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Enhancing Solid Waste Management Practices in Soroti Municipality: A Comprehensive Study

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ABSTRACT

This study undertakes a comprehensive examination of solid waste management practices in Soroti Municipality, employing a cross-sectional survey design to gather data from a diverse sample of 314 respondents. Utilizing a combination of quantitative and qualitative methods, the research explores various aspects of waste management, including collection, transportation, disposal, and treatment techniques. Sampling techniques such as basic random sampling and purposeful sampling were employed to ensure representation across demographic groups and occupational sectors. Data collection methods included interviews, questionnaires, and observations, allowing for a multifaceted analysis of the subject matter. The study presents detailed findings on respondents' demographic characteristics, including gender distribution, age distribution, occupation, marital status, and education level, providing insights into the diverse perspectives within the community. Additionally, the research examines respondents' attitudes towards solid waste management practices, revealing both strengths and weaknesses in current approaches. Analysis of the data highlights several key challenges facing Soroti Municipality in solid waste management, including limited resources, inadequate infrastructure, and a lack of community engagement. Despite these challenges, the study identifies potential solutions and opportunities for improvement. Recommendations include raising public awareness, implementing 4R strategies (reduce, reuse, recycle, recover), encouraging stakeholder participation, and investing in infrastructure and technology. By addressing these challenges and implementing recommended strategies, Soroti Municipality can work towards more sustainable and effective solid waste management practices. This not only enhances the quality of life for its residents but also contributes to environmental conservation and sustainable development in the region.

Keywords: Municipal, Solid waste, Waste management, Soroti Municipality, Waste Disposal, Reform, Survey.

INTRODUCTION

Maintaining proper personal hygiene is one of the most crucial components of our daily life. Many people in rural and urban regions may be unaware of the need of basic cleanliness, despite the fact that it can drastically lower the risk of infectious diseases including diarrhea, trachoma, and a variety of others. Solid wastes are separated into three groups based on their sources: municipal garbage, industrial waste, and biomedical waste [1]

Waste refers to waste, and its negative effects can be evident in the environment, water resources, and air pollution [2]. The act of disposing of waste involves the dumping or release of solid waste or hazardous waste into or into any land or water so that, as a consequence of community activities, the environment, the air, or any waters, including ground waters, may be affected [3]. Solid garbage can be found on the outskirts of cities, towns, urban regions, and municipalities, where it serves as a substantial source of contamination due to disease vectors including flies, mosquitoes, and rats incubating and reproducing. These ailments include diarrhea, gastrointestinal, dermatological, respiratory, hereditary, and other infectious disorders. Dumping areas or sites have a high economic and social cost in terms of public health services [4]. While few governments in the developed world have estimated this in terms of human health, developing countries, particularly Africa, have never considered this with action. They believe that inappropriate solid waste disposal puts populations in places where there is no approved waste disposal option, such as pre-school children, garbage workers, and employees at facilities that manufacture dangerous and infectious compounds, at

risk. Almost every developing country, including Uganda, has them.

Open dumpsites are the primary source of environmental problems, particularly in terms of air quality [5]. People become unwell as a result of the foul scents emitted by dumpsites. Dump sites are a source of airborne chemical contamination because of off-site gas migration and particles and chemicals adhering to dust, particularly during active operation [6]. The two are related in the same manner that soil and groundwater degradation can lead to direct indoor air pollution. According to the EPA, volatile organic compounds have been found in residences near dumpsites in other occasions [7]. The authors also cite unattended wastes that sit around appealing areas where rats and other critters can find a safe shelter during their spare time [8].

The wet waste decomposes most of the time and generates a nasty odor that has never been healthy for human health. The dumpsite's foul stench has an influence on those who live nearby [9], demonstrating that dumpsites have serious negative consequences for those who live nearby. Agricultural and industrial pollutions are extremely harmful to one's health. On the other hand, mixing industrial and municipal hazardous wastes could expose individuals to chemical and radioactive risks. Uncollected solid waste can hinder storm water flow, resulting in stagnant bodies of water that can serve as breeding grounds for disease vectors. Waste dumped near water sources pollutes the water, whereas garbage dumped directly into rivers, seas, and lakes accumulates toxic elements in the food chain through the plants and animals that eat it [10].

In African countries such as Uganda, solid waste disposal is massive and difficult. [11]. The focus of waste management has shifted from impact management and remediation to waste prevention and minimization. Residents who live near dumping grounds, on the other hand, are affected.

An integrated development approach emphasizes the linkages between people and their environments and encourages cross-sectoral collaboration and coordination, which helps solve complex problems and concerns while also satisfying the different requirements of disadvantaged households [12]. Even though it focuses on the domains of people, health, and the environment, the strategy's primary concept is integration. For sustainable waste management solutions, more than synergistic activity by institutional actors responsible for building the legal and organizational framework and monitoring implementation is necessary [12].

Over the last 25-30 years, environmental regulations have emphasized the need for enhanced environmental responsibility and the development of solutions that enable more sustainable activities [13]. The traditional landfill method has been the most widely used and followed strategy, with options such as composting and vermin composting, anaerobic digestion, incineration, pyrolysis, catalytic hydrogenation, open dumps, random refuse dumps, refuse blocks, organized dumps, controlled tipping, and pulverization. Among the machines utilized are rotating drum machines, hammer mills, and Dutch rasps [14]. Solid waste treatment alternatives include composting, the Windrow system, hydro-pulping, and fragmentation. According to experts, there are specific and effective techniques and approaches for dealing with massive amounts of solid waste [15]. A variety of mathematical, statistical, economic, scientific, and social strategies have been devised to counteract the buildup of solid waste, which eventually lowers the water table through seepage. There are about four effective ways to handle polyolefin waste: primary route, re-extrusion, which gives similar material; secondary route, waste reduction through mechanical compression; and tertiary route, thermochemical procedures, which yield fuel or petrochemical stock [16]. While various assessments are available for managing electronic waste, including Material Flow Analysis, Extended Producer Responsibility, Life Cycle Assessment, and others, designing environmentally friendly devices and implementing efficient collection, recovery, recycling, and community awareness programmes are the most effective ways to minimise electronic waste [17]. These models can be used to explain and analyze multi-stakeholder decision-making when they are combined with game-theoretic methodologies. According to the United Nations, gasification is a commonly employed method of solid waste management in developed countries around the world [18]. It is taken into consideration residual wastes, ensuring that landfill disposal is regulated and emissions are maintained to a minimum. In addition to the processes listed above, traditional methods such as aerobic and anaerobic digestion are also successful.

Composting is a tried-and-true approach of addressing the problem's cause. Both centralized composting and composting with Eiseniafoetida vermin beds follow the same composting principles. The former generates calcium, nitrogen, phosphorus, potassium, and sulphur [9].

Phytocapping is a landfill restoration method that entails burying trash behind a layer of trees. In most locations where it has been deployed, a cover of 21 tree species has been shown to intercept 30% of rainfall and have a transpiration rate of 2 mm per day. It reduced methane emissions by 4- 5 times when compared to a nearby non-vegetated landfill [19].

Despite the fact that there is a significant population growth, communities, Muncipalities like Soroti have never had a clear Master plan to reorganize the population planning and settlement which has put a strain on the environment and producing a slew of waste management issues [20].

This study will aid in improving the efficiency and efficacy of solid waste management in urban environments, specifically in the municipality of Soroti.

Future policy actions in solid waste management in Soroti Municipality and Uganda in general will benefit from the findings. The outcomes of the study will also assist legislators in formulating appropriate solid waste management policies and practices in urban areas. The findings of the study will also help to raise awareness about the difficulties of solid waste management methods. This study's main purpose was to assess the present solid waste management methods, challenges, and solutions for tackling waste management issues in Soroti Municipality. It aimed to examine the magnitude of solid waste management problems in Soroti District and to identify possible solutions of improving solid waste management challenges in Soroti District.

METHODOLOGY

Research design

A cross-sectional survey design was utilized in this study in Soroti Municipality, which is a sort of observational study that examines data from a population at a certain point in time [21][22][23][24]. The research included both quantitative and qualitative methods [25].

Sample Size and Selection

A subset of the population is specified as a sample size [26] as it is impractical to analyze the entire target group. The sample size, according to Taderhoost [28], is determined by the research style. A representative sample of the population was required in a survey study in order for the findings to be generalizable. As a result, the sample size of 314 respondents was determined.

Sampling Techniques and Procedures

Basic random sample and selective sampling approaches were used in the inquiry.

Every member of the community has an equal chance of being chosen for a sample using the probability technique known as simple random sampling, which was utilised to identify local families and businesses. The knowledgeable workforce was also chosen through the use of purposeful sampling. Tongco [29] claims that this method, commonly known as judgmental sampling, involves a researcher selecting participants for study participation based only on their personal judgements and perceived knowledge or experience related to the research being conducted. The key informants, who included Soroti Municipality council members and top management personnel, were chosen through the technique of purposeful sampling.

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Sources of Data

Primary and secondary data were used. This necessitated obtaining data via field research. Questionnaires, interviews, and observations were also used to collect data, which was then evaluated to find answers to the research problem [31]. Secondary data was gathered from books, journals, newspapers, reports, and the internet, which was utilized to give the researcher literature and knowledge based on theories, as well as make comments and aid in the interpretation of the data collected. In this study, which included both primary and secondary data gathering methods, the two types of data collection were used to complement each other throughout the research process.

Data Collection Methods

The study used three data collection methods, as given below: interview, questionnaire, and observation.

Interview Method

Interviewing is a type of conversation in which the purpose is to collect specific information through spoken words [32]. This strategy was used to acquire qualitative data.

Questionnaire survey method

A questionnaire is a group of questions that a person is asked to complete in order to offer information for a specific purpose [33][34]. Respondents request that questionnaires be

completed, which increases the possibility of receiving correct data while also preserving privacy [35]. The questionnaires were self-administered and featured a variety of alternative alternatives such as highly agree, agree, disagree, and strongly disagree [36]. Self-administered questionnaires are preferred by the target audience.

Observation method

In this strategy, the researcher used observation to look at what was going on in a real-life environment, then classifying and recording persistent observations [31].

This strategy provided firsthand information in explaining reality in its natural setting, as well as assisting in the supplementation of respondents' comments.

RESULTS

During the study, 314 questionnaires were distributed and all of them were returned.

Table 1: Response rate

Instrument	Planned	Actual	Percentage
Interview guide	314	314	**100%**
Questionnaire	314	314	**100%**
Total	**314**	**314**	

The findings from the table above reveals that there was an overall response rate of **100%** that was obtained from the return of the questionnaires from the respondents since according to Saczynski [31], argues that a response rate above 70% is good to represent a survey population.

Respondents' demographic characteristics (Respondents' Gender)

The investigator asked the respondents to declare their gender with the sole purpose of determining whether gender plays a significant impact in solid waste management practices and the results are presented in the figure below:

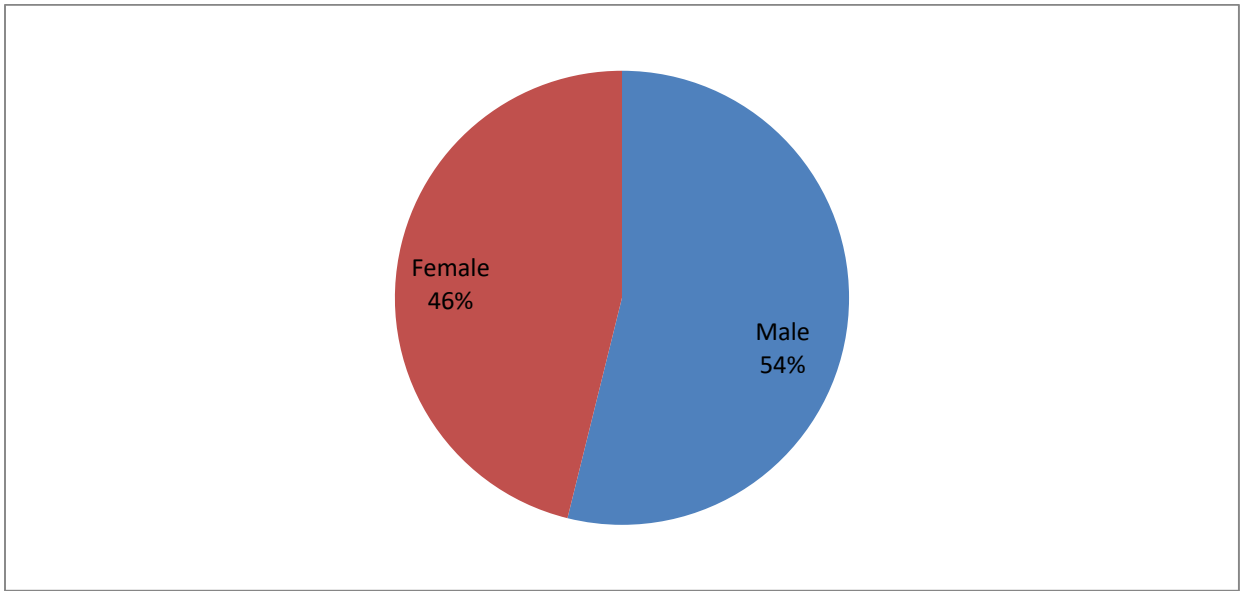

Figure 1 Sex of the respondents

The gender distribution of respondents is depicted in the graph above, with males accounting for 54 percent of all respondents and females accounting for 46 percent. These findings are related to men's assumption that women are responsible for all aspects of community cleanliness. However, the study's findings were gender balanced, with males accounting for 54% and females for 46%, and it should be remembered that men perform the majority of the manual labor, which includes hauling dust bins, containers, heavy forks, and cleaning floors. As a result, both men and women make

important contributions to solid waste management practices in the Soroti municipality.

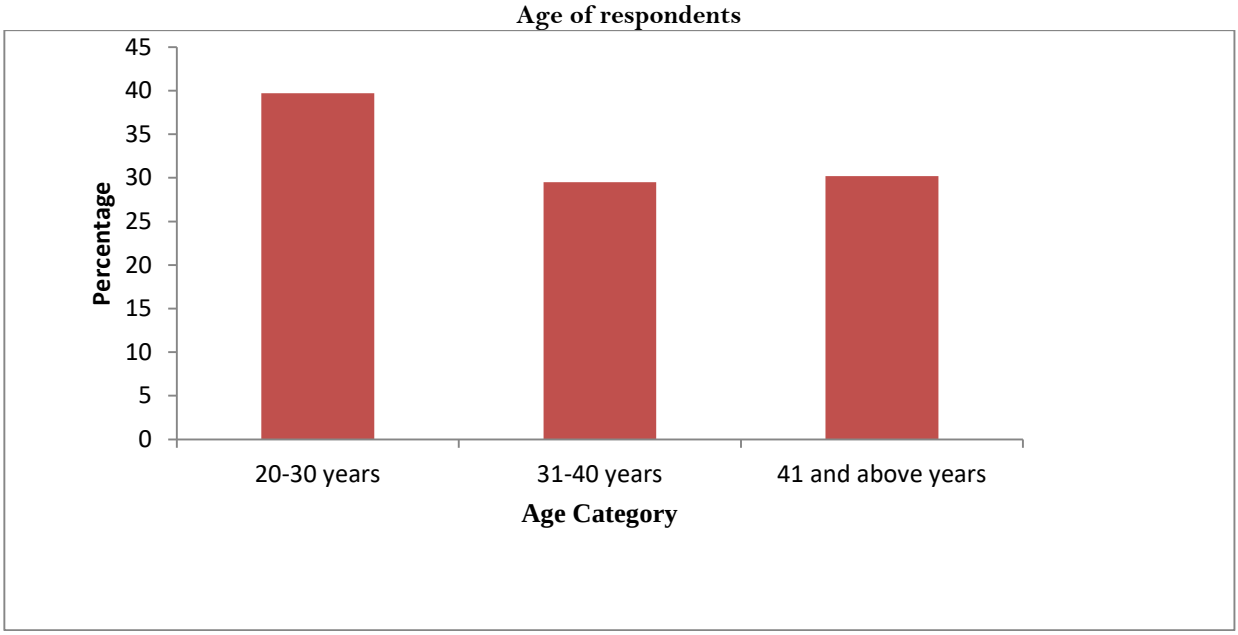

Figure 2 Shows Age category

Figure 2 shows that 39.9% of the respondents were between the ages of 20 and 30, 30.4 percent were between the ages of 41 and above, and 29.7% were between the ages of 31 and 40. This type of data shows that Soroti municipality's solid waste management practices are never discriminatory based on age, therefore the municipality recruits people of various age groups to work and as a result, the age group of 20-30 years was high since these were mostly singles without family ties who were also energetic, thus they tended to be more active in solid waste management activities than other age groups such as 41 and above who had family ties.

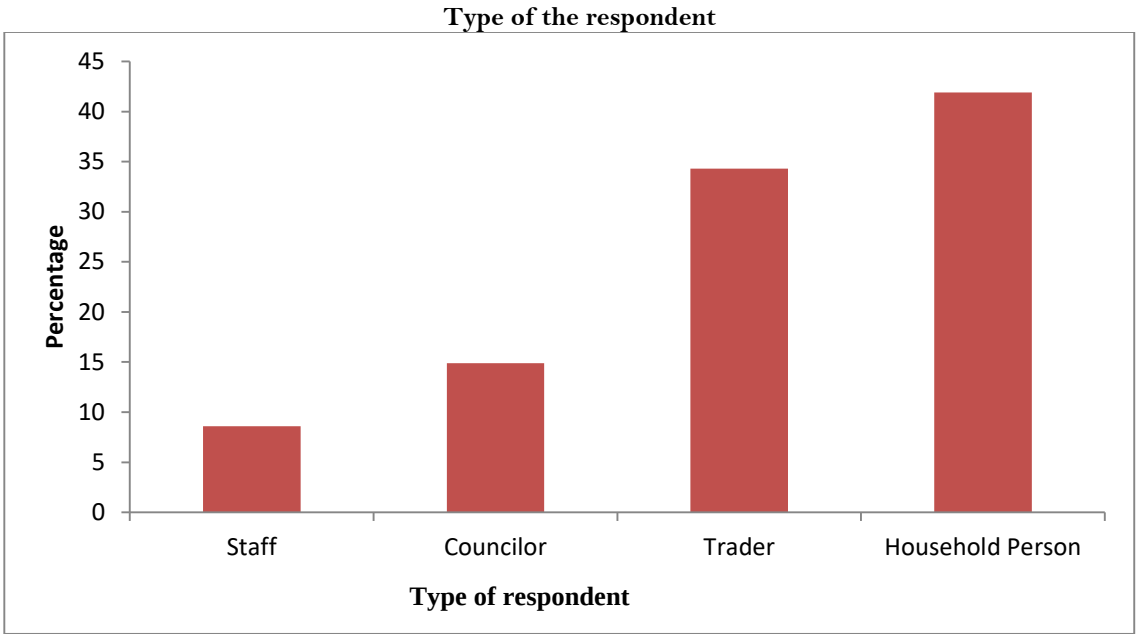

Figure 3 Shows type of respondents

The findings presented in figure 3 above reveal41.9% were house hold persons who had the highest percentage, followed by 34.3% who were traders, followed by 14.9% who were councilors and lastly 8.6% who were the staff.

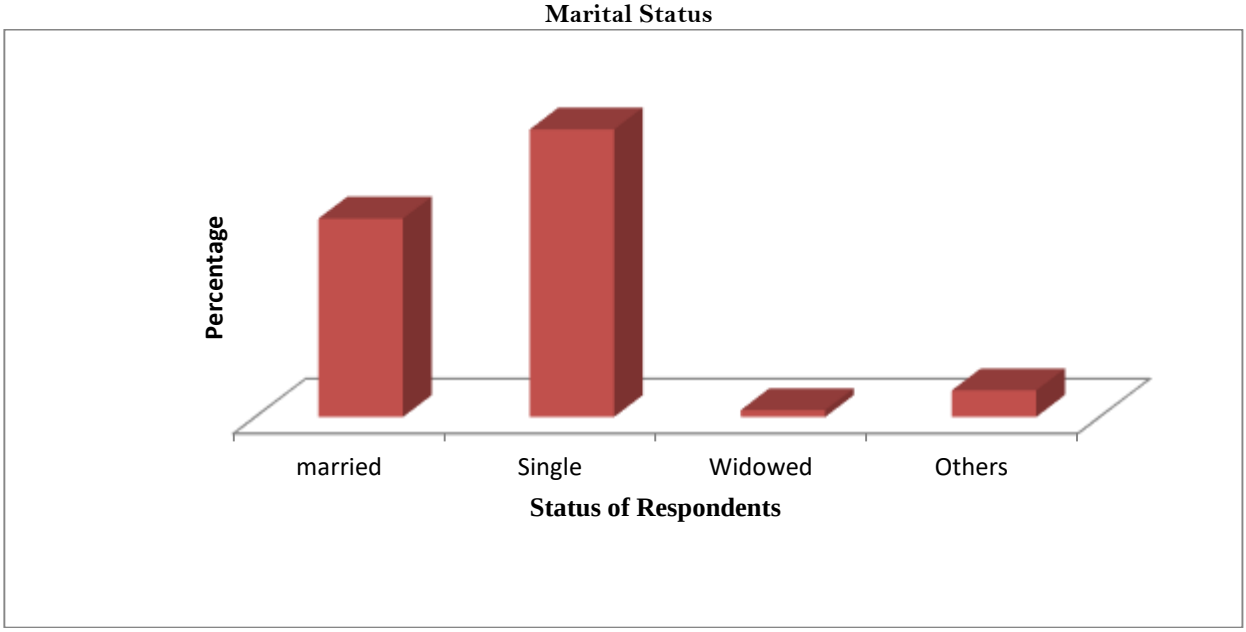

Figure 4 Shows status of respondents

The findings presented in figure 4 above reveal that the highest percentage was 55.2% of the respondents who were single, followed by 38.1% who were married then lastly followed by 5.1% who belonged to others and 1.3% who were widows as seen from the above figure.

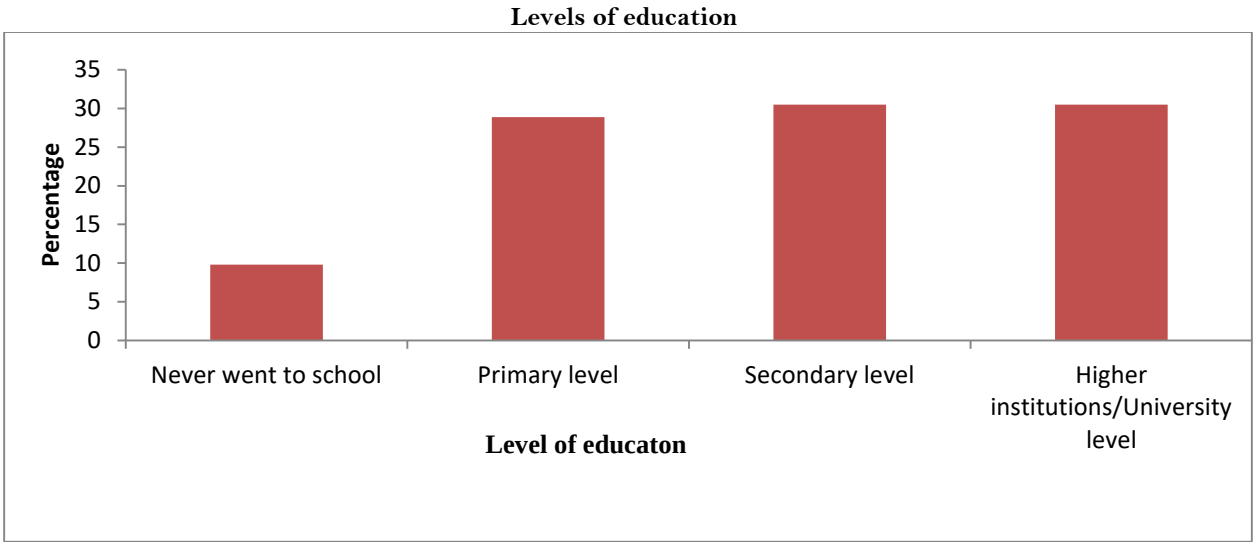

Figure 5 Shows Education Level

Figure 5 reveals that 30.5 percent of respondents have both secondary and post-level education, 28.9% had primary level education, and 9.8% had never attended school; this was due to the fact that some respondents had varying educational backgrounds, which the researcher requested they indicate by ticking. According to the study's findings, nearly all respondents could read and write, which can be attributed to the fact that the majority of respondents were literate, which means they had received a basic education that enabled them to fully comprehend that poor solid waste management practices are a threat to the local community and the environment as a whole. As a result, the varied academic degrees suggested a wide range of respondents who contributed data to this study, and the study's conclusions are instructional primarily because they captured the opinions of respondents of various intellectual calibers.

Occupation of Respondents

In addition, responses on respondents' jobs were obtained, and quantitative findings are presented in figure 6.

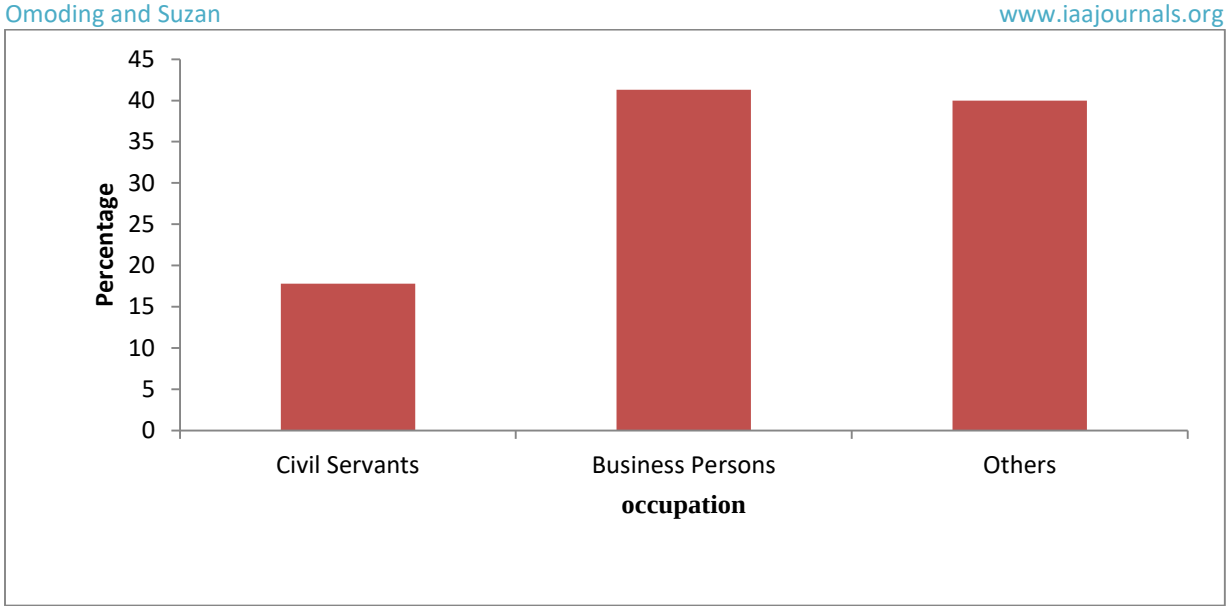

Figure 6 Shows Types of Occupation

The respondents had various occupations, according to the primary data in the above figure. 41.3 percent of the respondents were businesspeople, 40.0 percent were community leaders, and 17.8 percent were civil servants, but while in the field, the researcher asked respondents to indicate their occupation in order to collect a diverse range of perspectives on solid waste management practices in Soroti municipality, as shown above.

The results from the above figure show that the community and other people have a variety of occupations because the results show that business people dominated the study with 41.3 percent, indicating that business people are the ones who contribute the most to solid waste generation in the municipality in terms of plastics, paper, and food peels, among other things. Civil servants made up 17.8% of the total, but they were included because they make frequent trips to town for work and then return home in the evenings or on weekends, and because most of them did not live-in town. They were also included because they make a significant contribution and have a stake in the municipality's solid waste management.

The State of Solid Waste Management in the Municipality of Soroti

The study's objectives were to establish the existing state of solid waste collection, transportation, and disposal in the Soroti municipality, as well as treatment techniques. As a result, as illustrated below, this part begins with solid waste transportation and collection;

Practices for solid waste management

The goal of the study in this section was to see if solid waste is properly managed on a regular basis, and the results are given below;

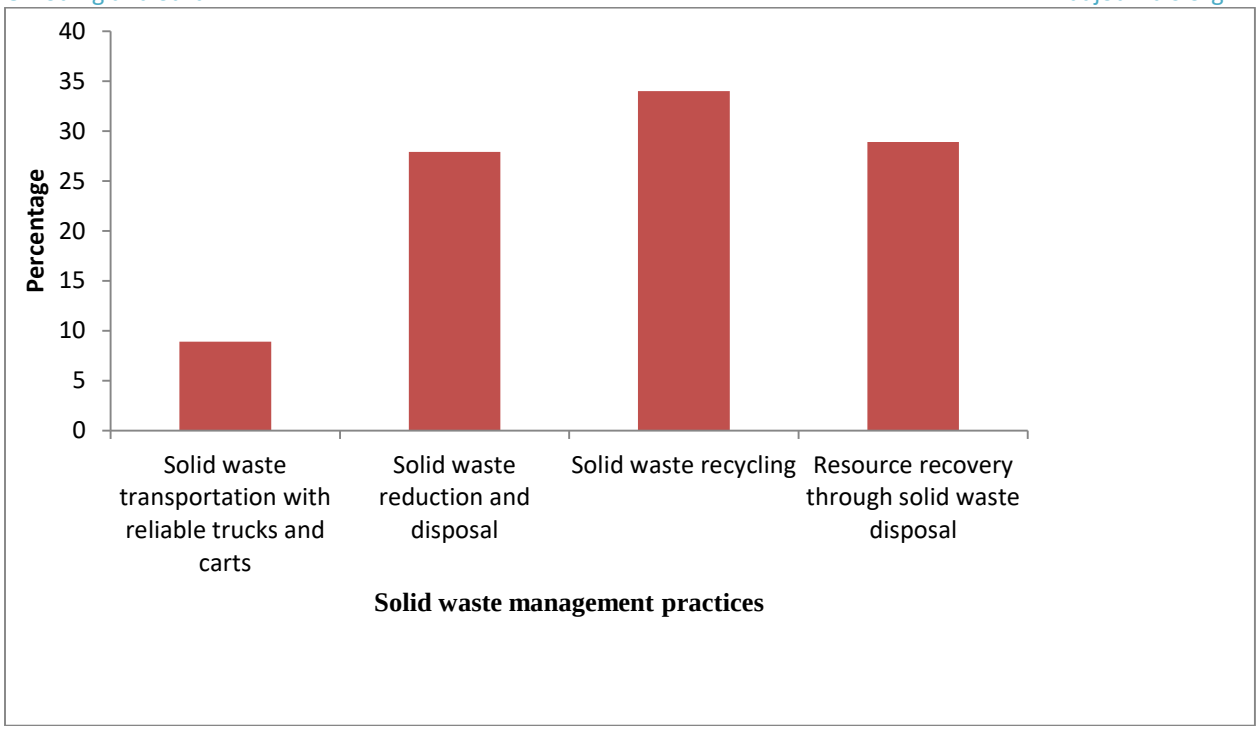

Figure 7 Shows Solid Waste Management Practices

The data shows that solid waste recycling is done on a regular basis, as evidenced by the 34.0 percent of respondents who strongly agreed, followed by resource recovery through solid waste disposal, as evidenced by the 28.9% of respondents who agreed that resource recovery was one of the solid waste management practices in Soroti municipality.

Effect of solid waste management planning on solid waste management practices;

Table 2: People have been given a chance to give an opinion on Solid waste management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	63	19.8	20.1	20.1
	D	63	19.8	20.1	40.1
	N	0.0	0.0	0.0	40.1
	A	32	10.1	10.2	50.3
	SA	156	49.1	49.7	100.0
	Total	314	98.7	100.0	
Missing	System	4	1.3		
Total		**318**	**100.0**		

The information presented above in shows that the majority of people strongly agreed that they were given chance to give their opinion on solid waste management practices and these was supported by 49.1 percent of the respondents who strongly agreed and 10.1 percent of the respondents who agreed.

But on the other hand, 19.8 percent strongly disagreed as well as disagreeing that they were not given chance to give their opinions on solid waste management practices as reflected in the above table.

Table 3: Leaders participate in solid waste management planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	63	19.8	20.1	20.1
	D	125	39.3	39.8	59.9
	N	0.0	0.0	0.0	40.1
	A	63	19.8	20.1	79.9
	SA	63	19.8	20.1	100.0
	Total	314	98.7	100.0	
Missing	System	4	1.3		
Total		**318**	**100.0**		

Table 4: Councilors discuss management plans

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	31	9.7	9.9	9.9
	D	94	29.6	29.9	39.8
	N	0.0	0.0	0.0	40.1
	A	156	49.1	49.7	89.5
	SA	33	10.4	10.5	100.0
	Total	314	98.7	100.0	
Missing	System	4	1.3		
Total		**318**	**100.0**		

Table 5: Councilors carryout regular surveys

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	62	19.5	19.9	19.9
	D	155	48.7	49.7	69.6
	N	0.0	0.0	0.0	40.1
	A	63	19.8	20.2	89.7
	SA	32	10.1	10.3	100.0
	Total	312	98.1	100.0	
Missing	System	6	1.9		
Total		**318**	**100.0**		

Effect of solid waste management planning

According to table 2, the majority of respondents with 49.1% strongly agreed that they were given the opportunity to contribute their thoughts and opinions on the solid waste management strategies of the Soroti municipality. Both local leaders and councilors agreed with 49.1% that they were given the opportunity to debate the municipality's management strategies.

The majority of respondents strongly disagreed that the councilors conduct regular surveys on the effects of solid waste management planning on

solid waste management practices, as demonstrated by 97%. This is due to the fact that fewer councilors consult community members on trash-related issues. Furthermore, the majority of local politicians did not appear to consult and debate matters related to the municipality's solid waste management procedures at the division, word, or village levels after taking office. As a result, the study's findings might be connected to the fact that the municipality of Soroti encourages community participation, with a wide range of stakeholders. However, the municipal authorities on the other hand, appear to have taken a bottom-up approach to planning, as evidenced by the statistics above.

Table 6: Effect of implementation of solid waste management plans on solid waste management practices

Table 6: Municipality disposes wastes in a good manner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	32	10.1	10.2	10.2
	D	63	19.8	20.1	30.4
	N	0.0	0.0	0.0	30.4
	A	124	39.0	39.6	70.0
	SA	94	29.6	30.0	100.0
	Total	313	98.4	100.0	
Missing	System	5	1.6		
Total		**318**	**100.0**		

Table 7: The Youth, Widows, Women and the disabled are involved in waste management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	94	29.6	29.9	29.9
	D	63	19.8	20.1	50.0
	N	0.0	0.0	0.0	50.0
	A	63	19.8	20.1	70.1
	SA	94	29.6	29.9	100.0
	Total	314	98.7	100.0	
Missing	System	4	1.3		
Total		**318**	**100.0**		

Table 7: Effect of implementation of solid waste management plans

The findings in table 7 shows that 29.6% of respondents strongly agreed that the municipality disposes of solid wastes in a good manner since they are consulted, and that the youth, widows, women, and disabled persons are also given a chance to participate in the implementation plans of solid waste management practices, as reflected by 29.6% in the above table.

Effect of monitoring and evaluation on solid waste management practices

Table 8: Specific days are set aside for cleaning up the Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SD	63	19.8	20.1	20.1
	D	156	49.1	49.7	69.7
	N	0.0	0.0	0.0	69.7
	A	63	19.8	20.1	89.8
	SA	32	10.1	10.2	100.0
	Total	314	98.7	100.0	
Missing	System	4	1.3		
Total		**318**	**100.0**		

Table 8: Shows the effects of monitoring and Evaluation on solid waste mgt Practices. The 10.1% of respondents with a frequency of 32 strongly agreed that solid waste management practices have a timetable that is provided by municipal authorities across all divisions for collecting wastes and 19.8% of the respondents with a frequency of 63 strongly agreed that there were specific days that were set by the municipality for cleaning up the town and 49.1% of the respondents disagreed that municipal authorities had never set any day aside for cleaning the municipality as seen with a frequency of 156 from the table.

Figure 8 Shows heaps of wastes being dumped along the corridors in Soroti municipality

To examine the magnitude of solid waste management problems

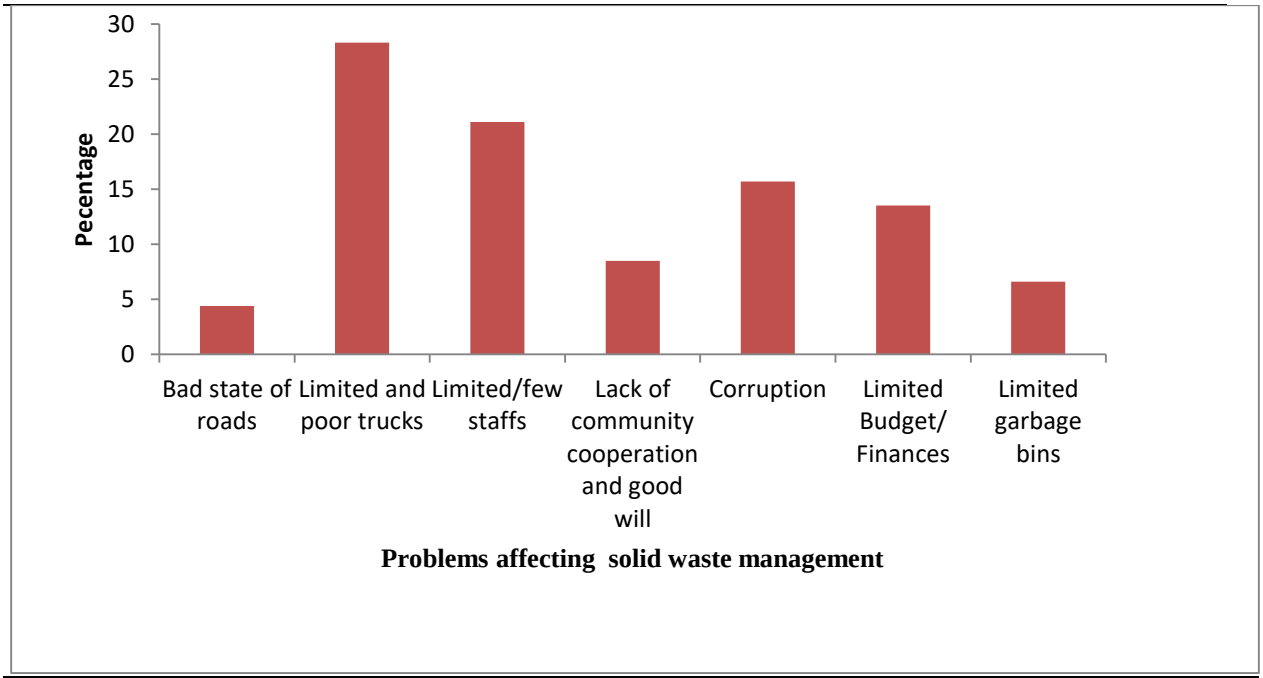

Figure 9 Shows Problems Affecting Solid Waste Management Practices

According to the graph above, 28.3% of respondents strongly agreed that the municipality's limited and ineffective vehicles posed a significant difficulty in solid waste management, which has posed a serious health risk. According to 21.1 percent of respondents, the municipality's low or insufficient garbage collection staff has posed a major waste management difficulty. Others in the municipality, particularly in divisions, have been corrupt, as seen by the 15.7 percent of respondents who blame unscrupulous officials for inadequate solid waste management. According to the study's findings, 13.5 percent of respondents agreed that the municipal waste management budget is limited, posing a significant challenge because uncollected waste is illegally dumped in open spaces, water bodies, or even burned on municipal streets and roadsides, making the financial factor a major concern.

The findings also show that 8.5 percent of respondents disagreed that there was no community cooperation and good will on the part of the people to participate in solid waste management, 6.6 and 4.4 percent agreed that the municipality had a shortage of garbage bins, which is one of the contributing factors to poor solid waste management, and 4.4 percent agreed that there was The lack of institutional facilities that are supposed to deal with waste-related issues, lack of expertise, financial resources, legal and administrative enforcement of environmental regulations, and lack of public awareness, according to the study's findings, are the primary causes of solid waste management problems in Soroti municipality and is, one of the major stumbling blocks to the municipality.

Solutions to Solid Waste Management

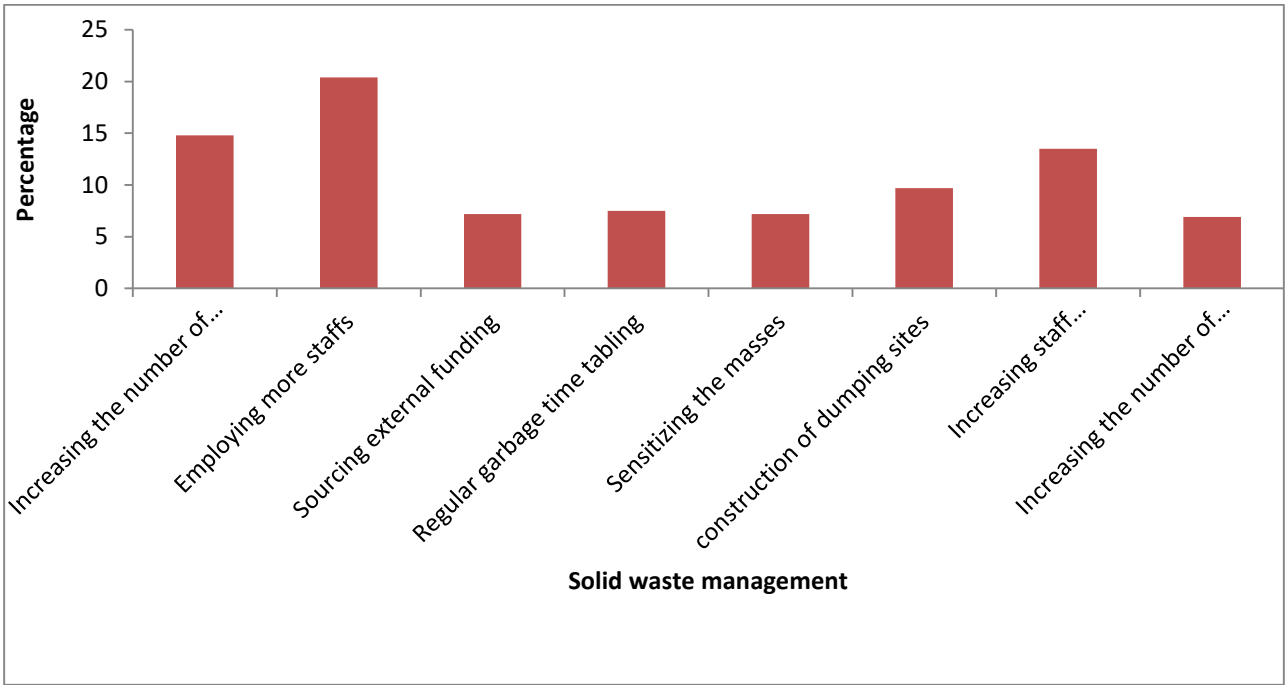

Figure 10 Shows Solutions to Solid Waste Management

According to the findings in figure 10 above, 20.4 percent of the population strongly agreed that employing more staff could help reduce the problem of solid waste management in the municipality, followed by 14.8 percent and 13.5 percent of the population who also agreed that increasing the number of waste-transporting trucks, as well as increasing staff salaries, could help reduce the problem of solid waste management in the municipality. While 7.2 percent and 6.9% strongly disagreed that obtaining external funding and increasing the number of containers in the municipality would help them solve the problem, 9.7 and 7.5 percent

agreed that the construction of dumping sites, regular garbage time tabling, and raising public awareness about the importance of solid waste could help them solve the problem.

The scope of the solid waste management issues

The study found out that the issues with solid waste management in Soroti municipality are primarily due to a lack of institutional facilities to address the issues that arise from poor solid waste management, such as a lack of technical expertise, funds, strong and strict laws and regulations, as well as a lack of public awareness of the problem.

According to the general study, the majority of people believe that only the uneducated are responsible for collecting and managing wastes, but disease spread in the municipality as a result of the breeding and multiplication of flies, mosquitoes, and rodents has in turn transmitted diseases to people. The investigation also discovered that open waste dumping in the city and along highways has caused havoc on the environment, particularly on the air and water that people breathe and drink, resulting in water-borne diseases in the municipality.

However, according to the observations, these dumpsites emit an unpleasant stench, resulting in air pollution. Furthermore, the proposed dumping site in Soroti is in a residential area.

Finally, the municipality of Soroti's solid waste management issues are due to significant urban population growth as a result of rural urban migration, as well as other factors such as expanding industrial operations, such as the Soroti fruit factory.

Soroti Municipality's Solid Waste Management Challenges

The fact that solid waste is a problem in Soroti; this has prompted the researcher to devise strategies for minimizing solid waste and addressing its challenges. Lack of trucks to collect and transport waste, as well as lack of staff and community involvement in waste management, was all mentioned in the research study. During the interview, one of the respondents stated that due to the poor state of the roads, most settlements are difficult to access by both the division and private collectors, and that most people have not been educated on the importance of solid waste management in their areas, resulting in several unofficial dumping sites throughout the municipality. One of the most important issues raised throughout the study was deficiencies in the procedures and legislation enforced by municipal authorities to regulate garbage.

In collaboration with the general population, the municipality of Soroti has not taken a substantial and good step in solid waste management initiatives such as source reduction and recycling, among others. Instead, the public has deafeningly remained mute. Another issue and challenge were the public's poor and negative attitude toward solid waste management practices. The general population had a negative attitude about garbage collection, disposal, or treatment, and residents did not participate appropriately in waste management, claiming that it was the municipality's responsibility, not theirs, to handle the waste.

DISCUSSION

Solid waste management is not a new activity for Soroti municipality, despite the fact that it is a relatively new municipality in Eastern Uganda but It is rather a process that requires public engagement rather than a one-day event.

Despite the fact that the municipality of Soroti is a relatively new to the region, man has been cleaning and disposing of solid wastes since the dawn of time, and his efforts have contributed to the town's cleanliness. However, the findings of this study show that solid waste collection and disposal are not solely the responsibility of municipal authorities, council divisions, individual persons, private companies, associations such as the Lions Club, individual households, and so on; the Ugandan government must also be involved in solid waste management in Soroti municipality, as these will necessitate.

The magnitude of the solid waste management problems

The results of the study show that the severity of the solid waste management issues in Soroti Municipality has been increasing as a result of a lack of knowledge, funding, and administrative and legal enforcement of environmental laws. The study concluded that the residents of Soroti Municipality lacked environmental ethics and public knowledge, which led to uncontrolled solid waste disposal that cut over all of the municipality's divisions. The study found that the people themselves, not the municipality, have been the problem with solid trash collection because of the law's shortcomings and the lack of funding. To gain a better understanding of the risks associated with inadequate solid waste management, the study found that little solid waste is collected in the municipality's periphery. These findings are consistent with those of a previous

study [37], which found that a significant amount of solid waste is located in these areas. The study's respondents also linked the municipality's poverty, illnesses, and suffering to inadequate solid waste management practices. The study discovered that there was bad order resulting from the accumulation of solid wastes in the town setting, and this attracted dogs, cats, and a large number of street children who were scavenging for food nearby. The Municipality's solid waste disposal was also linked to the development and reproduction of flies, mosquitoes, and rodents, all of which spread diseases like malaria, diarrhoea, dysentery, and other illnesses that have impacted the health of the general populace.

The scope of solid waste management issues

According to the findings of this study, the scope of Soroti's solid waste management problem has grown as a result of bad roads, limited and inferior cars, few workers, lack of community engagement, corruption, restricted budget, and limited garbage containers, among other factors.

This study revealed that a lack of public awareness has resulted in unregulated solid waste disposal, which has been found to cut across the municipality's four divisions, and that this is attributable to a lack of financial resources as well as deficiencies in regulations and legislation within the divisions. According to the investigation, solid trash collection has not been an issue in the municipality. Similarly, the study discovered that wastes are hardly being collected in a good manner in the outskirts of the municipality, particularly in the southern division, as shown in the pictures [37-41].

The study also discovered that a foul odor emanated from the accumulation of solid wastes within the market areas and along the streets, which had not been collected for several days due to lack of a proper waste collection schedule, and that this had attracted more street children in the municipality, particularly from Karamoja and other areas, who are now scavenging for food along the streets.

Strategies to overcome waste management challenges

In Uganda, solid waste management techniques must be carefully planned for and take into consideration changes brought about by advancements in a certain municipality or metropolitan centre, like Soroti. More space would be required to accommodate the garbage generated as the population and number of businesses grows. Increasing the number of wastes bins or skips in a city or municipality is a wise technique for improving solid waste management practices [37-41].

Stakeholder involvement is a crucial aspect of effective solid waste management systems or practices, because involving all community members in waste management struggle will make them active and key stewards for the success of community-based solid waste management projects. As a result, the following strategies can be utilized to address the issues of solid waste management:

One of the strategies identified by municipal authorities to address the problem is by conducting trainings on local communities and other stakeholders in productive waste recycling methods that are friendly to the environment and raising public awareness about the importance of solid waste management practices. For the effective management of solid wastes in both small and big quantities, there exist certain methods [38]. Increasing the number of technical and administrative staff in the municipality who works on waste management. According to the report, the municipality's lack of technical personnel precludes it from undertaking solid waste reduction, reuse, and recycling activities. By strengthening and enhancing solid waste management policies and regulations and adopting a comprehensive institutional or legal framework to address waste management issues in the municipality, the regulations, policies, and legal framework will provide an answer to the anomalies found in the study. On the other hand, these laws and rules will work wonders when combined with better equipment and technology, community awareness campaigns, and public participation. Although the aforementioned are the municipality's immediate concerns, new disposal sites and an increase in the number of garbage containers, among other things, are required to meet the daily waste generated. Another way to address the problems is to raise the budget or funds allocated to solid waste collection in the municipality, as evidenced by calls to invest more money in solid waste activity in the municipality and divisions in general.

CONCLUSION

This research report has attempted to analyze the current status, the magnitude of solid waste management problems and the strategies to overcome solid waste management challenges in Soroti Municipality. In particular, the study explored collection of solid waste, transportation, existing solid waste management practices. These investigations were addressed by employing questionnaires, field observation, semi structured and structured interview given to various people in

the Municipality and reviewing published and unpublished documents.

Solid waste management practices, however, apply to all societal groups residing in and around the municipality's boundaries. It should be noted that as the municipality develops, the effects on the environment and its citizens become more evident, and it is the responsibility of the municipality, the division, the state, and the residents to guarantee efficient solid waste planning, collection, management, and disposal at all times. The Municipality, Division, word, community nor government can work alone in all areas to reduce, control and manage solid waste but instead it needs a concerted effort from all sides where everybody is involved in the struggle since major inadequacies in the Soroti municipality's solid waste management systems have created limitations.

Recommendations

The following recommendations are given in order to reduce the amount of solid waste in the Soroti municipality and improve solid waste management methods;

- The development of community awareness and skills in solid waste management is essential, and can be accomplished through council-organized meetings, focus groups, and local radio programmes.
- To reduce garbage while simultaneously providing social and economic benefits to residents, the town must study the prospects for the 4Rs.
- Other approaches must be introduced and integrated, such as integrated waste management, which uses decentralized community-based systems involving community-based organizations to target the peri-urban poor, as well as more centralized city council and private operator systems to target central business areas, the wealthy and middle-class people.
- Women, youth, municipal workers, political leaders, community-based organizations, and religious bodies should all be encouraged to participate in the design, planning, and implementation of waste programs in both divisions, and the community can help identify cogeneration systems. I also suggest that local government officials organize a Community Environment Committee.
- Committees to address residents' complaints, issues, and obstacles with solid waste management. As a result, it is the Municipality's duty and responsibility to ensure that the community participates in solid waste management, and competent authorities must develop solid waste management rules that must be obeyed if the community is to participate.
- By constructing resource recovery facilities close to or on route to the final disposal locations, enabling the effective transportation of leftover waste from recovery facilities for disposal.
- In order to strengthen the local economy, Soroti Municipality should draw investors interested in establishing recycling industries. This will not only help the nation avoid losing significant amounts of foreign exchange to the processing industries, but it will also provide formal and informal employment opportunities for the many unemployed residents of the municipality.

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