



Socio-Economic Barriers and Community Participation in Waste Management in Ngaba Municipality, Kinshasa, Democratic Republic of Congo

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Abstract: The aim of the study was to assess the existing socio-economic barriers and community participation in waste management in Ngaba Municipality, Kinshasa, Democratic Republic of Congo. The study was anchored on collective action theory. A mixed method with convergent-parallel design was used. A population of 5,985 household heads and 8 local leaders was targeted. Further, 386 households were sampled using Yamane's formula of 1967 and stratified technique used to recruit the household heads while 8 local authorities were considered purposively. Interviews and observation techniques collected qualitative data while questionnaires gathered quantitative data. Validity was ensured by applying data triangulation to compare quantitative data from surveys with qualitative data from interviews with key informants. The quantitative data was analyzed using statistical techniques with the help of SPSS Version-27. Qualitative data were analyzed through semantic and narrative thematic analysis. Results show that, socio-economic and institutional factors hinder efficient management of domestic wastes because of poor government support, infrastructure, poor level of awareness and lack of incentives, regardless of affordable costs associated with the services. The study concluded that, household waste management in Ngaba Municipality is greatly impeded by intertwined socioeconomic issues. The study made a recommendation that the Ministry of Environment and Municipal Authorities (Ngaba Municipality): Enhance waste management processes through strengthening the service delivery process by ensuring there is enough infrastructure like waste bins, collection facilities, and waste collection services and addressing weaknesses in institutional capability which have made it hard to effectively engage with households on waste management

Key words: Socio-Economic Barriers, Community Participation, Waste Management

1.1 Background of the Study

Waste management is emerging as a matter of utmost concern to the global community because of its immediate relevance to global health, sustainability of the environment, and upholding human dignity. Community participation in waste management implies not only the awareness of households about various problems related to waste generation and management but also practical actions such as sorting out waste at source, utilizing proper disposal facilities, conducting cleaning campaigns and participating in local decision making on sanitation issues (Tarigan et al., 2020). Empirical studies have revealed that when community members are involved in such activities as sorting waste at source, utilizing waste bins, participating in recycling campaigns or conducting cleaning campaigns, the efficiency of solid waste management system increases considerably due to increasing joint efforts (Harnita, 2025).

Among the common indicators used to demonstrate the degree to which the community participates include: Waste sorting at household level, assessed by the number of households engaged in separation of organic, recyclable, and non-recyclable waste; Waste bins provision and usage, meaning presence of waste storage containers in households as well as the way people use these bins; Community clean-up or recycling initiatives, showing involvement in joint waste-related activities; and Service fee payments, meaning willingness of households to pay for the use of waste services (Harnita, 2025; Lunojo, Sesabo & Ilemba, 2025).

Community participation in Asian countries has also been very pivotal. Japan enacted the "3Rs" strategy: reduce, reuse, and recycle. The result has been an instance of certain regions that have achieved more than 80% recycling rates, (Noudeng et al., 2024). Another typical example is Taiwan, which, from being labeled the "garbage island," became a model country for effective waste governance through a pay-as-you-throw system and mandatory household sorting. The rate of recycling is around 55%, says Chen (2021).

Sub-Saharan Africa is forecasted to register a huge jump in the generation of waste, with the quantity possibly doubling by the year 2050 (UNEP, 2024). Presently, a huge amount of trash in the region is disposed of in the open or inadequately disposed of, which is quite harmful to the health and environmental conditions in the region. The answer to such issues lies not only in providing access to basic trash disposal but in identifying the socio-economic potential within the trash itself through recycling, reuse, and recycling processes, among others (World Bank, 2023).

Community participation in solid waste management has been found to correlate with several factors, including governance and infrastructure in Africa's urban areas. A study conducted in Lindi Municipal Council, Tanzania, identified several determinants of community participation in solid waste management. It was established that most respondents (92%) indicated their willingness to pay for solid waste management services, reflecting intrinsic motivations to participate in such activities (Tarimo, 2025).

Encouragingly, some African cities have been showing that improvement is possible with strong governance and community engagement. For example, Kigali, Rwanda, has gained a widespread reputation for an effective waste management system that incorporates rigid regulations into law-national bans on plastic bags-along with Umuganda, a mandatory monthly community cleanup. These have led citizens to be keenly involved in waste reduction and environmental sanitation, hence transforming Kigali into one of the cleanest cities on the continent today (Ngombe et al. 2024, Nduwimana et al. 2025).

In the Democratic Republic of Congo, Municipal towns, for instance, demonstrate the acute consequences of poor household waste management in areas such as Ngaba. High rates of uncollected waste have prompted residents to dump illegally and openly burn their wastes, exacerbating respiratory illnesses, water pollution, and environmental degradation. The progress concerning community-based initiatives, led by youth groups, NGOs, and households, has been promising, specifically with regard to clean-up campaigns and awareness programs. However, their impact remains constrained by limited funding, limited technical capacity, and weak institutional support (Mangenda, 2024; Okin et al., 2024). Evidence suggests that if grassroots efforts like these are supported with training, resources, and policy integration, they can significantly enhance urban waste management outcomes (Kabasele et al., 2021).

1.1 Statement of the Problem

In spite of the development of community-driven initiatives the management of household waste remains disorganized and inadequately served by institutional connections in Ngaba Municipality. Even though these efforts are making significant contributions to the recycling and reuse of household waste at the local level, they are faced with a number of institutional and funding limitations, such as a lack of technical training and a need for

personal protective gear (Mangenda, 2024). In addition to these limitations; the study area faces ‘ineffective governance coordination and inadequate waste infrastructure and household waste management have low awareness and representation at the level of the citizens. The effectiveness of the DRC’s entire environmental legislation and regulatory framework is being undermined because of the weakness of its enforcement at the institutional level and the living conditions of the poor at the level of the DRC’s sub-national poor living spaces in the major and productive areas of the country’ (UNEP, 2024). Though various researches and observations on the global and regional levels have pointed out that active community participation is the key and integral element for the effective management of household waste from the sustainability perspective, very little research work exists that tries to understand how community participation takes place in relation to the dynamics of solid waste management in the specific socio-economic environment of Kinshasa. Though the availability of research papers on the DRC exists in plenty that point towards the technical and infrastructure-related deficiencies associated from the angle of solid waste management practices in the concerned region (Kafula, 2024), very less emphasis appears to have been placed on socio-economic barriers associated with community participation on wasted management in Ngaba Municipality, hence research to fill in this gap.

1.2 Study Objective

To determine the influence of socio-economic barriers towards community participation in waste management in Ngaba municipality, Kinshasa, Democratic Republic of the Congo

1.3 The Conceptual Framework

Independent Variable

Dependent Variable

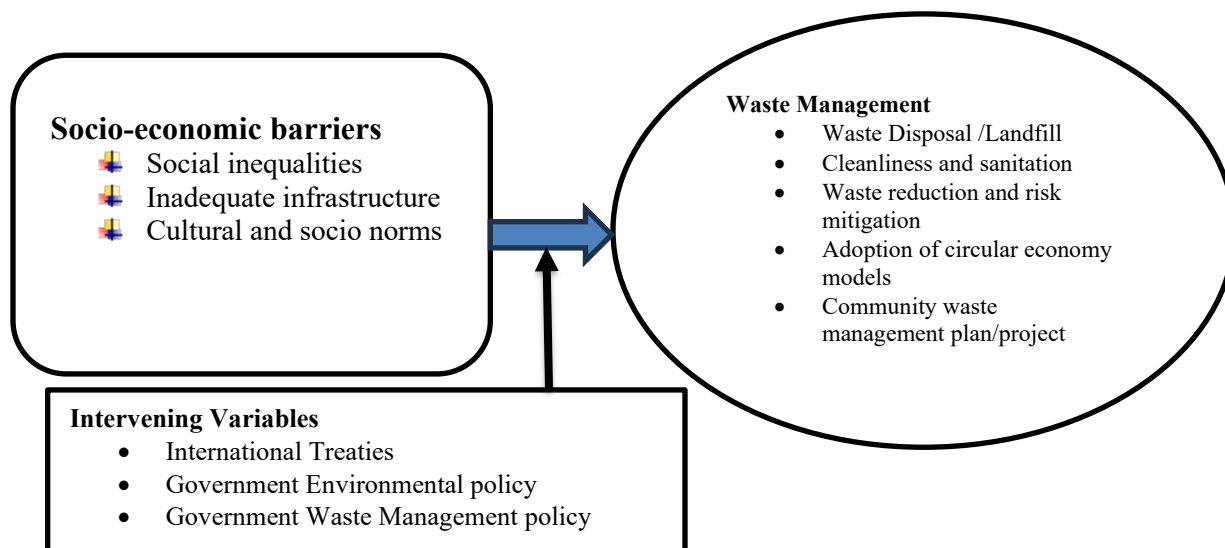


Figure 1: *The Conceptual Framework*

Source: *Own Conceptualization, 2025*

The conceptual framework outlined some independent variables (socioeconomic barriers) which includes social inequalities, inadequate infrastructure, cultural and socio norms which are hypothesized to influence the dependent variable: Household waste management. Relationships between those variables are further moderated by intervening variables, including international treaties, national environmental policies and waste management policies. These external factors may either facilitate or hinder community participation in collective efforts to manage household waste effectively.

1.4 Literature Review

In this section, theoretical and empirical reviews are presented.

1.5.1 Theoretical Review

This study was guided by collective action theory. The Theory of Collective Action was developed by economist Mancur Olson in 1965, as expressed in his book *The Logic of Collective Action: Public Goods and the Theory of Groups*. "Olson's key claim was that individuals in a group do not act in the common interest when they can receive the benefits from the collective good without having to bear any of the costs—a problem known as the free-rider issue." This insight has changed the orientation of literature concerning both the behavior of groups and the delivery of public goods. Subsequent scholarship extended the theory: Russell Hardin (1982) explored problems of cooperation in larger social settings, with particular emphasis on how trust and norms condition collective efforts, while Elinor Ostrom (1990) showed that communities themselves can establish mechanisms of self-governance that permit the effective management of common-pool resources independently from outside authorities. These various contributions have continued to enhance the theory's relevance for the analysis of socio-economic barriers within community-based resource management, including waste management at the household level.

The major components of the theory are the problem of free-riders, public goods, selective incentives, and participation costs. Free-riders' problem: This explains that people in a community can avoid any initiatives to benefit the community as a whole but continue benefitting anyway (Olson, 1965). In a community's perspective, for example in waste management in households, some community members may depend on others in disposing of their wastes while doing nothing themselves (Poteete and Ostrom, 2004). However, Ostrom explained that 'Public goods are non-rival and non-excludable goods; once supplied, what happens to a public good is irrelevant, as it can be accessed by whoever can get at it, regardless of whether others benefit or not' (Ostrom, 1990; Nzeadibe and Mbah, 2020). They are simply goods shared by all in a community without any conditions for all benefits of communal goods will be enjoyed by all whether a member contributes or not (Ostrom, 1990; Nzeadibe and Mbah, 2020). Such provisions help align individual interests with community goals; hence, people are motivated to contribute regularly (Choe & Fraser, 1999; Garnett et al., 2018). Lastly, the cost of participation in terms of time, effort, or resources invested in taking part can contribute considerably toward people's reluctance to contribute (DellaVigna, 2018).

In strength, Collective Action Theory gives a strong understanding of why community initiatives will not participate and gives ways in which such participation can be improved. The theory allows scholars and practitioners to note hindrances—for instance, free riding and high costs of participation—and develop targeted approaches toward raising participation. These concepts have been empirically tested across diverse fields, including environmental management, public health, and community mobilization. The theory's emphasis on selective incentives gives actionable guidance for policymakers and local authorities seeking to foster community participation in initiatives like household waste management.

1.4.1 Empirical Review

This section presents a review of existing empirical studies on household waste management, with particular emphasis on socio-economic barriers and the community strategies. Following a funnel approach, this review begins with an examination of global studies on waste management, then narrows its focus to the African continent, followed by the Democratic Republic of Congo (DRC), the city of Kinshasa, where this study is being conducted. Each section highlights key findings from previous research while identifying gaps in the existing literature that this study aims to address.

The United Nations Environment Programme (2022), was another global study on sustainable waste management practices used a mixed methods research approach. The methodology involved qualitative policy analysis together with quantitative modeling of environmental indicators. Multi-country case studies were utilized through purposive sampling of nations depending on their level of development and type of waste management practices. Data collection tools comprised policy analysis, interviews with key informants using standardized questions, and environmental performance indices. Data analysis was based on content analysis of qualitative data and multivariate statistics of quantitative data. Comparative statistical tests and cross-tabulations were among the methods utilized in analyzing data. The study emphasized that sustainable waste management entails integration of waste collection, recycling efforts, and public awareness strategies and that the effectiveness is significantly influenced by governance systems in each nation.

It was highlighted that for sustainability in waste management, an integrated system should comprise waste collection methods, recycling schemes, and awareness drives among the population, which were significantly effective in nations with good governance framework. Although this study had several methodological strengths, it lacked representation of grassroots information. Also, there is another limitation in terms of context since the issues related to urban areas with lower economic levels have not been considered enough.

Further, empirical study by Gümüş and Dursun (2024) investigated household behaviors, attitudes, and knowledge concerning solid waste management among the residents of the Mamak district, Ankara, Turkey. In the study, a quantitative cross-sectional survey design was utilized, which is suitable for measuring variability in household waste management behaviors. This tool was designed to capture information regarding environmental consciousness, attitude towards recycling and waste sorting, as well as personal involvement in household waste management. The study utilized both descriptive and inferential statistical analysis methods. Although there were high levels of awareness and positive attitudes, the degree of participation in waste sorting and recycling was average. Based on the findings, the study suggests increasing the effectiveness of environmental education programs; making sure people have easy access to recycling centers; and conducting campaigns to change behaviors regarding waste management. Critically looking at this research design, some drawbacks can be identified; the use of convenience sampling makes it less likely for the results to generalize the broader population, the study is missing significant predictors of participation in waste management, including trust in institutions, incentive structure, and socio-cultural factors that can influence one's actions. The lack of qualitative data also means that the reasons behind the gap between awareness and action are left unexplained. To address these limitations, the present research utilized a mixed-methods design, collected both quantitative and qualitative data, sampling from the broader population, and considering predictors like trust and incentives.

In another study in Ethiopia, Temesgen et al. (2025) undertook holistic empirical research based on systematic reviews and meta-analysis approach to analyze the extent of proper household waste management among urban populations. Based on the PRISMA framework, this research involved a synthesis of findings derived from over 20 empirical studies undertaken at district, zonal, and regional levels in the country. In terms of methodological procedures, the researchers used the systematic approach to search for evidence through the use of different scientific databases, including PubMed, Hinari, Cochrane Library, Wiley Online Library, and African Journals Online. The data extraction process was carried out using templates, whereas the methodological quality was analyzed using valid appraisal tools.

The analysis utilized advanced meta-analytic statistical approaches, namely pooled prevalence estimates to establish the general level of appropriate household waste management practices and Adjusted Odds Ratio (AOR) to determine significant determinants of these practices. Statistical significance was measured based on 95% confidence intervals while sensitivity analysis was used to ensure robustness of findings and minimize potential sources of bias. In turn, the findings established that only 32.06% of households practice proper waste management indicating relatively low levels of engagement with waste management among urban populations in

Ethiopia. Furthermore, inferential findings suggest that higher education levels significantly increase likelihood of practicing proper waste management practices in households (AOR = 6.01; 95% CI: 1.35-10.67). Among other important predictors, there were positive attitudes towards environmental protection, high income levels, availability of waste services, and participation in community-based activities (all statistically significant).

The research concluded that poor management of waste within households in Ethiopia is influenced by low awareness, inadequate infrastructure, and lack of involvement within the communities and advised on enhancing environmental education programs, infrastructure, and mechanisms of enforcing policies. However, even with its methodological soundness, the study has several weaknesses. In terms of the context, the application of meta-analysis makes it difficult to analyze specific social and cultural elements that could influence the behavior of people towards household waste management. In terms of the methodology, the reliance on secondary sources of information hinders the inclusion of current realities experienced within the households. Finally, the study did not consider the mechanisms for influencing behaviors of people through incentivization and development of trust among others.

In filling these gaps, the present study collected primary data through the use of an interview at the household level within Ngaba Municipality to analyze socio-economic barriers to waste management practices in light of their local context. This was done by the inclusion of socio-cultural, behavior, and trust factors in the study's analysis, which utilizes the mixed methods approach of convergent research design combining both inferential statistics and qualitative perspectives. Furthermore, the study adopted intervention methodologies, including community engagement and social work interventions.

Regarding the problem of waste collection, Holenu et al. (2022) investigated waste management infrastructure in the Democratic Republic of Congo's capital city of Kinshasa. The authors applied descriptive survey research design, emphasizing evaluating the availability and effectiveness of waste management infrastructure. They targeted municipal government officials and household members, adopting purposive and convenience sampling approaches due to feasibility challenges. They used questionnaires and field observations to collect quantitative data on frequency, infrastructure availability, and waste disposal practices. Quantitative data analysis was confined to descriptive statistics such as frequency and percentage distribution. The results showed that only less than 30% of the waste gets collected because of poor infrastructure and ineffective municipal services. The authors proposed improving infrastructure and waste collection services. Nevertheless, the researchers failed to apply inferential statistics in their work, which might have established relationships among study variables. Further, there is no evidence of behavioral and participatory analysis. Thus, the proposed study made up for these shortcomings through inferential statistics like correlation and regression analysis.

At the local level, Sata (2025) carried out a study assessing inequalities in provision of waste management services in Ngaba Municipality. The study employed a cross-sectional survey approach in assessing households in varying socio-economic zones. A stratified sampling technique was used to obtain a representative sample of households in both high- and low-income zones. Data were obtained via administration of structured questionnaires while the analysis employed descriptive statistical methods as well as inferential techniques such as chi-square tests and ANOVA to determine whether there are any disparities in waste management practices. Significant disparities were identified where waste management services were inconsistent and inadequate in low-income zones. The study recommended an equitable distribution of waste management services among socio-economic zones but presented an apparent conceptual gap in the lack of participatory practices and approaches. The present study aimed at addressing the identified gap by exploring participatory waste management initiatives.

Furthermore, McCabe (2020) carried out research on the significance of social work to improve community participation. The study used qualitative research designs through interview and document analysis for data collection. Thematic analysis was used to analyze data, showing that social work is significant in mobilizing,

educating, and advocating for communities. The study suggests incorporating social work methods to enhance community development projects. Nevertheless, the study has a methodological flaw since it does not quantitatively validate the results generated. The current study addressed this gap by using both quantitative and qualitative measures to gauge community participation.

1.5 Research Methodology

Research approach and design: The study used a mixed methods approach adopting the convergent parallel mixed methods design, where data was collected simultaneously, analyzed separately and the findings integrated during interpretation. Surveys and/or questionnaires was applied to collect quantitative data while interviews, focus group and observation helped to collect qualitative data.

Site Description: Ngaba municipality is one of the smallest municipalities in Kinshasa, with a space of 42 square Kilometers and one of the poorest regions, with limited access roads and unplanned urban space, unclear source of income and limited access to the basic social services (UN Habitat, 2019; Wilfried K, 2017). Ngaba as a municipality is a populated urban zone, with 300, 000 habitants in 6 square kilometers and is divided into 6 administrative subdivisions: Mukula, Luyi, Mpila, Baobab, Bulambemba and Mateba (UN Habitat, 2019; Kaza & al., 2018). The study therefore collected data from these administrative areas.

Study Population: The population for the current study consisted of residents living in Kinshasa city, with a special emphasis on Ngaba municipality because of the peculiar household waste management issues engendered by its rapid urbanization, inadequate infrastructure, and appealing pattern of settlement to people. This included all 5,985 household heads in Ngaba and 8 community representatives (Health Zone Office, 2023).

Sampling Techniques and Sample size: A stratified sampling method was adopted to ensure that all important subgroups of the Ngaba commune population are proportionally represented. To determine the house hold representatives' sample size, we used Yamane's (1967) formula with a level of precision of 5% (0.05). The household representatives were 386 and 8 community representatives.

Methods and Instruments of Data Collection and analysis: The study used a mixed-methods design to understand how community in Ngaba participates in the management of household waste. Primary Data collection methods included structured questionnaires with the household heads, semi-structured interviews, focus group discussions with the community representatives and observation techniques. The quantitative data gathered using questionnaires was first be cleaned, coded, and analyzed using statistical techniques with the help of SPSS Version 27. Frequency distribution, percentages, means, and standard deviations was employed for the generation of descriptive statistics to report the demographic details of the respondents along with general trends on the practice of waste management in households. In the qualitative phase of this study, the data collected was analyzed using a Semantic Thematic Analysis by following a six-step process as suggested by Creswell (2018). Direct quotes were also used in establishing the main themes identified in this study.

1.6 Study Findings and Discussion

Response Rate

The study sample comprised of 386 heads of households, with 350 responding to the questionnaires, representing a 90.7% response rate. The study also targeted 8 community representatives who were interviewed, all of whom participated, representing a 100% response rate. The findings are presented in Table 1. Poynton, et al. (2019) noted, a response rate above 70% is sufficient for representing a sampled population, thus the rate obtained in this study is considered highly satisfactory and adequate for reliable statistical analysis.

Table 1. Response Rate

Participants	Distributed Questionnaires	Returned questionnaires	Response rate (%)
Heads households	386	350	90.7
Local authorities	8	8	100

Source: *Field data, 2025*

Socio-Economic Barriers Towards Community Participation in Waste Management

This section discusses the socio-economic barriers that influence community participation in the management of waste. It points out the economic and social impediments that influence the participation of residents in the proper management of their waste in the Municipality of Ngaba, DRC. Results are as shown in the Table 2.

Table 2. Barriers to Waste Management Participation

	N	Mean	Std. Deviation
Lack of infrastructure	350	1.9714	.75267
Lack of government support	350	2.0171	.80453
Limited awareness campaigns	350	2.0029	.68758
Lack of incentives for participation	350	1.9486	.66228
Time constraints	350	1.8829	.71856
Cultural attitudes	350	1.6943	.70668
Gender disparities	350	1.5771	.72495
Valid N (listwise)	350		

Source: *Field data, 2025*

The findings presented in Table 2 indicate the major socio-economic and cultural factors that affect community participation in waste management in the Municipality of Ngaba. From the factors analyzed, the lack of support from the government received the highest mean score ($M = 2.02$, $SD = .805$). This implies that the community perceived the lack of support from the government as the major factor that affects community participation in waste management. More factors that received high mean scores include the lack of awareness campaigns ($M = 2.00$, $SD = .688$) and lack of infrastructure ($M = 1.97$, $SD = .753$). This implies that the community perceived the lack of awareness campaigns and infrastructure as major factors that affect community participation in waste management.

Other factors that affect community participation in waste management in the Municipality of Ngaba include the lack of incentives ($M = 1.95$, $SD = .662$), lack of enough time ($M = 1.88$, $SD = .719$), cultural factors ($M = 1.69$, $SD = .707$), and gender factors ($M = 1.58$, $SD = .725$). This implies that the community perceived the lack of incentives and lack of enough time as factors that affect community participation in waste management. This finding is consistent with earlier research by United Nations, through the United Nations Environment Program (UNEP), which emphasized that low awareness and community participation in waste management are due to gaps in infrastructure, lack of funding and the absence of ongoing awareness-raising policies (UNEP, 2022).

Therefore, the analysis suggests that structural and institutional factors such as government support, awareness, and infrastructure are the most critical factors that hinder community participation in the management of household waste. Addressing such factors is likely to improve community participation in the management of waste in the municipality. This concurs with Mensah al., (2022) who found that waste management issues are caused not just by infrastructure gaps but also by insufficient public engagement and awareness. In response to the solutions to overcome barriers that prevent residents from participating in waste management initiatives, the respondents proposed various strategies which includes the need for the development of waste disposal facilities in the region. Several respondents pointed out the need for the provision of trash bins in the region. For example, a respondent pointed out that *“the government needs to install public trash cans and ensure regular garbage collection.”* Another respondent pointed out that *“we need plenty of rubbish bags and organized waste collection services in every neighborhood.”* This indicates that inadequate facilities are a major obstacle in waste management activities in the region.

In addition,

The respondents pointed out the need for the intervention of the government in waste management activities in the region. For instance, a respondent pointed out that *“the state must establish a waste management service and provide the necessary resources for sanitation.”* Another respondent pointed out that *“the government must finance sanitation programs and provide equipment such as trucks, tools, and centers.”* This indicates that effective waste management in the region requires effective government institutions. Similarly, another participant noted that *“the government must finance sanitation programs and provide equipment such as trucks, tools, and collection centers.”*

Another solution that was presented by the key informants was the need for public awareness and education about the environment. The participants noted the importance of sensitizing the residents about the need to maintain cleanliness in the environment. One of the key informants noted that *“we need to raise awareness among the population from a very young age.”* Another participant noted that *“schools should introduce environmental clubs and teach children about recycling and waste management.”* These views that indicated that residents believe that education is important in creating behavioral change.

Community participation and social mobilization were also commonly cited as effective approaches. The respondents recommended the utilization of youth groups, churches, and individuals in the implementation of activities related to sanitation. Some respondents recommended the organization of regular community clean-up activities. For instance, one respondent recommended that *“the community should organize clean-up days where residents work together to clean their neighborhoods.”* Another respondent recommended that *“youth associations and volunteers should be mobilized to support sanitation initiatives.”* Lastly, it was revealed, the respondents recommended economic incentives and recycling as approaches for encouraging people to take part in waste management activities. Some respondents recommended the application of reward systems as incentives for encouraging people in the proper disposal of waste. One respondent recommended that *“recyclable waste could be exchanged for vouchers or goods to motivate the population.”* Some respondents emphasized the need for recycling and transformation of waste into useful materials. In addition, one respondent recommended that *“waste can be transformed into energy or reused through recycling programs.”*

1.7 Conclusion

In conclusion, it was established that household waste management in Ngaba Municipality is greatly impeded by intertwined socioeconomic issues. It was also established that structural issues, including government support, infrastructure, waste collection services, and equipment, greatly contributed to a lack of willingness among residents to participate in waste management. Social and economic issues, including time constraints, cultural issues, gender issues, and economic issues, also contributed to a lack of participation among residents.

1.8 Recommendations

The study made a recommendation that the Ministry of Environment and Municipal Authorities (Ngaba Municipality): Enhance waste management processes through strengthening the service delivery process by ensuring there is enough infrastructure like waste bins, collection facilities, and waste collection services and addressing weaknesses in institutional capability which have made it hard to effectively engage with households on waste management

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