
**WASTE GENERATION AND MANAGEMENT STRATEGIES IN UGANDA A CASE STUDY OF
RUBAGA DIVISION KAMPALA DISTRICT**

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Abstract

This qualitative study aimed at examining the impact of waste generation on waste management in Kampala through examining the effect of house hold generated waste on public disposable units, the effect of industrial solid waste on both Kiteezi landfill and sewerage channels and determine the strategies used by waste management authorities in Kampala in a bid to manage waste in Kampala. The waste administration theory, a cohesive body of knowledge concerning the production of waste and handling, served as the study's overarching theoretical framework. By using a descriptive research design on a sample of 184 participants interested in the creation and disposal of waste in Rubaga division Kampala district, the theory of waste and new consumption communities, which contends opposition and being empowered, as well as reconnecting to manufacturing, is able to argue that people there are able to put into effect alternates to the unproductive behaviors associated with traditional consumption patterns and achieve partial autonomy from the hegemonic forces of the market. The study also revealed that 121 (66%) agreed that waste disposal dirties disposable places and harms disposable units, whereas 11 (6%) were unsure and 52 (28%) disapproved with this statement. Last but not least, 98 of the participants (53%) agreed with the statement that household wastes contaminate neighboring water channels, whereas fifty-one participants (28%) were unsure and thirty-five participants (19%) disapproved.

Key words: waste generation and management strategies

Background

Waste is broadly described by (Environment and Climate Change Canada, 2018) as

abandoned material(s) produced by business operations. It originates from a variety of sources, including industrial, homes, businesses, and institutional, and it can be either hazardous or non-hazardous in nature. Waste has been produced as a result of human contact with the environment since the beginning of time. But as technology has advanced steadily since the beginning of the industrial era, the types of waste produced by human activity have become increasingly complicated.

Waste creation increases along with the urban population in developing nations in Africa and elsewhere in East Africa, which is made worse by inadequate funding for municipal sanitation agencies and lax implementation of cleanliness laws (Jackline et al., 2023). Municipal rubbish is transported to the Dandora dumping site, a disused quarry, in Nairobi, for instance. Residents who live close to the landfill are consequently at danger for both harmful emissions and sickness. The majority of the time, disposal facilities are situated in low-lying, ecologically delicate locations like marshes, the edge of forests, or close to bodies of water. As is the case in the majority of poor nations, they frequently lack liners, fences, soil covers, and compressors.

The sole sanitary landfill in Uganda is Kiteezi, which is presently under KCCA's management. The landfill is situated at latitude 0°25'0" and longitude 32°34'00", 13 km from the center of Kampala. It is in the peri-urban Kiteezi. The about 9 km long Kampala-Gayaza Road and subsequent 4 km Buwambo Road provide access to the garbage from the city. The dump accepts waste for free from Kampala city and the surrounding peri-urban areas in the Wakiso district.

Problem statement

The amount of waste produced in metropolitan areas occasionally exceeds the capacity of urban authorities to prepare for its gathering and disposal. According to Shaful and Mansoor (2003), the development of towns and cities, where a great deal of people begin congregating in relatively small regions in search of earnings, poses a problem

with regard to waste disposal. He calls for proper handling in order to protect the surroundings. The pace of collection and discharge has an opposite relationship to the rate of creation, which makes trash generation aggregation a source of sustainability issues even if waste management concerns might be difficult to control. A variety of techniques comprising significant amounts of money and human resources have been developed in an effort to successfully deal with this challenge. These tactics have little to no positive environmental effects (Kayoed & Omole, 2011). Programs for managing waste and recycling are expensive but immediately benefit society by lowering waste and litter. These initiatives occasionally produce processed waste goods that can be sold again. With this context in mind, this study looked at how waste production in Uganda affected administration tactics.

Specific objective

- 1. To examine the effect of house hold generated waste on public disposable units in Kampala.*
- 2. To examine the effect of industrial solid waste on both Kiteezi landfill and sewerage channels in Kampala.*
- 3. To determine the strategies used by waste management authorities in Kampala in a bid to manage waste in Kampala.*

Research questions

- 1. What is the effect of house hold generated waste on the public disposable units and areas in Kampala city?*
- 2. What is the effect of industrial solid waste on both Kiteezi dumping sites and sewerage channels in Kampala city and Wakiso district?*
- 3. What are the strategies used by waste management authorities in Kampala to control and reduce on waste generation?*

Methodology

Research Design

Both qualitative and quantitative methods were used in the study's descriptive investigation approach. The use of statistical measures and methodological descriptions as experienced by the researcher served as the foundation for quantitative procedures.

Because they showed actual, real-world knowledge required to offer more comprehensive comprehension and analysis of all associated areas, qualitative strategies were prioritized. It was intended to discuss the effects of the production of waste and handling in the Rubaga district of Kampala. Focus group discussions employing a qualitative methodology were used to conduct the investigation at a specific moment in time.

Population and sampling technique

Study population

The target population of this study was 383,216. The study examined 15 politicians, 5 Division administrators, 150 local masses, 10 community-based organization, 30 Nabugabo employees, 20 KCCA road cleaning personnel's and 3 Nabugabo administrators.

Sampling Method

Table 1 showing sample size and sampling technique

<i>Respondent</i>	<i>Size</i>	<i>Sampling technique</i>
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<i>Politicians</i>	<i>15</i>	<i>Purposive random</i>
<i>Division administrators</i>	<i>5</i>	<i>Purposive</i>
<i>CBOs members</i>	<i>10</i>	<i>Simple random sampling</i>
<i>Local masses</i>	<i>150</i>	<i>Simple random sampling</i>
<i>Nabugabo cleaning casual</i>	<i>30</i>	<i>Simple random sampling</i>
<i>KCCA cleaning personnel's</i>	<i>20</i>	<i>Cluster sampling</i>
<i>Nabugabo administrators</i>	<i>3</i>	<i>Purposive sampling</i>
<i>Total</i>	<i>233</i>	

Procedures for data collection

The investigator had received permission from Metropolitan International University to carry out the study in the form of an introductory letter. For approval, the investigator first went to the division director. Then, the indicated sampled selection methods were used to pick the participants. The study's purpose was explained to those who participated. The informed consent form was made available for participants to sign. The deadline for retrieving the surveys, which was one week after they were distributed, was stressed by the investigator. All questionnaires were examined for replies when they were retrieved, and those that were missing them had to be filled up.

Data collection and analysis

To make the data suitable and easier to present, the data that had been obtained had been edited. One by one, the completed surveys were modified to fix mistakes made by those who participated. Data was adjusted to ensure its precision, thoroughness, regularity, and homogeneity. Using SPSS, the altered data was analyzed both statistically and qualitatively as follows: qualitative information was sorted, and tables displaying frequencies and percentages were utilized for quantitative description to aid in better understanding (Nelson et al., 2022). However, analysis of the qualitative data was done in a method that allowed for the identification of the responses from participants that are pertinent to the study issue. Such data was mostly examined by describing the information gathered from the area in which the investigator was able to use quotes from participants.

RESULTS

Instrument return rate

The researcher administered 233 questionnaires to the respondents. During data collection, a researcher collected 184 (79%) questionnaires as a response rate.

Table 2: showing return response rate

<i>Participants</i>	<i>Questionnaires</i>	<i>Questionnaires returned</i>	
	<i>Frequency</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Politicians</i>	15	13	86.7
<i>Division administrators</i>	5	4	80
<i>CBOs members</i>	10	10	100
<i>Local masses</i>	150	106	70.7

<i>Nabugabo cleaning casual staffs</i>	30	28	93.3
<i>KCCA cleaning personnel's</i>	20	20	100
<i>Nabugabo administrators</i>	3	3	100
<i>Total</i>	233	184	79

Source: primary source 2022

Only 184 of the 233 participants who were presumed to be participating in the study submitted their survey responses after they had been entirely completed, according to Table 2's findings from the participant's reply rate. This is a 79% percentage of respondents. According to Mugenda & Mugenda (1999), an acceptance rate of 70% and above is acceptable for the study reactions, hence this rate of response was acceptable for the study.

Respondents' demographic data

The researcher sought to get an insight in the respondents' characteristics. These characteristics include gender, age group, marital status and education back ground.

Gender distribution of respondents

The researcher sought to establish the gender of the respondents for effective understanding of the respondents and to avoid miss interpretation of the results by the error of gender. This is represented in table 3 below.

Table 3: showing gender of respondents

<i>Gender</i>	<i>Male</i>		<i>Female</i>	
<i>Politicians</i>	4	30.8	9	69.2

<i>Division administrators</i>	2	50	2	50
<i>CBOs members</i>	5	50	5	50
<i>Local masses</i>	43	40.6	63	59.4
<i>Nabugabo cleaning casual staffs</i>	21	75	7	25
<i>KCCA cleaning personnel's</i>	9	45	11	55
<i>Nabugabo administrators</i>	3	100		

Source: primary source 2022

According to Table 3, there were 21 casual cleaning employees (or 75% of participants) and 3 supervisors (or 100% of participants) at Nabugabo. The division's legislators, who represented 9 (69.2%), 63 (59.4%) local masses, and 11 (55%) KCCA cleaning staff, however, recorded a large percentage of female responses. However, the survey found that among Rubaga division executives, 5 (50%) both males and females and 2 (50%) males had responded with the same reaction.

Response on the age group

The researcher sought to establish the age group of the respondents and the results are shown table 4 below.

Table 4: showing age gap of respondents

<i>Age group</i>	<i>Frequency</i>	<i>Percentage</i>
18-24	17	9
25-34	62	33
35-44	59	32

45-54	30	18
55-64	9	5
65 and above	7	3
Total	184	100

Source: Primary Source 2022

From table 4, respondents age group shows that majority 62 (33%) of the respondents were aged between 25-34 years, followed by 59 (32%) between 35-44 years, 30 (18%) between 45-54 years, 17 (9%) were between 18-24 years and the minority 16 (8%) were between 55 and above years. The findings imply energetic personals that are working with Nabugabo and KCCA cleaning officers, Rubaga division leaders, politicians and majority of the local masses.

Response on Educational level

The researcher sought to establish the level of education of the respondents. The results are presented in table 4 below.

Table 5: showing respondent's education level

<u>Educational level</u>	<u>Frequency</u>	<u>Percentage %</u>
O Level certificate	39	21.2
A Level certificate	42	22.8
Tertiary certificate	7	3.83
Diploma	29	15.76
Degree	29	15.76

<i>Masters and above</i>	9	4.89
<i>No response</i>	29	15.76
<i>Total</i>		

Source: Primary source 2022

According to Table 5 above, the vast majority of the study's respondents—42 (22.8%)—had completed Senior Six; 39 (21.2%) had Senior Four certificates; 29 (15.76%) had diplomas; the same number also had degrees; and still, 29 (15.76%) were unwilling to admit to any level of schooling; meanwhile, 9 (4.89%) had master's degrees or higher levels of education. However, the minority of the participants had attended a higher education course and successfully completed the course.

Responses on Marital Status

The marital status of the respondents was analyzed and findings are presented in Table 6.

Table 6: presenting marital status of respondents

<i>Marital status</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Married</i>	143	77.7
<i>Single</i>	30	16.3
<i>Divorced</i>	11	6
<i>Total</i>	184	

Source: primary source 2022

The study found that majority 143 (77.7%) of the respondents were married, 30 (16.3%) were single while the number of divorced stood at 11 (6%).

The effect of house hold generated waste on public disposable units.

To provide answer to this research question, respondents were made to answer a five -point likert-scale questionnaire constructed on a five-point scale ranging from strongly agree, agree, not sure, disagree and strongly disagree. The responses were then categorized into three main divisions: -agree, not sure and disagree. The analysis of their responses is presented in table 7 below.

Table 7: Distribution of respondents by the effect of house hold generated waste on public disposable units

Statement	Agree		Not	
	sure		Disagree	
	Freq.	%	Freq.	%
1. Wastes are disposed without separation	184	100		
2. Wastes are disposed around the entire area and	162	88	3	1.7
3. Wastes are littered allover areas around the	181	98.4	2	1.1
sites and units.			1	0.5
damages the disposable units.				
5. The disposed household wastes contaminate	98	53	51	28
nearby water channels.			35	19
It threatens public health by attracting disease				
7. It pollutes the entire environment because of the	184	100		

generated from the wastes disposed in the disposing sites and units.

Source: Primary source 2022

Table 7's data presents the views of participants on how trash from their homes affects public disposal units. 184 out of 184 participants (100%) agreed that garbage created is always dumped of without segregation and that this pollutes the entire environment due to the smell the wastes produce when they are dumped in disposal sites and units. No responders either disapproved or didn't respond at all.

171 (93%) people agreed that the attraction of disease vectors poses a hazard to public health; 13 (7%) people were unsure about the impact. Additionally, 181 (98.4%) of the people surveyed agreed that trash is scattered around near temporary housing sites and units, 2 (1.1%) were unsure, and 1 (0.5%) disapproved. 162 (88%) of the units agreed on the effect of dumping throughout the entire area, whereas 19 (10.3%) disapproved and 3 (1.7%) were unsure.

The study also revealed that 121 (66%) agreed that waste disposal dirties disposable places and harms disposable units, whereas 11 (6%) were unsure and 52 (28%) disapproved with this statement. Last but not least, 98 of the participants (53%) agreed with the statement that household wastes contaminate neighboring water channels, whereas fifty-one participants (28%) were unsure and thirty-five participants (19%) disapproved.

The effect of industrial solid waste on both Kiteezi landfill and sewerage channels in Kampala.

To provide answer to this research question, the respondents were made to answer a five -point likert-scale questionnaire constructed on a five-point scale ranging from strongly agree, agree, not sure, disagree and strongly disagree. The responses were then categorized into three main divisions: -agree, not sure and disagree. The

analysis of their responses is presented in table 6 below.

Table 8: Distribution of respondents on the effects of industrial solid waste on Kitezi and sewerage channels

No	Statement	Agree		Not	
sure	Disagree				
		Freq	%	Freq	%
1.	Industrial wastes pollute the landfill soil	136	73.9	5	2.7
2.	Industrial wastes contaminate ground waters.	178	96.74	3	1.63
3.	Industrial wastes are harmful to the waste management	119	64.7	36	19.5
4.	Industrial wastes are harmful to the entire	181	98.4	2	1.1
5.	The effect of industrial wastes is costly expensive and labour force intensive.	165	89.7	5	2.7
	Industrial effluents generated from industries to water streams are toxic to the aquatic organisms			14	7.6

Source: Primary source 2022

The information in table 8 unmistakably demonstrates the impact of industrial solid waste on both the Kiteezi dump and Kampala's sewerage lines. The survey found that 181 (98.4%) of the people who took part agreed that industrial effluents discharged into water streams are poisonous to aquatic organisms and destructive to the natural world as a whole. Two of the participants (1.1%) were unsure, and one (0.5%) disagreed with the effects. 178 of the 184 participants (96.74%) agreed with this statement.

Three of the participants (1.63%) were unsure if waste from factories contaminated ground water, whereas three of the participants (1.63%) disapproved.

165 of the participants (89.7%) agreed that industrial wastes are costly and labor-intensive, whereas five participants (2.7%) disapproved and fourteen participants (7.6%) were unsure. Regarding the first sub-concept, "Industrial waste waters pollute land fill," 136 respondents (73.9%) agreed with the effect, 5 (2.7%) were unsure, and 43 (23.4%) disapproved. A total of 119 participants (64.7%), thirty-six participants (19.5%), and thirty-nine participants (15.8%) concurred with the statement that toxic industrial wastes are dangerous to waste management workers.

Strategies used by waste management authorities

To provide answer to this research question, respondents were made to answer a five -point likert-scale questionnaire constructed on a five-point scale ranging from strongly agree, agree, not sure, disagree and strongly disagree. The responses were then categorized into three main divisions: -agree, not sure and disagree. The analysis of their responses is presented in table 9 below.

Table 9: strategies put in place and other suggestions by the respondents

No	Statement	Disagree		Agree		Not Sure	
		Freq	%	Freq	%	Freq	%
1.	Aiming at reducing waste we generate	184	100				
2.	Re using wastes as much as possible	184	100				
3.	Decompose organic waste materials to the	122	66.3	11	6	51	27.7
4.	The government should enact waste generation laws	158	86	7	3.8	19	10.3

5.	Reduction in the importation of polyethene	184	100					
6.	There is incineration of waste at the landfill	43	23.4	112	60.29	15.8		
					8			
7.	Open air combustion is used at the landfills to manage the rising volume of wastes.	169	92	3	1.5	12	6.5	

Source: Primary source 2022

The conclusions pertaining to the tactics employed by Kampala's garbage disposal authority are presented in table 9's results. According to the findings, leadership throughout the entire city is focused on decreasing waste produced by households, aiming at reusing (recycling), and reduces the importation of polyethene bags. 184 (100%) of the 184 participants agreed with this statement.

169 (92%) of the people surveyed agreed with the statement that open-air incineration at landfills is used to manage the growing volume of waste, while 12 (6.5%) disapproved and 3 (1.5%) were unsure about the method. When asked whether they agreed with the government's efforts to adopt waste generation legislation, 158 (86%) of those who responded said yes. Seven (3.8%) were unsure of the response, while 19 (10.3%) disapproved. In regards to organic waste items decaying in the ground, 122 respondents (66.3%) approved of the approach, 11 (6%) were unsure, and 51 (27.7%) opposed.

The majority of those who participated (112, 60.8%) to the sixth sub-construct, which indicates that the burning process of waste is used at land fields, were unsure of the technique used at land fill sites. Nevertheless, 43 (23.4%) of participants agreed with the use of the method, while 29 (15.8%) of participants disapproved.

Conclusion

Through the disposal of wastes that lack separation, harm the environment, have a terrible odor, and leach chemicals into the soils, the effects of household trash and commercial solid wastes on public disposal units and landfill environments may be seen. Professionals should become more appealing to the strategy's execution

hindrances in order for strategies to be successfully carried out. The likelihood of success is raised by continuously identifying and addressing the obstacles and monitoring the implementation processes. For successful execution of a strategy, it is believed that a thorough plan must be created and effectively conveyed to all levels of the organizational structure.

Recommendations of the study

The sum that citizens provided in taxes earlier was seen as an opportunity to raise contributes to help take care of the city; nevertheless, with the establishment of rubbish gathering companies like Nabugabo in Rubaga, it is seen as a way of double burdening the same individuals since those businesses are additionally reimbursed by the same group to collect garbage. Individuals and staff members in Kampala pay revenue taxes to the Kampala city authority and the Uganda earnings authority. The study suggests that the Kampala municipal government analyze its residents' problems for improved comprehension. It is stated that Nabugabo Up Deal Joint should engage experienced field representatives and increase the number of days they gather rubbish from the general public rather than just one day each week.

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