

Who's Work, Whose Power? Gendered Roles and Decision-Making in Solid Waste Management in Tamale Metropolis

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Abstract

Background

Solid waste management (SWM) in urban Ghana is deeply gendered, with men and women assuming different roles shaped by cultural norms and structural inequalities. This study examines gender roles and decision-making dynamics in solid waste management (SWM) within Tamale Metropolis, Ghana.

Methodology

Using a mixed-methods approach, data were collected through household surveys, focus group discussions, and key informant interviews with stakeholders such as the Tamale Metropolitan Assembly and Zoomlion Ghana Limited.

Results

The findings reveal a clear gendered division of labour in SWM. At the household level, women predominantly engage in routine waste handling tasks, including sweeping, kitchen waste management, and sorting, while men are more involved in technical and disposal-related activities such as burning non-recyclables and recycling. At the community level, men dominate leadership, logistical, and infrastructure-related roles, whereas women focus on sorting, composting, and informal organizing. Decision-making processes demonstrate a mix of shared and gendered patterns: while many households report joint decisions, men often retain greater influence over strategic and resource-related actions. At the community level, decision-making is more inclusive, but men still lead in formal leadership roles. Women's participation in leadership is constrained by cultural norms and structural barriers, though mentorship and training programmes have begun to provide opportunities for change.

Conclusion

Overall, the results highlight persistent gender disparities in authority, leadership, and resource access, even within inclusive platforms.

Recommendations

Addressing these inequalities through gender-sensitive policies, targeted mentorship, and improved access to financial and institutional support is essential to promote equity and enhance the effectiveness of SWM systems in the Metropolis.

Keywords: Gender Roles, Solid Waste Management, Decision Making, Leadership Dynamics, Tamale Metropolis

1. Introduction

Urbanization, economic growth, and population increase have intensified global concerns about solid waste management (SWM). In 2016, global waste generation was estimated at 2.01 billion tonnes and is projected to reach 3.4 billion tonnes by 2050, with associated greenhouse gas emissions of 2.38 billion tonnes of CO₂-equivalent annually [2]. Developing countries, particularly in Sub-Saharan Africa (SSA), are expected to experience the fastest growth in waste generation due to population expansion

and changing consumption patterns [3]. The region's population rose to 1.31 billion in 2019, generating 55 million tonnes more waste than in 2012, and is projected to produce over 244 million tonnes of waste annually by 2025 [4]. Poor waste handling has both environmental and economic implications, with Ghana losing an estimated USD 290 million annually, about 1.6% of GDP, due to improper disposal practices [5]. SWM challenges in SSA are linked to inadequate infrastructure, weak institutional capacity, and limited public awareness, often resulting in indiscriminate

dumping, burning, or burying of waste [6,7]. In Ghana, waste collection inefficiencies, insufficient transportation systems, and poor community participation continue to undermine effective management [8]. In Tamale Metropolis, where only one functional waste truck serves large populations, poor monitoring, inadequate logistics, and public perceptions that SWM is the sole responsibility of local authorities exacerbate the problem (Tama). The COVID-19 pandemic further intensified waste burdens through increased use of personal protective equipment (PPE), much of which was improperly disposed of, creating new health and environmental risks [9].

In response, global frameworks such as the circular economy (CE) are being advanced to promote waste reduction, recycling, and sustainable production-consumption patterns [10,11]. However, scholars emphasize that gender remains a critical but neglected dimension of SWM. Women often bear the primary responsibility for household waste handling and informal recycling, while men dominate formal, paid, and decision-making roles in community waste systems [12,13]. This imbalance reflects broader gender inequalities, as women are underrepresented in higher-level eco-design, technology, and leadership roles despite their central involvement in everyday waste practices [14]. Without deliberate gender-sensitive approaches, SWM modernization efforts, including CE adoption, risk reinforcing these disparities rather than addressing them [13]. In Tamale, where SWM challenges are deeply embedded in socio-cultural and institutional systems, understanding gender roles and dynamics is essential for designing effective interventions. Examining who performs specific tasks, who makes decisions, and who accesses leadership or institutional support provides insights into the intersection of gender, waste, and power. This study therefore explores gendered roles and decision-making in SWM in Tamale Metropolis, with attention to household

and community task allocation, decision-making dynamics, leadership participation, and available support systems for men and women.

2. Materials and Methods

2.1. Study Area

Tamale Metropolis is one of the 261 Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana and one of 16 within the Northern Region. It is the most populous MMDA in Northern Ghana and the fifth most populous metropolis nationally. The area generates an estimated 2,100 tonnes of municipal solid waste (MSW) annually, reflecting both its demographic weight and urbanized character [15]. The Metropolis attained metropolitan status in 2004 and currently serves as the administrative and commercial hub of the Northern Region. Geographically, Tamale lies between latitudes 9.16° and 9.34° North and longitudes 0.36° and 0.57° West, with an elevation of approximately 180 meters above sea level. The landscape is gently undulating with intermittent stream channels and scattered hills, which do not significantly restrict settlement or infrastructural development. The Metropolis is bordered by Savelugu Municipality to the north, Yendi Municipal Assembly to the east, Tolon District to the west, Central Gonja District to the southwest, and East Gonja Municipality to the south. According to the 2021 Population and Housing Census, Tamale Metropolis has a population of 374,744, comprising 185,051 males and 189,693 females (GSS). The average household size is 6.3, which is lower than the regional average of 7.8 but higher than the national average of 4.4. About 80.8% of residents live in urban settlements, which significantly contributes to the high volume of solid waste generated. As an expanding urban center, Tamale's rapid growth places considerable pressure on its waste management systems, while also shaping the social and gendered dimensions of household and community waste handling practices.

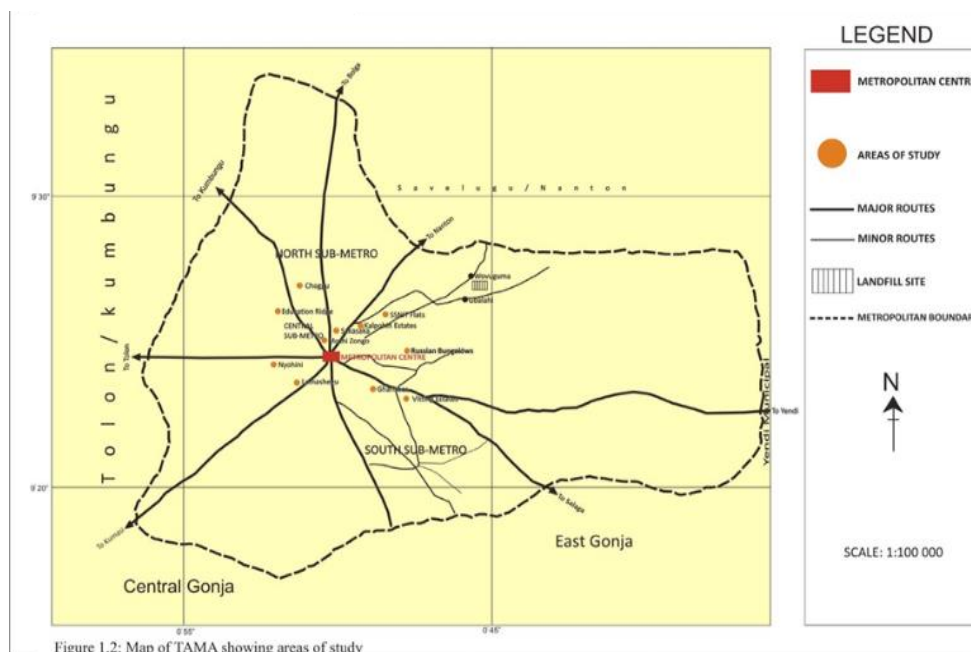


Figure 1: Map of the Study Area

2.2. Research Design and Data Collection Methods

This study employed a mixed-methods research design (MMR), which enabled the integration of both quantitative and qualitative approaches. This design was appropriate given the complex and socially embedded nature of gender roles and circular economy (CE) practices in solid waste management (SWM), which could not be fully captured by a single method [16,17]. An explanatory sequential procedure was adopted, beginning with a structured household survey, followed by qualitative data collection. In the first phase, a household survey was conducted across selected communities in the Tamale Metropolis to generate quantitative data on awareness, adoption, and gendered participation in CE practices such as waste reduction, reuse, and composting. Data was gathered through interviewer-administered questionnaires supported by electronic tools (KoboCollect and Google Forms) to minimize errors and improve efficiency.

The second phase complemented the survey with qualitative approaches. Semi-structured interviews were held with key stakeholders, including officials from the Tamale Metropolitan Assembly (TaMA) and Zoomlion Ghana Limited, to capture institutional perspectives on SWM and gender roles. Focus group discussions (FGDs) were organized separately for male and female groups in each community to encourage open expression of experiences and perceptions. In addition, non-participant observations guided by a structured checklist were conducted to document physical evidence of waste management practices, including the presence of waste bins, proximity to households, and the state of disposal sites. Photographs and field notes were used to complement survey and interview data. Participants for the FGDs were purposively selected with the assistance of community leaders to ensure inclusivity across gender and social groups. Collectively, these methods provided complementary insights and facilitated a comprehensive understanding of gendered dynamics in CE practices within the Tamale Metropolis.

2.3. Sample Size Determination

The sample frame of 35,408 households was used to calculate the study's sample size (GSS, 2021). The study utilized the Taro (1967) method among other approaches to establish the study's sample size. In line with the formula,

$$n = \frac{N}{1 + N(0.05)^2}$$

Where n = sample size, N = population frame and e = margin of error.

But $N = 35,408$, and $e = 0.05$

$$\Rightarrow n = \frac{35,408}{1 + 35,408 (0.0025)} \quad \Rightarrow n = \frac{35,408}{89.52} \quad \Rightarrow n = 396$$

This sample size was, however, adjusted to 400 to cater for missing data in the process of the research. The qualitative data collection phase targeted stakeholders directly or indirectly involved in solid waste management and circular economy practices. Purposive sampling was used to select participants with relevant knowledge and experience. A total of 20 in-depth interviews and 4 focus group discussions (each comprising 6–8 participants) were conducted. All sessions were audio-recorded (with consent) and transcribed verbatim.

2.4. Sampling Techniques

The study population comprised individuals and groups involved in waste generation and management in Tamale, including men, women, traditional authorities, political leaders, and waste management workers. The study's respondents were chosen using the following sampling strategies: Cluster, stratified, and accidental sampling. The research region was first divided into three clusters, which are called the Central Sub-Metro, North Sub-Metro, and South Sub-Metro. Secondly, ten (10) areas were chosen for the survey of the three sub-metros using purposive sampling. The chosen neighborhoods were further divided into metropolitan residential districts belonging to the lower, middle, and upper classes. Data collection involved the use of structured questionnaires with open and closed-ended questions on demographics and gender factors influencing CE participation. The tool was pre-tested and refined for validity.

2.5. Data Analysis

Quantitative data were analyzed in Stata 15 using descriptive statistics (frequencies and percentages) to summarize household and community SWM roles. Chi-square tests examined gender differences in specific tasks, while logistic regression assessed the extent to which gender predicted participation in household waste management, revealing significant effects for two activities. Qualitative data from interviews, FGDs, and observations were thematically analyzed in NVivo 12, providing contextual explanations for the statistical results. Together, these methods allowed for a comprehensive understanding of gendered roles and decision-making in SWM within Tamale Metropolis.

3. Results and Discussions

3.1. Specific Tasks in the SWM System Performed by Females or Males at the Household Level

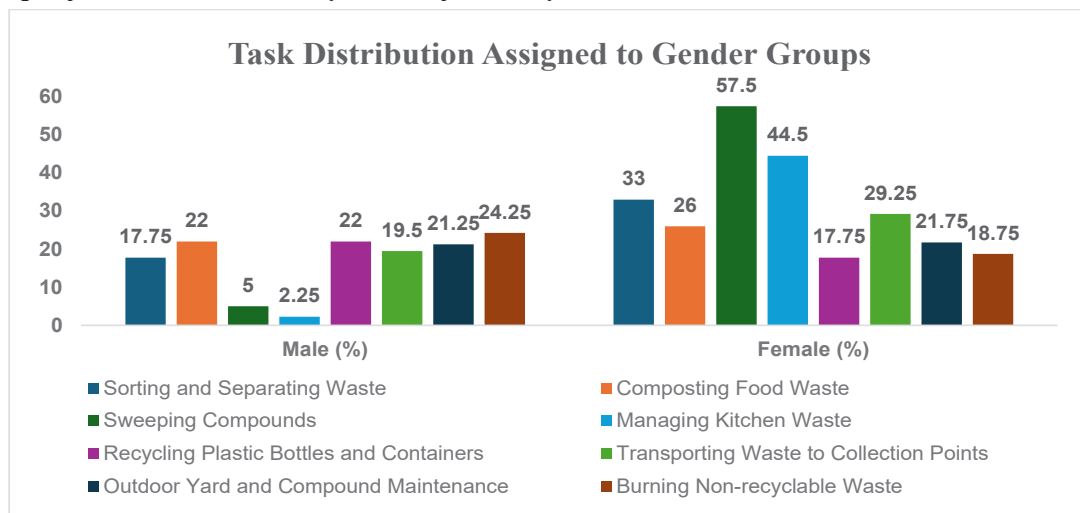


Figure 2: Gender Differences in Specific Tasks within the SWM System at the Household Level

The findings presented in Figure 1 indicate distinct gender differences in household-level SWM tasks. Females were more engaged in sweeping compounds (57.5% vs. 5% for males), managing kitchen waste (44.5% vs. 2.25%), and sorting/separating waste (33% vs. 17.75%). They also played a slightly higher role in transporting waste to collection points (29.25% vs. 19.5%). By contrast, males were more active in burning non-recyclable waste (24.25% vs. 18.75%) and recycling plastic bottles and containers (22% vs. 17.75%). Tasks such as composting food waste (26% female, 22% male) and outdoor compound maintenance (21.75% female, 21.25% male) showed more balanced participation.

These results underscore the gendered division of labor within households. Women primarily managed hygiene and indoor-related activities, reflecting their culturally ascribed domestic roles. Similar findings have been reported elsewhere, where women's waste-related tasks are often seen as extensions of caregiving and household management responsibilities [18]. On the other hand, men's greater involvement in burning and recycling tasks reflects a tendency toward disposal- and technology-related activities. Studies from Tanzania and Zambia highlight comparable patterns, where men dominate machinery operation and disposal logistics, while women remain concentrated in manual and hygiene-related work [19]. Overall, the

household-level evidence suggests that gender not only shapes who does what within SWM but also influences the types of tasks associated with power, technology, and decision-making.

3.2. Chi-Square Test Results of Gender Differences in Household SWM Tasks

The chi-square test results revealed statistically significant gender differences in several household Solid Waste Management (SWM) tasks. Highly significant differences were found in sweeping compounds ($\chi^2 = 189.57$, $p < .001$), managing kitchen waste ($\chi^2 = 153.81$, $p < .001$), and sorting and separating waste ($\chi^2 = 20.92$, $p < .001$), indicating that these tasks are strongly gendered. A statistically significant difference was also observed in transporting waste to collection points ($\chi^2 = 6.93$, $p = .0085$). However, no significant gender differences were found in burning non-recyclable waste ($\chi^2 = 2.42$, $p = .120$), recycling plastic bottles and containers ($\chi^2 = 2.91$, $p = .088$), composting food waste ($\chi^2 = 1.28$, $p = .258$), and outdoor yard and compound maintenance ($\chi^2 = 0.01$, $p = .913$). These findings suggest that while some SWM tasks remain heavily divided along gender lines, particularly those related to household cleanliness and food waste, others show more balanced participation between males and females.

Task	χ^2	p-value
Sweeping Compounds	189.57	0.001***
Managing Kitchen Waste	153.81	0.001***
Sorting and Separating Waste	20.92	0.001***
Transporting Waste to Collection Points	6.93	0.0085
Burning Non-Recyclable Waste	2.42	0.120
Recycling Plastic Bottles & Containers	2.91	0.088
Composting Food Waste	1.28	0.258
Outdoor Yard & Compound Maintenance	0.01	0.913

Note: *Stands for the significant p-value where, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 1: Chi-Square Test Results of Gender Differences in Household SWM Tasks

3.3. Regression Analysis on Gender Roles in Household Waste Management Tasks

The regression analysis revealed that gender significantly influenced participation in two household-level SWM tasks. Females were more likely to engage in sweeping compounds, with an odds ratio of 0.816 ($p < 0.10$), and in burning non-recyclable waste, with a coefficient of 0.610 ($p < 0.05$). These results suggest that while sweeping aligns with culturally feminized responsibilities tied to domestic hygiene, women's involvement in burning waste reflects the extension of their roles into disposal-related tasks traditionally perceived as

neutral or male-oriented. No statistically significant gender effects were found for other activities, including kitchen waste management, sorting, composting, recycling plastics, transporting waste, or outdoor maintenance, pointing to areas of shared responsibility within households. Similar findings from African contexts highlight that women remain central to everyday waste practices, particularly tasks tied to cleanliness and household upkeep, yet the evidence from Tamale also indicates a gradual blurring of gendered boundaries in certain SWM activities [18].

Variable	Coefficients for Tasks Performed by Males and Females in Regression Model								
	Sorting and Separating Waste	Composting Food Waste	Sweeping Compounds	Managing Kitchen Waste	Recycling Plastic Bottles and Containers	Transporting Waste to Collection Points	Outdoor Yard and Compound Maintenance	Outdoor Yard and Compound Maintenance	Burning Non-recyclable Waste
Gender	/	/	0.816 *	/	/	/	/	/	0.610 **

Note: *Stands for the significant p-value where, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2: Regression Analysis on Gender Roles in Household Waste Management Tasks

3.4. Specific Tasks in the SWM System Performed by Females or Males at the Community Level

The findings from the quantitative analysis, supported by qualitative insights from FGDs, highlight clear gendered divisions in community-level SWM. Males reported greater participation in physically demanding and leadership-oriented roles such as clean-up campaigns (44% vs. 14% females), waste reduction education (36%), managing recycling programs (34%), and overseeing open dumpsites (37%). By contrast, females reported higher involvement in sorting, collection, and burning activities (34%), tasks often perceived as extensions of household chores. These patterns indicate that while men dominate technical, managerial, and infrastructural aspects of SWM, women remain central to activities that are organizational, routine, and environmentally focused. FGD narratives reinforced

these quantitative results. Women emphasized their roles in waste sorting, composting, and waste picking, describing these as natural extensions of domestic responsibilities and agricultural duties. Some also highlighted their contribution to administrative roles, leveraging their organizational skills in community waste initiatives. Men, however, described their dominance in waste collection, transportation, landfill operations, and machinery use, roles tied to physical strength and technical expertise. They also frequently occupied supervisory and decision-making positions in recycling and waste-related enterprises. Taken together, these findings reveal a gender imbalance where men hold more visible and authoritative positions in community SWM, while women's contributions, though critical, remain undervalued and often confined to support or extension of household roles.

Tasks	Male		Female	
	Freq	%	Freq	%
Waste Sorting and Segregation	99	25%	97	34%
Community Clean-Up Campaigns	174	44%	55	14%
Waste Reduction Advocacy and Education	145	36%	53	13%
Managing Community Recycling Programs	135	34%	41	10%
Waste Collection and Transportation	120	30%	79	20%
Clearing Large or Bulk Waste	137	34%	47	12%
Management of Open Dumpsites	146	37%	37	9%
Waste Burning (where permitted)	122	31%	64	16%

Table 3: Specific Tasks in the SWM System Performed by Females or Males at the Community Level

3.5. Chi-Square Analysis on Gender Differences in SWM Tasks

The results reveal significant gender differences in several Solid Waste Management (SWM) tasks at the household level. Tasks such as Sweeping Compounds ($p = 0.0000^*$), Managing Kitchen Waste ($p = 0.0000^*$), Sorting and Separating Waste ($p = 0.0000^*$), and Transporting Waste to Collection Points ($p = 0.0013^*$) show statistically significant differences, indicating a strong association between gender

and these activities. Conversely, tasks such as Burning Non-Recyclable Waste ($p = 0.0584$), Recycling Plastic Bottles and Containers ($p = 0.1324$), Composting Food Waste ($p = 0.1858$), and Outdoor Yard and Compound Maintenance ($p = 0.8636$) do not exhibit significant gender-based differences ($p > 0.05$). These findings highlight distinct gender roles in specific SWM tasks, with certain activities being more likely performed by one gender.

Task	Chi-Square Residual	P-Value
Sweeping Compounds	-19.411	0.0000*
Managing Kitchen Waste	-16.2728	0.0000*
Sorting and Separating Waste	-5.0277	0.0000*
Transporting Waste to Collection Points	-3.2284	0.0013*
Burning Non-recyclable Waste	1.8952	0.0584
Recycling Plastic Bottles and Containers	1.5064	0.1324
Composting Food Waste	-1.3243	0.1858
Outdoor Yard and Compound Maintenance	-0.1719	0.8636

Source: Field Survey, 2024

Note: *Stands for the significant p-value where, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Specific Tasks in the SWM System Performed by Females or Males at the Community Level

3.5. Decision Making Dynamics on SWM System

3.5.1. Decision Making Dynamics on SWM System at Household Level

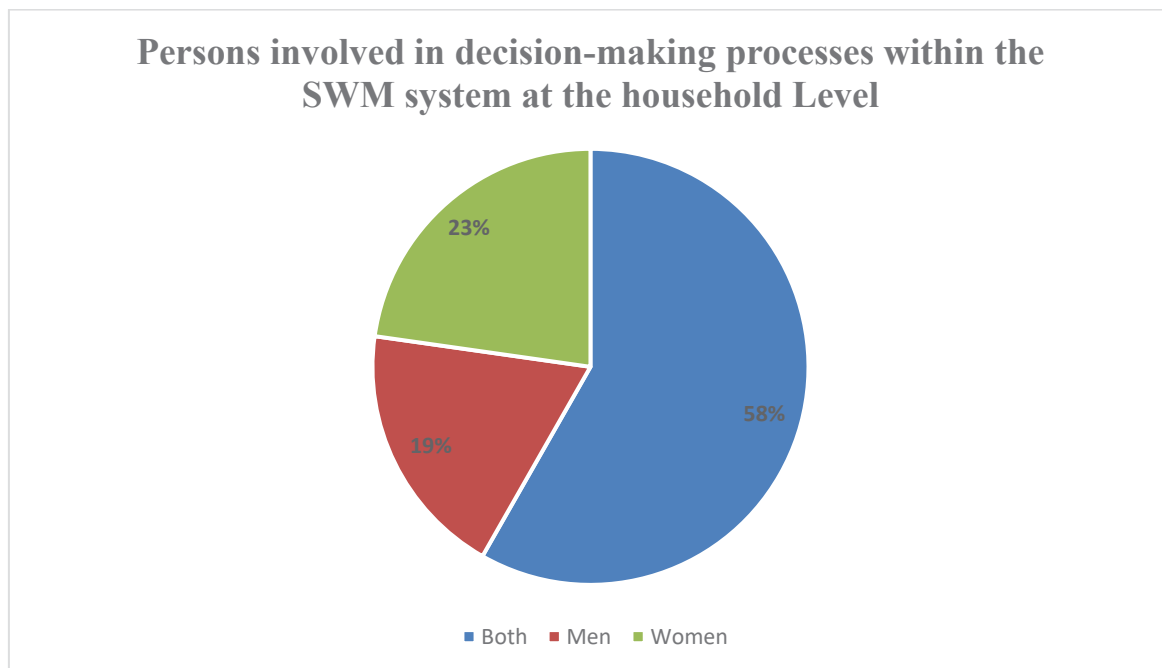


Figure 3: Decision Making Dynamics on SWM System at Household Level

The analysis of household-level decision-making shows that while 58% of households report joint decision-making in waste management, 23% of decisions are made exclusively by women and 19% solely by men. At first glance, this suggests a strong culture of collaboration, challenging assumptions

of male dominance in household SWM decisions. However, insights from FGDs reveal that even within joint arrangements, men often control strategic and financial aspects, such as hiring disposal services or deciding when large items should be transported, while women handle daily operational tasks

like sorting and composting. These findings mirror patterns documented in other contexts, where women contribute heavily to execution but remain underrepresented in high-level planning and resource allocation [20,21]. Qualitative accounts reinforce this gendered division of decision-making power. Male participants often emphasized their authority over major waste-related choices, describing themselves as responsible for coordinating with service providers and allocating household resources. In contrast, women highlighted their central role in ensuring effective day-to-day practices, particularly sorting and recycling. As one female participant explained, “I may not decide when to

hire a disposal service, but I am the one who makes sure the waste is separated properly every day.” This illustrates how women’s contributions are indispensable for the functioning of SWM at the household level, yet their influence over strategic decisions remains limited. Overall, collaboration exists, but it operates within a structure where men retain authority in high-level matters, while women’s agency is largely confined to execution and routine management.

3.5.2. Decision Making Dynamics on SWM System at Community Level

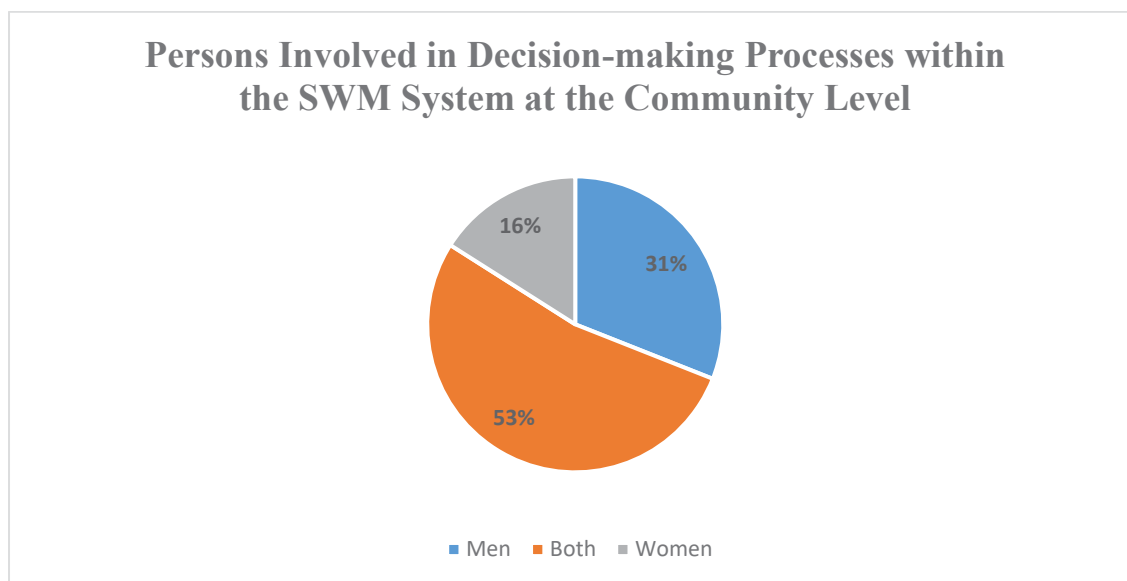


Figure 4: Decision Making Dynamics on SWM System at Community Level

Figure 4 shows that 53% of community-level Solid Waste Management (SWM) decisions are made jointly by men and women, reflecting greater inclusivity compared to the household level. FGDs confirmed this collaborative trend, as one woman noted, “In our community, we often come together to make decisions about how to manage waste.” Similarly, a male participant explained, “We work together to decide when to organize clean-up campaigns or address waste not collected regularly.” Despite this inclusiveness, men were often reported to take the lead in resource mobilization

and liaising with authorities. As one participant put it, “Both genders are involved, but men usually lead the initiatives.” Women acknowledged their voices are heard but highlighted that leadership roles remain male-dominated. This reflects findings by Dos Muchangos & Vaughter, who note that women’s preferences are often overlooked in community consultations despite joint participation [22].

3.5.3. Gender Influence on Leadership Roles in SWM Initiatives at the Community Level

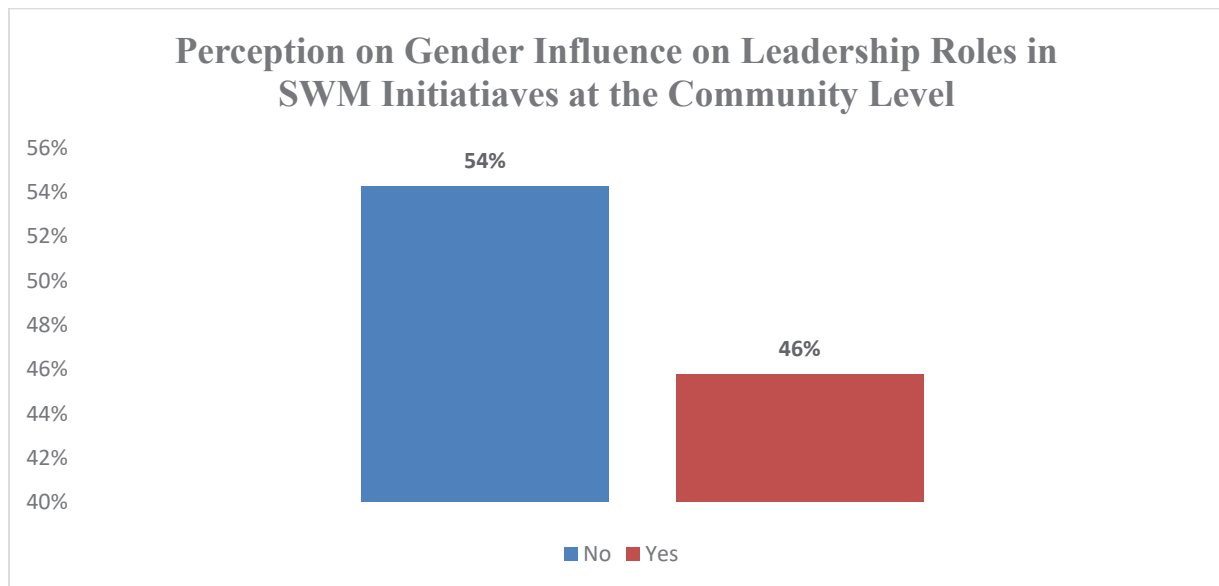


Figure 5: Gender Influence on Leadership Roles in SWM Initiatives at the Community Level

Figure 5 shows that 46% of respondents believe gender significantly shapes leadership roles in community-level Solid Waste Management (SWM). FGDs reinforced this, with one woman noting, “In our community, it’s often the men who take charge of organizing large waste collection efforts and overseeing recycling programmes, while women play supportive roles like sorting.” A male participant added, “Men are often seen as better suited for leadership roles in waste management, especially coordinating clean-up campaigns.” These views reflect entrenched gender norms that place men in visible, authoritative roles, while women contribute through less recognized but equally essential tasks. Nonetheless, participants also highlighted signs of change. Women are increasingly leading initiatives such as recycling centres and awareness campaigns, though still in the minority. As one male observed, “Women are starting to have a say in how things are run, but traditionally it’s still men who take the leadership roles.” This evolving dynamic mirrors wider research: men dominate formal SWM leadership tied to logistics and infrastructure, while women drive informal organizing and education roles critical for sustainability [23,24]. Together, the findings suggest gradual but uneven progress toward more gender-inclusive leadership in community waste management.

3.5.4. Challenges Women and Men Face in Attaining Leadership Positions in the SWM System

The results show clear gendered disparities in challenges to attaining leadership roles in Solid Waste Management (SWM). For women, the most cited barriers were social and cultural norms (42%) and discrimination or bias (23%). These factors reinforce traditional gender expectations that restrict women’s leadership opportunities. As one respondent explained, “Women are traditionally viewed as caregivers, which limits their acceptance in leadership roles.” Women also reported facing stereotypes about their physical capacity and concerns about safety, further constraining their access to formal leadership positions. For men, the most significant challenges were lack of education or training (36%) and limited access to resources (24%), which hinder their progression into leadership despite cultural acceptance of their authority. Men also noted difficulties in networking (17%), showing that structural barriers are not entirely gender-exclusive. These findings align with wider research showing that stereotypes and bias disproportionately restrict women’s leadership mobility, while men’s barriers are more resource- and skills-based [23,25]. Overall, leadership access in SWM remains unequal, with women constrained by systemic bias and norms, and men by training and resource limitations.

Challenges	Women		Men	
	Freq	%	Freq	%
Discrimination or bias	91	23%	29	7%
Lack of access to resources	22	6%	94	24%
Lack of education/training	57	14%	145	36%
Lack of safety and security	9	2%	11	3%
Limited networking opportunities	27	7%	68	17%
Physical demands of the job	25	6%	12	3%

Social and cultural norms	168	42%	37	9%
Others	1	0%	4	1%
Grand Total	400	100%	400	100%

Table 5: Challenges Women and Men Face in Attaining Leadership Positions in the SWM System

3.6. Available Support to Women and Men in the SWM System

3.6.1. Type of Support Available to Women and Men in the SWM System

The findings reveal that training and capacity building are the most widely available forms of support for both genders in Solid Waste Management (SWM), benefiting 47% of women and 49% of men. Respondents emphasized the importance of these programs in equipping individuals with the necessary knowledge and technical skills for effective waste management. As one noted, "Training programmes have been instrumental in equipping both men and women with the tools needed for effective waste management." This finding aligns with studies in Nigeria that highlight training as the most accessible and impactful support mechanism, contributing to improved performance and economic outcomes when gender-inclusive approaches are adopted

[26]. However, support diverges across other domains. Mentorship programmes appear more accessible to women (21%) than men (14%), helping women navigate systemic challenges and expand leadership representation (Lawal & Sawyer, 2024). In contrast, financial support is slightly more available to men (21% vs. 15%), reflecting persistent disparities in resource access, a trend also documented in Lagos where women in waste livelihoods faced barriers to capital [27]. Legal support remains limited for both groups (15% of women, 13% of men), mirroring findings from South Africa where gender-specific provisions in waste policies are lacking (Sikhosana, 2025). These results suggest that while training is a shared priority, mentorship addresses women's barriers, and financial access continues to favor men, underscoring the gendered nature of support systems in SWM.

Type of Support	Women		Men	
	Freq	%	Freq	%
Financial support	32	15%	46	21%
Legal support	32	15%	29	13%
Mentorship programs	45	21%	31	14%
Training and capacity building	103	47%	106	49%
Others	5	2%	5	2%
Grand Total	215	100%	215	100%

Table 6: Type of Support Available to Women and Men in the SWM System

4. Conclusion and Recommendations

4.1. Conclusion

This study highlights the persistence of gendered divisions of labour and authority in Solid Waste Management (SWM) within Tamale Metropolis. At the household level, women predominantly perform routine and hygiene-related tasks such as sweeping, sorting, and managing kitchen waste, while men take on more disposal-related and physically demanding roles. Decision-making is often reported as joint, yet qualitative insights reveal that men retain greater authority over strategic and financial decisions, whereas women's influence is concentrated on daily operational practices. At the community level, participation is more collaborative, but leadership roles remain skewed toward men, reflecting entrenched socio-cultural norms and perceptions of authority. Despite these disparities, the findings also reveal emerging shifts. Women are increasingly participating in leadership roles, particularly in areas such as recycling initiatives, awareness campaigns, and administrative functions. Support systems such as training and mentorship are playing a role in narrowing gender gaps, though financial access and structural

biases continue to limit women's advancement. Overall, while progress toward inclusivity is visible, systemic barriers and persistent stereotypes maintain a gender hierarchy in SWM, underscoring the need for intentional interventions to promote equitable participation and leadership.

Recommendations

Based on the study's findings, the following recommendations are proposed:

- The Tamale Metropolitan Assembly (TaMA), in collaboration with the Ministry of Sanitation and Water Resources (MSWR), should integrate gender equity into waste management bylaws and community sanitation programmes. This would ensure women's roles go beyond routine tasks to include decision-making and leadership.
- The Zoomlion Ghana Limited, together with local NGOs such as SEND Ghana and NORSAAAC, should implement targeted mentorship and leadership training programmes for women. This would address cultural barriers and build confidence for women to lead in recycling, composting, and waste business enterprises.

- The Microfinance and Small Loans Centre (MASLOC) and Ghana Enterprises Agency (GEA) should develop tailored financial schemes to support women-led SWM enterprises. Access to resources will empower women to scale up innovations in recycling and composting while creating green jobs.
- Community leaders and traditional authorities should ensure that women's voices are equally represented in waste management committees. This can be institutionalized by mandating at least 40% female representation in local SWM leadership structures.

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