

Amoah, John Oti; Britwum, Akua O.; Essaw, David W.; Mensah, Justice

## Article

# Solid waste management and gender dynamics: Evidence from rural Ghana

Research in Globalization

## Provided in Cooperation with:

Elsevier

*Suggested Citation:* Amoah, John Oti; Britwum, Akua O.; Essaw, David W.; Mensah, Justice (2023) : Solid waste management and gender dynamics: Evidence from rural Ghana, Research in Globalization, ISSN 2590-051X, Elsevier, Amsterdam, Vol. 6, pp. 1-8, <https://doi.org/10.1016/j.resglo.2023.100111>

This Version is available at:

<https://hdl.handle.net/10419/331038>

### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by-nc-nd/4.0/>



# Solid waste management and gender dynamics: Evidence from rural Ghana

John Oti Amoah<sup>a,b,\*</sup>, Akua O. Britwum<sup>c</sup>, David W. Essaw<sup>d</sup>, Justice Mensah<sup>e</sup>

<sup>a</sup> Centre for Gender Research Advocacy and Documentation (CEGRAD), University of Cape Coast, Ghana

<sup>b</sup> Centre for African and International Studies (CAIS), University of Cape Coast, Ghana

<sup>c</sup> Department of Labour and Human Resource Development, University of Cape Coast, Ghana

<sup>d</sup> Department of Environment, Governance & Sustainable Development, University of Cape Coast, Ghana

<sup>e</sup> Directorate of Academic Planning & Quality Assurance, University of Cape Coast, Ghana

## ARTICLE INFO

### Keywords:

Gender  
Solid waste management  
Rural  
Ghana  
Sanitation

## ABSTRACT

Proper solid waste management (SWM) is critical for sustainable environmental development. Despite high-level policy efforts and technical investments, unmanaged solid waste remains a problem in many developing countries including Ghana. The quantity of waste generated is increasing in rural areas due to increased population. However, most waste management studies have concentrated on cities, such as Accra, Lagos, Addis Ababa, Dar es Salaam, Lusaka and Tshwane. Also, missing in such studies is an understanding of the rural gender perspective in SWM. This paper explains why rural gender perspectives should inform future policies and initiatives on SWM. Drawing on an exploratory research design, evidence was gathered through observations, semi-structured interviews, and focus group discussions. Our findings show that women solid waste workers were denied access to training programs on the use of tricycles (one of the methods of collecting and transporting solid wastes) on the basis that it requires physical strength. Traditional gendered divisions of labour in solid waste management were not only limited to the domestic space but also the public spaces. Policies to improve solid waste management in developing countries should consider a gender lens. Public education towards changing attitudes and stereotypes about gender norms and practices of appropriate masculinity and femininity is critical as other technical changes. Gender-disaggregated data and analysis across all aspects of the SWM cycle are essential for developing sustainable policies and curbing gender inequalities.

## Introduction

SWM in many developing countries remains dominated by open dumping as a result of lower maintenance and operational cost when compared with other solid waste disposal methods such as incineration, sanitary landfills, composting, and waste compaction (Fadhullah et al., 2022; Moh & Manaf, 2014). The effects of improper SWM on public health include outbreaks of diseases such as warm infection, diarrhoea, cholera, irritation nose and skin, and food poisoning, among others. Ineffective SWM provides a fertile breeding space for biological vectors such as insects, rodents and flies that cause these diseases (Gutberlet & Uddin, 2017; Norsa'adah et al., 2020).

Despite the health implications of unproper solid SWM practices, Ghana Statistical Service (2022) indicated that only a third (33.4 %) of households have their solid waste collected and the proportion is higher in urban (51.4 %) than in rural (5.8 %) areas. Also, most rural

households (57.3 %) dispose of their solid waste in open spaces/public dumps compared to 24.6 percent of urban households. The most prevalent method of disposal of uncollected household solid waste is burning (77.5 %). The report further suggests that the proportion of households that dump solid waste indiscriminately is higher in rural localities (18 %) compared to 4.8 percent in urban areas (Ghana Statistical Service, 2022). This problem raises concerns because over 42 per cent of the country's inhabitants representing approximately 13.3 million, live in rural areas (Sasu, 2022). The quantity of waste generated is increasing in rural areas due to increased population, consumerism, changes in household consumption patterns and rising standard of living (Widyarningsih et al., 2015).

Solid waste generation and management must be seriously considered and dealt with from different interlocking perspectives of regulatory, environmental, economic, technical and social spheres. Kadfak (2011) stressed that solid waste management involves various actors

Abbreviations: SWM, Solid Waste Management.

\* Corresponding author at: Centre for Gender Research Advocacy and Documentation (CEGRAD), University of Cape Coast, Ghana.

E-mail address: [joamoah@ucc.edu.gh](mailto:joamoah@ucc.edu.gh) (J.O. Amoah).

<https://doi.org/10.1016/j.resglo.2023.100111>

Received 9 November 2022; Received in revised form 3 January 2023; Accepted 3 January 2023

Available online 4 January 2023

2590-051X/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

operating within different social spaces. One critical area that needs to be considered when assessing the impact of social factors on SWM is gender relations (Poswa, 2004). Feminist scholarship has articulated the need to engage frameworks that allow an understanding of gendered effects and the roles women and men can play to achieve environmental sustainability (UNEP, 2016).

Waste is a subject embedded with cultural meanings which shape and are shaped by the social organisation of waste work and the political landscape of waste management (Fredericks, 2008; Khan et al., 2016). Socio-culture traditions penetrate everything in Ghana, including formal institutions (Tsikata, 2001). This gives the gender problem a depth that is not recognised or addressed by current attempts to deal with gender issues in Ghana. Fredericks (2008), for example, questioned how the connection of household waste to women's work plays in the politics of waste management. However, in many developing countries, waste management practice has focused on technical issues instead of socio-economic aspects such as gender relations. A range of research studies has demonstrated the fact that waste management is gendered, regardless of the nature of the theoretical approach adopted (Asia, Busch, & Nkengla, 2013; Foster, Dixey, Oberlin, & Nkhama, 2012; Fredericks, 2008; Kadfak, 2011; Poswa, 2004). However, most of the studies reviewed focused on urban households' SWM practices in big cities, such as Accra, Lagos, Addis Ababa, Dar es Salaam, Lusaka and Tshwane in South Africa (see Lissah et al., 2021; Adam et al., 2015; Bjerkli, 2015; Worku & Muchie, 2013; Asia et al., 2013; Foster et al., 2012; Fredericks, 2008; Poswa, 2004). Kadfak (2011) and Amfo-Otu et al. (2012) studied SWM in semi-rural areas in Ghana.

Additionally, lacking in such studies is an understanding of the gender dimensions in SWM in rural areas. Again, although rural settings are potential periurban and urban settings, studies on SWM have mainly focused on urban spaces. Therefore, the rural context and how it impacts gender relations in SWM is unclear. That is, SWM in rural settings has received little attention in research. This paper sets out to address the knowledge gap in understanding the gendered division of labour forces and the allocation of resources in rural SWM spaces by focusing on two rural localities in the Twifo-Ati Mokwa District of Ghana. Twifo-Ati Mokwa District, a predominantly rural district, faces several challenges in managing its solid waste relative to other rural settings in Ghana (Twifo-Ati Mokwa District Assembly, 2022). Thus, this paper explores resource allocation and gender division of labour in SWM in a rural space.

The rest of the paper is structured as follows. Section 2 describes the issues in gendered solid waste management, Section 3 sets out the method used, Section 4 discusses the findings, and Section 5 concludes and suggests recommendations.

### *Gender roles and waste management*

In all societies, women have a different roles from men. Accordingly, creating different expectations about specific responsibilities between women and men on solid waste management within the household and public space. Davis and Greenstein (2009) suggest that gender norms influence people's beliefs about appropriate tasks for women and men. These beliefs, in turn, determine the division of responsibilities in domestic and public spaces. Thus, gender division of labour and occupational sex segregation in solid waste management reflect societal gender ideologies and socialisation processes (Davis & Greenstein, 2009).

Generally, waste management responsibilities originate from the social construction of roles. Societal norms in many communities tend to ascribe waste management duties within the domestic and public spaces to women. Awumbila (2001) mentioned that in traditional Ghanaian society, women were primarily responsible for all reproductive activities, including cleaning, cooking, nurturing children, laundry and SWM. Studies have also demonstrated that women handle waste at home across many cultures (e.g., Tanzania, Zambia, Nigeria, India, Vietnam, the Philippines, Mongolia, Nepal and Indonesia), although the more

affluent women tend to delegate this task to domestic workers (dos Muchangos & Vaughter, 2019; Scheinberg et al., 1998; Seager et al., 2020).

Muller and Scheinberg (2001) further explained that women might often be involved at a civic activity level. Still, when there is an opportunity to institutionalise waste management activities, it is overwhelmingly men who are selected for paid labour (Scheinberg et al., 1998; Wilson et al., 2015). Even when women are involved, they usually work within the stereotypically acceptable women's administrative roles as clerical assistants. Gender division of labour in solid waste management is not limited to the domestic sphere. Earlier studies revealed variations in the tasks performed by both men and women in SWM organisations (dos Muchangos & Vaughter, 2019; Foster et al., 2012; Seager et al., 2020). Thus, men dominated jobs requiring physical strength, such as loading waste into trucks, while women dominated revenue collection. There were differing reasons for this gender division of labour in waste work. These include the lower physical demands of the work and the perception that women are more trustworthy than men (Fredericks, 2008, p. 7). Similarly, women are among the lowest-paid in the waste management enterprise; they work in the dirtiest and most dangerous conditions; they have no social or health insurance; and they may have to have their children work with them in these conditions (Dias et al., 2015; Muller & Scheinberg, 2001). This reinforces many women's precarious working conditions, including low wages. Thus, they are considered second-class citizens (dos Muchangos & Vaughter, 2019).

Foster et al. (2012) point to existing evidence, which appears that the social stereotypes associating masculinity with authority in the workplace and the ensuing notion of what is "man's work" and "women's work" was being challenged. According to Foster et al. (2012), women were contesting traditional gender roles and were heading SWM organisations as managers and carrying out heavy work usually reserved for men. While some of the work in SWM questioned women's roles, some reinforced women's and men's traditional roles (Foster et al., 2012, p.214). For example, SWM organisations in Senegal actively recruited young women as sweepers to justify that women were better workers and significantly less likely to cause trouble (Fredericks, 2008, p. 7).

Muller and Scheinberg (1997) observe that community participation in decision-making about waste management is gendered. They insist that despite women's relatively high involvement in private and public spaces, men are more likely to have access to institutions that set priorities and make decisions regarding waste management infrastructure. One of the reasons for such denial according to Dankelman (2005) is probably that apart from a merely technical and statistical viewpoint, gender carries a vital component of politics and power. Community consultation processes often fail to consider gender inequalities and thus neglect women's preferences (dos Muchangos & Vaughter, 2019; Muller & Scheinberg, 1997).

Muller (n.d) explained that introducing new technology for waste collection, disposal, and treatment, such as recycling equipment or tricycle designed for SWM organisations, requires asking gender-related questions. Such questions include the ability of women-owned enterprises just as men's to afford such investment. Others are if women and men have the managerial expertise required to operate such equipment. Do women, as well as men, have an equal chance to get the necessary training? How the new technology affects the health of both women and men, and if their operation creates equal risks or offers equal protection against health risks for women and men (Muller, n.d). These issues Muller (n.d) observe are often ignored or taken for granted, eventually leading to a growing socioeconomic disadvantage for women (e.g. Sal-lwey et al., 2017). Thus, without a gender analysis, the modernisation of SWM, including introducing new equipment, is likely to widen gender inequalities (Seager et al., 2020).

## Methodology

### Study area

The study was carried out in Twifo-Ati Mokwa District, located in the central region of Ghana. The population of Twifo-Ati Mokwa District is 100,851. Females constitute 50.4 percent of the Twifo-Ati Mokwa District's population (Ghana Statistical Service, 2022). The district has 74,142 (74 %) of its population living in rural areas (Ghana Statistical Service, 2022). The district is a typical rural district. Twifo-Ati Mokwa District is located between latitudes 5°50'N and 5°51'N and Longitudes 1°50'W and 1°10'W. It is bounded on the north by the Upper Denkyira East Municipal, on the south by the Twifo-Heman Lower Denkyira District, on the west by the Mpohor Wassa East District and on the East by the Assin North Municipal (see Fig. 1).

Specifically, this study was carried out in *Benpogya* and *Nyenase* communities. These two communities were selected purposively because they face challenges in managing their solid wastes relative to other rural communities within the district (Twifo-Ati Mokwa District Assembly, 2022). These challenges are primarily attributed to the location and nature of communities' final dumpsites. The dumpsite at Benpogya is situated at the entrance to the community, and it also has limited capacity. Nyenase dumpsite is placed between the community's main road and a river. The main purpose of choosing more than one community is to get a detailed picture of the gender dynamics of the solid waste management situation in the studied area but not necessarily to compare the two communities.

The District's Environmental Health and Sanitation Unit is mandated by the Ministry of Local Government and Rural Development (MLGRD) to handle all waste management issues at the district level. The Environmental Health Officer is the head of the unit. Assistant environmental health officers and sanitary guards support the head of the unit. Sanitation Act 296 of 1993 gives the environmental health officers and sanitary guards the right to enter and inspect any house to see whether or not the household members, in practice, observe the sanitation laws. Sanctions such as fines are prescribed for any breach of sanitation by-laws (Twifo-Ati Mokwa District Assembly, 2022). The private waste organisation collects and transports solid waste in public spaces. The district assembly has contracted Zoomlion Company Limited to perform this task. Terms of service delivery include the collection of all solid wastes from markets and other public spaces such as streets. Zoomlion Company Limited is a waste management and environmental sanitation business in Ghana. The company was formed under the Company's Act in January 2006 but became operational in Twifo-Ati Mokwa District in March 2009.

### Research design and sampling issues

The study employed a qualitative research approach. The choice for the approach is based on the assumption that the subjective experience of women differs from that of men and children. Specifically, the exploratory research design was adopted for the study. There is a paucity of information on the gendered aspect of solid waste in Ghana. Exploratory research was employed to gain insight into gender dynamics in rural solid waste management. Consequently, exploring the processes and nature of social relations in rural solid waste management practice. The study population was waste generators and management institutions in Twifo-Ati Mokwa District. This consisted of traditional leaders, children, men and women and agro-processing enterprise owners and workers. Others were government political office holders, officers of the District assembly's waste management structure, and private waste management workers. The respondents were selected from three main levels. These comprise community-level, state-level, and private waste management organisations. These levels are represented by households, Twifo-Ati Mokwa District Assembly of Ghana and Zoomlion Company Limited.

Purposive sampling was used to select two rural communities and eleven key persons for the study. The choice of this technique was guided by the fact that there is foreknowledge about the actors involved in the solid waste management process in the district. These included two assembly members in *Benpogya* and *Nyenase* communities, respectively, the head of a private waste management organisation (Zoomlion Company Limited), the head of the District Environmental Health and Sanitation Unit, and four sanitary guards. Besides, six Zoomlion Company Limited workers and two traditional leaders in *Benpogya* and *Nyenase* communities were purposively selected to be interviewed. The adoption of this technique was also based on the study's need to understand the gender dynamics in resource allocation. The two communal dump sites in the studied communities were purposively selected to observe the interaction among the various actors. Dump sites were observed four hours a day for fourteen days.

Quota sampling was used to select respondents from specific population groups. Specifically, the selection was based on occupational groups. The quota sampling technique was chosen to represent the significant characteristics of the population by sampling a non-proportional amount of each occupational group in the communities. The quota sampling technique was also employed to get a deeper understanding of the gender dynamics of the solid waste management situation in the studied area but certainly did not generalise the findings. The community was divided into zones based on dominant occupations. The households in *Nyenase* were divided into four groups: traders, palm oil extraction workers, farmers and craft producers. Similarly, household respondents in *Benpogya* were split into four groups: small-scale miners, cassava processing workers, farmers and traders. Two married men and women, single men and women were selected from each occupational group. Married and single persons were chosen to understand the gender dynamics. Twenty-four respondents were selected in *Nyenase* and *Benpogya*, respectively (see Table 1).

### Ethical considerations

Before the data collection, an introductory letter and clearance for fieldwork were sought from the Institute for Development Studies, University of Cape Coast. The respondents were told their right to withdraw at any given time. Written and oral consent of study participants was sought for interviews. The researchers explained that participation was voluntary and that the study participant could withdraw from the interview without any consequences.

### Data collection and analysis procedure

The data were collected through semi-structured interviews, FDGs and observation. Semi-structured interviews were conducted in *Nyenase* and *Benpogya*. A semi-structured interview was employed to gain individual perspectives of households, private service provider (Zoomlion Company Limited) and district assembly staff regarding waste management. In the process of conducting the interview, note-taking was done so as to capture information that was provided by the respondents. However, where respondents allowed their voices were taped. To get a great deal of insight into the gender dynamics of SWM in Twifo-Ati Mokwa District, four FDGs were organised with the assistance of two research assistants. FDG 1 consisted of women and men in *Nyenase* and FDG 2 consisted of women in *Nyenase*. Similarly, FDG 3 was made of men and FDG 4 consisted of both women and men in *Benpogya*. Each of the FDGs was made up of ten respondents. Though the FDG guide was written in English, the interactions were conducted in Twi, the people's widely spoken local language.

Credibility or trustworthiness (validity) of the study was enhanced by employing multiple data sources (respondents) and different methods of data gathering. Triangulating the findings from the FDGs with different respondents from the same interest group increased the trustworthiness of the results. Finally, the rich description of the study also

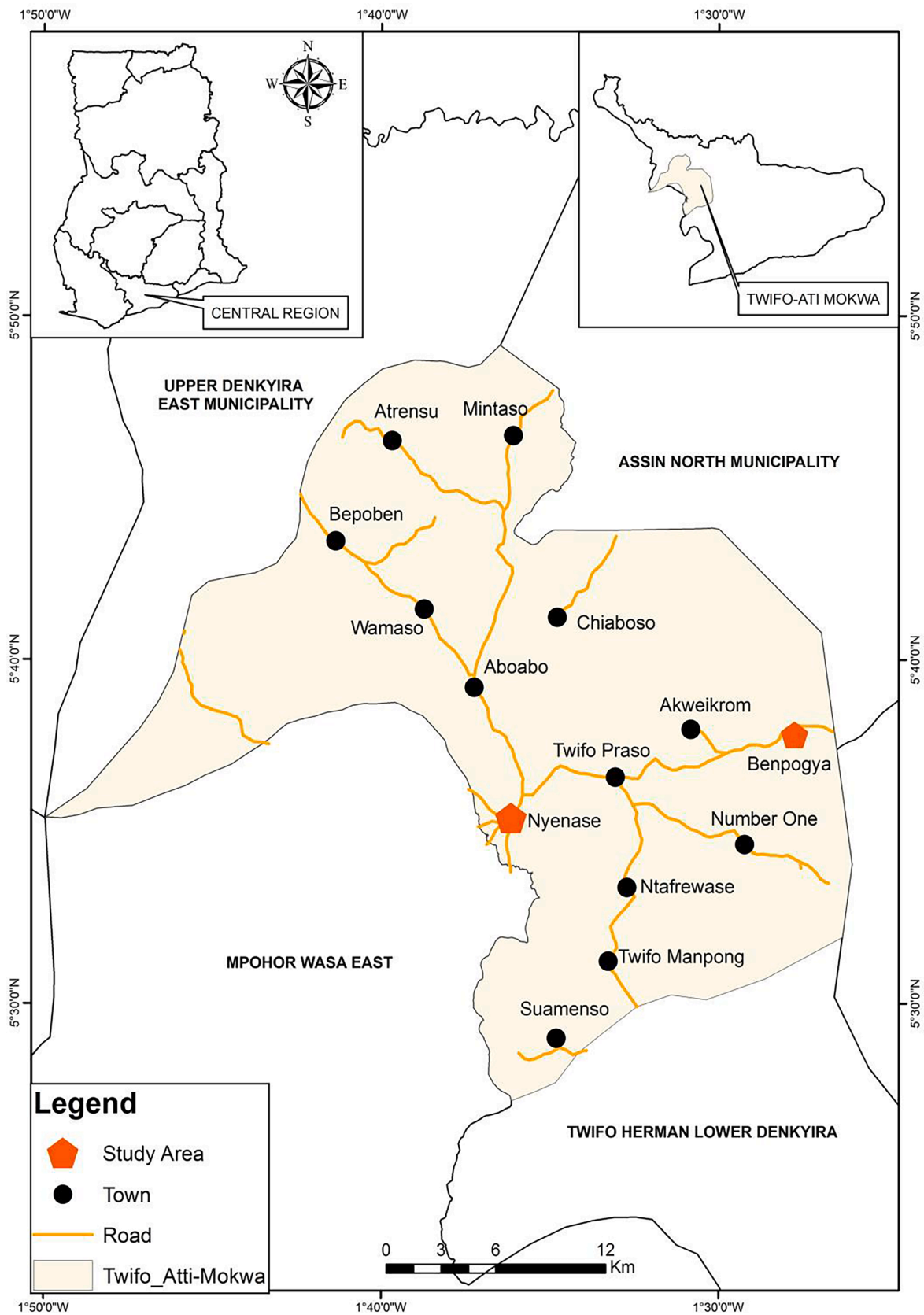


Fig. 1. Map of Twifo-Ati Mokwa District. Source: Department of Geography and Regional Planning, UCC, 2014.

**Table 1**  
Overview of category of respondents involved in the field study.

Category of respondents	Sample
<b>Household level</b>	
Traders	12
Palm oil extraction workers	6
Farmers	12
Craft producers	6
Small scale miners	6
Cassava processing workers	6
<b>Community level</b>	
An assembly member each from:	
Benpogya	1
Nyenase	1
Chief of Benpogya	1
Chief of Nyenase	1
Queen mother of Nyenase	1
<b>District Assembly level</b>	
Head of District Environmental Health and Sanitation Unit	1
Sanitary guards	4
<b>Services Provider</b>	
District operations supervisor	1
Project staff	6

Source: Fieldwork.

enables readers of this study to make decisions on the credibility of the findings.

The analysis of the data was done manually. The data analysis began in the field with a recording of incidents and reflections on the research process. Interview notes were edited at the end of each day, and where necessary, follow-ups were made. All the FGDs and interviews with the household respondents were translated into English and transcribed fully. The common trends defined from the data were sorted and organised into various thematic areas. An abstractive approach was applied to categorise the data. This involved transferring the highlighted statements into a table, each placed under the key concept it aligned with. Similar topics were combined to form the sub-themes: resource allocation between women and men; and the gender division of labour. Quotes were used in the analysis to support the argument being made.

### Findings and discussion

In the following section, we present our findings on resource allocation and gender division of labour in SWM reported by our study participants across the study sites. The findings on resource allocation between women and men centred on the difference between access to and control over resources. To unpack the gender division of labour, the results presented here focused on what work women and men did and why these patterns existed.

#### Allocation of solid waste management resources

About the way resources are allocated between women and men, the analysis centred on the difference between access to and control over resources. Access here refers to the right to use and control means rights to decision making, including allocative power. The studied communities used material resources such as wooden baskets, faulty buckets and sacks as solid waste bins. Women mobilised these material resources. Brooms are the primary solid waste gathering device within the domestic space. There were divergent views among the female respondents about the source of these brooms. Some of the female respondents mentioned that they manufacture the brooms themselves.

On the other hand, some females claimed they bought the brooms. When asked why women buy the brooms needed for domestic SWM. One

male respondent answered:

*Men pay the electricity bill and other expenses requiring vast sums of money. Besides, women are responsible for housework such as sweeping, so why should I buy brooms for them? It is shameful if a woman cannot mobilise things needed for housework.*

Another female made a similar comment:

*I am the caretaker of all domestic work, so when the house is not tidy, my husband and the other men within the household will blame me. As such, I need to mobilise all required to ensure the house is clean.*

This finding confirms that socialization believes in most rural areas that women are home keepers (dos Muchangos & Vaughter, 2019; Scheinberg et al., 1998; Seager et al., 2020; Shaheed, 2017). This stereotype about women affects women’s positioning in public spaces and the capacity to claim their right to control.

The material resources used by Environmental Health and Sanitation Unit and Zoomlion include; brooms, wheelbarrows, rakes, shovels, nose masks, picking rods, baskets, foot forks, skip trucks, stairs, skip containers and tricycles. Women (waste collectors) have access to use material resources such as wheelbarrows and brooms but no control over them. These resources are allocated and controlled by environmental sanitation health officers, Zoomlion district operations supervisor, and his assistant.

The use of tricycles is one of the methods of collecting and transporting solid wastes to landfill sites. It accounts for 2.4 percent of methods of solid waste collection in the central region of Ghana (Ghana Statistical Service, 2022). Women were denied access to tricycle training programs on the basis that it requires physical strength. The male tricycle riders claimed women lack the physical power to ride a tricycle. On the contrary, Circular and Conservancy (2019) found that waste workers in Vietnam typically have no distinction between men and women regarding access to bicycles or tricycles. The institutional pattern of excluding and positioning women reinforces gender relations and other social inequalities.

The primary human resources in domestic SWM are women and children. The societal norms within the studied communities explain this observation. That is waste related activities are seen as women’s work. In the domestic sphere, women control relations in terms of assigning SWM roles, and they allocate various SWM tasks to children in their respective households. Women, therefore, have allocative power over both human and material SWM resources within the household.

However, resources were mobilised within the organisational spheres by the District Assembly and Zoomlion Company Limited management, respectively. Management of both organisations is dominated by men (Table 2).

In both District Environmental Health and Sanitation Unit and

**Table 2**  
Positions in waste management organisations and sex of occupant.

Waste management organisation	Position	Sex of occupant
District Assembly	Head of Environmental Health and Sanitation Unit	Male
District Assembly	Technical officers	Males
District Assembly	Administrative staff	Females
District Assembly	Sanitation guards	Males and females
Zoomlion Company Limited	District Operations Supervisor	Male
Zoomlion Company Limited	Assistant Operations Supervisor	Male
Zoomlion Company Limited	Secretary/Administrative staff	Female
Zoomlion Company Limited	Project staff (Field workers)	Males and females

Source: Fieldwork.

Zoomlion, leadership and management roles were occupied by men. On the contrary, women were the main actors in terms of clerical duties within the two organisations. At the district office of Zoomlion Company Limited, all leadership and administrative roles are performed by the District Operations Supervisor and his assistant. Educational and technical competence was often cited as requirements for leadership positions. For instance, the District Environmental Health Officer said:

*Technical officers make all decisions concerning solid waste management. There are five male technical officers and two female administrative staff. However, in terms of rank, the men hold higher positions than the women. These ranks are based on the level of education and years of experience.*

An examination of the data shows that women have access to the local politics of SWM but little control over which issues are discussed and the final decisions. The evidence is that men dominate the leadership of waste management organisations in the studied communities. Men have both allocative and authoritative power over organisational SWM resources. This reflects how power determines who decides and whose interests are served. The results of hiring only women for clerical work reinforce Muller and Scheinberg's (2001) finding. These authors argued that even when women are involved in SWM organisational leadership, it is unusual for them to work outside of stereotypical acceptable women's administrative roles, such as clerical. Recent studies also suggest that variations in the tasks performed by both men and women in SWM organisations still exist (dos Muchangos & Vaughtner, 2019; Seager et al, 2020).

In the social structure of Ghana, traditional leaders are custodians of natural resources, including land and also offer guardianship of traditional heritage such as norms and values. Traditional leaders cooperate with locally elected state officials (i.e., assembly members, and unit committee members) in promoting community development. The one critical role of traditional leaders is to allocate land space for communal dumpsites. In collaboration with unit committees of the studied communities, traditional leaders occasionally mobilise households for communal waste management exercises. The unit committee, which assists the assembly member, mobilises and allocates the material resources needed for the activity.

Drawing from the results and discussion above, it is clear that gender plays a vital role in resource allocation in SWM at household, community and organisation levels. However, the discrimination women face is not only due to gender but also their positioning as home keepers and lower-ranked workers in domestic and organisational spaces, respectively. Findings show that women have allocative power within the domestic sphere while men dominate the decision-making process at the organisational and community levels due to their leadership positions. Women's subordination to men put them in a more disadvantaged position.

#### *Gendered division of labour in solid waste management*

To understand the gender division of labour in the various spaces, the analysis focused on what work men and women did and why these patterns existed. The discussion is divided into two sections. The first section explores the division of labour in the domestic space and the second section describes task allocation within the organisational space.

Women and children are the key players in domestic SWM. In the two study communities, domestic work, including SWM, is solely the responsibility of women and children. This role forms part of the cultural norms of both communities. Women are socialised to take care of their homes. This socialisation forms a basis for women's involvement in waste management. Unmarried men sweep their rooms. However, SWM within a shared space of any compound house remains the exclusive responsibility of the women who live in that house. One of the female respondents had this to say:

*Women in this house are responsible for managing all waste. We sweep and also transport the wastes to the dump site. The men are kings; they do not handle any waste.*

Mothers assign roles to children based on traditional gender norms. Male children are typically asked to fetch water for the household. But female children are tasked to assist in cooking and handle waste-related activities like sweeping. Both boys and girls are involved in solid waste disposal. Observations at the dumpsite revealed an average of forty-six girls representing 71 percent as against nineteen (19 %) boys bringing in household refuse to dispose of in a day. Interview sessions and observations revealed that of the children assigned to dispose of waste at the dumpsite, the boys were generally younger than the girls. According to a 16-year-old female respondent:

*The boys can decide to relinquish wastes related activities such as sweeping and transporting waste to community dump sites at certain ages. This is usually the case when there are other females in the house. Females do not have that choice.*

The socialisation process in terms of waste management is skewed towards women. Women's role in solid waste management is not mediated by age. Observations revealed that the aged and young women dispose of solid wastes at the communal dumpsite.

The gendered division is not restricted to only the domestic spaces. In both District Environmental Health and Sanitation Unit and Zoomlion District Office, women and men participated in SWM. In both organisations, there were more women grounds workers than men. When asked why more females were recruited as sanitary guards and labourers, the District Environmental Health Officer answered:

*You know women form the more significant part of people who clean the environment, so we employed more females. Also, because women dominate cleaning activities, they will be in a better position to educate people on SWM and other environmental issues. Besides, when we advertised the job, more women applied relative to men.*

Only women did street sweeping. On the other hand, the riding of tricycles was mainly reserved for men. Riding tricycles was seen as a very robust activity as opposed to sweeping. Most women claimed they were told the tricycle is very difficult to ride. The women have internalised this assertion without any contestation. Training for tricycle riders was organised for only men. The District Operations Supervisor of Zoomlion Company explained:

*You know that naturally, men are stronger than women; besides, tricycles are very heavy; ask yourself how many women can ride a bicycle, not to talk of a tricycle. Tricycle riding is the exclusive reserve of men because it requires special skills which women lack.*

A 38-year old male tricycle rider justified this discussion of labour by explaining that:

*It is challenging to ride a tricycle. Riding also requires courage which most women lack; imagine a woman riding in front of a truck!*

Training only men as tricycle riders explains how institutional practices determine which groups of people are; included and excluded and how they are assigned different responsibilities within the SWM process. Though both women and men were engaged in collecting solid waste, marked differences in the mode of transporting the waste were observed. Women were found using wheelbarrows whilst men rode a tricycle.

A skip container site attendant regulates activities at the skip containers storage site. The skip container site attendant is also responsible for loading wastes dumped by the tricycle riders into the skip container. Loading wastes into skip containers were considered a man's work. When asked why only men do this work, physical demands of the job were often mentioned:

*Loading waste into a skip container using a shovel requires physical strength, which women lack (male assistant district operations supervisor).*

About men loading wastes into skip containers, a similar observation was made by Foster et al. (2012). The latter argued that lifting and loading waste into pushcarts, trucks or trailers were nearly always considered a man's job. Circular and Conservancy (2019) also noted that while men are tasked with the more labour-intensive loading and unloading, women carry out repetitive and time-consuming activities such as sorting and separating. Despite the high degree of agreement about what is considered a woman's work and a man's work in SWM, these gendered divisions of labour did not go unchallenged. A female janitor assists the district skip truck driver. The janitor is expected to cover the skip container on the truck with a net. This is done to prevent waste from falling off the truck during transportation from the skip container site to the final dump site. The janitor operates the gears which load and offload the skip container at the last disposal site. She also directs the skip driver at the skip container site and final disposal sites about proper positioning for loading and offloading skip containers. During the interviews, the District Operations Supervisor stated:

*This is the first time a woman is performing this task. The female janitor showed interest and courage when the position became vacant. The reason for assigning her to work was that she had previously demonstrated leadership skills.*

The training of only men as tricycle riders confirms the assertion made by Muller (n.d). Muller (n.d) argues that introducing new technology for waste collection, such as tricycle designed for SWM organisations, requires asking gender-related questions. For example, do women and men have an equal chance to get the necessary training? These issues are often ignored or taken for granted, eventually leading to a growing socioeconomic disadvantage for women (e.g. Sallwey et al., 2017). Thus, without a gender analysis, the modernisation of SWM, including introducing new equipment, is likely to widen gender inequalities (Seager et al., 2020). The discussion so far appears to support the conclusion that SWM is gendered. This is demonstrated by: the gendered division of labour; and the challenge of the traditional gendered division of labour.

## Conclusions and recommendations

Using a gender perspective, we have shown how gender underpinned solid waste management. Our approach diverges from earlier established research focused on technical and urban settings. We contribute further to the solid waste management debates using the rural space and gender intersection to account for how solid waste is managed in households, private and state organisations. The study also shows that the material resources, such as wooden baskets, faulty buckets and sacks used as domestic solid waste bins, were mobilised by women. In the domestic sphere, women are assigned SWM tasks. However, at the organisational level, women have access to the local politics of SWM but little control over which issues are discussed and the final decisions. The male-dominated District Assembly and Zoomlion Company Limited management mobilised resources within the organisational spheres.

Women had no tricycle training programs on the basis that they required physical strength. Denying women access to such training tends to reinforce social gender inequality. The only critical role of traditional leaders is to allocate land space for communal dumpsites. The gendered nature of SWM is apparent in both domestic and private spheres. Thus, domestic SWM is solely the responsibility of women and children. Women's roles in solid waste management are not mediated by age; men's are. This finding implies that age is vital in determining men's engagement in domestic SWM. However, the stereotype women face is not only due to gender but also women's subordination position to men in the context of SWM. The finding shows that boys can renounce their

domestic SWM duties at certain ages, but girls do not have that choice. Public street sweeping was actively done by only women. On the other hand, riding the solid waste collection tricycle was also mainly reserved for men. Again, loading wastes into skip containers was considered a man's work. This is attributable to the physical demands of the job. Solid waste management operations are gendered.

To address the multidimensional change in solid waste management, a gender lens is required. Thus, for effective and efficient solid waste management, we recommend that a gender perspective be integrated into assessment studies, planning, implementation and monitoring of waste management projects. There is an urgent need to support state and non-state actors (i.e., District Environmental Health and Sanitation Unit and Zoomlion) in gender analysis approaches in solid waste management to overcome gender blindness in the waste management cycle. This should include a gender-specific analysis of the role of actors and resources used. Also, public education towards changing attitudes and stereotypes about gender norms and practices of appropriate masculinity and femininity is critical as other technical changes. Gender-disaggregated data and analysis across all aspects of the SWM cycle are essential for developing sustainable policies and curbing gender inequalities. Therefore, knowledge of gender is critical to alleviating improper SWM in rural and urban spaces of developing countries.

## CRedit authorship contribution statement

**John Oti Amoah:** Conceptualization, Methodology, Data curation, Formal analysis, Investigation, Project administration, Resources, Validation, Writing – original draft, Writing – review & editing. **Akua O. Britwum:** Conceptualization, Methodology, Project administration, Supervision, Writing – review & editing. **David Essaw:** Conceptualization, Methodology, Investigation, Project administration, Supervision, Writing – review & editing. **Justice Mensah:** Conceptualization, Methodology, Formal analysis, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## References

- Adam, S. U., Shamsudin, M. N., Sidiq, S. F., Rahim, K. A., & Radam, A. (2015). Determinants of privatised solid waste management service provision in Lagos. *Journal of Environmental Planning And Management*, 58(10), 1804–1826.
- Amfo-Otu, R., Waife, E. D., Kwakwa, P. A., & Akpah-Yeboah, S. (2012). Willingness to pay for solid waste collection in semi-rural Ghana: A logit estimation. *International Journal of Multidisciplinary Research*, 2(7), 40–49.
- Asia, E., Busch, G., Nkengla, L., 2013. The evolving role of women in sustainable waste management in developing countries: a proactive perspective? International Conference on Integrated Waste Management and Green Energy Engineering (ICIWMGEE), (pp. 289-291). Johannesburg.
- Awumbila, M. (2001). Women and gender equality in Ghana: A situation analysis. In D. Tsikata (Ed.), *Gender training in Ghana: Politics, issues & tools* (pp. 33–58). Accra: Woeli Publishing Services.
- Bjerkli, C. L. (2015). Power in waste: Conflicting agendas in planning for integrated solid waste management in Addis Ababa, Ethiopia. *Norwegian Journal of Geography*, 69(1), 18–27.
- Circular, G. A., & Conservancy, O. (2019). *The role of gender in waste management gender perspectives on waste in India. Indonesia: the Philippines and Vietnam*.
- Dankelman, I., 2005. Women: agents of change for a healthy environment. <http://aaws07.org/english3/speech/5.2.IreneDankelman.pdf> (accessed March 2015).
- Davis, S. N., & Greenstein, T. N. (2009). Gender ideologies: Components, predictors and consequences. *Annual Review of Sociology*, 35, 87–105.
- Department of Geography and Regional Planning (2014). Map of Twifo-Ati Mokwa District. University of Cape Coast.
- Dias, S.M., Ogando, A.M. and Mintz, L., 2015. From Theory to Action: Gender and Waste Recycling. *A Toolkit for Teachers, Researchers and Practitioners. Book 1: Theoretical Considerations on Gender, Empowerment and Waste*.
- dos Muchangos, L. S., & Vaughter, P. (2019). Gender mainstreaming in waste education programs: A conceptual framework. *Urban Science*, 3(1), 29.

- Fadhullah, W., Imran, N. I. N., Ismail, S. N. S., et al. (2022). Household solid waste management practices and perceptions among residents in the East Coast of Malaysia. *BMC Public Health*, 22, 1. <https://doi.org/10.1186/s12889-021-12274-7>
- Foster, S., Dixey, R., Oberlin, A., & Nkhama, E. (2012). Sweeping is women's work: Employment and empowerment in solid management in Tanzania and Zambia. *International Journal of Health Promotion and Education*, 50(4), 203–217. <https://doi.org/10.1080/14635240.2012.703392>
- Fredericks, R., 2008. Gender and the politics of trash in Dakar: participation, labour and the "undisciplined" woman. *Thinking Gender Papers*. UCLA Center for the Study of Women, Los Angeles.
- Ghana Statistical Service, 2022. Ghana 2021 Population and Housing Census: General Report Volume 3M. [https://statsghana.gov.gh/gssmain/fileUpload/pressrelease/Volume%203M\\_Water%20and%20Sanitation\\_240222a.pdf](https://statsghana.gov.gh/gssmain/fileUpload/pressrelease/Volume%203M_Water%20and%20Sanitation_240222a.pdf) (accessed 21 December 2022).
- Gutberlet, J., & Uddin, S. M. N. (2017). Household waste and health risks affecting waste pickers and the environment in low-and middle-income countries. *International Journal of Occupational and Environmental Health*, 23(4), 299–310.
- Kadfak, A., 2011. An analysis of the social relations in waste management: two case studies on Somanaya and Agormanya in Ghana. (Master's dissertation). Uppsala University, Sweden. <http://uu.diva-portal.org/smash/get/diva2:453271/FULLTEXT01>.
- Khan, D., Kumar, A., & Samadder, S. R. (2016). Impact of socioeconomic status on municipal solid waste generation rate. *Waste Management*, 49, 15–25.
- Lissah, S. Y., Ayanore, M. A., Krugu, J. K., Aberese-Ako, M., & Ruitter, R. A. C. (2021). Managing urban solid waste in Ghana: Perspectives and experiences of municipal waste company managers and supervisors in an urban municipality. *PLoS ONE*, 16(3), e0248392.
- Moh, Y. C., & Manaf, L. A. (2014). Overview of household solid waste recycling policy status and challenges in Malaysia. *Resources, Conservation & Recycling*, 82, 50–61.
- Muller, M. S. (n.d). Gender, social inequality and waste management. gouda, holland. [http://www.worldbank.org/urban/solid\\_wm/erm/Annexes/US%20Sizes/Annex%201.2.pdf](http://www.worldbank.org/urban/solid_wm/erm/Annexes/US%20Sizes/Annex%201.2.pdf) (accessed 17 January 2015).
- Muller, M. S., Scheinberg, A., 2001. Gender and waste electronic discussion group. A summary of waste. Gouda. UWEP Occasional Paper.
- Muller, M., Scheinberg, A., 1997. Gender and urban waste management. gender, technology and development. Amsterdam.
- Norsa'adah, B., Salinah, O., Naing, N. N., & Sarimah, A. (2020). Community health survey of residents living near a solid waste open dumpsite in Sabak, Kelantan, Malaysia. *International Journal of Environmental Research and Public Health*, 17(1), 311.
- Poswa, T. 2004. The importance of gender in waste management planning: A challenge for solid waste managers. The 8th world congress on environmental health. Durban.
- Sallwey, J., Hettiarachchi, H., & Hülsmann, S. (2017). Challenges and opportunities in municipal solid waste management in Mozambique: A review in the light of nexus thinking. *AIMS Environmental Science*, 4, 621–639.
- Sasu, D. D., 2022. Rural and urban population of Ghana 1990-2020. *Statistica*, pp. 25.
- Scheinberg, A., Muller, M., Tasheva, E., 1998. Integrating gender into community waste management: projects insight and tips. *gender and waste*.
- Seager, J., Rucevska, I., & Schoolmeester, T. (2020). Gender in the modernisation of waste management: Key lessons from fieldwork in Bhutan, Mongolia, and Nepal. *Gender & Development*, 28(3), 551–569.
- Shaheed, F. (2017) Women, Culture, and Rights in Acholi. Available at: <<https://crossculturalfoundation.or.ug/wp-content/uploads/2018/04/Women-Culture-and-Rights-in-Acholi-2017.pdf>>. Accessed on 31/12/2022.
- Tsikata, D. (2001). *Gender training in Ghana*. Accra: Woeli Publishing Services.
- Twifo-Ati Mokwa District Assembly. 2022. *District info: Twifo-Ati Mokwa District Assembly*. <http://tamda.gov.gh/> (accessed 30 December 2022).
- United Nations Environment Programme (UNEP). 2016. *Global Gender and Environment Outlook*; United Nations Environment Programme: Nairobi, Kenya.
- Widyaningsih, N., Tjiptoherjanto, P., Widanarko, S., & Seda, F. S. (2015). Linkage model between sustainable consumption and household waste management. *Procedia Environmental Sciences*, 28, 195–203.
- Wilson, D. C., Rodic, L., Modak, P., Soos, R., Carpintero, A., Velis, K., et al. (2015). Global waste management outlook. *UNEP*.
- Worku, Y., & Muchie, M. (2013). Differential factors of efficiency in the management of solid waste in the city of Tshwane, South Africa. *African Journal of Science, Technology, Innovation and Development*, 2, 129–141.