Effects of Gender Biases on Project Performances in Water and Sanitation Projects in Njombe Region

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Abstract

Gender biases in Water, Sanitation, and Hygiene (WASH) projects globally, regionally, and in Tanzania pose significant challenges to effective project management. This study examines gender representation in leadership roles and the performance of NGO-led WASH projects in Njombe, Tanzania. Using a mixed-methods approach, data were collected from 197 participants, including project managers, beneficiaries, and stakeholders, to assess the effects of leadership inclusivity on project outcomes such as timelines, budget adherence, and stakeholder satisfaction. Findings revealed a strong positive correlation ($r = 0.628$, $p < 0.001$) between gender-balanced leadership and budget adherence. Similarly, inclusive leadership demonstrated a significant positive influence on stakeholder satisfaction and project timeliness. Respondents highlighted that male-dominated leadership structures often contributed to delays and inefficiencies, while projects with greater female representation showed improved decision-making and resource utilization. The study emphasizes the importance of implementing gender-inclusive policies and leadership training to promote balanced representation in decision-making roles. By fostering inclusivity, WASH projects can enhance their efficiency, ensure timely completion, and build stronger trust with stakeholders.

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1. Introduction

Globally, gender biases have long been recognized as a significant barrier to inclusive and effective decision-making processes across various sectors. These biases, deeply embedded in cultural and social norms, hinder women's participation in leadership roles, adversely impacting project outcomes. Research has shown that projects with women in leadership, particularly in sectors such as water and sanitation (WASH), tend to be more sustainable, efficient, and effective. For example, the World Bank evaluated 122 water resource management projects globally and found that projects with women at the management level were six to seven times more effective than those without female leadership (World Bank, 2015; Thompson & O'Dell, 2017). This underscores the critical role of women in fostering comprehensive and inclusive decision-making, which is essential for the success of development projects (Eagly & Carli, 2007; Brown & Taylor, 2020).

Gender biases often manifest in both overt and subtle ways, shaping perceptions of competence, leadership potential, and the suitability of women for certain roles. These biases reinforce unequal power dynamics, limit representation, and diminish the value placed on women's insights and contributions (Cortina et al., 2013; Eagly & Karau, 2002). In water and sanitation projects, such biases can result in poor project outcomes, including inefficiencies, delays, and a lack of sustainability (Smith, 2018; Kaplan et al., 2022). For instance, in a study of water projects in Kenya, it was found that cultural constraints and stereotypes significantly reduced women's involvement in management, leading to ineffective resource utilization and project failures (Kathini, 2020). Similarly, research in Tanzania and other parts of Africa has highlighted the detrimental effects of underrepresentation and biased perceptions on project performance (Fielmua & Dongzagla, 2020; Dery, 2021).

Africa faces unique challenges when addressing gender biases in WASH projects. Many African countries, including Tanzania, have adopted national policies to promote gender inclusivity in water management, but significant gaps persist in implementation (Trivedi, 2018; Gender and Water Network, 2019). In Ghana, for example, water access inequalities are rooted in broader societal gender disparities, which negatively affect project outcomes (Fielmua & Dongzagla, 2020). Similarly, in Tanzania's Njombe region, women's underrepresentation in leadership roles and biased perceptions of their capabilities contribute to inefficiencies and reduced stakeholder satisfaction in WASH projects (Cavill & Mott, 2022; Smith & Johnson, 2023). These biases not only restrict women's opportunities but also compromise the overall effectiveness and sustainability of development projects (Khan et al., 2019; Kitole et al., 2023).

Moreover, gender biases are often compounded by intersectional factors, such as age, socioeconomic status, and education level, which further marginalize women in WASH projects (Connell, 1987; Gross et al., 2000). For instance, projects in rural areas frequently fail to address the diverse needs of women, resulting in designs that are neither inclusive nor effective (Ahmed & Clark, 2022; Mwangi, 2017). Such disparities emphasize the need for targeted interventions, including gender sensitivity training, capacity-building initiatives for women, and the incorporation of gender-sensitive metrics in project evaluation frameworks (WaterAid, 2020; IRC, 2016).

Despite these challenges, there is increasing recognition of the importance of addressing gender biases to enhance project outcomes. Research shows that integrating gender equity into WASH programs not only improves project performance but also contributes to broader social and economic development goals (UNICEF, 2021; Khan et al., 2019). For example, gender-responsive

WASH programs in Ghana and Tanzania have demonstrated significant improvements in community participation, financial management, and project timelines when women's perspectives are prioritized (Fielmua & Dongzagla, 2020; Johnson & Brown, 2023). These findings highlight the transformative potential of inclusive leadership and equitable practices in driving sustainable development.

This study addresses a critical gap in understanding the specific manifestations and consequences of gender biases in NGO-led WASH projects in Tanzania, with a particular focus on the Njombe region. By examining how biases influence decision-making, resource allocation, and project performance, this research provides valuable insights to inform policy and practice (Kaplan et al., 2022; Kitole et al., 2023). It also contributes to the growing body of knowledge on gender equity in project management, offering evidence-based strategies to promote inclusivity and effectiveness in WASH initiatives. By addressing these gaps, this study aims to support the development of sustainable and equitable water and sanitation projects that meet the diverse needs of communities (Trivedi, 2018; Gender and Water Network, 2019; UN Water, 2017).

2. Theoretical Review

Role Congruity Theory (RCT)

The theoretical framework of the gender bias is grounded in the role congruity theory of prejudice toward female leaders proposed by Eagly and Karau (2002). This theory posits that prejudice arises when there is a perceived incongruity between the female gender role and the leadership role. In WASH projects, this theory helps explain why women are often underrepresented in decision-making roles, as they are perceived as less congruent with the typical characteristics of leadership (Sangodoyin, 1993). Ridgeway's (2001) expresses that the theory on gender status and leadership provides insights into how societal status beliefs about gender influence leadership dynamics and decision-making. This theory is crucial for analyzing the power dynamics in NGO WASH projects in the Njombe region.

Gender Theory

The theory explores how society norms and structures shale the roles, responsibilities and expectations of men and women leading to systematic inequalities. It suggests that gender biases are socially constructed and deeply ingrained in social norms and practices (Connel, 1987). In WASH context, gender theory helps to understand how these norms influence access to resources, participation in decision-making, and representation in leadership roles. Gender biases, which are based on these norms, often result in unequal power dynamics and hinder effective project outcomes by limiting the involvement and contributions of women (Connell, 1987). Furthermore, gender biases manifest as exclusionary practices that limit women's access to leadership roles and decision-making process and hence affects project outcomes. Such biases are detrimental to the effectiveness and sustainability of WASH projects, as they undermine the value of diverse perspectives and inclusive decision-making.

In terms of representation of women in leadership roles, the World Bank (2019) denotes that, only a small percentage of leadership positions in water utilities globally are occupied by women. This trend is mirrored in Tanzania, where women are significantly underrepresented in leadership and decision-making roles within WASH projects (Tanzania Gender Networking Programme, 2018). Gender biases prevent women from accessing these roles, even when they possess the necessary qualifications and experience. Research shows that projects with diverse leadership teams are more likely to achieve better project performance, including timeliness, budget adherence, and

stakeholder satisfaction, because diverse teams bring varied perspectives and inclusive decision-making practices (World Bank, 2019).

In analysing the how equitably women are engaged in WASH project and in decision making at regional context, Sangodoyin (1993) taking the case of Nigeria iterates that, rural women, especially those of younger years, are heavily involved in water collection as compared to men though when it comes on decision making on WASH projects, women are given less priority and hence less involved. This affects family life streams in particular other domestic socio-economic activities. In Nigeria for instance, Sangodoyin (1993) found that the time and energy involved in water fetching and purification as part of the WASH activities could sometimes be so high that other economic and domestic activities were adversely affected.

Furthermore, looking on the need to address gender disparities in WASH projects, Juliet Willetts (n.d) in her research in Ghana which is a patriarchal society, finds that women and girls are primarily responsible for water collection in most households (Dery, 2021; GSS, 2018;). According to WHO/UNICEF (2008), in 75% of cases in developing countries it is women who collect and carry water. Their exclusion from community decision making and other aspects of WASH denies them their rights and results in various unwanted outcomes including inappropriate system design, potentially negative social and economic effects, and perpetuation of existing gender inequalities. Despite of the challenges, women and girls are not equally prioritized in decision making especially in WASH projects where they are much involved even than men. These inequalities in WASH access and the institutionalization of water rationing and pricing (Fielmua & Dongzagla, 2020; Jambadu *et al*., 2022) reinforce women and girls' vulnerabilities to GBV (Nunbogu et al., 2023). Further research indicates that the sustainability of investments (in terms of functionality and use of infrastructure after a project) is enhanced when women are closely involved (Gross et al. 2000).

3. Empirical Review

Empirical studies have highlighted the pervasive nature of gender bias and its impact on decision-making across various sectors. Eagly and Karau (2002) found that women in leadership roles often face significant biases that undermine their authority and effectiveness. Powell *et al*. (2002) demonstrated that gender stereotypes persist in managerial contexts, affecting both the perception and performance of female leaders. This concept relates the unequal representation of leadership role between men and women in project and managerial positions. This bias trigger impacts to project completeness/timelines, project resources allocation and utilization context as well as stakeholders' satisfaction.

Research shows that diverse leadership teams tend to make decisions more quickly and effectively, reducing delays and ensuring projects stay on schedule (Eagly & Carli, 2007). In contrast, gender biases that prevent women from taking leadership roles can lead to delays in decision-making and project implementation, affecting project timelines. In terms of project budget management and resources allocation, women leaders often bring different perspectives and priorities, which can lead to more efficient budget management (UN Women, 2016). Biases in perceptions of competence can result in unequal opportunities for women to manage resources, affecting budget adherence. This concept likewise applies to concept of competence of which if stakeholders perceive that, women are not competent enough to lead or make critical decisions, it can reduce overall satisfaction with the project.

Research by Valian (1998) underscores the need for greater gender inclusivity to enhance project outcomes. Studies specific to the WASH sector indicate that gender biases can significantly hinder the effectiveness of projects by limiting the participation and influence of women in decision-making processes (Ridgeway, 2001). Kathini (2020) in his literature recognizes the challenges that women in Makueni county in Kenya have been undergoing through and he iterates that while there have been continued efforts to increase women involvement in grass-root community at the water projects, women continue to be underrepresented at the management level of the projects.

4. Methodology

Research Philosophy

This study used a pragmatism as its research philosophy that emphasizes the utilization of multiple approaches to best address the research objectives. Pragmatism stresses the use of mixed methods, which allow collection of both quantitative and qualitative data, as well as useful application of research findings and permits flexibility in methodological decisions (Kothari, 2004; Creswell, 2014; Saunders *et al*., 2019). This attitude is especially appropriate for the study since it aims to comprehend and tackle actual problems with gender prejudice in WASH project decision-making processes that are run by non-governmental organizations.

The study intended to provide a comprehensive knowledge of the effects of gender bias on decision-making by employing a mixed-methods approach based on pragmatic philosophy. A comprehensive review that ensures the conclusions are genuine and dependable have been made possible by the integration of qualitative and quantitative data. This methodological framework aimed to provide important insights into how gender functions in the management and execution of WASH projects in the Njombe region.

Research Design

The study used cross-sectional research design taking into account qualitative and quantitative research approaches. So far, exploring perceptions, experiences, and subjective interpretations is particularly good fit for qualitative approaches, which offer rich, in-depth insights into individual viewpoints. Nevertheless, quantitative method poses the advantage of being able to generalize findings across bigger groups. It was used to measure attitudes and experiences through closed-ended questions and Likert scale (1 to 7). Combining these techniques enabled a more thorough investigation. Ultimately, SPSS which is a statistical software was used to examine the gathered data to find trends and correlations, guaranteeing the validity and reliability of the findings.

Population and Sample Size

A total of 386 population was available from which this study targeted to explore the perception of gender biases tagging the constructs that constitutes the biasness within different societal. The study target to reach between 30 to 50% of the total 386 available population relevancy to participate in the survey including individuals involved in the decision-making processes on WASH projects operated by NGOs in the Njombe region. The respondents accounted for a diverse group of stakeholders, including NGO staff, project managers, community leaders, local government officials, and community members (both men and women) who participate in or are affected by these projects. The respondents included women and girls specifically to understand their roles and experiences in the decision-making processes (more details in chapter four).

To ensure a representative sample and achieve a comprehensive understanding of the effects of gender bias, the study employed a stratified sampling to capture various sub-groups within the study population. The sample size was determined based Cochran's sample size formula (Cochran W.G, 1977) for a finite population with assumption aiming for 95% confidence level and a 5% margin error, and 0.5 maximum variability.

$$n = \frac{Z^2.p.(1-p)}{E^2}$$

Whereas Z = 1.96 (95% confidence level), P = 0.5 (maximum variability), E = 0.05 (margin of error). With the Cochran's formular, the study identified a need to have moderate sample that is finite and hence had to be adjusted by finite population correction with a help of the following adjusted formula

$$n_{adjusted} = \frac{n}{1 + \frac{n-1}{N}}$$

Whereas n_{adj} = adjusted sample size, n = initial sample size from Cochran's formula, N = total population size, The $n_{adjusted}$ in a given formular is meant to adjust sample size, especially when the population is considered small or moderate, to retain precision of results without over-sampling. Thus, Table 3-1 presents the available population per stratified sample of groups according to category. Thus, the study used the adjustment formular to adjust sample size from which the proportion of respondents were contacted to respond to the survey. The survey managed to interview 93 NGO staff including project officers (48), project managers (41), and directors (4). Furthermore, managed to engage 29 project beneficiaries (including community members and their leaders) who gave out their opinions over the subject matter. Also, 34 stakeholders were interviewed as well as 26 community development officers as well as 15 other field members part of the project stakeholders (Table 1).

Table 1: Percentage of sample size for study respondents

Respondents	Population available	Proportion sample size	% of respondents reached	Category
Project officer	95	76	63.2%	
Project manager	70	59	69.5%	NGOs
Director	10	9	44.4%	
Project beneficiary	75	62	46.8%	Beneficiaries
Project stakeholder	65	55	61.8%	Stakeholders
CDO	45	40	65%	Government officials
Others	26	24	62.5	
Total	386	325	(average) 59.0%	

Source: Researcher, (2024)

Lastly, is the gender balance whereby the research study targeted to interview 50% men and women of which 95 male (48.2%) and 102 female (51.8%) were interviewed in this study. This gender distribution was meant to highlight specific challenges and barriers faced by women and girls in decision-making processes.

Validation and Reliability

To ensure the validity and reliability of the research data, the researcher submitted the data collection tools to professionals, including the research supervisor and an external expert, for review. These tools, which consisted of online surveys and interview guides, were shared with the research supervisor and a WASH sector expert from the Tanzania Water and Sanitation Network (TAWASANET). Their insights helped refine the tools to ensure comprehensive coverage of relevant aspects related to gender bias in decision-making. A pre-test study was conducted with a small sample from the target population to evaluate the performance of the data collection tools. This pre-test assessed the tools' relevance, timing, and respondents' understanding. Feedback from the pre-test was used to adjust the instruments, improving their clarity, relevance, and comprehensiveness to ensure all critical dimensions of the topic were addressed.

The study also incorporated the use of an online system designed with Kobo Toolbox to facilitate data collection from distant respondents who were not in Njombe at the time of the study. To enhance the validity of the research, triangulation methods were employed, utilizing multiple data collection techniques such as surveys, interviews, and focus group discussions. This approach enabled cross-verification of data from different sources, thereby increasing the overall reliability of the study and providing a more holistic perspective on the effects of gender bias. On the context of reliability, which refers to the consistency and stability of the measurement process, the study assessed internal consistency using Cronbach's Alpha coefficient of which alpha value of 0.7 or higher indicate that the survey variables are reliably measuring the same underlying construct.

The study, maintained consistency in data collection procedures by using standardized procedures for data collection to minimize variability including using the same interview questions, survey formats, and data collection methods for all participants. Nevertheless, the study trained data enumerators prior to being released for fieldwork. The aim was to equip them to understand study protocol, procedures, and the importance of consistency in data collection. Pre-testing of the instrument was performed with a small sample size of enumerators and respondents especially the way to ask question and test response from participants and measuring their understanding and undertake any adjustments before the main data collection exercise. The test included coherency, timing, flow of asking questions, and comfortability of respondent.

5, Results and Discussion of Findings

Data collection for the study was conducted between September and October, targeting WASH project implementers (officers and managers), project beneficiaries, project supervisors (government officials), and other stakeholders. The tools were designed to accommodate both physical and distant participants, using online platforms for remote respondents and hardcopy questionnaires for those available in person. The questionnaire was aligned with the research objective, specifically focusing on analyzing the effects of representation in leadership roles on WASH project performance in Njombe. This included examining gender biases and their impact on critical project outcomes such as completion timelines, budget adherence, and stakeholder satisfaction. The study aimed to assess how gender biases influence project performance in NGO-led WASH initiatives within the region.

Demographic Characteristics of Respondents

The demographic overview result (Table 1) presents a total of 197 respondents (N = 95 male and N = 102 female) from water, Sanitation and Hygiene (WASH) Non-Governmental Organizations

(NGOs), Njombe Town Council (NTC), WASH project beneficiaries as well as WASH stakeholders focusing on variables like gender, age group, academic level, experience in WASH projects, their roles in NGO or WASH projects, their engagement to have been worked in NGO or WASH projects and year which they worked in WASH projects in Njombe TC.

The data in Table 2 indicates that 48.2% of the respondents were male and 51.8% female, showing a relative balance of gender distribution. This balance suggests that both genders are well-represented, reflecting possible gender-inclusive policies within the NGO or WASH projects in Njombe.

Table 2: Distribution of gender and age (n=197)

Variable	Category	Percentage
Gender	Male	48.2%
	Female	51.8%
Age group	18-25	14.7%
	26-35	36.5%
	36-45	24.4%
	46-55	14.2%
	above 56	10.2%

Source: Researcher, (2024)

The age group of the respondents in Table 2 is predominately between 18-25 (14.7%) followed by 26-35 years (36.5%), 36-45 years (24.4%), 46-55 years (14.2%) and those above 56 years (10.2%). This indicates that the respondents are in their prime working range. Furthermore, it suggests a youthful and dynamic workforce, which is essential in the physically demanding field of WASH sector. Notwithstanding, the relatively lower representation of respondents over 46 years (24.4%) could suggest that experience is valued and is a treasure to honour.

The academic level of the respondents ranged from primary to PhD whereas 19 respondents (9.6%) had attained primary education, 15 (7.6%) have attained secondary education, 12 (6.1%) certificates, 60 (30.5%) Diploma, 68 (34.5%) Bachelor's degree, 19 (9.6%) Master's degree, and 4 (2.0%) have PhD degree. This indicates that most respondents had attained university degree qualification which positions them to a better understanding of WASH project context as well as substantial formal education among participants.

Table 3: Frequency Distribution of response by academic qualification (n=197)

Variable	Category	Frequency	Percentage
Highest level of academic qualification	Primary education	19	9.6%
	Secondary education	15	7.6%
	Certificate	12	6.1%%
	Diploma	60	30.5%
	Bachelor's degree	68	34.5%
	Master's degree	19	9.6%
	PhD	4	2.0%

Source: Researcher, (2024)

In terms of experience, the result in Table 4 shows that most respondents had experience in the WASH projects. The large group falls between 1-3 years (24.9%) and 7-10 years (26.9%) respectively. Other age range groups are 4-6 years (18.3%), 11-15 years (13.2%), 16-20 years (11.7%) and above 20 years of experience were 5.1%). Furthermore, the result in Table 4-3 shows

that most respondents have experience in WASH sector ranging between 7 to 10 years (26.9%) which best positions them to a better understanding of WASH sector issues and challenges as well as best practices.

Table 4: Frequency distribution on years of experience (n=197)

Variable	Category	Frequency	Percentage
Years of experience	1-3 years	49	24.9%
	4-6 years	36	18.3%
	7-10 years	53	26.9%
	11-15 years	26	13.2%
	16-20 years	23	11.7%
	Above 20 years	10	5.1%

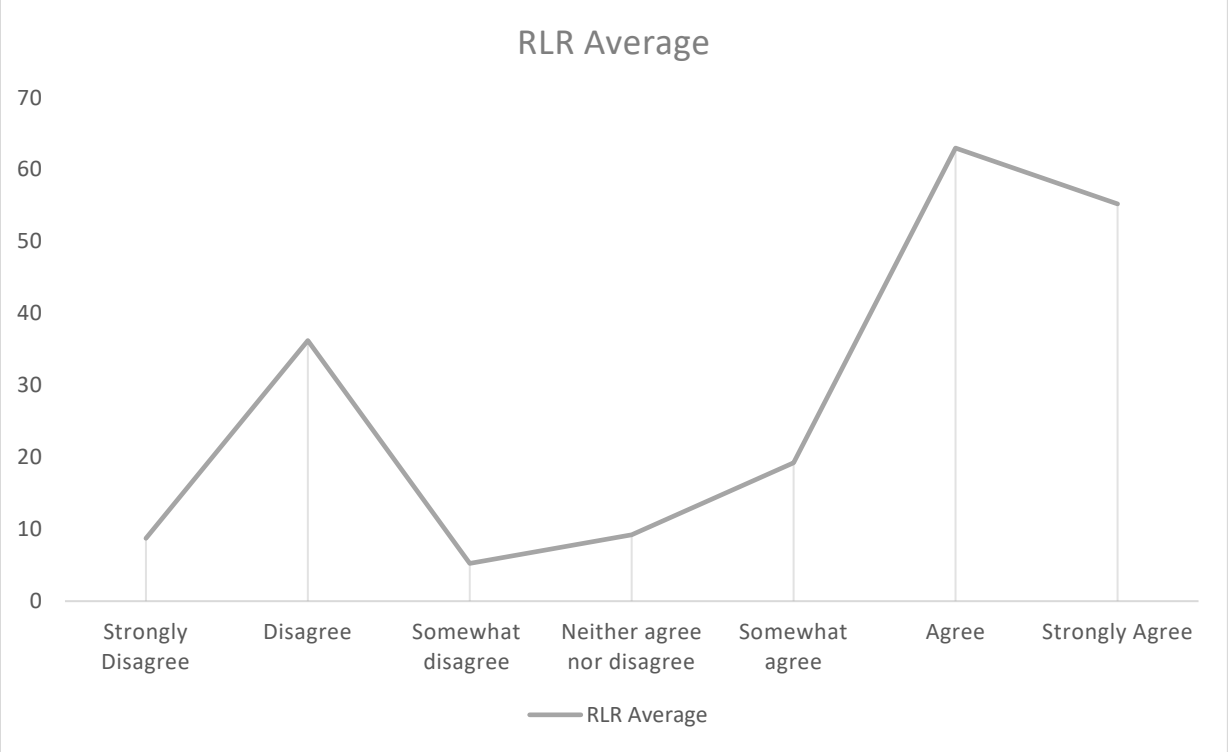
Source: Researcher, (2024)

Nevertheless, another age group with primary experience lies between 1 to 3 years (24.9%) and 4-6 years (18.3%) of experience in the field which indicates that youth group is also well engaged in the WASH sector which builds young and fresh minds to work within Njombe region (Table 4-3). With the research objective of examining the *"effect of gender biases on project performances in NGO WASH projects"*, the first specific objective was to analyse the effect of representation in leadership roles on project performances on WASH projects in Njombe. The results on the perception of gender representation in leadership roles from participants were obtained from 197 respondents (95 male, 102 female) as presented in Table 4-6 tailing from strongly disagree to strongly agree of which combining the agree and strongly agree sums to 60.03% with disagree responses summing to 26.5% and a small proportion of 4.73% of neutral responses. The results suggest that respondents largely feel that having representation in leadership roles with women inclusion is a paramount important factor that triggers project performance and should be given high imperative considerations (*Eagly, A. H., & Carli, L. L. (2007)*. Nevertheless, the comparatively high Relative Importance Index (RII) of 0.722 indicates that respondents perceive the importance of women's inclusivity of leadership in WASH projects is very crucial.

Among the four variables in Table 5, the women inclusion in leadership positions were gauged to be high 79.2% (agree and strong agree) as marked from RII of 0.864 with negligible disagreement (6.1%) followed by unequal representation of women which is lower than that of men (RII of 0.801 and 73.6% agree and strongly agree) with minimal disagreement (15.7%) which indicates that majority of respondents agree and this implies a clear perception that women are truly underrepresented in leadership. This reflects a recognition of disparity, suggesting gender inclusivity is an area that requires focused attention.

On the perception that women are excluded from key decision-making processes, most respondents (53.3%) disagreed and strongly disagreed while 31% agreed with the statement. This also gave the RII of the construct a value of 0.511 indicating a low importance rating. With significant disagreement. The low RII value and high disagreement indicate that most respondents feel women are not systematically excluded from decision-making. This suggests that while there may be challenges, outright exclusion from decision-making is not widely perceived as a significant issue in WASH projects in Njombe region.

Figure 1: An average response of representation in leadership roles (RLR)



Lastly is the issue of male dominance on leadership in WASH project, respondents agreed and strongly agree (66.3%) with the statement male-dominated leadership is prevalent, within WASH project in Njombe region while 22.8% disagreed with the statement. This suggests a notable consensus that male-dominated leadership is prevalent, with a high RII value (0.711) supporting this perception. It reflects a belief that leadership roles in the sector are more accessible to men, emphasizing the need for gender-balancing initiatives. This male dominance trend and social norms that view technical jobs, such as engineering as inappropriate to women restrict and shade-off women from participating in WASH sector (World Bank, 2019).

Table 5: Frequency distribution on representation in leadership roles

Statement	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree	RII
Weight	1	2	3	4	5	6	7	
Representation in Leadership Roles (RLR 1.1)	(8.75) 4.45%	(36.25) 18.40%	(5.25) 2.65%	(9.25) 4.73%	(19.25) 9.80%	(63) 31.98%	(55.25) 28.05%	0.722
Proportion of women in leadership roles within the WASH projects is significantly lower than that of men	(0) 0%	(26) 13.20%	(5) 2.50%	(0) 0%	(21) 10.70%	(83) 42.10%	(62) 31.50%	0.801
Women leaders in WASH projects are often excluded from key decision-making processes	(28) 14.20%	(77) 39.10%	(8) 4.10%	(9) 4.60%	(14) 7.10%	(34) 17.30%	(27) 13.70%	0.511
Male-dominated leadership is more common in WASH projects in Njombe region	(7) 3.60%	(32) 16.20%	(6) 3%	(20) 10.20%	(21) 10.70%	(71) 36%	(40) 20.30%	0.711
Including more women in leadership positions leads to better project outcomes	(0) 0%	(10) 5.10%	(2) 1%	(8) 4.10%	(21) 10.70%	(64) 32.50%	(92) 46.70%	0.864

Source: Researcher, (2024)

Analysis of Representation of Leadership Roles Through Descriptive statistics

Table 6 presents the result of respondent's perception on the representation in leadership roles from a different angle of distributional statistics (mean, standard deviation, skewness, and kurtosis). Looking on the proportionality between men and women in leadership roles, the results show a mean (5.604) and median (6.0) suggesting that most respondents agree with the general statement that representation of women in leadership is lower than that of men in WASH projects. The response also shows a left-skewed distribution of (-1.383), meaning that most responses were on the higher end of the scale, supporting the statement while the Kurtosis (0.682) indicates a lightly peaked distribution, showing a concentration of responses around high agreement levels.

Most respondents on perception that women leaders are often excluded from key decision-making were in disagreement as indicated with mean (3.578) and median (2.0). Skewness (0.412) is slightly positive indicating few higher scores and Kurtosis (-1.481) reflecting flatter distribution and more variability. This hence indicates a mixed response suggesting disagreement on exclusion of women of which even minor exclusionary practices could limit project effectiveness if women leaders are unable to fully contribute to decision-making.

On the male leadership dominance practice in Njombe, respondents suggest to be in agreement with the statement as indicated by mean (4.9746) and median (6). Skewness (-0.756) which lights to the left indicating that most respondents agree with the statement and Kurtosis (-0.778) which is slightly flatter curve indicting varied responses but with overall agreement.

Lastly is the women inclusion in leadership and its impact to project outcomes. The results show a mean (6.0457) and median (6.0) show a high agreement of the statement while skewness (-1.785) and Kurtosis (2.959) suggest a very left skewed and peaked distribution, indicating strong consensus and belief that gender inclusive leadership positively influences project outcomes (Table 6).

Table 6: Mean, standard deviation, skewness, and kurtosis on RLR

Statement	Mean	Media	SD	Skewness	Kurtosis
Proportion of women in leadership roles within the WASH projects is significantly lower than that of men	5.6041	6	1.61801	-1.383	0.682
Women leaders in WASH projects are often excluded from key decision-making processes	3.5787	2	2.17362	0.412	-1.481
Male-dominated leadership is more common in WASH projects in Njombe region	4.9746	6	1.85559	-0.756	-0.778
Including more women in leadership positions leads to better project outcomes	6.0457	6	1.28291	-1.785	2.959

Standard range: Skewness (-2 to +2); Kurtosis (-1 to +1)

Constructs Validity Test (CVT)

Grouped data constructs were tested using validity test in SPSS from the independent to dependent variables which were grouped through "transform variables" of the likeness which were representation in leadership roles (4 items), perception of confidence (4 items), discriminatory

practices (5 items), project timelines (2 items), budget adherence (3 items) and stakeholder perception (3 items).

The validity test was then used to analyzed grouped construct which gave an overall Cronbach Alpha of $\alpha = 0.867$. The overall result shows that the construct validity test demonstrates each item in the measured constructs contribute positively to the internal consistency of the overall scales. With Cronbach's Alpha values ranging from $\alpha = 0.821$ to $\alpha = 0.875$ across constructs, all values exceed the acceptable threshold of $\alpha = 0.70$, supporting good internal consistency and reliability. This analysis confirms that the constructs are reliably measured and valid for assessing respondent's perceptions in this study, as each cohesively measure district aspects of project performance factors. The mean and standard deviation ranges from (M = 4.0477 to 5.8621) and (SD = 0.84901 to 1.74527) respectively imply positive perceptions and moderate to high variabilities of all constructs (Table 7)

Table 7: Construct validity test

Measured variable	Mean	Std. Deviation	Cronbach's Alpha if item Deleted
Leadership roles	5.0508	1.25888	0.828
Perception of Competence	4.9721	1.20817	0.846
Discrimination Practices	4.0477	1.35615	0.821
Project Timelines	4.5939	1.74527	0.868
Budget adherence	5.2978	1.36791	0.826
Stakeholder satisfaction	5.8621	0.84901	0.875

Source: Researcher, (2024)

The study aimed to analyze the effects of gender biases on project performances metrics: timelines, budget adherence, and stakeholder satisfaction. The results were analysed in relation to the research objective providing insights into how representation in leadership roles influence these dependent constructs. The independent and dependent variable correlation was analysed using SPSS looking at how independent construct relate and impact the dependent variables (PTM, BAD, and SHS). To ensure that there is a correlation between variables, a matching correlation using the Pearson correlation factor (r) was used. The standard correlation factor scale measure presented in Table 8 was used to analyze the relationship and impact of the independent construct to project performance constructs and check if they fall within or outside the recommended scale range.

Table 8: Correlation scale factor range

Sign	**Negative -** **Opposite direction** ↓ ↑					**Positive +** **Same direction** ↑ ↑			
Value	**-1**	**-0.75**	**-0.5**	**-0.25**	**0**	**0.25**	**0.5**	**0.75**	**1**
Strength	Perfect	Strong	Moderate	Weak	No relationship	Weak	Moderate	Strong	Perfect
Sign, +, -	Negative	Negative	Negative	Negative		Positive	Positive	Positive	Positive

Impact of RLR on Budget adherence (BAD)

Likewise, the analysis of data presented in Table 9 indicates a strong positive correlation between leadership representation and budget adherence (r = 0.628, p < 0.001), implying that higher representation in leadership contributes to improved financial control and reduce budget overruns. This financial control can enhance resource allocation and overall efficiency of project expenditure. On the context of competency perception, the results shows that **g**ender-biased perceptions significantly affect budget adherence. A strong positive correlation ($r = 0.535$, $p < 0.001$) indicates that teams recognizing women's competencies manage budgets more effectively. On the terms of discriminatory practices, the results show that there is a strong correlation ($r = -0.666$, $p = < 0.001$) suggesting that minimizing discrimination directly improved budget performance.

Impact of RLR on Stakeholder satisfaction (SHS)

The results in Table 9, also demonstrate a positive correlation between perception of competence and project performance metrics, with the Pearson correlation for competence perception and stakeholder satisfaction at ($r = 0.385$, $p < 0.001$). This value suggests the value stakeholders place on fair and skilled decision-making once women are trusted with competency

In data analysis, a moderate positive correlation ($r = 0.463$, $p < 0.001$) was observed between gender-balanced leadership and stakeholder satisfaction, underscoring the importance of inclusivity for trust and community engagement. Nevertheless, the results also posed a moderate negative correlation ($r = -0.509$, $p < 0.001$) revealing that discriminatory practices reduce stakeholder satisfaction by undermining perceptions of fairness and inclusivity. Similarly, competence perception is moderately correlated with budget adherence (r = 0.535) and stakeholder satisfaction (r = 0.385), indicating that the higher the competence levels among team members the better association with financial management and stakeholder satisfaction. Nevertheless, qqualitative findings underscored that discriminatory practices, such as the exclusion of women from community engagement and decision-making processes, eroded stakeholder confidence, diminishing support for project initiatives

Table 9: Correlation analysis of independent and dependent constructs

Variable	Project timelines (*r*)	Budget adherence (*r*)	Stakeholder Satisfaction (*r*)	Significance (p)
Leadership roles	0.509	0.628	0.463	$p < 0.001$
Competence perception	0.393	0.535	0.385	$p < 0.001$
Discriminatory Practices	0.521	0.666	0.509	$p < 0.001$

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

Also, the gender-sensitive training construct as among the mitigation measures on gender biases in decision-making received solid backing (N = 147; 74.6%), suggesting that equipping team members with knowledge on gender equity is widely recognized and fundamental. The strong consensus on gender-sensitive training construct, with a high mean (1.2538) and low standard deviation (0.43630), implies that respondents believe training directly contributes to creating a more respectful, inclusive environment, and hence improving collaboration and project efficiency.

Nevertheless, inclusive policy development (N = 101; 51.3%) and regular gender audits (N = 98; 49.7%) and relatively lower mean values (1.4873 and 1.5025 respectively) and higher variability. Such a mixed perception may indicate that while policies and audits are recognized as valuable, they might not be seen as immediately impactful or universally implemented (Table 10)

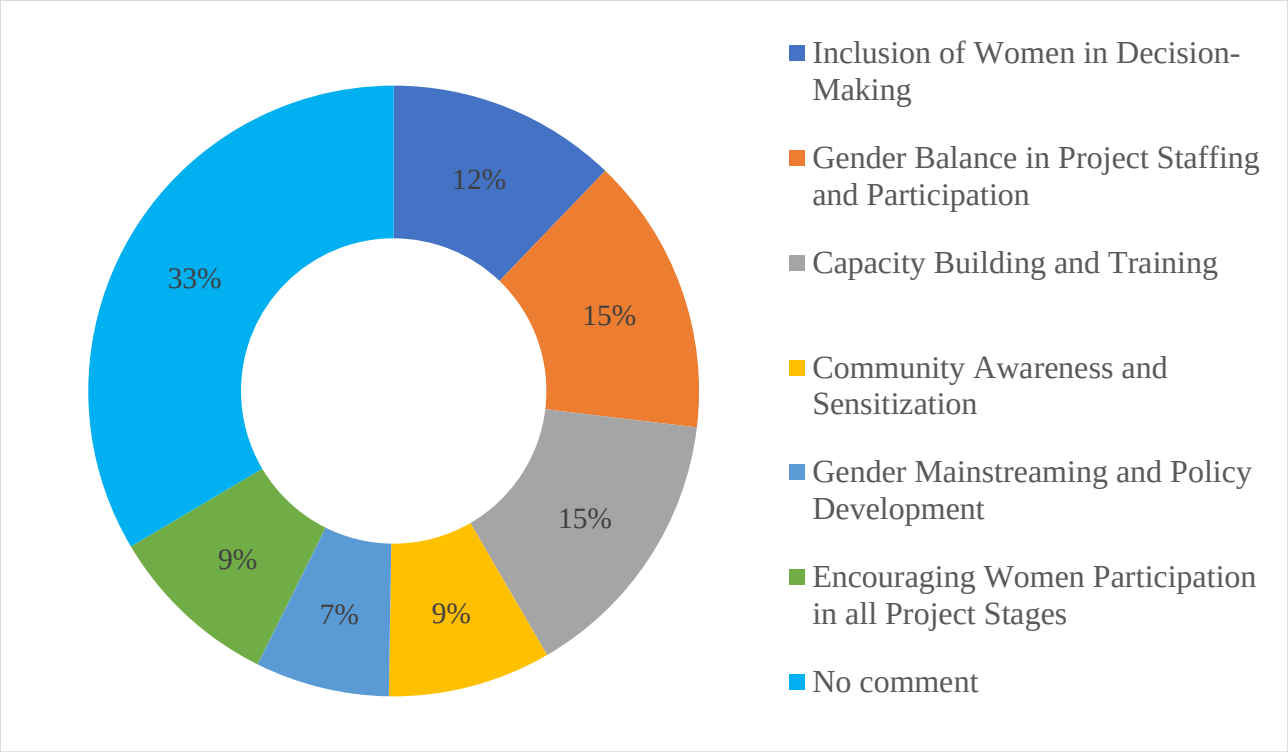
Table 10: Frequency distribution on mitigation measures

Code	Construct	N	%	Mean	SD	Skewness	Kurtosis
MST1.1	Gender-sensitive training	147	74.60%	1.2538	0.43630	1.140	-0.707
MST1.2	Inclusive policy development	101	51.30%	1.4873	0.50111	0.051	-2.018
MST1.3	Active promotion of women into leadership roles	149	75.60%	1.2437	0.43038	1.203	-0.557
MST1.4	Regular gender audit	98	49.70%	1.5025	0.50127	-0.010	-2.021
MST1.5	Community awareness program	157	79.70%	1.203	0.40329	1.488	0.216

The questionnaire, in probing if there have been any measures taken in projects or communities where projects have or are being implemented, (N = 145; 73.6%) confirmed that mitigation measures have been taken to address the gender biases at their local level (Figure 4-4). Nevertheless, with 12.2% of respondents supporting the "inclusion of women in decision-making" measure, there is recognition of the importance of including women in decision-making processes. When women are involved in key decision-making processes, it ensures that diverse perspectives are considered, which can lead to more balanced and effective project strategies. This implies that with a perceived context of gender biases, inclusion of women in decision making impact positively impacts to project performance with considerations of capacity building trainings and gender project staffing.

Gender balance in project staffing and participation scored 14.7% of respondents, reflecting the belief that a balanced workforce leads to a more inclusive environment. This approach not only creates a fair representation of gender but also helps reduce stereotypes by normalizing equal gender aspects are all project levels (Figure 4). Capacity building and training construct was supported by 14.7% of the respondents, emphasizing that equipping both men and women with right skills and awareness, foster gender equity (Figure 4-4). Notwithstanding, capacity building efforts foster to empower team members to recognize the actively counter gender biases as well as encourage collaboration and build awareness on gender inclusivity issues.

Figure 4: Effective mitigation measures to reduce gender biases by respondents



Community awareness and sensitization (8.6%) construct highlights the need to address gender biases beyond the project team and reach community members. Gender Mainstreaming and Policy Development scored (7.1%) of responses from respondents, indicating a more formal approach to integrating equity into organizational policies and practices. Policy development lays a structural foundation for ongoing gender inclusivity and ensures accountability within an organization or project. Respondents on the other hand supported for "encouraging women's participation in project stages (9.1%) suggesting that women's perspectives are integrated into all aspects of project planning, implementation, and evaluation. Hence, this approach fosters continuous representation, challenging biases that limit women's involvement in certain project areas. Lastly, the majority of respondents 33.5% had no comments to contribute on mitigation measures to address gender biases in decision-making as a contribution to project performances.

5. Conclusion and Recommendations

Summarizing the findings of this research study, it is imperative to iterate that the study found that representation of women in leadership roles within WASH projects in Njombe significantly lower than that of men. The relative importance index (RII) of 0.801 supports the perception of gender disparity in leadership. Respondents highlighted that male-dominated leadership contributes to slower decision making and inefficient project outcomes. However, the inclusion of women in leadership positions showed a strong positive correlation with improved project performance metrics, such as timeliness and stakeholder satisfaction as well was ranged high with RII of 0.864.

Nevertheless, the study notes that the mixed-methods approach provided both quantitative and qualitative insights, ensuring a comprehensive understanding of the issues related to gender biases in WASH projects. The findings are highly relevant to policy and practice, offering actionable recommendations for NGOs and policymakers, thereby enhancing the study's practical applicability. Additionally, the use of advanced statistical techniques such as correlation analysis and the Relative Importance Index (RII) added robustness to the data analysis, increasing the credibility of the results.

Despite its strengths, the study has some limitations. Its geographical focus on Njombe limits the generalizability of the findings to other regions, as contextual factors may differ elsewhere. There is also the potential for bias in responses, as participants may have been influenced by social desirability, particularly in the qualitative data collection. Furthermore, while the sample was diverse, it might not fully represent all perspectives, especially those of underrepresented community groups, which could have enriched the findings.

Notwithstanding, the study opens several opportunities for further research. Investigating gender biases in other sectors beyond WASH could provide comparative insights and broaden the understanding of how these biases manifest across different contexts. Exploring the long-term impacts of implementing gender-inclusive policies in project management would also be valuable, as it could reveal sustainable strategies for addressing gender disparities. Additionally, assessing the role of cultural norms in shaping perceptions of competency in leadership roles would deepen understanding of the root causes of gender biases and inform more culturally sensitive interventions.

6. Conclusion

This study concludes that gender bias significantly impacts the performance of WASH projects in the Njombe region. Findings reveal that biases, such as underrepresentation in leadership, biased competency perceptions, and discriminatory practices, hinder project outcomes. Increasing female leadership representation was shown to improve project timelines, financial control, and stakeholder satisfaction, emphasizing the value of balanced leadership in decision-making and community engagement. These insights highlight the pressing need to address gender disparities to enhance the effectiveness of NGO-led WASH initiatives.

The study makes a meaningful contribution to understanding gender biases in project management, particularly in the WASH sector. It provides empirical evidence linking gender biases to critical performance indicators like budget adherence, timelines, and stakeholder satisfaction. By demonstrating the transformative potential of inclusive leadership and equitable practices, the research underscores the importance of gender-sensitive policies, capacity-building for women, and regular gender audits. These recommendations offer practical frameworks for NGOs and policymakers committed to fostering gender equity in project management.

By linking gender inclusivity to measurable improvements in project performance, this study provides a foundation for future research and actionable strategies for development practitioners. The findings underline the importance of addressing unconscious biases and integrating gender-sensitive practices in WASH projects. Such initiatives can drive sustainable improvements not only in project outcomes but also in broader gender equity efforts across sectors and regions.

The study further recommends mandatory gender sensitivity training, equitable resource allocation, and the inclusion of women in decision-making processes. It calls for theoretical exploration of intersectionality, emphasizing how factors like age and socioeconomic status interact with gender biases. Future research should assess the long-term impacts of gender-sensitive interventions and explore strategies, such as engaging male champions, to challenge stereotypes and promote sustainable gender equity in project management.

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