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Waste Collection and Disposal Service Gaps in an Urban Community of Kano State, Nigeria

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Abstract
Effective urban waste management depends not only on the generation of waste but also on the availability, accessibility and reliability of collection and disposal services. This study examined household waste collection and disposal services in Bompai Community, Kano State, Nigeria, with emphasis on disposal methods, access to designated collection facilities, collection frequency, residents' satisfaction and socioeconomic characteristics associated with disposal choices. A quantitative cross-sectional survey was conducted among 177 respondents selected from 1,298 residential buildings across four districts of Bompai Community. Data were analysed using frequencies, percentages, multinomial logistic regression and the Pearson chi-square test of independence. The findings show that informal private waste collectors, locally referred to as "Baro boys", constituted the principal disposal arrangement, reported by 59.9% of respondents, while 24.9% relied on open dumping. Access to designated waste bins or collection points was limited, with 75.7% reporting that such facilities were not available near their homes. Formal private collection was also irregular: 45.8% reported irregular collection and 32.2% reported no collection. Consequently, 91.0% of respondents were dissatisfied with the existing waste-disposal system. The multinomial model showed significant associations of age, occupation and income with disposal method, while education was not significant. Disposal method was also significantly associated with residents' satisfaction. The study concludes that the waste-management problem in Bompai is closely connected with weaknesses in service provision and infrastructure. It recommends improved collection coverage, accessible collection points, reliable service schedules, stronger monitoring and the regulated integration of informal collectors into the urban waste-management system.
Keywords: household waste, waste collection, informal collectors, service delivery, residents' satisfaction
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1. Introduction

Solid waste management is a central concern of urban development because the effectiveness of cities depends partly on their ability to collect, transport and dispose of household waste in a manner that protects the environment and supports acceptable living conditions. In many developing-country cities, however, the growth of residential areas has not been matched by equivalent expansion in collection infrastructure and service capacity. Waste may therefore remain uncollected, be taken to unauthorised locations, or be handled through informal arrangements. In this context, waste collection is not merely a technical activity; it is a basic urban service whose accessibility and reliability influence the way households manage the waste they generate.

The Nigerian situation illustrates this service challenge. The Nigeria General Household Survey Panel 2023–2024 shows that only 4.2% of households reported government collection and 5.5% reported collection by a private firm or individual. In contrast, 43.1% reported informal disposal on land and 27.6% reported burning (National Bureau of Statistics [NBS], 2024). These figures point to a waste-management system in which formal collection reaches a relatively small proportion of households and many households depend on self-disposal or informal arrangements. Xu (2024) similarly argues that the effectiveness of environmental regulation in Nigeria is closely related to the availability of physical waste-management facilities. His analysis showed that the introduction of bins alongside regulation produced greater changes in disposal behaviour than regulation without corresponding facilities.

The structure of waste collection in Nigerian cities is also characterised by interaction between formal institutions and informal operators. Informal collectors often provide services in locations where formal collection is limited or unreliable. Chukwuone, Amaechina and Ifelunini (2022), in their study of Lagos, found substantial reliance on informal collectors and showed that household disposal choices were associated with the availability of waste-management facilities and socioeconomic characteristics. Ezebilo and Animasaun (2012), examining public-private participation in household waste management in southwestern Nigeria, likewise emphasised the importance of monitoring and accountability in ensuring that partnerships translate into effective services. More recently, Adewole and Akinmoladun (2026) found a hybrid waste-collection system in selected Abuja residential areas involving private providers, government services and informal collectors, with differences in service quality and household satisfaction across residential settings.

Residents' satisfaction is another important consideration in assessing urban waste services. The existence of a collection provider does not necessarily mean that the service is adequate from the household perspective. Frequency of collection, accessibility, reliability and the condition of the surrounding environment all influence residents' assessment of service performance. Adeniyi, Olayiwola and Ademola (2024), for example, found that municipal waste collection in Ede was irregular during the COVID-19 lockdown and that residents' satisfaction with the service was low. Aminu et al. (2022), studying non-service areas in Jigawa State, also demonstrated that the absence or inadequacy of formal collection created a need for alternative collection arrangements and called for stronger institutional and legal arrangements for integrating non-formal collectors.

These studies establish that waste collection in Nigeria should be examined as a service-delivery issue involving infrastructure, institutional arrangements, private and informal providers, service regularity and users' experience. Yet evidence at neighbourhood level remains important because city-wide and national statistics may conceal substantial differences in the services actually available to households. Bompai Community in Kano State provides a useful case for such an examination. The study focuses on the waste-disposal arrangements used by households, the availability of designated collection facilities, the frequency of formal private collection, residents' satisfaction and the socioeconomic characteristics associated with disposal choices.

The study therefore examines household waste collection and disposal services in Bompai Community, Kano State. Specifically, it seeks to examine the major waste-disposal methods used by residents; assess access to designated waste bins and collection points; examine the frequency and reliability of waste-collection services; assess residents' satisfaction with the existing waste-disposal system; and determine whether selected socioeconomic characteristics are associated with household waste-disposal choices.

2. Literature Review

2.1 Urban waste collection and disposal services

Urban waste management comprises a chain of activities that includes storage, collection, transportation, treatment and final disposal. Collection is a particularly important link because weaknesses at this stage are immediately experienced at household and neighbourhood levels. Imam, Mohammed, Wilson and Cheeseman (2008) observed that solid waste management in Abuja was constrained by institutional and operational weaknesses, illustrating the difficulty of maintaining effective collection systems in rapidly expanding Nigerian cities. Fakunle (2024), in a review of household solid waste management in Nigeria, similarly notes that the country's waste problem is shaped by deficiencies in collection, disposal infrastructure, institutional coordination and household practices.

Recent national evidence provides a broader picture. The NBS (2024) General Household Survey reports that informal disposal on land was the most commonly reported household refuse-management option, while government and private collection accounted for much smaller shares. The figures suggest that formal collection services do not yet provide sufficiently broad coverage. For urban communities, this raises questions about whether households have access to reliable collection points and whether service providers can maintain regular collection schedules.

The availability of infrastructure is central to this question. Xu (2024) found that Nigeria's environmental regulation had stronger effects on household disposal behaviour where regulatory implementation was accompanied by the provision of waste bins. Where facilities were absent, regulation alone did not produce

comparable improvements. The implication is that waste policy cannot be separated from the physical infrastructure through which households are expected to comply. Collection points, bins, transport arrangements and disposal facilities form part of the service system itself.

The service-delivery perspective is also supported by recent evidence on the institutional conditions surrounding household disposal. Xu and Kang (2025), using national Nigerian household data, report that state-level waste-management authorities are associated with more sustainable disposal practices, particularly where administrative intervention improves access to waste bins and reduces collection costs. Their findings reinforce the argument that household disposal decisions are shaped not only by individual preferences but also by the institutional and infrastructural environment within which services are provided. For neighbourhood-level analysis, this suggests that the presence, accessibility and affordability of collection facilities should be considered alongside household characteristics when evaluating disposal practices.

2.2 Formal and informal waste collection systems

Waste collection in Nigerian cities is frequently characterised by the coexistence of public authorities, formal private operators and informal collectors. This mixed arrangement reflects the practical difficulty of providing universal formal collection in rapidly growing urban areas. Informal operators can reach households that are poorly served by formal systems and may provide door-to-door collection at a time or location convenient to residents.

Chukwuone et al. (2022) provide empirical evidence of this pattern in Lagos. Their study found that informal collectors or cart pushers were widely used by households, while government or government-appointed private-sector facilities also served a substantial proportion of respondents. The study demonstrates that informal collection is not necessarily a peripheral activity; in some Nigerian urban communities it forms part of the everyday waste-service structure. Ezebilo and Animasaun (2012) similarly found that residents' perceptions of public-private waste-management arrangements were influenced by the effectiveness of service provision and the degree of public-sector monitoring and accountability.

The recent study by Adewole and Akinmoladun (2026) reinforces the hybrid character of Nigerian waste collection. Examining selected residential areas in Abuja, the authors found that private providers, government services and informal collectors all formed part of the collection system and that service quality and household satisfaction varied across residential typologies. Omokaro et al. (2026), in a scoping review of Nigerian waste-management studies, identify fragmented institutional mandates, weak enforcement, infrastructure deficiencies and the marginalisation of informal waste workers as interconnected features of the national waste-management problem. Their analysis points towards formal integration of informal workers, supported by appropriate safety, financing and regulatory arrangements.

The literature therefore suggests that informal collection should be understood in relation to the deficiencies of the wider service system. The presence of informal collectors may indicate unmet demand for collection rather than simply poor household behaviour. At the same time, informal collection without appropriate regulation may create difficulties in monitoring where waste is ultimately taken and how it is disposed of. The policy question is consequently not whether informal operators should simply be removed, but how their activities can be brought within a more accountable and coordinated urban waste-management system.

Recent evidence further demonstrates that informal and private actors remain important components of Nigeria's waste-service chain. Afon et al. (2026), examining private-sector participation in solid waste collection and transportation in Lagos Metropolis, found that private operators undertake regular collection and transportation activities but require effective monitoring, facilitation and regulation for improved performance. At a broader system level, Ezeudu and Ugochukwu (2026) show that the informal waste sector contributes substantially to collection, transportation, sorting, resource recovery and recycling in Nigeria, while also facing institutional and operational constraints. These studies strengthen the case for viewing informal collectors as service actors whose contribution needs to be coordinated and regulated rather than treated only as an alternative to formal provision.

2.3 Accessibility, service regularity and household disposal behaviour

Accessibility is fundamental to the use of waste-collection services. Households are more likely to depend on available collection arrangements when bins or collection points are located within reasonable reach, collection schedules are known, and services are sufficiently regular. Where these conditions are absent, households may

resort to open land, roadsides, drainage channels, burning or informal collectors. Disposal behaviour is therefore shaped partly by the choices that the local service environment makes available.

Evidence from Nigeria supports this service-based interpretation. The NBS (2024) reports high levels of informal land disposal and burning nationally, while formal government and private collection account for comparatively small proportions. Xu (2024) further demonstrates that the provision of bins matters because regulatory measures produced greater improvements in disposal practices where facilities were introduced. Chukwuone et al. (2022) also found that the availability of waste-management facilities was related to household disposal choices in Lagos.

Socioeconomic circumstances may also influence the choice of disposal arrangement. Chukwuone et al. (2022) found that household characteristics and service conditions were associated with disposal practices. Such evidence suggests that waste-disposal behaviour should not be interpreted exclusively as a consequence of environmental awareness or formal education. Economic circumstances, occupational patterns, service affordability and physical access to collection facilities may also shape the alternatives available to households.

The issue of regularity is equally important. A collection service that is formally available but operates intermittently may not provide a dependable household waste-management solution. Adeniyi et al. (2024) found irregular municipal collection in Ede and associated this with low resident satisfaction. Aminu et al. (2022), studying non-service areas in Jigawa State, similarly found that the limited reach of formal collection created a role for non-resident collectors and argued for stronger institutional arrangements to improve service delivery. These findings point to the need to assess not merely whether a service exists but how consistently it functions.

The relationship between institutional capacity and household disposal is also evident in recent national analysis. Xu and Kang (2025) found that the influence of waste-management authorities is partly connected to the affordability and availability of waste-collection services, indicating that institutional arrangements can alter the practical options available to households. This is particularly relevant to communities where formal collection is intermittent or geographically uneven. In such settings, households may combine formal services, informal collection and self-disposal, making the local service environment an important explanatory context for observed disposal behaviour.

2.4 Residents' satisfaction with waste-management services and the evidence from Nigerian communities

Residents' satisfaction provides a useful way of examining waste management from the perspective of service users. Satisfaction reflects how households judge the adequacy, reliability and convenience of the services available to them. It can therefore complement technical assessments of collection coverage by revealing whether the service actually meets residents' expectations.

Adeniyi et al. (2024) found low satisfaction among residents of Ede during a period when municipal collection was irregular. Aminu et al. (2022) reported a more mixed pattern in non-service areas of Jigawa State, where residents recognised the contribution of non-resident collectors but also expressed dissatisfaction with the absence of formal collection. The difference between these findings is instructive: satisfaction may depend not only on whether an informal or formal collector is present, but also on the reliability, cleanliness, frequency and institutional support associated with the service.

The literature reviewed above points to a consistent concern in Nigerian urban waste management: households frequently operate within a fragmented service environment in which formal provision is incomplete, informal providers fill some of the gaps, infrastructure is unevenly distributed, and residents experience differences in service quality. However, fewer studies bring these dimensions together at the neighbourhood level by examining disposal method, access to designated facilities, collection frequency, socioeconomic differences in disposal choice and residents' satisfaction within the same empirical setting. This is the specific gap addressed by the present study in Bompai Community. By linking service characteristics with household experience, the study provides evidence of how weaknesses in the local collection system are reflected in residents' disposal arrangements and satisfaction.

Taken together, the literature indicates that satisfaction is best understood as an outcome of the interaction between service availability, reliability, accessibility and household circumstances. The evidence also suggests that the distinction between formal and informal providers should not be treated as sufficient on its own to explain residents' experiences. A service may be informal but valued when it is accessible and dependable, while

a formally organised service may receive poor assessments when collection is irregular or facilities are inadequate. The present study therefore treats satisfaction as a user-level indicator that complements the assessment of service coverage and disposal practices.

The literature reviewed above points to a consistent concern in Nigerian urban waste management: households frequently operate within a fragmented service environment in which formal provision is incomplete, informal providers fill some of the gaps, infrastructure is unevenly distributed, and residents experience differences in service quality. However, fewer studies bring these dimensions together at the neighbourhood level by examining disposal method, access to designated facilities, collection frequency, socioeconomic differences in disposal choice and residents' satisfaction within the same empirical setting. This study addresses this gap in the Bompai Community. By linking service characteristics with household experience, the study provides evidence of how weaknesses in the local collection system are reflected in residents' disposal arrangements and satisfaction.

3. Materials and Methods

3.1 Study area

The study was conducted in Bompai Community, Kano State, Nigeria. Bompai is an urban community comprising twelve districts, with a mixture of residential, commercial and industrial activities. The present study focused on four districts: Korau, Race Course, Bompai Police Station District and Batawa. These districts were selected because they contained substantial concentrations of residential buildings and provided an appropriate setting for examining household waste collection and disposal services (Figure 1).

The study focused on households' experiences of waste-management services, including how residents dispose of household waste, access to designated waste bins or collection points, the frequency of collection by formal private collectors, and satisfaction with the existing waste-disposal system.

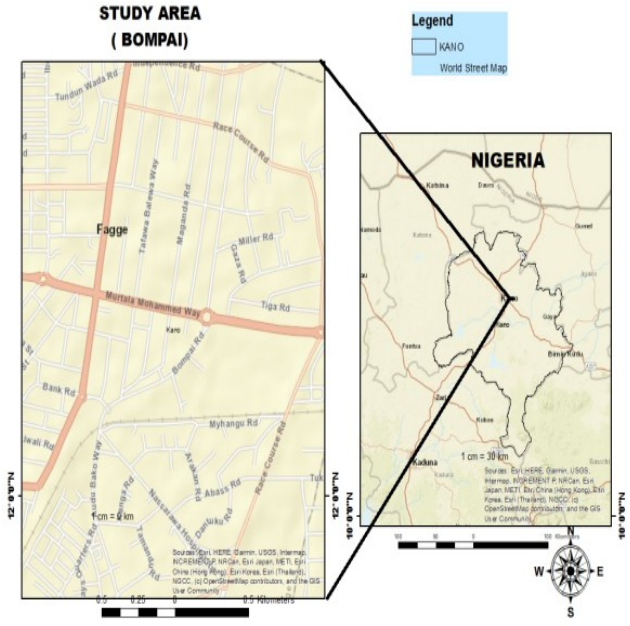


Figure 1. Bompai in the context of Kano State

Source: ArcMap, 2025.

3.2 Research design and data collection

The study adopted a quantitative cross-sectional survey design. Primary data were obtained from residents through a structured questionnaire. The questionnaire collected information on respondents' socioeconomic characteristics and household waste-management practices, with emphasis on waste-disposal methods, places of disposal, availability of designated waste bins or collection points, frequency of collection by formal private collectors and satisfaction with the current waste-disposal system.

Secondary spatial information was used to establish the sampling frame. Residential buildings within the selected districts were identified using Google Earth Pro, and QGIS and relevant spatial data were used to classify them. The mapped residential buildings were subsequently verified during fieldwork. The resulting sampling frame comprised 1,298 residential buildings.

3.3 Sampling procedure and sample size

The sampling frame consisted of 1,298 residential buildings across the four selected districts. A total of 177 residential buildings were selected for the survey, representing 13.64% of the identified residential buildings. The sample was proportionally distributed across the four districts according to the number of residential buildings identified in each district (Table1).

Table 1. Distribution of sampled residential buildings across the study districts

District	Residential buildings	Sampled buildings
Korau	330	45
Race Course	300	41
Bompai Police Station District	487	66
Batawa	181	25
Total	1,298	177

Source: Google Earth Pro, field verification and authors' field survey (2025).

The overall systematic sampling interval was calculated as $K = N/n = 1,298/177 = 7.33$. The interval was therefore operationalised as approximately every seventh residential building, following the identification of a random starting point. The predetermined proportional allocation for each district was maintained during selection. One eligible respondent was selected from each sampled residential building and administered the questionnaire.

3.4 Variables and analytical process

The principal dependent variables were household waste-disposal method and residents' satisfaction with the current waste-disposal system. Other service-related variables included place of disposal, availability of designated waste bins or collection points and frequency of waste collection by formal private collectors. The independent socioeconomic variables comprised age, education, occupation and income.

The analytical process followed the structure of the research objectives. First, frequencies and percentages were used to summarise respondents' socioeconomic characteristics and reported waste-management service experiences. Second, multinomial logistic regression was applied to examine whether age, education, occupation and income were associated with the reported waste-disposal method, which comprised multiple nominal categories. The overall model was assessed using the model chi-square, while likelihood-ratio chi-square statistics were used to examine the contribution of each socioeconomic predictor to the model. Third, Pearson's chi-square test of independence was used to examine the association between waste-disposal method and residents' satisfaction. The likelihood-ratio chi-square was also reported as a complementary test. Statistical decisions were made at the 5% significance level ($p < 0.05$). The analytical results are interpreted as associations because the cross-sectional design does not establish temporal or causal relationships.

3.5 Ethical considerations

Ethical procedures were observed during the field survey. Respondents were informed about the purpose of the study, and participation was voluntary. The author sought respondents' consent before administering the questionnaire, and only respondents who agreed to participate provided information. The information obtained was treated confidentially and used solely for academic purposes.

4. Results and Discussion of Findings

4.1 Socioeconomic characteristics and waste-disposal choices

The study comprised 177 respondents. Males accounted for 89.3% and females 10.7%. Respondents were distributed across the reported age categories: below 18 years (19.2%), 18–30 years (19.8%), 31–45 years (22.6%), 46–60 years (20.3%) and above 60 years (18.1%). In terms of education, 35.6% had tertiary education, 31.1% had primary education, 17.5% had secondary education, and 15.8% had no formal education. Businesspersons constituted 35.6% of respondents, followed by other occupations (26.0%), civil servants (15.8%), students (11.3%) and self-employed respondents (11.3%), as shown in Table 2. The highest income category was ₦61,000–₦80,000 (26.6%). These characteristics are important because household socioeconomic circumstances can shape the affordability, convenience and accessibility of alternative waste-disposal arrangements, as observed in the Lagos study by Chukwuone et al. (2022).

Table 2. Socioeconomic characteristics of respondents

Characteristic	Category	Frequency	Percentage (%)
Sex	Male	158	89.3
	Female	19	10.7
Age	Below 18	34	19.2
	18–30	35	19.8
	31–45	40	22.6
	46–60	36	20.3
	Above 60	32	18.1
Education	No formal education	28	15.8
	Primary	55	31.1
	Secondary	31	17.5
	Tertiary	63	35.6
Occupation	Businessperson	63	35.6
	Civil servant	28	15.8
	Student	20	11.3
	Self-employed	20	11.3
	Other	46	26.0
Income	Below ₦20,000	18	10.2
	₦21,000–₦40,000	43	24.3
	₦41,000–₦60,000	33	18.6
	₦61,000–₦80,000	47	26.6
	Above ₦80,000	36	20.3

Source: Author's field survey (2025).

4.2 Household waste-disposal methods

Informal private waste collection was the dominant disposal arrangement in Bompai. As shown in Table 3, 106 respondents (59.9%) reported using informal private waste collectors, locally referred to as "Baro boys". Forty-four respondents (24.9%) reported open dumping, while 10 respondents (5.6%) used community waste collection services. Burning accounted for 4.5%, while 5.1% reported other methods.

Table 3. Main method of household waste disposal

Waste-disposal method	Frequency	Percentage (%)
Open dumping	44	24.9
Burning	8	4.5
Community waste collection service	10	5.6
Informal private waste collection service ("Baro boys")	106	59.9
Others	9	5.1
Total	177	100.0

Source: Authors' field survey (2025).

The dominance of informal collection suggests that these operators make up a substantial part of the waste-service system households experience. This is consistent with Chukwuone et al. (2022), who found extensive use of informal collectors in Lagos. It is also consistent with the hybrid service structure reported by Adewole and Akinmoladun (2026) in Abuja. The Bompai result should therefore be read in the context of service availability: informal collectors may be responding to unmet demand where formal collection is inadequate. At the same time, the 24.9% reliance on open dumping shows that informal collection does not provide complete coverage.

4.3 Places where waste is disposed

The reported locations of disposal reinforce the evidence of limited access to organised waste services. Table 4 shows that open land was the most frequently reported disposal location (44.7%), followed by other locations (24.9%), roadside disposal (14.1%), waste collection centres (10.1%) and rivers or drainage channels (6.2%).

Table 4. Place of waste disposal

Place of disposal	Frequency	Percentage (%)
Roadside	25	14.1
Waste collection centre	18	10.1
River/Drainage	11	6.2
Open land	79	44.7
Others	44	24.9
Total	177	100.0

Source: Authors' field survey (2025).

The predominance of open land as a disposal location is consistent with the national pattern reported by the NBS (2024), in which informal disposal on land was the most common reported refuse-management option. The Bompai result is therefore not an isolated household preference but part of a broader Nigerian pattern in which formal collection does not reach all households. Xu (2024) further demonstrates that the availability of disposal facilities is an important component of policy effectiveness. Where appropriate facilities are absent, households face fewer practical alternatives to unauthorised disposal.

4.4 Availability of designated waste bins or collection points

Access to designated waste infrastructure was very limited. Table 5 shows that 134 respondents (75.7%) reported that there were no designated waste bins or collection points near their homes. Only 11 respondents (6.2%) reported that such facilities were available, while 32 respondents (18.1%) did not know whether such facilities existed.

Table 5. Availability of designated waste bins or collection points

Availability	Frequency	Percentage (%)
Yes	11	6.2
No	134	75.7
I do not know	32	18.1
Total	177	100.0

Source: Authors' field survey (2025).

This is one of the clearest service gaps identified by the study. The finding accords with Xu's (2024) national evidence that waste-management regulation is more effective when accompanied by the provision of physical facilities. In Bompai, the scarcity of designated collection points provides a plausible service-level explanation for the widespread use of informal collection and open disposal. The implication is that improving household behaviour cannot be separated from providing households with practical and accessible disposal options.

4.5 Frequency of waste collection by formal private collectors

The frequency of formal private collection was also poor. As shown in Table 6, 81 respondents (45.8%) reported irregular collection, 57 respondents (32.2%) reported that formal private collection did not occur at all, and 39 respondents (22.0%) reported monthly collection. No respondent reported daily or weekly collection.

Table 6. Frequency of waste collection by formal private collectors

Collection frequency	Frequency	Percentage (%)
Daily	0	0.0
Weekly	0	0.0
Monthly	39	22.0
Irregularly	81	45.8
Not at all	57	32.2
Total	177	100.0

Source: Authors' field survey (2025).

The finding indicates that the weakness in Bompai is not only limited coverage but also poor regularity. This agrees with Adeniyi et al. (2024), who reported irregular municipal waste collection and low resident satisfaction

in Ede. Aminu et al. (2022) similarly found that residents in non-service areas of Jigawa State relied on non-resident collectors where formal services were absent. The Bompai evidence therefore reinforces the importance of regular collection schedules and adequate service coverage rather than simply increasing the number of collection providers.

4.6 Residents' satisfaction with the waste-disposal system

Residents expressed a markedly negative assessment of the existing waste-disposal system. Table 7 shows that 161 respondents (91.0%) were not satisfied, compared with only 7 respondents (4.0%) who were satisfied and 9 respondents (5.0%) who were somewhat satisfied.

Table 7. Residents' satisfaction with the current waste-disposal system

Satisfaction level	Frequency	Percentage (%)
Yes	7	4.0
No	161	91.0
Somewhat	9	5.0
Total	177	100.0

Source: Authors' field survey (2025).

The very low level of satisfaction is consistent with the service deficiencies reported elsewhere in the study. The absence of nearby collection points and the irregular or absent formal collection provide concrete reasons for residents' negative assessment. Adeniyi et al. (2024) similarly found low satisfaction in Ede, where collection services were irregular. Aminu et al. (2022), however, reported that some residents in Jigawa accepted the services provided by non-resident collectors even though formal collection was limited. The difference suggests that satisfaction is influenced by the reliability and usefulness of the service actually available to households, rather than by whether a provider is formally or informally classified.

4.7 Socioeconomic characteristics and waste-disposal methods

The multinomial logistic regression model (Table 8) was statistically significant, $\chi^2(60) = 458.985$, $p < 0.001$. The likelihood-ratio tests showed that age, occupation and income were significantly associated with waste-disposal method, whereas education was not. Age recorded $\chi^2 = 64.596$, df = 16, $p < 0.001$; occupation recorded $\chi^2 = 53.558$, df = 16, $p < 0.001$; income recorded $\chi^2 = 75.799$, df = 16, $p < 0.001$; and education recorded $\chi^2 = 7.923$, df = 12, $p = 0.791$.

Table 8. Likelihood-ratio tests for socioeconomic predictors of waste-disposal methods

Predictor	Chi-square (χ^2)	df	p-value	Decision
Age	64.596	16	<0.001	Significant
Education	7.923	12	0.791	Not significant
Occupation	53.558	16	<0.001	Significant
Income	75.799	16	<0.001	Significant

Source: Authors' field survey (2025).

The results indicate that disposal choices differed significantly across age, occupation and income groups, whereas formal educational attainment did not significantly distinguish the disposal methods in the model. This finding is important because it cautions against treating inappropriate disposal principally as an educational problem. Chukwuone et al. (2022) similarly found that socioeconomic and service-related characteristics were associated with household disposal practices in Lagos. The Bompai result therefore supports a broader interpretation in which household circumstances interact with the service environment. The statistical relationships should, however, be interpreted as associations and not as evidence that age, occupation or income directly causes a particular disposal method.

4.8 Waste-disposal method and residents' satisfaction

The Pearson chi-square test (Table 9) showed a statistically significant association between waste-disposal method and residents' satisfaction, $\chi^2(8) = 247.915$, $p < 0.001$, based on 177 valid cases. The likelihood-ratio test was also statistically significant, $\chi^2(8) = 277.286$, $p < 0.001$. The null hypothesis of no association was therefore rejected.

Table 9. Chi-square test of waste-disposal method and residents' satisfaction

Test	Chi-square (χ^2)	df	p-value
Pearson chi-square	247.915	8	<0.001
Likelihood ratio	277.286	8	<0.001
Linear-by-linear association	0.796	1	0.372
Valid cases	177	—	—

Source: Authors' field survey (2025).

The result indicates that residents using different disposal arrangements did not report satisfaction at the same level. This finding is consistent with the broader argument that residents evaluate waste services in relation to their experience of accessibility, reliability and convenience. It does not, however, establish a causal relationship between disposal method and satisfaction. The association may reflect differences in service quality, collection frequency, accessibility, cost and the alternatives available to different households.

The findings present a coherent picture of the Bompai waste-service environment. Informal private collection is the principal disposal arrangement, open land is the most common reported disposal location, designated collection facilities are scarce, formal private collection is largely irregular or absent, and residents' satisfaction is very low. The socioeconomic analysis further shows that age, occupation and income are associated with disposal choices, while education is not. These findings support the position of Omokaro et al. (2026) that Nigeria's waste-management difficulties are systemic and involve infrastructure, governance, enforcement and the relationship between formal and informal actors. At neighbourhood level, the Bompai evidence shows how these broader weaknesses are reflected in residents' everyday waste-disposal arrangements.

5. Conclusion

This study examined household waste collection and disposal services in Bompai Community, Kano State, with particular attention to disposal practices, access to collection facilities, service regularity, residents' satisfaction and the socioeconomic characteristics associated with disposal choices. The evidence indicates that the local waste-management system is characterised by limited formal service provision and substantial dependence on alternative arrangements, particularly informal collection and disposal outside organised facilities.

The findings point to a service environment in which the availability and reliability of waste-collection infrastructure remain inadequate. The widespread use of informal collectors reflects the important role these operators play in meeting household waste-collection needs, while the continued use of open disposal indicates that some households still lack dependable and accessible alternatives. The low level of satisfaction reported by residents further indicates that the existing arrangements do not adequately meet household expectations of a functional waste-disposal service.

The statistical analysis shows that socioeconomic circumstances are relevant to household disposal choices, although education did not distinguish the reported disposal methods in the model. The significant relationship between disposal method and residents' satisfaction further demonstrates that household experience of waste management varies according to the disposal arrangements available to them. These relationships are associative and should not be interpreted as evidence of direct causation.

The neighbourhood-level evidence also has an important institutional implication. Improving household waste management in Bompai cannot depend solely on changing residents' disposal behaviour; it requires a service environment in which appropriate disposal options are physically available, collection is sufficiently regular, and both formal and informal providers operate within a coordinated framework. The findings therefore point to the need for an integrated service model that recognises the practical role of informal collectors while strengthening formal collection coverage, infrastructure provision and institutional oversight.

The study provides a focused account of waste-service conditions within selected districts of Bompai Community and should be interpreted within the limits of its cross-sectional design and study area. Nevertheless, the evidence provides a useful neighbourhood-scale basis for improving waste-service planning and for further research comparing service gaps across communities and residential settings in Kano State and other Nigerian cities.

6. Recommendations

The study recommends the provision of adequate and accessible designated waste-collection points within Bompai Community. Collection points and waste bins should be appropriately distributed in relation to residential density and household needs so that residents have practical alternatives to open-land, roadside and other inappropriate forms of disposal. Their provision should be accompanied by routine maintenance and timely evacuation of accumulated waste.

The regularity and coverage of formal waste-collection services should be improved through clear service schedules and systematic monitoring of compliance. Areas receiving irregular or no collection should be identified and prioritised for service improvement. Service providers should also establish mechanisms for responding promptly to missed collections and complaints so that households can depend on a predictable waste-collection service.

Informal collectors operating in Bompai should be recognised within the existing waste-management structure and progressively brought under an appropriate regulatory framework. Registration, basic training, operating guidelines, identification of collection routes and routine monitoring should be considered to improve accountability and service coordination. This would allow the collection role already performed by informal operators to be retained while improving control over collection and disposal practices. The institutional monitoring of both formal and informal waste-service providers should be strengthened. Monitoring should cover service coverage, collection frequency, responsiveness to complaints, operating practices and the final destination of collected waste. Also, accessible channels should be provided through which residents can report missed collections and other service failures. The information generated should be used regularly to assess service performance and guide corrective action.

Waste-management planning should take account of differences in household circumstances. Since socioeconomic characteristics were associated with disposal choices, service arrangements should not assume that all households face identical constraints. Consideration should therefore be given to household circumstances when planning collection arrangements, payment systems, communication approaches and community-level interventions.

Public awareness should form part of waste-management programmes, but awareness activities should complement rather than replace improvements in service provision. Residents need clear information on appropriate disposal practices, collection schedules and the locations of designated facilities, while the relevant authorities and service providers must ensure that suitable facilities and dependable collection services are available.

Community participation should also be incorporated into the monitoring and improvement of waste services in Bompai. Residents can contribute to decisions on suitable locations for collection points, report service failures and provide periodic feedback on collection performance. A simple neighbourhood monitoring arrangement involving residents, service providers and relevant authorities could help identify persistent service gaps, strengthen accountability and support continuous improvement in waste collection and disposal.

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