HOUSEHOLDERS' SATISFACTION TOWARDS SOLID WASTE COLLECTION SERVICES OF ZOOMLION GHANA LTD IN WA, GHANA

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Abstract

Solid waste management remains a major challenge to most governments in developing countries in view of the increasing volumes of waste materials generated and disposed to the environment in urban areas. As a result, many governments have embraced public-private partnerships to improve the effectiveness and efficiency in the delivery of waste management services. This study used a cross-sectional household survey to investigate householders' satisfaction with solid waste collection services provided by Zoomlion Ghana Ltd in the Wa Municipality. A total of 193 householders were selected through simple random sampling from registered household clients of Zoomlion Ghana Ltd in the Wa Municipality. The results of the study revealed that householders were 'moderately satisfied' with most waste management services delivered by the Company indicating an acceptable level of service delivery. The one-way ANOVA results showed significant differences in householders' satisfaction by income level and house type for service delivery dimensions on frequency of waste collection; handling of waste during transport and disposal; and household education on waste management. The study posits that although the services delivered by the company can be considered as acceptable, much improvement could be made by simply addressing issues on household education, prompt response to user complains and ensuring effective monitoring and sanctioning by the Municipal Assembly. This will enable Zoomlion Ghana Ltd deliver quality services to its clients.

Keywords: Householder satisfaction, waste management, Zoomlion, Wa, Ghana

Introduction

Solid waste management has become a major challenge in many cities in the developing world where hitherto waste management had been the sole responsibility of central government. The problems of solid waste in these countries have been worsened with rapid urbanization and growing numbers of slums resulting in major problems relating to public health, environmental pollution and aesthetic nuisance (Katusiimeh et al, 2012). Historically, in many developing countries in Africa, the public sector took monopoly of providing solid waste management services in urban cities and this was largely blamed for the mess in solid waste management. The public sector was commonly reported to be constrained due to lack of managerial and technical capacity, cumbersome procurement procedures and inadequate financial resources (Longe *et al*, 2009; Obirih-Opareh and Post, 2002). These constraints have resulted in an increased interest in Public–private partnerships in urban solid waste management in many developing countries in recent years with the main objective of improving efficiency in waste collection, reducing costs and reforming the weak performance of the public sector (Joness and Pisa, 2000; Rakodi, 2003).

In Ghana like most African countries, local government authorities have traditionally been responsible for public services including solid waste management services. However, due to government inability to provide adequate and efficient waste management services, private sector involvement in urban solid waste management was initiated in the early 1990s to reduce the financial burden on local governments, improve access to solid waste services and ensure efficient and quality service delivery. The move towards private sector involvement in waste management in the country was largely influenced by the World Bank sponsored Urban Environmental Sanitation Project (World Bank, 1996) and this has grown to receive backing from the National Environmental Sanitation Policy (1999) which was revised in September 2010. Currently, contracting out to the private sector has become the predominant approach for delivering waste management services in many cities in Ghana with the private sector collecting over 80% of the waste generated in many cities in Ghana.

Just as the benefits of private sector participation in waste management abound in literature (Baud, 2001, Helmsing 2000 cited in Oteng-Ababio, 2010), there are also inconclusive findings that seem to dispute the outlined benefits of the private sector and its superiority over the public sector (Awortwi, 2004). There is a growing recognition that for private sector to deliver its assigned duties, appropriate safeguards must be built to ensure that the private sector operates in a competitive and accountable environment (Cointreau-Levine, 1994; Awortwi, 2004; Oteng-Ababio, 2010). Among the key arguments for private sector participation in

waste management is to improve the quality of service delivery. Private waste management firms are therefore considered to be reliable and efficient in delivering waste management services.

In literature, various attempts have been made to assess the performance of private agencies vis-a-vi public agencies in waste management in developing countries (Massoud et al, 2003; Kassim and Ali, 2006; Baud et al., 2001; Kasseva and Mbulingwe, 2005; Obirih-Opareh and Post, 2003; Longe et al, 2009). These studies devised various indicator systems and instruments to measure the quality of waste management services delivered to residents and generally concluded that although residents perceive marginal service quality improvements with private sector participation, the problems and challenges of waste management continue to persist. Baud et al (2001) used a 9-point indicator system combining ecological, economic, social and public health concerns to assess how alliances between the public and private sector in solid waste management contribute to sustainable development and concluded that alliances could help solve the problem of disposal and the performance of the landfills. Obirih-Opareh and Post (2002) assessed the quality of public and private modes of solid waste collection in Accra, Ghana and revealed that private participation in solid waste collection has benefited consumers in terms of wider coverage and service reliability but has also increased environmental dangers and worsened labour conditions. Katusiimeh et al (2012) assessed the effectiveness of the operations of public and private entities in solid waste collection in Kampala, Uganda and found the private sector to be more effective with more satisfied customers than the public sector. They however pointed out that clients of both public and private actors perceive the problem of solid waste to be very serious. The findings from these studies imply that waste management still continues to be a major concern for many people even with the participation of the private sector.

Quality assessment of waste management services is very relevant in view of the health consequences associated with poor quality waste management services. Thus, the general public and customers of waste management firms are more concerned about the quality of services delivered than they are about how services are provided. Since residents pay user charges for services delivered, they expect the services to be reliable and refuse sites to be devoid of waste overflow, flies and rodents. In view of this, customer satisfaction surveys have become the leading criteria for determining the quality of services delivered to customers and a key performance indicator for both public and private organizations (Vavra, 1997; Boyne, 2002).

The focus of this paper therefore is to assess householders' satisfaction towards the solid waste collection services provided by

Zoomlion Ghana Ltd in the Wa Municipality of Ghana. Since householders are the major generators of solid waste in the Municipality, it is important to investigate their level of satisfaction and perspectives of the services rendered by the private sector (Zoomlion Ghana Ltd). This is necessitated by the fact that recent studies on private sector participation in solid waste management in the country and most especially in the study area have not paid explicit attention to householders' satisfaction with services rendered by private solid waste management agencies. In addition, although existing research (see Obiri-Opareh and Post, 2002; Awortwi, 2003; Massoud et al, 2003; Kassim and Ali, 2006) report an increased coverage in solid waste services   due to the participation of the private sector, issues on service quality have not been widely researched and therefore require detailed studies.

Insititutional Arrangements for Private Sector Involvement in Solid Waste Managment in Wa, Ghana

The Wa Municipal Assembly was the sole agency providing solid waste management services in the Wa Municipality until 2006 when the government of Ghana contracted the services of Zoomlion Ghana Limited to augment the efforts of the various Metropolitan, Municipal and District Assemblies across the country in solid waste management. Currently the responsibility for waste management within the Municipality is shared between the Municipal Assembly and Zoomlion Ghana Ltd with the latter responsible for collecting and disposing up to 80% of the waste generated in the Municipality and the remaining 20% managed by the former. The existing partnership arrangement between the Municipality and the Company is in the form of a service contract for the management of Communal Collection Points and kerbsides. As part of the contract arrangement, Zoomlion Ghana Ltd provides waste management logistics and manages personnel recruited by the *Ghana* Youth Employment and Entrepreneurial Development Agency.

Two levels of services are rendered by Zoomlion Ghana Ltd in the municipality: House-to-House system and Communal Collection System. The communal collection system operates largely in densely populated and low income areas within the Municipality. Households participate by taking their waste to the central collection point for the company's collection crew to dispose. The collection crews use skip and roll-on trucks to transport empty containers to the central collection point and lift containers filled up with waste to designated disposal sites. The House-to-house collection service is mostly delivered in accessible areas largely in high income and middle class residential areas as well as in institutions, restaurants/hotels and shops. Whilst households using the communal services pay no fees, (fees are

paid by the Municipal Assembly through deductions from the District Assembly Common Fund) households utilizing the house to house service are charged between GH¢10.00 (US$5.00) and GH¢7.00 ($3.50) for the 240 litres and 120 litres bin respectively per month. The bins are however provided at no cost to the households. A written agreement is signed between households and Zoomlion Ghana Ltd to collect waste weekly from the households. These institutional arrangements suggest that householders are not just mere consumers of solid waste services provided by the private sector but are also important actors within the arrangement either by offering their waste for collection and/or by paying for the   services rendered. It is in the light of this that assessing their satisfaction with the quality of services delivered by the private sector is considered relevant.

Methods And Description Of Study Area

Wa is the Regional capital of the Upper West Region of Ghana and doubles as the capital town of the Wa Municipality. The Municipality is one of the fastest growing Municipalities in Northern Ghana with a total population of 107,214 and a total of 18,891 households (Ghana Statistical Service, 2012). Due to increasing population in the Municipality, the quantity of waste generated has increased from an estimated 44,403 metric tons in 2000 to 48,246 metric tons in 2010. The responsibility for waste management within the Municipality is shared between the Environmental Health Department of the Wa Municipal Assembly which plays a regulatory role for Zoomlion Ghana Ltd.

Data for the study was gathered from householders, who were registered clients of Zoomlion Ghana Ltd in the Wa Municipality through a household survey in June, 2013. Structured questionnaires were used to collect data from householders. In additon, interviews were conducted with the the Environmental Health Department of the Wa Municipal Assembly on the partnership and insitutional arrangements for solid waste collection in the Municipality. As at the time of the survey, there were a total of 601 registered clients of the Company. Out of this number, a total of 215 householders were sampled for the study but 193 household respondents with complete data were used for the analysis. To ensure representativeness, a simple random sampling strategy was used in which the list of all registered householders within the Municipality was obtained from Zoomlion Ghana Ltd and grouped into Door-to-Door and Central Collection Point service recipients and a random selection of households drawn from these two service categories according to their proportionate distribution. Where a householder declined responding to the questionnaire or there was no one present at the sampled residence, the Research Assistants, proceeded to the next residence until the desired sample size was achieved.

A 12-item structured questionnaire was administered to respondents to measure their level of satisfaction with the solid waste collection services rendered by Zoomlion Ghana Ltd. Respondents were asked to assess the extent to which they were satisfied with services rendered by the company by providing responses to 12 statements. Responses to the statements were scored against a five-point Likert-scale ranging from "very dissatisfied" to "very satisfied". In situations where respondents were literate, the questionnaires were self completed by them but where the respondents were illiterate; they were interviewed by Research Assistants. This was to make sure respondents understood the questions. In addition to the 12 statements measuring householders' satisfaction, the questionnaire also contained a section that gathered data on socio-demographic and economic characteristics of respondents as well as waste collection and disposal methods. Such data covered age, gender, educational attainment, marital status, income level, house types, resdential tenure status, frequency of waste collection, among others. An initial pre-test of the questionnaire was done for reliability evaluation using Cronbach's alpha. The reliability test revealed a Cronbach's alpha of 0.707 indicating internal consistency. For basic research, a reliability value of > 0.7 is considered satisfactory (Litwin, 1995).

Data gathered for the study was processed and analysed using the Statistical Package of Social Sciences (SPSS), Version 20 software. Descriptive statistics (mean and standard deviation) were largely used for the analysis. The responses for each of the 12 statements contained in the questionnaire were entered as 5 = very satisfied to 1 = very dissatisfied. The satisfaction levels were calculated by adding responses. A higher mean (M) indicated a higher satisfaction level. A mean of below 3 was considered as indicative of "dissatisfaction", a mean range from (M = 3.0 to M = 4.0) was considered as an indicative of "moderate satisfaction" whilst a mean range of above 4 was considered "high satisfaction". This study also used the one-way ANOVA to investigate any differences among the householders level of satisfaction based on income level and housing type. The dependent variable was client satisfaction with the waste collection services provided by Zoomlion Ghana Ltd. A p-value of ≤ 0.05 was accepted as statistically significant.

Results And Discussion
Socio-economic and demographic characteristics of respondents

Out of the total of 193 respondents reached, 60.6% were males whilst 39.4% were females. The majority (45.1%) of respondents fell within the ages of 31-50 with 43.5% within the ages of 18-30 and only 11.4% above 50 years. In terms of marital status, 65.1 percent of the respondents were married, 26.6 percent were single, 5.7% were widowed and 2.6 percent were

divorced. The educational attainments of respondents were relatively high as over 50% (54.4%) had attained up to tertiary education. About 11.9% of respondents had never attended school, 12.4% and 21.2% had basic and secondary education respectively. This confirms the assertion by Katusiimeh et al (2012) that private firms serve those with higher education (tertiary). This could be attributed to the reasoning that highly educated individuals due to thier level of education are more concerned with proper solid waste managment and also have the ability to pay for waste collection services provided by the private sector.

Regarding housing tenure, the results of the study revealed that the majority of respondents were tenants (47.2%) compared to 31.1% who were owner-occupants as shown in Table 1. This contradicts findings by Katusiimeh et al (2012) that suggest that most clients of private firms live in their own houses rather than being tenants. The study further revealed that the majority of respondents lived in compound and semi-detached houses. A cross analysis of house types and residential tenure however revealed that over 60 percent of compound houses were occupied by tenants rather than owners (61.6% were tenants compared to 16.2% being owners; $\chi^2 = 26.524$; $p < .001$) whilst detached houses were also significantly more likely to be occupied by owners than tenants. Table 1 presents the basic household characteristics of the surveyed households.

Table 1: Household characteristics of respondents

Variable	Frequency	Percent
Residential Tenure Status		
Owner-occupant	60	31.1
Tenant	91	47.2
Rent-free occupant	42	21.8
House Type		
Detached	60	31.1
Semi-Detached	33	17.1
Compound	100	51.8
Monthly Income Level		
Below GH¢500 (US$250)	30	21.3
GH¢500 - 1000 (US$250-500)	69	48.9
Above GH¢1000 (US$500)	42	29.8

The study grouped the income levels of households into three categories as shown in Table 1. It could be observed from this Table that most respondents (48.9%) earn between GH¢500 - 1000 (US$250-500) whilst about 29.8 earn above GH¢1000 (US$500) monthly. Considering the

general income levels in the Municipality, the results of the study suggest that low income households in Wa are not largely served by Zoomlion Ghana Ltd. This finding is similar to findings by Kasim and Ali (2006) and Katusiimeh et al (2012). A cross analysis of householders' monthly income with house type and residential tenure presented in Table 2 revealed that householders with incomes above GH¢1000 (US$500) were significantly more likely to stay in detached buildings compared to householders with incomes of below GH¢500 (73.8% compared to 13.3%; $\chi^2 = 43.908$; $p <$ .001). Also, householders with incomes above GH¢1000 (US$500) were about 50 percent more likely to be home owners (61.9 % compared to 10.0%; $\chi^2 = 26.802$; $p < .001$) compared to those with incomes of below GH¢500 (US$250). Observations and interviews during the household survey revealed that the majority of these detached buildings that are largely owned and occupied by householders with higher incomes were located in relateively accessible areas with good layouts and access routes which make them accessible to the waste collection vehicles. This relative good accessibility coupled with the good payment habits of the high income households makes it propfitable for Zoomlion Ghana Ltd to operate in these areas than in the less-affluent-densely populated areas where fee collection is problematic and the cost of collection is relatively high. This explains why low income householders are not largely served by Zoomlion Ghana's door-to-door waste collection services compared to the high and midlle income households in Wa. This confirms the widely held view that the private waste collection agencies largely serve the high income residents (Katusiimeh *et al*, 2012; Kasim and Ali 2006).

Table 2: Monthly Income, House type and Residential tenure status of Respondents

Monthly income	House type			
	Detached	Semi-Detached	Compound	Total
	N (%)	N (%)	N (%)	N
Below GH¢500	4 (13.3%)	3 (10.0%)	23 (76.7%)	30
GH¢500 – 1000	17 (24.6%)	15 (21.7%)	37 (53.6%)	69
Above GH¢1000	31 (73.8%)	7 (16.7%)	4 (9.5%)	42

Monthly income	Residential tenure status			
	Owner	Tenant	Rent-free occupant	Total
	N (%)	N (%)	N (%)	N
Below GH¢500	3 (10%)	15 (50%)	12 (40%)	30
GH¢500 – 1000	22 (31.9%)	34 (49.3%)	13 (18.8%)	69
Above GH¢1000	26 (61.9%)	14 (33.3%)	2 (4.8%)	42

Householders' satisfaction with waste management services

In view of increasing public demands nowadays on service quality from both public and private organizations, it is important for various actors in public service delivery including waste management services to be increasingly concerned about increasing customer satisfaction. The study tested the quality of solid waste collection services delivered by Zoomlion Ghana by looking at the extent to which householders were satisfied with the services delivered. The indicators covered as well as the level of satisfaction of households are presented in Tables 3 and 4.

Table 3: Descriptive Statistics of Householders' Level of Satisfaction

	Statement: **To what extent are you satisfied with the following services rendered by Zoomlion Ghana**	Mean	SD	Rank
1	Frequency of waste collection from household	3.95	0.78	3[a]
2	Reliability of waste collection	3.70	0.89	8
3	Prompt response to user complains	3.18	0.97	10
4	Vehicles and equipment used to collect and dispose waste	3.93	0.55	4[a]
5	Handling of waste containers during transportation	3.81	0.85	6
6	Final Disposal site where vehicles dispose waste	3.02	0.62	11
7	Cleanliness of service area	3.80	0.71	7
8	Public monitoring and sanctioning by the Municipal Assembly	2.60	0.93	12
9	Behaviour/attitude of collection crew towards residents	3.92	0.55	5[a]
10	Household education on waste management	3.21	1.11	9
11	Neatness of waste collection crew, wearing of protective clothing	3.96	0.72	2[a]
12	Overall service delivery	4.00	0.60	1[a]

Likert scale scores: 1 = Very Dissatisfied; 5 = Very Satisfied a The five highest-ranking statements SD= Standard deviation

The results from Tables 3 and 4 suggests that overall, householders are "moderately satisfied" with the waste collection services rendered by Zoomlion Ghana Ltd which indicates a relatively acceptable quality of waste collection services. Householders reported higher levels of satisfaction in the areas of *neatness of waste collection crew, wearing of protective clothing; frequency of waste collection;* and *vehicles and equipment used to collect and dispose waste* than in the other areas. The majority of households were largely dissatisfied with monitoring and sanctions by the Municipal Assembly. Other lowest ranked waste collection services where householders were disatisfied about were interms of *final disposal site; Prompt response to user complains; and Household education on waste management as shown on* Table 3. The officially stipulated frequency for waste collection is once a week for house-to-house collection and no defined collection frequency for the Central Collection Point (waste is collected as and when containers are full). Although this frequency appears low, householders on the whole indicated that they were 'moderately satisfied' with the collection frequency. Moderate levels of satisfaction were also

reported for use of protective clothing among collection crew, cleanliness of service areas as well as the kinds of vehicles and equipment used for waste collection.

Table 4: Extent to which householders are satisfied with waste collection services

Statement: **To what extent are you satisfied with the following services rendered by Zoomlion Ghana**	**Very Dissatisfied N (%)**	**Not Satisfied N (%)**	**Not Sure N (%)**	**Satisfied N (%)**	**Very Satisfied N (%)**
1 Frequency of waste collection from household	4 (2.1)	13(6.7)	0 (0)	147 (76.2)	29 (15.0)
2 Reliability of waste collection	4 (2.1)	28 (14.5)	5 (2.6)	140 (72.5)	16 (8.3)
3 Prompt response to user complains	8 (4.1)	42 (21.8)	62 (32.1)	70 (36.3)	11 (5.7)
4 Vehicles and equipment used to collect and dispose waste	0 (0)	11 (5.7)	3 (1.6)	167 (86.5)	12 (6.2)
5 Handling of waste containers during transportation	2 (1.0)	25 (13.0)	3 (1.6)	140 (72.5)	23 (11.9)
6 Final Disposal site for where vehicles unload refuse	2 (1.0)	26 (13.5)	134 (69.4)	28 (14.5)	3 (1.6)
7 Cleanliness of service area	3 (1.6)	14 (7.3)	11 (5.7)	155 (80.3)	10 (5.2)
8 Public monitoring and sanctioning by Municipal Assembly	20 (10.4)	70 (36.3)	78 (40.4)	18 (9.3)	7 (3.6)
9 Behaviour/attitude of collection crew towards residents	1 (0.5)	9 (4.7)	4 (2.1)	169 (87.6)	10 (5.2)
10 Household education on waste management	11 (5.7)	53 (27.5)	30 (15.5)	83 (43)	16 (8.3)
11 Neatness of waste collection crew, wearing of protective clothing	0 (0)	18 (9.3)	0 (0)	146 (75.6)	29 (15.0)
12 Overall service delivery	0 (0)	11 (5.7)	2 (1.0)	156 (80.8)	24 (12.4)

These findings are consistent with findings by Obirih-Opareh and Post (2002); Kasim and Ali (2006) and Katusiimeh et al (2012) who reported that households are satified with the frequency of services provided by private waste collection firms but contrary to findings by Awortwi (2004); Ezebilo and Animasaun (2011) and Longe *et al*. (2009) who reported that most residents were dissatisfied with solid waste management services provided by the private sector.

The few householders (8.9%) who were disastisfied with the service frequency of Zoomlion Ghana Ltd were largely clients of the Central Collection Points who were disastisfied with the absence of barricades around the collection points and spill overs of uncollected waste which raises

public health concerns. Contrary to the assertion by Katusiimeh et al (2012) that clients of private sector waste managment agencies in Kampala are not satisfied with the vehicles used due to the use of old vehicles and uncovered trucks that litter garbage on the streets, in this study, householders were satisfied with the vehicles and equipment used. Householders explained that the company uses appropriate vehicles which do not often break down to collect, transport and dispose off waste.

Householders were however largely dissatisfied with the extent of public monitoring and sanctioning of the company by the Municipal Assembly. For public-private partnerships in waste managment to be effective, it is important that when service responsibilities are contracted out to the private sector, local authorities ensure that performance standards are upheld. The National Environmental Sanitation Policy of 1999, required the Metropolitan, Muncipal and District Assemblies to set the goals and standards for the private sector to operate. Despite this requirement, Oteng-Ababio (2010) identified structural failures in the governance of public-private partnerships in solid waste management in Accra. Awortwi (2004) also concluded that merely shifting public services to the private sector will not in itself guarantee service quality and effectiviness. For public-private partnerships to generate the much emphasised benefits in literature, local goverments need to get the fundamentals of public private partnerships right and implement them. Householders in this study explained that they were not happy with the Municipal Assembly Monitoring role as they expected the Assembly to regulate and monitor the quality of services delivered by Zoomlion Ghana Ltd and give sanctions when required. The dissastisfaction was largely with services rendered at the Central Collection Points where wastes pile up for weeks without being cleared despite extensive complaints from households with the company seldomly ever sanctioned by the local authorities. In order to avoid deterioration of service standards by a monopolistic service provider whose main motive is to maximise profits, it is important for the Wa Municipal Assembly to continously monitor services delivered by the Company in the Municipality.

Householders satisfaction by income level and house types

Tables 5 and 6 depict the effect of householders income level and house types on satisfaction with various waste collection services of Zoomlion Ghana Ltd in Wa. Table 5 indicated that there were statistically significant effect of householders income level on satisfaction with service compoents regarding frequency of waste collection from households (F=3.16, p=0.04); behaviour/attitude of collection crew towards residents (F=5.59, p=0.00); household education on waste management (F=8.99, p=0.00); and overall service quality (F=4.11, p=0.01). There were however no significant differences across income levels on the remaining waste

managment service components as shown on Table 5. Householders with higher incomes (Above GH¢1000/ US$500) were more satisfied with waste management services (particularly regarding the frequency of collection; attitude of collection crew; household education on waste management; and overall service delivery) than those with lower incomes. The relatively higher levels of satisfaction with waste collection services reported by higher income householders contradicts the finding of Ezebilo and Animasaun (2011) that residents who have more money are less likely to be satisfied with solid waste management. A plausible explanation for the relatively lower reported satisfaction among householders with low income is the irregular solid waste collection and spillovers at the Central Collection Points that largely serve low-income neighborhoods compared to the weekly house-to-house collection services rendered to relatively higher income households.

       In terms of the relationship between house types and householders' satisfaction, Table 6 shows that there were significant differences in the mean satisfaction across house types regarding frequency of waste collection from household (F=3.16, p<0.05); handling of waste containers during transportation (F=4.74, p<0.05); and household education on waste management (F=9.73, p<0.05). Meanwhile, there was no significant difference between detached, semi-detached and compound houses and the remaining service areas such as response to client complaints, cleanliness of service areas, public monitoring and sectioning as shown in Table 6. The results in Table 6 suggests that householders in detached houses are significantly more satisfied with Zoomlion Ghana Ltd waste collection frequency, waste handling during transport and household education than householders in semi-detached and compound houses. From field observation, many householders living in detached houses were in accessible locations and this could possibly explain their satisfaction with collection frequency as the collection crew were more likely to collect waste more regularly in accessible locations. Zikri (2012) found no significant difference between housing type and resident satisfaction with waste management services in terms of staff ability, infrastructure provision, complaint service and service delivery in residential areas. The mean satisfaction among householders in detached houses was significantly higher compared to those in semi-detached buildings and compound houses regarding household education on waste management. Residents of semi-detached houses reported dissatisfaction with the company's performance with reference to household education on waste management. To ensure the co-operation of householders, it is imperative for Zoomlion Ghana Ltd to educate and communicate with households about their responsibilities in the contract arrangements as well as the operations of the service providers and the service methods. This will promote good relationship between the

households and the company in order to identify potential bottlenecks and improve service delivery.

Table 5: Results of one-way ANOVA Analysis between income lever and householders' satisfaction

	Income Level	Below GH¢500 (a)[a]	GH¢500-1000 (b)[a]	Above GH¢1000 (c)[a]	F	P	Bonferroni
	Statement: To what extent are you satisfied with the following services rendered by Zoomlion Ghana Ltd						
1	Frequency of waste collection from household	3.97	3.98	4.30	3.16	0.04*	
2	Reliability of waste collection	3.63	3.67	3.90	1.2	0.305	
3	Prompt response to user complains	3.07	3.12	3.48	2.27	0.107	
4	Vehicles and equipment used to collect and dispose waste	3.93	3.88	3.95	0.2	0.82	
5	Handling of waste containers during transportation	3.53	3.80	4.02	2.87	0.06	
6	Final Disposal site for where vehicles unload refuse	2.97	2.98	2.90	0.29	0.75	
7	Cleanliness of service area	3.67	3.74	3.98	2.15	0.12	
8	Public monitoring and sanctioning by Municipal Assembly	2.30	2.64	2.78	2.37	0.09	
9	Behaviour/attitude of collection crew towards residents	3.73	3.97	4.11	5.59	0.01*	a&c
10	Household education on waste management	3.20	2.96	3.83	8.99	0.00*	a & c, b&c
11	Neatness of waste collection crew, wearing of protective clothing	3.87	3.96	4.02	0.42	0.66	
12	Overall service delivery	3.80	4.00	4.19	4.11	0.02*	a&c

*The mean difference is significant at 0.05 level All figures in bracket are means

Table 6: Results of one-way ANOVA Analysis between house type and householders' satisfaction

	House Type	Detached (a)[a]	Semi Detached (b)[a]	Compound (c)[a]	F	P	Bonferroni
	Statement: To what extent are you satisfied with the following services rendered by Zoomlion Ghana						
1	Frequency of waste collection from household	4.15	3.94	3.84	3.04	0.04*	a&c
2	Reliability of waste collection	3.78	3.61	3.69	0.45	0.64	
3	Prompt response to user complains	3.20	3.15	3.15	0.15	0.86	
4	Vehicles and equipment used to collect and dispose waste	3.95	3.87	3.94	0.19	0.82	
5	Handling of waste containers during transportation	4.03	3.48	3.79	4.74	0.01*	a&b
6	Final Disposal site for where vehicles unload refuse	2.91	3.09	3.06	1.26	0.29	
7	Cleanliness of service area	3.93	3.61	3.79	2.34	0.1	
8	Public monitoring and sanctioning by Municipal Assembly	2.63	2.45	2.62	0.47	0.63	
9	Behaviour/attitude of collection crew towards residents	3.98	3.91	3.89	0.55	0.57	
10	Household education on waste management	3.62	2.63	3.15	9.37	0.00*	a&b, a&c
11	Neatness of waste collection crew, wearing of protective clothing	3.87	3.91	4.04	1.18	0.31	
12	Overall service delivery	4.07	3.84	4.01	1.43	0.24	

*The mean difference is significant at 0.05 level

All figures in bracket are means

Conclusion

In Ghana, contracting out to the private sector is largely the major mode of delivering solid waste collection services to households. The justification for this is mostly based on arguments of the private sector's ability to bring about efficiency in service provision and improvement in service quality. As a result of this increased reliance on contracting out to the private sector, studies on the quality and efficiency of services delivered by the private sector are gradually becoming a common issue of interest to researchers in Ghana. The main objective of this paper was to assess householders' level of satisfaction with solid waste collection services delivered by Zoomlion Ghana Ltd in Wa, Ghana. In general, results from this study revealed that householders are 'moderately satisfied' with waste collection services rendered by the company even though some perceive the problems and challenges of solid waste management as still very serious. The study confirmed the belief that the private sector providers mainly serve the rich. Although households were largely satisfied with service aspects such as frequency of waste collection, use of protective clothing; types of vehicles used for collection, transportion and disposal of waste, much improvement could be made by simply addressing other areas regarding response to user claims; household education on waste management; and final disposal sites of solid waste. This will allow the company to improve on its services to its customers.

The effectiveness of solid waste collection in the Municipality is to a large extent hampered by weak monitoring and sanctioning by the Municipal Assembly and the failure of the Zoomlion Ghana Ltd to adequately educate householders on their role in the solid waste management process and provide prompt response to user complains. For a public private partnership to deliver its expected results, all actors in the partnership arrangement are required to execute their assigned responsibilities. Simply transferring waste collection services in the Municipality to Zoomlion Ghana Ltd without the Assembly having the capacity to ensure contract enforcement, monitoring and sanctioning of contract terms, will not result in quality service delivery to the greater satisfaction of householders. This study therefore generated the much needed evidence to suggest planning and policy focal areas for Zoomlion Ghana Ltd to improve its service delivery quality to householders and for the Wa Municipal Assembly to ensure the partnership generates its anticipated results.

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