Assessment of Solid Waste Management Privatization and Continued Pollution in Makadara Sub-County Residential Areas, Nairobi – Kenya

[1]Lilian Wambani Nalyanya*, [2] Dr. Frida Nyiva Mutui (PhD) and [3]Dr. Rose Mugiira (PhD)
[1]Master Student, Humanities Department Catholic University of Eastern Africa, Nairobi Kenya
[2]Lecturer, Humanities Department, Catholic University of Eastern Africa, Nairobi Kenya.
[3]Lecturer, Development Studies Department, Catholic University of Eastern Africa, Nairobi Kenya.
***Corresponding Author**
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ABSTRACT

The study sought to assess how private waste companies have contributed to continued pollution in Makadara Sub-County, Nairobi City County. The study employed mixed method design, specifically concurrent triangulation strategy. Simple random sampling was used to select 218 resident leaders whereas purposive sampling was used to select 1 Sub-County environmental officer and 23 managers of private waste firms. Instruments for data collection were questionnaires, semi-structured interview guides and observation guide. Quantitative data was analysed using Statistical Package for Social Sciences (SPSS Ver. 27.0) and presented in tables and pie charts. Qualitative data was analysed using content analysis and presented through narrative forms and thematic text approach. The study findings revealed that Private Waste Companies (PWCs) contributed to continued pollution in Makadara Sub-County by insisting on prompt waste collection charges, littering and waste spillage, irregularity in waste collection, creation of mini-dumps and poor maintenance of waste collection points, and inadequate finances. The study concluded that insufficient funds was the main challenge facing private waste companies leading to continued pollution in the residential areas and therefore there was need to review the terms and conditions of operation between PWCs and the residents that gear towards environmental sanitation that is fit for human survival. The study recommended that the PWCs to increase frequency of waste collection while the City County Government to implement the policy on contracting private waste companies that operate in residential areas and develop a policy on public-private partnership which focuses on the government subsidizing PWCs that carry out waste management in low-income residential areas.

Key words: Privatization, solid waste management, pollution and residential areas

INTRODUCTION

Waste management is an essential component in any human society. According to the report of World Bank (2018), the amount of solid waste produced by cities worldwide in 2016 was 2.01 billion tonnes which was a result of rapid urbanization and population growth and it is predicted to reach 3.40 billion tonnes in 2050. Similarly, Nairobi being the capital city of Kenya has been experiencing increase in generation of solid waste. For instance, Nairobi City County generated 2.30 million tonnes of solid waste in 2021 compared to 1.97 million tonnes in 2020 (Kenya National Bureau of Statistics Economic Survey (KNBS), 2022). This scenario prompted the government to look for better ways of ensuring environmental sanitation. Thus, many governments turned to privatization of municipal waste management in order to increase coverage and improve efficiency of management of waste (Zadjali and Jantan, 2022).

Globally, several governments have experimented with privatization of solid waste management for a while. Some countries seem satisfied with the services being provided by private sector, while others have been discontented with their services. In most African countries, the state or municipality is responsible for

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providing waste services and infrastructure (UNEP, 2015). Weghmann (2019) observed that, overwhelmed by the size of waste problems, many African countries have turned to private sector.

According to the report of NEMA (2015), solid waste management remains to be one of the major challenges in all the 47 Counties in Kenya. In Nairobi, uncollected solid waste is one of the environmental challenges that the County government is facing. However, there have been several efforts to manage the solid waste in the city; one of them being privatization of the solid waste management.

In effort to manage solid waste in residential areas, many private waste companies have come up and they are registered as business establishments under Company Act. Environmental Management and Co-ordination Act (EMCA) no. 8 of 1999 section 87 states that, "Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed of such waste in the manner provided under this act" (Kenya Law Reports, 2012). This implies that individuals are responsible for managing the waste they generate and therefore citizens have an option of hiring someone or a company to collect and dispose the waste they generate.

Makadara Sub-County is one of the seventeen Sub-Counties in Nairobi County. The Sub-County waste management system appears to be struggling with issues like inefficient collection and environmentally unfriendly disposal systems such as direct dumping of waste. Even though solid waste management in the residential areas in Makadara Sub-County is being handled by private waste companies, there are certain areas with heaps of uncollected waste along the streets and drainage channels and in other areas litter is strewn all over. Therefore, the goal of this study is to establish how privatization has contributed to continued pollution in some residential areas in Makadara Sub-County, Nairobi City County and suggest ways of improving solid waste management in the residential areas.

REVIEW OF RELATED LITERATURE

The countries of Sub-Saharan Africa are making efforts to improve their waste management systems, but these efforts are being impeded by the general public's lack of information and bad attitude toward waste management, which encourage undesirable practices including littering, open dumping, and waste burning; inadequate management of landfills; having little budget and poor governance, as well as failing to implement the law and the regulatory framework already in place (UNEP, 2020). Some of these challenges have made the sustainability of healthy sanitation standards of residential areas difficult.

Effective waste management is costly, frequently accounting for 20% to 50% of municipal spending (World Bank, 2022). Due to this, many governments moved towards privatization as an alternative to reduce public spending (Tshekiso, 2020). However, it should be noted that, the private sector is a business venture that seeks to maximize its profits. On the other hand, since waste management operation cost is relatively high, most private waste companies prefer to operate in high-income residential areas whereby the owners are able to pay for the services (Mungai, 2014). Therefore, financial constraints facing private sector can lead to certain areas without services or with bare minimum services that cannot effectively ensure sanitation of the environment.

In Kenya, there are quite a number of waste management bylaws and policies but without enough enforcement which has resulted to inefficient waste management (Sibanda *et al.*, 2017). Even though there are rules in Kenya governing waste management, their lax enforcement has caused waste generators and handlers to be overwhelmed by their own rubbish (NEMA, 2020). Consequently, there has been illegal dumping of waste along the streets, open spaces and drainage channels. This has led to environmental pollution and thus need for intervention to curb this situation.

Though there is literature on waste management challenges that have contributed to continued

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environmental pollution, the current study sought to identify the specific challenges of private waste operators in Makadara Sub-County leading to continued pollution in the residential areas. Thereafter suggest ways of improving solid waste management and control environmental pollution in the residential areas.

THE STUDY AREA

The study was conducted in Makadara Sub-County, Nairobi County, Kenya. Makadara Sub-County is located on latitude 1^{o} 17´ 0´´ South of the equator and longitude 36^{o} 1^{o} 53´ 0´´ East of prime meridian (maplandia.com). It occupies 13 square kilometres. It is situated in the central part of Nairobi City County. Makadara Sub-County has four wards; Makongeni, Viwandani, Harambee and Maringo-Hamza as shown in Figure 1.

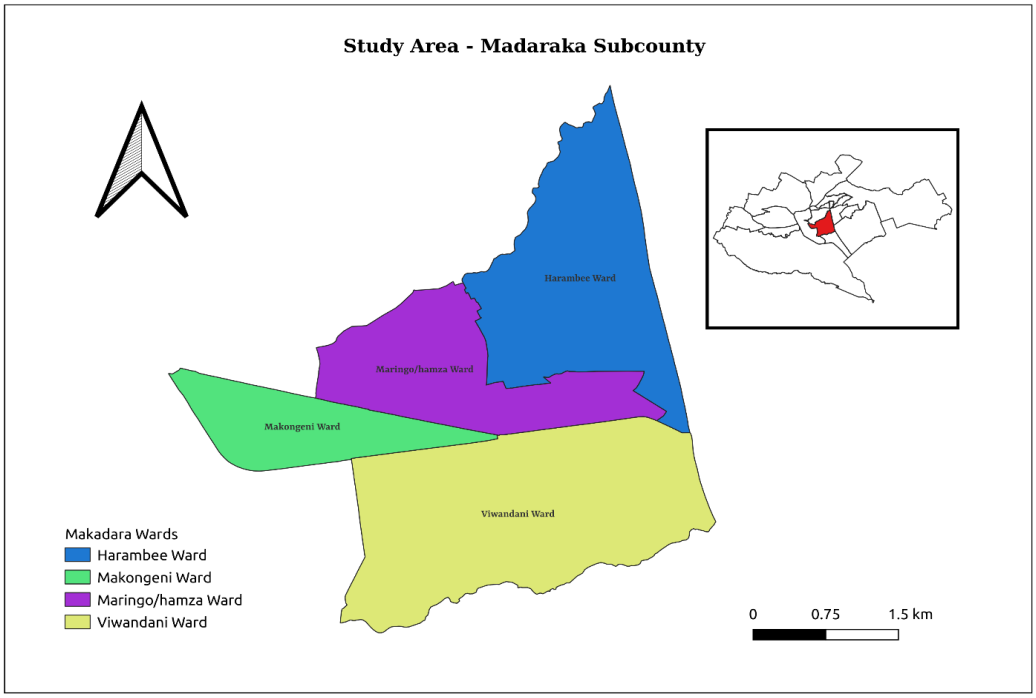

Figure 1: The Study Area – Makadara Sub-County, Nairobi

Makadara Sub-County has a total population of 189,536 with a population density of 16,150 per square kilometre and 70,080 households (KNBS, 2019). The high population density has contributed to the increase in consumption levels and thus increases in waste generation that need to be well handled to avoid instances of improper wastes disposal.

METHODOLOGY

The study employed mixed method design, specifically, concurrent triangulation strategy. The study was conducted in 11 estates in Makadara Sub-County and the sampled population was 242. That is, 1 Sub-County environmental officer, 218 resident leaders of Makadara Sub-County and 23 managers of PWCs operating in Makadara Sub-County. Simple random sampling was employed to sample the resident leaders and purposive sampling was used to sample the Sub-County environmental officer and managers of PWCs. Research instruments used were questionnaires, semi-structured interview guides and observation guide. Questionnaires were administered to resident leaders while the semi-structured interview guide were used when interviewing Sub-County environmental officer and managers of PWCs. The researcher analysed quantitative data using Statistical Package for Social Sciences (SPSS Ver. 27.0) and then presented data using tables and pie charts. On the other hand, qualitative data were reported using detailed description and also some responses were categorized into similar themes and presented through narrative forms and direct quotations from the participants.

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RESULTS

The objective of the study was to evaluate how PWCs that could have contributed to continued pollution in the residential areas. Figure 2 depicts the findings revealing whether or not the residents were satisfied with the services of PWCs. That is, 65% were satisfied, 21% were somehow satisfied, while 14% were not satisfied

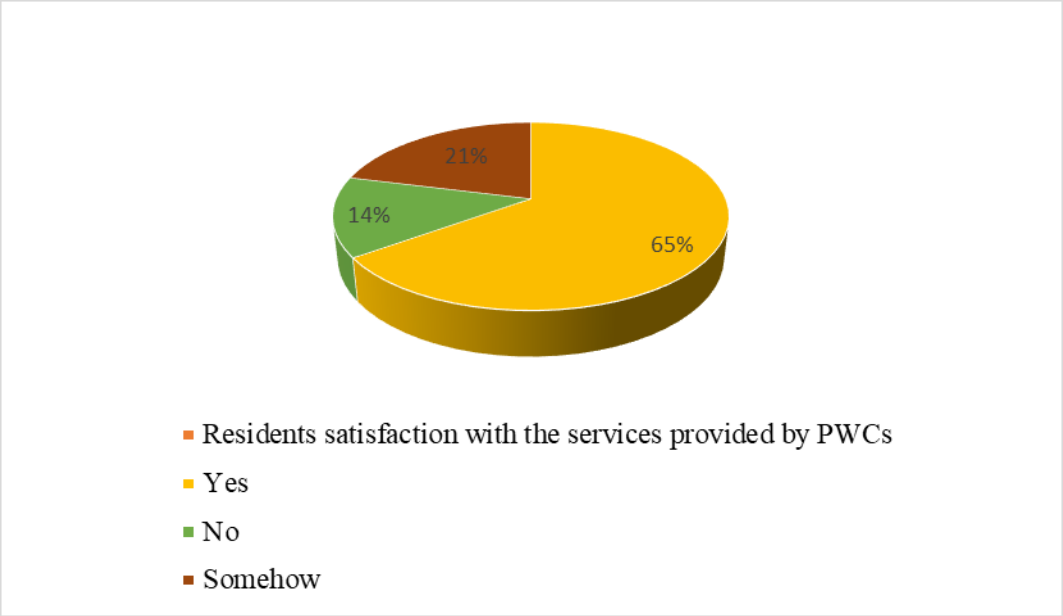

Figure 2: Residents' Level of Satisfaction with Private Waste Company Services

Forms of Waste Collection

The respondents were also asked to indicate the forms of garbage collection services they received. Table 1 shows that 12.4% received door to door waste collection services, 72.9% disposed their waste at designated place within the residential area (which acted as waste collection point for PWCs) and 14.7 % placed their waste at the roadside.

Table 1: Forms of waste collection

Forms of waste collection		Frequency	Percent (%)	Cumulative Percent (%)
	Private Companies Collect from door to door	27	12.4	12.4
	Residents carry the wastes to collection points	159	72.9	85.3
	Residents place the wastes along the road	32	14.7	100.0
	Total	**218**	**100.0**	

The cross tabulation was further done between satisfaction level of residents with the services of PWCs and forms of waste collection as shown in table 2. The study revealed that 92.6% of the residents who received door to door services were satisfied, 3.7% were somehow satisfied while 3.3% were not satisfied. Further, the residents who carried their waste to designated places, majority (67.9%) were satisfied; slightly more (25.2%) were somehow satisfied while the minority (6.9%) were not satisfied. Finally, concerning the residents who took their waste to the roadside, significantly more (56.3%) were not satisfied, 15.6% were somehow satisfied, while 28.1% were satisfied.

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Table 2: Cross Tabulation Between Satisfaction Level of Residents with the Services of PWCs and Forms of Waste Collection

			Satisfaction Levels of Residents			Total
			Yes	No	Somehow	
How is the waste collected by the waste companies	PrivateCompanies Collect from door to door	Count	25	1	1	27
		% within How is the waste collected by the waste companies	92.6%	3.7%	3.7%	100.0%
		% within Are the residents satisfied with the services provided by private waste company	17.6%	3.3%	2.2%	12.4%
	Residents carry the wastes to collection points	Count	108	11	40	159
		% within How is the waste collected by the waste companies	67.9%	6.9%	25.2%	100.0%
		% within Are the residents satisfied with the services provided by private waste company	76.1%	36.7%	87.0%	72.9%
	Residents place the wastes along the road	Count	9	18	5	32
		% within How is the waste collected by the waste companies	28.1%	56.3%	15.6%	100.0%
		% within Are the residents satisfied with the services provided by private waste company	6.3%	60.0%	10.9%	14.7%
Total		Count	142	30	46	218
		% within How is the waste collected by the waste companies	65.1%	13.8%	21.1%	100.0%
		% within Are the residents satisfied with the services provided by private waste company	100.0%	100.0%	100.0%	100.0%

The study findings revealed various ways PWCs contributed to continued pollution. The results were analyzed using content analysis. That is, 91.3% of PWCs pointed out that some residents failed or delayed to pay waste collection fee that resulted to failure by PWCs to collect garbage leading to illegal dumping of waste; 6.0% of the resident leaders raised the concern about irregularity of waste collection by PWCs; 29.4 % of the resident leaders raised the issue of littering in the residential areas while 4.1% hinted on spillage of waste by PWCs. Further, it was observed that PWCs contributed to creation of mini dumps. Finally, the PWCs highlighted on inadequate finances by PWCs that which contributed to ineffective service delivery.

DISCUSSIONS

The findings revealed that the respondents who were satisfied applauded the PWCs for frequent collection

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of waste, supply of waste bin/bags, sweeping the streets and picking of litter. The respondents who were not satisfied mentioned about the PWCs collecting the waste irregularly, leaving some waste in the bins during collection, littering the environment while collecting the waste and leaving the waste collection points dirty.

The study noted that the most common form of waste collection in the residential area in Makadara Sub-County was placing of waste at a common waste collection point. This is in conformity with the findings of World Bank (2018) that identified the common forms of waste collections as door to door and disposal of waste at a collection point where it is picked and disposed at final disposal site.

From the study findings, the residents could have been satisfied with door to door services because it was more convenient since they did not move with waste from their various households to designated sites to dispose their waste. Furthermore, it was more organized and private firms provided waste collection bags to the households (Chisiska & Yeom, 2022). On the other hand, the cross tabulation revealed that majority of the residents who were not satisfied (56.7%) were the ones who disposed their waste at the roadside. Thus, they had to move with the waste from their various households to the roadside for collection by PWCs contributing to pollution of the environment.

Despite the fact that significantly majority (65%) of the respondents were satisfied with PWC services, PWCs have contributed to continued pollution in some of the residential areas in Makadara Sub-County in the following ways; waste collection charges that led to illegal dumping of waste, irregularity in waste collection, littering and spillage of garbage, creation of mini dumps, and inadequate finances by PWCs that hindered effective service delivery.

Waste Collection Charges Leading to Illegal Dumping of Waste: Failure and delayed payment of waste collection fee by some residents discouraged the private waste companies who also failed to turn up and collect the waste. Therefore, the residents ended up dumping the waste along the road and drainage channels causing pollution. This finding concurs with the studies conducted by Oyendele (2016) in Nigeria who observed that people did not want to pay for garbage collection because of the extreme poverty and lawlessness in developing nations, preferring instead to dump their rubbish in the street.

On the other hand, some (7.3%) respondents highlighted that the collection fee charged by PWC was high. This implies that some residents could not afford the monthly waste collection fee charged by PWCs and therefore they pay intermittently. This leads to intermittent collection of waste by PWCs and thus residents ended up dumping the waste in any available open space such as along the road whenever waste was not collected. This is slightly similar with the study findings conducted by Njoroge *et al.*, (2014) who noted that, the management of solid waste has become difficult and expensive, especially for the urban poor who cannot afford the necessary service and are therefore left to manage waste disposal on their own.

Irregularity in Waste Collection: From the findings the respondents raised the concern about irregularity of waste collection by PWCs. This implies that the residents who received door to door services would eventually dispose their waste in any available space resulting to waste heaps in residential areas. Additionally, irregularity in collection of waste by PWCs from the designated sites contributed to increase of waste and littering around such locations. A similar case was observed in Abuja, Nigeria by Olukanni and Nwafor (2019) who stated that, despite privatization, efficient management of waste was still a challenge since there was overflow of waste into the road due to intermittent collection of solid waste from waste collection points by private waste collectors.

Littering and Spillage of the Waste: Spillage of the waste occurred when PWCs took the garbage from households to the temporal waste collection site as well as when they were loading the waste on the hand carts and trucks. During door to door waste collection, it was observed that, waste collectors emptied the waste from sacks/ bins on handcarts, open trucks and donkey carts. Thereafter, they would take the waste to a common collection point. During this whole process, a lot of waste would be spilled around the

households and along the way causing littering. Further still, open trucks were used to transport waste from collection points to the dumpsites causing more waste spillage and littering. This is in conformity with earlier findings by National Environmental Complain Committee (NECC, 2021) which noted that open trucks, hand carts, donkey carts, and other antiquated methods are often used to move garbage, and this lack of adequate means of transportation had resulted in littering, which had rendered waste, particularly plastics in the environment, blight.

Creation of Mini-dumps and Poor Maintenance of Waste Collection Points: The mini-dumps were a result of existence of many PWCs who collect waste from different households and they all have different collection points. Furthermore, the PWCs have different days for waste collection resulting to ever present heaps of waste in the residential areas.

The respondents pointed out on the failure of PWCs to clean up waste collection points after waste collection and overstaying of waste at the site attracting stray cats and dogs that tear waste bags littering the waste collection points. For instance, in one of the questionnaire, the respondent stated that, "private waste companies do not clean the waste collection points after collecting the waste". Consequently, in one way or the other, the PWCs have contributed to creation of mini-dumps and littering of waste at the collection points.

Inadequate finances: The findings during the interviews with the managers of PWCs revealed that due to inadequate finances they were not able to have all the necessary resources such as trucks and working gear for efficient waste management. In some way, this had contributed to continued pollution within the residential areas. Nine out of twenty-three (39.1%) PWC managers stated that they did not have trucks for waste collection. One of the managers of PWC said, "The main challenge is lack of a truck for collection of waste from the residential area to disposal site and it is because of insufficient funds." Upon further interrogation concerning the fee collected for service delivery, the manager asserted that it was not enough to cater for all the needs of waste management and also purchase the truck. Therefore, the PWCs had to hire trucks from either Nairobi City County Government or other PWCs. In most cases, they would find the trucks engaged and would delay to collect the waste from the residential areas. This would lead to overstaying of the waste at waste collection points or illegal dumping of the waste by the residents. This challenge is echoed by Diangamo (2020) who conducted a study in Lusaka, Zambia and commented that inadequate transport means and frequent breakdown of vehicles experienced by private firms had affected the frequency of garbage collection resulting to illegal dumping.

During the study, the researcher observed that 56.5% of the workers of PWCs did not have protective gear such as masks, gloves, gumboots and overalls. Yet, the management of solid waste involves dangers at every stage, including during collection, transportation, disposal, and even at recycling locations (Endreddy & Sandul, 2015). That is, the waste collectors were exposed to injuries (being cut or pricked by broken utensils, wires and metals) and disease causing pathogens. Thus they could fail to turn up on the day of garbage collection resulting to either illegal dumping of waste by residents or overstaying of garbage at waste collection points thus continued pollution.

Table 3: Contribution of Continued Pollution by Private Waste Companies

Causes of pollution	Explanation	Impact
Waste collection charges	Failure of payment of collection fee by residents	Failure of PWCs to collect garbage leading to illegal dumping of waste by residents
	High waste collection fee	Intermittent waste collection by PWCs
Irregularity in waste collection	Irregularity in waste collection by PWCs	Waste heaps along the road and within residential areas

Littering and spillage of waste	Spillage of waste during loading Littering of waste during transportation of waste	Littering of the environment
Creation of mini-dumps	Different PWCs have different waste collection sites	Several garbage heaps within the residential areas
Inadequate finances	Inadequate lorries Inadequate working gear	Delay in collection of waste from waste collection points Exposure to injuries and sickness of waste workers leading to intermittent waste collection

CONCLUSIONS

Waste management is an important aspect in the human society. Basing on the findings, the study noted that financial crisis facing most PWCs was the major cause of continued pollution. That is, insufficient funds led to PWCs delaying to pick garbage leading overstaying of waste at collection points; use of dubious means to transport waste such as handcarts resulting to spillage and littering; and failure to provide working gears endangering the health of workers hence failing to turn up for waste collection. All this ended up contributing to heaps of waste either within the residential areas or along the road, thus continued pollution. Since the residents are the beneficiaries of the services of PWCs, the study concluded that there was need for the residents and PWCs to review and discus on better terms and conditions that gear towards environmental sanitation that is fit for human survival. This is in terms of frequency of waste collection, amount of money to be paid for the services and repercussions for failure to pay, and cleaning of the entire environment, especially waste collection points.

RECOMMENDATIONS

Based on the analysis, the researcher recommended that the residents need to develop self-discipline by properly disposing waste in designated places, avoid littering and pay waste collection fee at the right time. On the other hand, the private waste companies are urged to increase frequency of garbage collection, collect the waste at regular intervals to avoid illegal dumping and overstaying of the waste at designated sites, and supply adequate waste collection bins/bags to residents.

Since waste management is one of the duties of the County Government, the study recommended that the City County Government to implement the policy on contracting private waste companies that operate in residential areas. This will enable the private waste companies to effectively perform their task. In addition, the County Government should develop a policy on public-private partnership which focuses on the government subsidizing PWCs that carry out waste management in low-income residential areas.

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