.7% of the cases. This finding suggests that women are significantly underrepresented in decision-making positions, which can hinder their ability to influence WASH project outcomes. The lack of female leadership in WASH management positions likely perpetuates other challenges such as gender bias and cultural norms.

Gender bias and stereotypes were also frequently reported, with 55 responses, accounting for 14.1% of total responses and affecting 33.7% of the cases. This indicates that women often face preconceived notions about their abilities or roles, which can limit their opportunities and undermine their contributions to project management. The prevalence of gender bias could also contribute to other barriers, such as male domination in leadership roles. Additionally, cultural norms and expectations were identified as a challenge by 53 respondents (13.6% of total responses), affecting 32.5% of cases. These norms may dictate traditional gender roles, which could limit women's involvement in public or leadership activities related to WASH projects. This suggests that cultural practices continue to shape women's participation in ways that are restrictive and may require targeted interventions to promote gender equality in these settings.

Male domination, cited by 52 respondents (13.3% of responses, 31.9% of cases), reflects the ongoing dominance of men in decision-making and managerial roles in WASH projects. This male dominance could marginalize women's voices in project management and lead to unequal access to resources and opportunities. Other notable challenges include limited professional development opportunities (10% of responses, 23.9% of cases) and the lack of supportive policies (9.7% of responses, 23.3% of cases), which point to structural barriers that limit women's advancement in the WASH sector. These challenges highlight the need for targeted interventions, such as policy reform and capacity-building initiatives, to enhance women's skills and create a more equitable work environment. In conclusion, the data shows that women face a variety of challenges in managing WASH projects, with underrepresentation in leadership, gender bias, cultural expectations, and male domination being the most significant. Addressing these challenges requires a multi-faceted approach, including policy changes, professional development opportunities, and shifts in cultural attitudes towards gender roles in the WASH sector.

6. Discussion

The findings of this study demonstrate the crucial role of cultural practices, community acceptance, and cultural influence on the sustainability of WASH projects, aligning with prior research on the importance of local context and community involvement in project success. Adeyemi et al. (2023) emphasized that sustainable outcomes in WASH projects are significantly influenced by women's leadership, which is often shaped by cultural practices within the community. The positive impact of involving community leaders and respecting traditional structures, as seen in our study, resonates with findings by the African Development Bank (2021), which argued that recognizing and adapting to local customs improves community support and project effectiveness.

The study also uncovered the numerous challenges that women face in managing WASH projects, as detailed in the results. Table 9 revealed that underrepresentation in leadership (38.7% of cases) and gender bias and stereotypes (33.7%) are among the most significant barriers. These findings align with the broader literature on gender inequalities in WASH management, as reported by Ibrahim et al. (2022) and Becker et al. (2021), who noted that cultural norms often restrict women from participating in leadership roles. The study further showed that male domination and cultural norms and expectations were substantial obstacles, affecting 31.9% and 32.5% of the cases, respectively. These challenges not only limit women's contributions but also impact the diversity of perspectives in decision-making, ultimately hindering the efficiency and sustainability of WASH projects.

Community acceptance, particularly through active involvement in planning, emerged as a crucial factor for WASH project sustainability, as found by Moser and Levy (2019) and Jones (2014). These authors argue that community participation from the planning stage fosters a sense of ownership, which directly contributes to long-term project success. Our findings support this view, as local community involvement in planning significantly improved project acceptance and sustainability. Jones and Lemoine (2024) further noted that when communities are involved from the beginning, they are more likely to commit to and support project goals, enhancing overall effectiveness. However, the challenges women face in managing WASH projects, such as limited professional development opportunities (23.9% of cases) and lack of supportive policies (23.3%), indicate structural gaps that need to be addressed to enable women to take more active roles in project leadership and management.

Transparency and accountability in WASH projects were shown to build trust within the community, echoing findings by Mukherjee and Shah (2021). The high importance given to these factors in our study aligns with their argument that openness and clear communication between project leaders and community members can foster collaboration and trust. According to Smith et al. (2023), these elements are essential for preventing misunderstandings, which can undermine community support. Our findings emphasize the need for regular, clear communication and transparent processes to maintain high levels of trust and project sustainability. At the same time, the lack of support networks and mentorship (15.3% of cases) and difficulty in balancing work and family responsibilities (11.7%) present additional hurdles for women in managing these projects, suggesting a need for more structural support mechanisms to enhance their participation and leadership.

The role of cultural festivals and community bonding as influencers on WASH project sustainability reflects insights from Khadka and Bhattarai (2020), who suggest that local gatherings offer an ideal platform for promoting health and hygiene practices. Cultural festivals provide opportunities for disseminating information about sanitation and hygiene, aligning the project's objectives with community values. In our study, this approach fostered community engagement and promoted project goals in an accessible, culturally sensitive manner, which has been shown to improve acceptance and integration of WASH practices (Tilley et al., 2022). However, addressing the limited knowledge of WASH practices (13.5% of cases) and lack of trust in women's abilities (14.7%) also emerged as key challenges, further underscoring the need for targeted educational and capacity-building interventions to empower women in managing WASH initiatives.

Thus, the integration of cultural values into WASH project design is essential for ensuring sustainability. Recognizing the challenges women face in managing these projects—ranging from underrepresentation in leadership to cultural biases—emphasizes the need for gender-inclusive approaches that empower women while respecting local customs. Studies by Moyo and Moyo (2023) and Malmberg-Calvo (2022) emphasized that aligning project design with cultural practices not only improves acceptance but also empowers communities to take responsibility for WASH improvements. Addressing both cultural and structural barriers, particularly for women, is crucial for enhancing WASH project sustainability in Tanzania and beyond.

7. Conclusion and Recommendations

This study highlights the profound impact of cultural practices, community acceptance, and socio-cultural dynamics on the sustainability of Water, Sanitation, and Hygiene (WASH) projects. The findings underscore that integrating cultural values, involving local leaders, and acknowledging traditional norms significantly enhances community support and fosters an environment conducive to project success. Community participation, particularly in the early planning stages, emerged as a critical factor, with a strong sense of ownership playing a key role in ensuring the longevity and effectiveness of WASH projects. This research underscores the importance of culturally sensitive approaches that respect and incorporate local customs and social structures, as these elements are instrumental in securing community buy-in and enhancing project sustainability.

Moreover, the study emphasizes the necessity of transparent and accountable management practices within WASH projects to build trust and encourage active community participation. While cultural norms often restrict women's involvement in leadership roles, these same norms can also be leveraged to engage women in culturally appropriate ways. The findings indicate a need for strategies that recognize and elevate women's roles in the community to improve WASH project outcomes. Additionally, cultural influences, such as the authority of local elders and the significance of cultural festivals, highlight the importance of aligning project goals with the community's social frameworks to facilitate successful implementation and sustained impact.

Despite the benefits of cultural integration, the study also identified challenges related to cultural taboos and restrictive norms that can impede project activities if not properly managed. For instance, sensitivities around sanitation practices may limit the adoption of new methods unless these practices are adapted to align with community beliefs. By understanding and addressing these potential obstacles, WASH project managers can design programs that are both culturally respectful and operationally effective. This culturally adaptive approach is essential for achieving greater resilience and long-term community acceptance.

To improve the sustainability of WASH projects, it is recommended that project planners and policymakers engage community leaders, including elders and other influential figures, at the earliest stages of planning. This engagement will help align project objectives with community values, increasing acceptance and participation. Additionally, encouraging community involvement in decision-making processes will promote a sense of ownership and accountability among all stakeholders. Educational initiatives should be implemented to bridge the gap between traditional practices and modern sanitation and hygiene standards, helping communities recognize the benefits of improved practices.

Addressing gender roles in WASH projects requires inclusive training programs that empower women and facilitate their active participation in project management and decision-making. Partnering with local organizations to provide mentorship and capacity-building programs can help overcome cultural barriers that limit women's involvement in WASH leadership. Furthermore, WASH projects should be designed with flexible frameworks that can adapt to cultural taboos or restrictions, ensuring that essential hygiene practices are promoted while respecting community-specific values.

Lastly, it is crucial for policymakers to establish transparent mechanisms for monitoring and evaluating WASH projects to ensure accountability and maintain community trust. Regular updates and open communication channels with the community can reinforce trust and provide opportunities to address concerns as they arise. By adopting these culturally sensitive and community-centered strategies, WASH projects can foster resilience, gain long-term community support, and achieve sustainable improvements in water, sanitation, and hygiene outcomes.

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