

Waste-to-Wealth and Community Participation in Solid Waste Management: Evidence from the Tamale Urban Area, Ghana

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Abstract

Rapid urbanisation in Ghana's secondary cities has intensified solid waste management challenges, including inadequate collection services, indiscriminate dumping, and limited community participation. At the same time, the predominance of organic and plastic waste presents opportunities for resource recovery through waste-to-wealth initiatives. This study examined the role of community participation in advancing waste-to-wealth approaches to solid waste management within the greater Tamale urban area, with a focus on Jisonayili and Gurugu in the Sagnarigu Municipal Assembly. A qualitative, exploratory research design was adopted, guided by Participatory Development Theory, Behaviour Change Theory, and the Circular Economy Framework. Data were collected through key informant interviews, focus group discussions, and direct observation, and were analysed thematically. The findings show that waste management practices in the study communities are characterised by high volumes of organic and plastic waste, uneven access to collection services, and widespread reliance on informal disposal methods. Although awareness of environmental and health risks was relatively high, sustained community participation remained limited. Plastic recycling and composting were identified as viable waste-to-wealth opportunities, though constrained by a lack of waste segregation, technical capacity, organisation, and institutional support. Structured participatory models, such as the proposed Community Waste Champions approach and waste-to-wealth initiatives, offer a viable pathway for improving waste management in Ghana's secondary cities. This approach provides a scalable strategy for enhancing environmental sustainability, public health, and socio-economic benefits in low- and middle-income country (LMIC) urban contexts.

Keywords: Community participation, waste-to-wealth, solid waste management, circular economy, participatory development, urban sanitation, Ghana

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1.0 INTRODUCTION

1.1 Research Problem

Rapid urbanisation in Ghana has significantly intensified the challenge of solid waste management, particularly in secondary cities where population growth and spatial expansion often outpace institutional capacity and service delivery. In the Tamale urban area, solid waste management is characterised by irregular collection services, limited coverage of formal waste disposal systems, and widespread reliance on informal practices such as open dumping and burning. These practices contribute to environmental degradation, clogged drainage systems, flooding, and increased public health risks.

Although national policy frameworks recognise waste as a potential resource and emphasise sustainable waste management, translating these policy ambitions into effective local practice remains a significant challenge. A growing body of literature suggests that conventional, top-down approaches to urban waste management are often insufficient in addressing the behavioural and social dimensions of waste generation and handling, highlighting the need for innovative, participatory organisational models to optimise community-based waste management practice.

1.2 Background

Across Africa, rapid population growth, expanding economic activities, and increasing urbanisation have led to a significant rise in the volume and complexity of solid waste generated in urban centres. Urban areas are experiencing not only higher quantities of waste but also more diverse waste streams due to changing consumption patterns, increased use of packaged goods, and the proliferation of single-use plastics. However, waste management systems in many African cities have not expanded commensurately. Inadequate infrastructure, limited financial resources, and weak institutional capacity continue to constrain effective waste collection, treatment, and disposal.

Recognising the urgency of these challenges, the African Union adopted Agenda 2063: "The Africa We Want," which articulates a long-term vision for environmentally sustainable and climate-resilient development across the continent. At the national level, Ghana's approach to waste management is guided by several key policy frameworks, including the National Environmental Sanitation Strategy and Action Plan (NESSAP) and the National Plastics Management Policy, which reflect a shift towards sustainability, waste reduction, recycling, and the creation of green jobs through resource recovery.

The Tamale urban area, one of the fastest-growing urban centres in Northern Ghana, exemplifies these challenges. Rapid population growth, urban expansion into peri-urban areas, and shifts in production and consumption patterns have contributed to increasing volumes of solid waste, predominantly composed of organic matter and plastics. At the same time, the composition of waste generated in Tamale presents significant opportunities for resource recovery and value creation. Harnessing this potential, however, requires more than technical solutions. It necessitates behavioural change, waste segregation at source, and active community participation in waste management processes.

1.3 Objectives

The primary aim of this study was to examine the role of community participation in advancing waste-to-wealth approaches to solid waste management in the Tamale urban area of Ghana. Specific objectives were to:

- Examine existing solid waste disposal practices in selected communities within the Tamale urban area.
- Assess community attitudes and perceptions towards solid waste management and waste segregation.
- Analyse the extent to which community participation influences waste segregation and disposal behaviours at the community level.
- Explore the potential of waste-to-wealth initiatives, particularly plastic recycling and composting of organic waste, to generate environmental, social, and economic benefits in the study communities.

1.4 Conceptual Framework

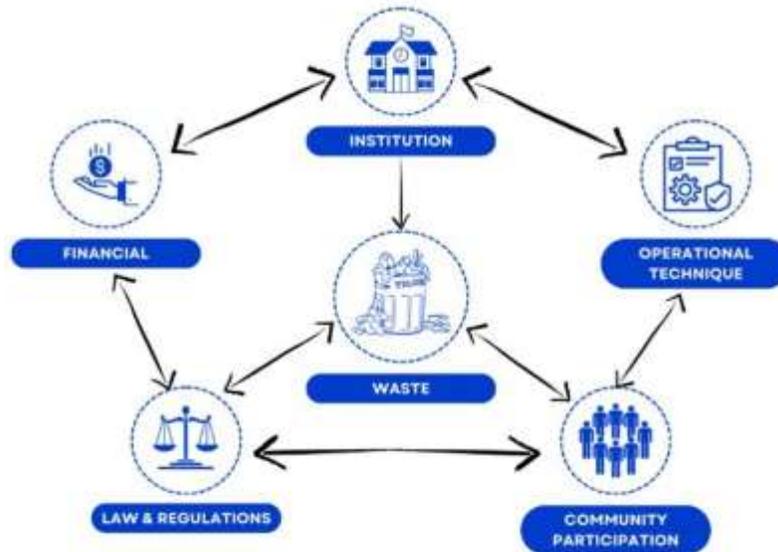
This study is guided by an integrated conceptual framework that explains how participatory, community-led models influence waste management behaviours and enable waste-to-wealth outcomes. The framework combines three complementary theoretical perspectives: Participatory Development Theory, Behaviour Change Theory, and the Circular Economy Framework.

Participatory Development Theory emphasises the active involvement of local communities in identifying problems, designing solutions, and implementing interventions, positioning them as agents with valuable knowledge and capacities essential for sustainable outcomes. Behaviour Change Theory offers insights into how individual and collective behaviours are shaped by social norms, incentives, and peer influence, and how these behaviours can be modified over time through community mobilisation and social learning. The Circular Economy Framework promotes the reduction, reuse, recycling, and recovery of materials to minimise waste and maximise resource efficiency, viewing waste as a potential resource that can be reintegrated into economic and social systems.

The framework proposes that meaningful community participation, operationalised through models such as the Community Waste Champions approach, influences waste management practices (e.g., waste segregation and proper disposal). These improved practices,

in turn, enable waste-to-wealth initiatives (e.g., recycling, composting), thereby enhancing environmental cleanliness, reducing public health risks, and yielding socio-economic benefits such as income generation and skills development. Contextual and enabling factors, including institutional support and market access, shape the effectiveness and sustainability of these initiatives.

Figure 1 – Conceptual Framework



Source: Author's conceptualisation, informed by Participatory Development Theory (Chambers, 1994; Arnstein, 1969), Behaviour Change Theory (Pretty, 1995), and the Circular Economy Framework (Geissdoerfer et al., 2017).

1.5 Significance of the Study

This study contributes to the limited evidence on integrated, community-led models that link participation, behaviour change, and resource recovery in solid waste management within LMIC urban contexts. By documenting community perceptions, participation dynamics, and locally identified waste-to-wealth opportunities in a secondary city, the findings provide guidance for municipal authorities, policymakers, and development practitioners on designing inclusive, context-sensitive waste management strategies. The study highlights scalable, participatory strategies for improving urban environmental quality, public health, and livelihood creation, aligning with national, continental (Agenda, 2063), and global (Sustainable Development Goals) sustainability commitments.

1.6 Research Gap

While existing literature documents solid waste management challenges and separately highlights the potential of participatory approaches and waste-to-wealth initiatives, research that integrates community participation, waste management behaviours, and waste-to-wealth strategies within a single analytical framework is scarce, especially in secondary cities in Sub-Saharan Africa. Most studies focus on technical, institutional, or pilot-project dimensions, leaving a knowledge gap regarding how structured community participation can be operationalised to improve waste management practices and enable resource recovery at the local level. This study addresses this gap by examining a participatory waste-to-wealth approach in the Tamale urban area, Ghana.

2.0 MATERIALS AND METHODS

2.1 Solid Waste Management in Developing Cities

Solid waste management remains a persistent and complex challenge in developing cities, where rapid urbanisation, population growth, and changing consumption patterns have outpaced municipal capacity. Studies indicate widespread issues of inadequate collection coverage, insufficient disposal facilities, limited technical capacity, weak institutional coordination, and unstable financing (Hoornweg & Bhada-Tata, 2012; Wilson et al., 2006).

In Sub-Saharan Africa, governance weaknesses often create gaps between national policies and local implementation (Miezah et al., 2015). In Ghana, municipal solid waste is dominated by organic matter and plastics. However, management systems frequently prioritise collection and disposal over waste reduction and resource recovery, leading to environmental and public health risks (Agyemang & Boateng, 2019).

2.2 Participatory Approaches to Environmental Management

Participatory approaches challenge top-down development models by emphasising the role of citizens as active agents. Arnstein's (1969) ladder of participation illustrates varying degrees of involvement, highlighting that meaningful participation leads to greater ownership and sustainability. In environmental management, top-down interventions often neglect local knowledge and social norms, resulting in weak compliance and poor sustainability (Mansuri & Rao, 2013).

Evidence shows that community involvement in sanitation, water management, and natural resource governance enhances compliance, accountability, and infrastructure maintenance (Pretty, 1995). In urban waste management, models like neighbourhood clean-up groups and waste cooperatives can complement municipal services and improve outcomes when supported by local leadership and institutional backing.

2.3 Waste-to-Wealth and the Circular Economy

The waste-to-wealth concept is central to the circular economy, which promotes the reduction, reuse, recycling, and recovery of materials to minimise waste (Geissdoerfer et al., 2017). In developing countries, the informal sector plays a critical role in material recovery, providing livelihoods while contributing to waste reduction. Composting organic waste offers a low-cost solution for managing biodegradable waste and supporting urban agriculture (Hoornweg & Bhada-Tata, 2012).

Pilot initiatives in Ghana have demonstrated environmental benefits from plastic recycling and composting, though they often remain small-scale and face challenges related to financing, market access, and institutional support (Miezah et al., 2015). Integrating these initiatives into participatory community models offers a promising pathway to enhance both environmental and socioeconomic outcomes.

2.4 Synthesis and Identified Gap

The reviewed literature establishes solid waste management challenges in developing cities and the separate promise of participatory approaches and waste-to-wealth initiatives. However, there is limited empirical research that integrates community participation, behaviour change, and waste-to-wealth strategies within a cohesive framework, particularly in secondary cities like Tamale. This study aims to fill this gap by providing context-specific evidence on how participatory approaches can be structured to improve waste management practices and unlock opportunities for resource recovery.

3.0 METHODOLOGY

3.1 Study Design

This study adopted a qualitative, exploratory research design within a descriptive case study framework. The design was considered suitable for examining community waste management practices, participation levels, and the potential of waste-to-wealth initiatives in the Tamale urban area. The exploratory approach allowed for an in-depth understanding of complex social and behavioural dimensions, while the case study design enabled a focused examination of selected communities.

3.2 Setting

The study was conducted in the Tamale urban area in Northern Ghana, with a specific focus on two communities, Jisonayili and Gurugu, within the Sagnarigu Municipal Assembly. These communities were purposively selected for their high population density, visible solid-waste management challenges, and status as rapidly growing peri-urban areas with inadequate waste-collection services.

3.3 Data Collection and Quantitative Metrics

Data were collected through three primary methods:

- Key Informant Interviews (KIIs): Six semi-structured interviews were conducted with community leaders and institutional stakeholders (e.g., officials from the Sagnarigu Municipal Assembly).
- Focus Group Discussions (FGDs): Four FGDs (two per community) were held, each with 6-8 participants from households, youth, and women's groups.
- Direct Observation: An observation checklist was used to document physical waste disposal sites, environmental conditions, and evidence of community activities.

Data collection was conducted over two weeks in November 2025.

3.4 Governance and Oversight

Data from interviews and FGDs were transcribed and analysed thematically. Transcripts were carefully reviewed to identify recurring patterns and themes related to waste disposal practices, community attitudes, participation forms, and waste-to-wealth opportunities. Observational data were analysed thematically to support and contextualise the interview findings. Analysis focused on identifying similarities and differences between the two study communities.

3.5 Ethical Considerations

The study obtained necessary permissions from community leaders and local authorities. Informed consent was secured from all participants, who were assured of confidentiality and anonymity. Participation was voluntary, with the right to withdraw at any time. Data were handled securely and used solely for academic purposes.

4.0 RESULTS AND DISCUSSIONS

4.1 Existing Solid Waste Management Practices

Findings revealed that solid waste in Jisonayili and Gurugu is predominantly organic waste (food leftovers) and plastic waste (sachets, bottles). Disposal practices are largely informal and inconsistent. Standard methods include open dumping in bushes/plots, use of overflowing communal dumping sites, and open burning. Access to formal waste collection services is uneven, often requiring payment that excludes low-income households. Observational data confirmed widespread indiscriminate dumping and blocked drains.

4.2 Community Attitudes and Participation

Awareness of the negative environmental and health impacts of poor waste management was relatively high among community members. However, waste management was frequently perceived as the responsibility of local authorities, weakening individual and collective accountability. Community participation was found to be limited and ad hoc, primarily taking the form of occasional, leader-organised clean-up exercises or radio campaigns. Barriers to participation included a lack of incentives, weak enforcement of bylaws, and the normalisation of improper disposal practices. Despite this, respondents expressed willingness to engage in community-led initiatives that promised tangible benefits and were spearheaded by trusted local actors.

4.3 Waste-to-Wealth Opportunities and Barriers

Community awareness of formal "waste-to-wealth" concepts was low, although informal reuse practices (e.g., reusing containers, feeding organic waste to animals) were prevalent. Participants identified plastic recycling and composting of organic waste as the most promising opportunities, recognising potential benefits such as income generation, job creation, and

environmental benefits. Key barriers included the lack of waste segregation at source, the absence of technical knowledge and start-up capital, limited access to recycling markets, and inadequate organisational structures at the community level.

4.4 Perceived Effectiveness of Participatory Approaches

Community-led approaches were generally perceived as more acceptable and potentially more effective than top-down interventions. Participants believed that initiatives led by trusted community members would garner greater support and compliance. Leadership was identified as a critical factor, underscoring the relevance of models such as Community Waste Champions. However, participants noted that participatory approaches are not a standalone solution and require complementary institutional support, including waste collection infrastructure, enforcement, and market linkages.

Table 1. Summary of Key Findings from Jisonajili and Gurugu

Aspect	Key Findings
Dominant Waste Types	Organic waste (food scraps) and Plastic waste (sachets, bottles)
Common Disposal Methods	Open dumping, use of communal sites (often full), open burning
Service Access	Irregular, uneven; private services require payment, limiting access for low-income households
Community Awareness	High awareness of environmental/health risks
Perception of Responsibility	Primarily viewed as a municipal authority responsibility.
Forms of Participation	Limited, ad-hoc; mainly occasional clean-ups or radio campaigns
Waste-to-Wealth Awareness	Low formal awareness, but recognition of potential in plastics/organics
Identified Opportunities	Plastic recycling, Organic waste composting
Key Barriers	No waste segregation, lack of technical/financial capacity, weak organisation, poor market links
View on Participatory Models	Positively viewed; seen as more sustainable if community-led and well-supported

4.5 Discussion

The implementation of a participatory waste-to-wealth approach in the Tamale urban area demonstrates the interconnected challenges and opportunities in urban solid waste management. The findings align with existing literature on the inadequacy of top-down systems in developing cities (Hoornweg & Bhada-Tata, 2012) and the critical role of informal disposal when formal services fail (Wilson et al., 2006).

The gap between high awareness and low sustained participation underscores a core tenet of Behaviour Change Theory: knowledge alone is insufficient to alter deeply ingrained practices (Pretty, 1995). Perceiving waste management as an external responsibility highlights a lack of local ownership, which Participatory Development Theory identifies as crucial for sustainable outcomes (Chambers, 1994). The expressed willingness to engage in community-led initiatives, however, provides a strong foundation for models such as Community Waste Champions, which leverage peer influence and local leadership as key mechanisms for behaviour change (Mansuri & Rao, 2013).

The identification of plastic and organic waste as key resources aligns with the Circular Economy Framework, emphasising the potential to transform linear "take-make-dispose" models into circular systems (Geissdoerfer et al., 2017). The barriers identified lack of segregation, technical capacity, and market access echo challenges documented in other waste-to-wealth initiatives in Ghana (Miezah et al., 2015) and point to the need for integrated support systems.

The study's findings suggest that a structured participatory model can bridge the gap between community potential and effective action. By formalising community roles (e.g., through Waste Champions), providing necessary training, and fostering links with municipal authorities and markets, such a model can enhance accountability, promote sustained behaviour change, and unlock the economic value of waste. This integrated approach addresses the institutional, behavioural, and technical dimensions of the waste crisis simultaneously.

5.0 CONCLUSIONS

This study concludes that solid waste management in the Tamale urban area is inadequate, relying heavily on informal disposal methods despite high community awareness of the associated risks. Community participation is currently weak and unsystematic, limiting its impact. Significant waste-to-wealth opportunities exist, particularly in plastic recycling and composting, but are constrained by a lack of segregation, capacity, and organisation. Crucially, participatory, community-led approaches are perceived as viable and effective pathways for improving waste management practices and realising the potential for resource recovery, provided they are well-structured and receive institutional support.

5.1 Recommendations

For Policy and Institutions: Metropolitan, Municipal, and District Assemblies (MMDAs) should integrate structured community engagement models (e.g., Community Waste Champions) into local sanitation plans and policies. Support should include promoting source segregation through education and infrastructure, and facilitating market linkages for recyclables and compost.

For Community Action: Communities should adopt structured participatory models to mobilise residents, with particular emphasis on the involvement of youth and women in waste-to-wealth value chains. Efforts should shift from sporadic clean-ups to routine monitoring, peer education, and collective responsibility.

For Capacity Building: Training programmes should be developed to build technical and organisational capacity for community-based recycling and composting. Community leaders and volunteers should receive institutional recognition and support to sustain their efforts.

5.2 Suggestions for Further Research

- Future studies could: 1) extend this research to other municipalities for comparative analysis;
- Employ mixed-methods or longitudinal designs to assess the long-term impacts of participatory waste-to-wealth initiatives;
- Conduct in-depth analysis of the economic feasibility and market dynamics of community-based recycling and composting; and
- Explore gender-specific roles and outcomes within waste-to-wealth value chains.

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Conflict of Interest Statement

The author declares no conflicts of interest.

REFERENCES

- African Union Commission. (2015). Agenda 2063: The Africa we want. African Union. <https://au.int/en/agenda2063/overview>
- Agyemang, S., & Boateng, S. (2019). Urban flooding and the role of poor solid waste management in Ghana. *Journal of Urban Environmental Studies*, 4(2), 45–58.
- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216–224. <https://doi.org/10.1080/01944366908977225>
- Chambers, R. (1994). Participatory rural appraisal (PRA): Analysis of experience. *World Development*, 22(9), 1253–1268. [https://doi.org/10.1016/0305-750X\(94\)90003-5](https://doi.org/10.1016/0305-750X(94)90003-5)

- Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy – A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- Hoornweg, D., & Bhada-Tata, P. (2012). What a waste: A global review of solid waste management. *World Bank*. <https://openknowledge.worldbank.org/handle/10986/17388>
- Mansuri, G., & Rao, V. (2013). Localizing development: Does participation work? *World Bank*. <https://doi.org/10.1596/978-0-8213-8256-1>
- Miezah, K., Obiri-Danso, K., Kádár, Z., Fei-Baffoe, B., & Mensah, M. Y. (2015). Municipal solid waste characterisation and quantification as a measure towards effective waste management in Ghana. *Waste Management*, 46, 15–27. <https://doi.org/10.1016/j.wasman.2015.09.009>
- Ministry of Environment, Science, Technology and Innovation. (2020). National plastics management policy. Government of Ghana.
- Ministry of Local Government and Rural Development. (2010). National environmental sanitation strategy and action plan (NESSAP). Government of Ghana.
- Pretty, J. N. (1995). Participatory learning for sustainable agriculture. *World Development*, 23(8), 1247–1263. [https://doi.org/10.1016/0305-750X\(95\)00046-F](https://doi.org/10.1016/0305-750X(95)00046-F)
- Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International*, 30(4), 797–808. <https://doi.org/10.1016/j.habitatint.2005.09.005>

