

Role of Private Sector in Solid Waste Management: A Case Study of Homeklin Uganda Ltd

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Abstract.

This study examined the role of the private sector in solid waste management, focusing on Homeklin Uganda Ltd as a case study. The study aimed to assess the impact of private waste collection services on waste management efficiency, environmental sustainability, and economic benefits in Uganda. Using a sample of 200 households, data were collected through surveys, interviews, and secondary sources, and analysed using descriptive statistics, regression analysis, chi-square tests, and cost comparison methods. The results indicated that private waste management services significantly improved waste collection frequency, customer satisfaction, and environmental outcomes, including pollution reduction and increased recycling practices. Private sector involvement was found to have a positive impact on waste collection efficiency, with regulatory support and financial stability playing key roles in its success. Despite the higher costs of private services, which presented an affordability challenge for some households, the study found that private waste management contributed to job creation and supported the economic development of urban areas. Based on these findings, the study recommended enhancing public-private partnerships, increasing investment in waste management infrastructure, and promoting community engagement to improve waste disposal practices. The study concluded that while the private sector played a critical role in enhancing waste management services, policy interventions were needed to address affordability and ensure sustainable, equitable service delivery.

Key Words: Private Sector in Solid Waste Management

Background of the Study

Solid waste management (SWM) remains a critical challenge in urban areas, particularly in developing countries where rapid urbanization and population growth exert immense pressure on waste collection and disposal systems. Traditional municipal solid waste management systems often face inefficiencies due to inadequate funding, limited technical expertise, and weak regulatory enforcement (Ajayi & Oyedele, 2018). As a result, improper waste disposal contributes to environmental degradation, public health risks, and unsustainable urban development. In response to these challenges, private sector involvement in SWM has gained prominence as an alternative or complementary approach to public sector efforts. The private sector's role in SWM includes waste collection, recycling, transportation, treatment, and final disposal, often under contractual agreements with local governments. Private firms bring in much-needed investment, innovation, and efficiency, which contribute to more effective waste management systems (Plesa et al., 2022). Homeklin Uganda Ltd is one of the private companies actively involved in SWM in Uganda. Established to bridge the gap between public sector inadequacies and the growing demand for efficient waste management services, Homeklin has positioned itself as a key player in the industry (Rath et al., 2020). The company offers services such as household and commercial waste collection, recycling initiatives, and environmentally friendly disposal solutions. By employing modern waste management technologies and engaging in public-private partnerships (PPPs), Homeklin Uganda Ltd has enhanced waste collection coverage and introduced innovative waste recycling

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methods (Hajrizi & Aliu, 2022). However, despite its contributions, challenges such as high operational costs, lack of regulatory support, and public apathy towards proper waste management continue to impact its effectiveness (Shin et al., 2019).

The role of private companies like Homeklin Uganda Ltd in SWM extends beyond waste collection and disposal to broader environmental sustainability and economic development. The company contributes to employment generation, promotes circular economy principles by supporting recycling initiatives, and enhances public awareness of waste management practices (Werkneh & Gebru, 2023). The integration of private firms in SWM aligns with global best practices, as seen in cities where PPPs have improved waste collection efficiency and reduced environmental hazards. However, the effectiveness of private sector participation depends on regulatory frameworks, community cooperation, and financial sustainability. Analyzing the case of Homeklin Uganda Ltd provides valuable insights into the strengths, challenges, and potential improvements in private sector-led waste management strategies (Curri et al., 2021).

Given the increasing role of private entities in SWM, this study seeks to assess the contributions, challenges, and opportunities associated with Homeklin Uganda Ltd's operations in Uganda. Understanding the company's impact on waste management efficiency, environmental sustainability, and economic development will provide policy recommendations for strengthening private sector involvement in SWM (Subha Pradha & Saranya, 2023). The role of the private sector in solid waste management (SWM) has been widely examined in global and regional studies, emphasizing its contribution to efficiency, innovation, and service delivery. Scholars argue that the involvement of private firms in SWM improves waste collection coverage, enhances recycling efforts, and fosters environmentally sustainable practices (Katusiimeh, 2015). According to ("Waste Material Recycling in the Circular Economy - Challenges and Developments," 2021), privatization of waste management services reduces the burden on municipal governments, enabling them to focus on policy formulation and regulatory oversight. Additionally, studies highlight the benefits of public-private partnerships (PPPs) in waste management, where local governments collaborate with private companies to provide waste collection and disposal services (Tam & Tam, 2006). In many developing countries, private sector involvement has proven effective in addressing gaps left by inefficient public waste management systems. However, researchers also caution that privatization may introduce challenges such as cost-related barriers, lack of regulatory enforcement, and social inequalities in waste service distribution (Huang et al., 2020).

In the Ugandan context, studies have explored the growing role of private waste management firms like Homeklin Uganda Ltd in improving urban cleanliness and environmental sustainability. According to (Nyika & Dinka, 2022), private companies in Uganda have contributed to job creation and increased waste collection efficiency, particularly in urban areas where public waste collection services are inadequate. However, challenges such as limited public participation, weak enforcement of waste management policies, and financial constraints hinder the effectiveness of private sector involvement. Scholars also note that community engagement and proper policy frameworks are essential for the success of private sector-led waste management initiatives (Jawaid et al., 2023).

Problem Statement

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Solid waste management (SWM) remains a significant challenge in Uganda, particularly in urban areas where population growth, industrialization, and inadequate public waste management systems have led to increased waste generation. The inability of municipal authorities to effectively collect, transport, and dispose of waste has resulted in environmental pollution, health hazards, and poor urban sanitation. Public waste collection services in Uganda are often characterized by inefficiency, irregular waste collection schedules, and inadequate coverage, especially in informal settlements (Zhdanova et al., 2022). As a result, private sector involvement in waste management has emerged as an alternative solution to bridge the service delivery gap. Companies like Homeklin Uganda Ltd have stepped in to provide waste collection, recycling, and disposal services, aiming to improve sanitation and promote environmental sustainability. However, despite the increasing reliance on private companies, there is limited research on the extent to which their involvement effectively addresses Uganda's solid waste management challenges (Panashe & Danyuo, 2020).

While private sector participation in SWM has introduced efficiency and innovation, several challenges continue to hinder its effectiveness. High operational costs, inadequate regulatory frameworks, limited public awareness, and weak enforcement of waste management policies pose significant obstacles to private sector success. Additionally, many households and businesses still lack the willingness or ability to pay for private waste collection services, limiting the reach and financial sustainability of companies like Homeklin Uganda Ltd (Lamba et al., 2022). Furthermore, there is a need to assess the impact of private waste management firms on environmental conservation, employment generation, and overall waste reduction. Without a comprehensive evaluation of the effectiveness and sustainability of private sector involvement in SWM, policymakers may struggle to develop frameworks that maximize private-public collaboration. This study seeks to examine the role of Homeklin Uganda Ltd in Uganda's waste management sector, identify the key challenges it faces, and explore potential solutions to enhance private sector contributions to sustainable waste management.

Objectives of the study

1. To assess the efficiency and effectiveness of Homeklin Uganda Ltd in solid waste collection, recycling, and disposal
2. To identify the key challenges faced by Homeklin Uganda Ltd in the implementation of solid waste management services
3. To evaluate the impact of private sector involvement in solid waste management on environmental sustainability and economic development in Uganda

Study Hypotheses

1. **H₁:** The involvement of Homeklin Uganda Ltd in solid waste management significantly improves waste collection efficiency and urban sanitation in Uganda.
2. **H₂:** Regulatory challenges, financial constraints, and limited public awareness negatively impact the effectiveness of Homeklin Uganda Ltd's solid waste management services.
3. **H₃:** Private sector participation in solid waste management contributes positively to environmental sustainability and economic development in Uganda.

Methods

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This study employed a descriptive and analytical research design to assess the role of Homeklin Uganda Ltd in solid waste management. The target population comprised households, business owners, and waste management professionals within Kampala, where Homeklin Uganda Ltd operates extensively. A stratified random sampling technique was used to ensure a representative sample, categorizing respondents into residential users, commercial users, and key stakeholders such as company employees and municipal officers. The study sample size was determined using Cochran’s formula for proportions:

$$n = \frac{Z^2 P(1 - P)}{e^2}$$

where n is the required sample size, Z is the z-score corresponding to a 95% confidence level (1.96), P is the estimated proportion of the population using private waste collection services (assumed at 50% or 0.5 for maximum variability), and e is the margin of error (set at 5% or 0.05). This yielded a sample size of approximately 384 respondents (Nelson et al., 2022, 2023). Data were collected through structured questionnaires distributed to households and businesses, as well as key informant interviews with waste management officials and Homeklin Uganda Ltd representatives. Additionally, secondary data on urban waste management trends were sourced from online reports, government publications, and academic articles.

The study employed both descriptive and inferential statistical methods to analyze the data. Descriptive statistics, including frequency distributions and measures of central tendency, were used to summarize household participation in private waste management, waste collection efficiency, and public perception of Homeklin Uganda Ltd. Inferential analysis was conducted using multiple regression and hypothesis testing to examine the relationship between private sector involvement and solid waste management outcomes. A logistic regression model was applied to determine the likelihood of improved waste collection efficiency based on factors such as private sector participation, regulatory frameworks, and financial constraints. The model was formulated as follows:

$$\log \left(\frac{P}{1 - P} \right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

where P represents the probability of efficient waste management, X_1 is private sector involvement, X_2 is regulatory support, X_3 is financial capacity, and ϵ is the error term. The justification for using logistic regression was based on the binary nature of the dependent variable (efficient vs. inefficient waste management) and its ability to handle categorical predictors. Furthermore, hypothesis testing was conducted using chi-square tests to assess whether significant associations existed between private waste collection services and environmental sustainability. The combination of these methods ensured a comprehensive evaluation of Homeklin Uganda Ltd’s role in solid waste management and provided empirical evidence to inform policy recommendations.

Results

Table 1: Descriptive Statistics of Waste Collection Efficiency

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>
<i>Frequency of Waste Collection (per week)</i>	3.2	1.1	1	7

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<i>Satisfaction with Waste Collection (1-5 scale)</i>	3.9	0.8	1	5
<i>Household Waste Generation (kg per day)</i>	2.5	0.9	1.0	5.5

The waste collection efficiency data revealed that waste was collected 3.2 times per week on average, with a standard deviation of 1.1 and frequency ranging from once to seven times weekly. Residents generally expressed satisfaction with the waste collection services, giving an average rating of 3.9 out of 5 (standard deviation of 0.8), with ratings spanning the entire 1-5 scale. Household waste generation averaged 2.5 kg per day with moderate variation (standard deviation of 0.9 kg), and daily waste production ranged significantly from 1.0 kg to 5.5 kg. Overall, the findings indicated a moderately frequent waste collection system that most residents were satisfied with, despite notable variations in both service frequency and household waste production levels.

Table 2: Multiple Regression Results on Factors Affecting Waste Collection Efficiency

<i>Variable</i>	<i>Coefficient (β)</i>	<i>Standard Error</i>	<i>t-Statistic</i>	<i>p-Value</i>
<i>Private Sector Involvement (X_1)</i>	0.65	0.12	5.42	0.000
<i>Regulatory Support (X_2)</i>	0.38	0.10	3.80	0.001
<i>Financial Capacity (X_3)</i>	0.42	0.09	4.67	0.000
<i>Constant (β_0)</i>	1.21	0.34	3.56	0.002
R^2	0.62			

The regression results showed that private sector involvement had a statistically significant positive effect on waste collection efficiency ($\beta = 0.65$, $p < 0.01$), confirming its role in improving urban sanitation. Regulatory support ($\beta = 0.38$, $p < 0.01$) and financial capacity ($\beta = 0.42$, $p < 0.01$) also had significant positive impacts, indicating that government policies and financial stability are crucial for enhancing private sector effectiveness. The model explained 62% of the variation in waste collection efficiency ($R^2=0.62$), suggesting a strong predictive ability. These findings align with Guerrero et al.'s (2013) framework on sustainable waste management, which identified regulatory frameworks and institutional capacity as key determinants of successful private sector operations in waste management. The strong coefficient for private sector involvement ($\beta = 0.65$) supports Rodić and Wilson's (2017) proposition that market competition incentivizes operational efficiency improvements beyond what public systems typically achieve. The significant influence of financial capacity ($\beta = 0.42$) validates Abdrabo's (2021) research in East African urban centers, which demonstrated that well-capitalized private waste management firms could invest in superior collection technologies and route optimization systems. Additionally, the substantial explanatory power of the model ($R^2=0.62$) corresponds with Mwanza and Mbohwa's (2022) findings that identified multifactorial determinants of waste management efficiency, with private sector participation being the most influential factor. The importance of regulatory support ($\beta = 0.38$) further reinforces Dasgupta and Wheeler's (2023) institutional theory that effective waste management systems require both market mechanisms and appropriate government oversight to achieve optimal environmental and service delivery outcomes.

Table 3: Logistic Regression Results on the Probability of Efficient Waste Management

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Variable	Coefficient (β)	Odds Ratio	Standard Error	p-Value
Private Sector Involvement	1.45	4.26	0.35	0.000
Regulatory Framework	0.92	2.51	0.27	0.002
Household Willingness to Pay	0.78	2.18	0.24	0.005
Constant	-1.12	0.33	0.31	0.004

The logistic regression model indicated that private sector involvement significantly increased the likelihood of efficient waste management, with an odds ratio of 4.26 ($p < 0.01$), meaning households with access to private waste collection services were over four times more likely to experience efficient waste management. Regulatory framework ($OR = 2.51$, $p < 0.01$) and household willingness to pay ($OR = 2.18$, $p < 0.01$) also significantly contributed to waste management effectiveness.

Table 4: Chi-Square Test Results for Association Between Private Waste Collection and Environmental Sustainability

Variable	χ^2 Value	df	p-Value
Private Waste Collection & Reduced Pollution	21.56	1	0.000
Private Waste Collection & Recycling Practices	14.32	1	0.001
Private Waste Collection & Public Health Improvement	18.74	1	0.000

The chi-square test results revealed a statistically significant association between private waste collection and environmental sustainability indicators. Households that relied on private waste collection services reported significantly lower pollution levels ($\chi^2 = 21.56$, $p < 0.01$), higher recycling engagement ($\chi^2 = 14.32$, $p < 0.01$), and improved public health outcomes ($\chi^2 = 18.74$, $p < 0.01$).

Table 5: Comparative Analysis of Waste Management Costs Between Public and Private Sectors

Waste Management Provider	Average Monthly Cost (UGX)	Service Frequency (per week)	Satisfaction Score (1-5)
Public Service	10,000	1	2.8
Homeklin Uganda Ltd	20,000	3	4.2

Households using private waste collection services (Homeklin Uganda Ltd) paid an average of UGX 20,000 per month compared to UGX 10,000 for public services. However, the increased cost was associated with a higher service frequency (3 times per week vs. 1 time per week) and greater satisfaction (4.2 vs. 2.8 on a 5-point scale). These results indicated that private sector services, despite being costlier, provided better waste collection reliability and customer satisfaction.

Table 6: Employment Impact of Private Waste Management Services

Job Category	Number of Employees	Percentage (%)
Waste Collectors	250	50%
Recycling Workers	100	20%
Administrative Staff	80	16%
Logistics & Transport	70	14%

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Private waste management companies, such as Homeklin Uganda Ltd, contributed significantly to employment generation, with waste collectors forming the largest workforce (50%). Recycling workers comprised 20% of the workforce, highlighting the company's role in promoting sustainable waste management. The administrative and transport sectors also benefited from job creation, emphasizing the broader economic impact of private waste management services.

Discussion of Results

The findings of this study align with previous literature on the role of the private sector in solid waste management, confirming that private waste collection services contribute to improved efficiency, environmental sustainability, and economic benefits. The descriptive statistics revealed that Homeklin Uganda Ltd provided relatively frequent waste collection (3.2 times per week) and was associated with high customer satisfaction (Mean = 3.9, SD = 0.8). These findings are consistent with the work of (Mustafa & Moses, 2023), who argued that privatized waste collection services tend to be more efficient and responsive to household demands compared to public services. The higher frequency of waste collection by Homeklin Uganda Ltd, compared to municipal services, highlights the effectiveness of private-sector-led waste management in mitigating urban sanitation challenges, as emphasized in studies by (Mohajerani et al., 2020). Additionally, our findings on average household waste generation (2.5 kg per day) align with Okot-Okumu and Nyenje's (2021) research on East African urban areas, which found that privatization of waste collection led to more consistent service delivery and reduced illegal dumping. The significant variation in household waste generation (SD = 0.9 kg) further supports Mwangi and Thuo's (2022) argument that private waste management companies can better adapt to varying household needs through customized collection schedules. The theoretical framework proposed by Li et al. (2019) on public-private partnerships in waste management also explains our results, suggesting that the high satisfaction scores reflect improved service quality typically associated with competitive market dynamics. Furthermore, the maximum collection frequency of 7 times per week demonstrates the capacity for premium service delivery that Wilson and Velis (2024) identified as a key advantage of private sector involvement in waste management systems in developing urban contexts. The regression analysis further demonstrated that private sector involvement had a statistically significant positive impact on waste collection efficiency ($\beta = 0.65$, $p < 0.01$), supporting findings from Bartone (2000), who noted that private firms often have better operational structures, financial management, and incentives to ensure timely service delivery. Additionally, regulatory support ($\beta = 0.38$, $p < 0.01$) was found to be crucial for the success of private sector involvement, corroborating (Aisha & Rebecca, 2023a), who argued that ineffective policies and weak enforcement mechanisms hinder private firms' contributions to sustainable waste management. Furthermore, the logistic regression results showed that households relying on private waste collection services were over four times more likely to experience efficient waste management (OR = 4.26, $p < 0.01$). These results reinforce findings by (Aisha & Rebecca, 2023b), who emphasized that privatization of waste services improves operational efficiency when supported by regulatory frameworks and financial sustainability.

The chi-square test results provided further evidence that private waste collection is significantly associated with environmental benefits, including reduced pollution ($\chi^2 = 21.56$, $p < 0.01$), increased recycling practices ($\chi^2 =$

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14.32, $p < 0.01$), and improved public health outcomes ($\chi^2 = 18.74$, $p < 0.01$). These findings resonate with work by Ogawa (2008), who emphasized that private-sector-led waste management leads to better waste segregation, reduced landfill dependency, and lower environmental degradation. Additionally, the comparative cost analysis revealed that while private waste collection was more expensive than public services (UGX 20,000 vs. UGX 10,000 per month), it provided higher service frequency and customer satisfaction. This supports previous studies which highlighted that households are often willing to pay higher fees for reliable and efficient waste collection services. Lastly, the study confirmed the employment-generating potential of private waste management, with Homeklin Uganda Ltd employing significant numbers of waste collectors, recyclers, and administrative personnel. These results align with Kaza et al.'s (2018) comprehensive World Bank study on solid waste management, which identified private sector participation as a key driver for improving collection efficiency and environmental outcomes in developing economies. Our chi-square findings on increased recycling practices corroborate Amoani and Bright's (2022) research in Sub-Saharan Africa, which demonstrated that private waste management firms are more likely to implement resource recovery systems. The significant association with improved public health outcomes ($\chi^2 = 18.74$, $p < 0.01$) further validates Zurbrügg et al.'s (2023) theoretical framework linking efficient waste collection to reduced disease vectors in urban environments. The willingness of households to pay premium prices for better service quality reflects Marshall and Farah bakhsh's (2020) economic analysis of waste management systems, which proposed that perceived value rather than absolute cost determines service adoption rates. Furthermore, our findings on employment generation support Medina's (2021) socio-economic model of waste management, which positions the private waste sector as a significant contributor to formal employment opportunities in emerging economies, particularly for previously informal waste workers.

Conclusion

This study examined the role of the private sector in solid waste management, using Homeklin Uganda Ltd as a case study. The findings revealed that private waste collection services significantly improved waste management efficiency, environmental sustainability, and economic benefits. Households that relied on private services reported higher waste collection frequency, greater satisfaction, and better waste disposal practices compared to those dependent on public waste services. These results reaffirmed existing literature, which suggested that privatization enhances operational efficiency through better resource management, financial investments, and service reliability. However, while private waste collection was found to be more effective, its higher costs posed an affordability challenge for low-income households, indicating the need for subsidy mechanisms or cost-sharing models.

The statistical analyses confirmed that private sector involvement had a significant positive impact on waste collection efficiency. Factors such as regulatory support and financial stability were also crucial in determining the effectiveness of private waste management services. The chi-square tests further established a strong association between private waste collection and environmental benefits, including pollution reduction, increased recycling practices, and improved public health. These findings underscored the importance of an enabling policy environment, where government agencies collaborated with private firms to ensure regulatory

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compliance, financial viability, and equitable service delivery. Furthermore, the study highlighted the economic benefits of private waste management, particularly in employment generation. Homeklin Uganda Ltd provided job opportunities across different categories, including waste collection, recycling, and logistics, supporting the broader socio-economic development of urban areas. The cost comparison between public and private waste management services also demonstrated that while private services were more expensive, they offered superior service quality and higher customer satisfaction. This called for policy interventions to make private-sector waste management more accessible to a wider population. In conclusion, the study confirmed that the private sector played a critical role in enhancing waste management services in Uganda. However, challenges such as financial constraints, regulatory bottlenecks, and affordability barriers remained key areas that required intervention.

Recommendations

Enhance Public-Private Partnerships (PPPs): Given the positive impact of private sector involvement in waste management, it is recommended that the Ugandan government strengthen public-private partnerships (PPPs) to optimize waste collection services. These partnerships could help mitigate the financial challenges faced by private companies and ensure that waste management services are accessible to a wider population.

Increase Investment in Infrastructure and Capacity Building: The study highlighted the importance of financial stability and regulatory support for the success of private waste management services. It is recommended that the government and private sector invest in infrastructure development and capacity building for waste management companies. This includes the provision of waste collection equipment, recycling facilities, and training programs for employees. Additionally, strengthening the regulatory framework to ensure compliance with waste management standards and policies will further enhance the effectiveness of private sector-led waste management, promoting both operational efficiency and environmental sustainability.

Promote Awareness and Community Engagement on Waste Management: To maximize the benefits of private waste collection services, it is essential to promote public awareness and community engagement on the importance of waste separation, recycling, and sustainable disposal practices. This can be achieved through community outreach programs, educational campaigns, and collaboration with local leaders to inform residents about the advantages of privatized waste management services.

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