

The Contribution of Community Practices to Solid Waste Management in Rwanda: The Case of Musanze District Town

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ABSTRACT: Most cities in developing nations have struggled to manage their massive amounts of solid waste, and some waste may finally be dumped in open dumpsites with carelessness, not separated and then treating them becomes very difficult which could have a variety of environmental effects and doing so costs a sizable sum of money. In Rwanda, Communities can participate in the collection and transportation of solid waste from the point of generation to the disposal sites thanks to their practices. This study's major goal was to find out how much community practices contributed to solid waste management in Musanze District town's four sectors-Cyuve, Musanze, Muhoza, and Kimonyi. Using the Slovin formula, a sample size of 393 people was calculated and chosen at random from a population of 20260. Open-ended and closed-ended questionnaires and observation checklist were used as data-gathering tools. The data were analyzed using the IBM program version 20 for finding the level of contribution of the community practices to solid waste management and the relationship between them. The study discovered that people of Musanze District Town always kept the surroundings and public spaces clean (mean score 4.37, SD: 1.103), community practices in waste management in Musanze District town included animal feeding at home (mean score 4.88, SD: 0.322) and paying waste collection fees (mean score 4.67, SD: 0.623) but on the other side it was found difficult for some practices at the dumpsites such as waste separation (mean score 2, SD: 0.926) and recycling (mean score 2, SD: 0), as a result of low community's contribution on waste reduction at source (mean score 1.9, SD: 0.91), wastes sorting at source (mean score 2.58, SD: 1.16) and recycling of waste at source (mean score 2.72, SD: 1.34). This issue has led to waste accumulation

and deterioration at dumpsite, and right now, there is more rubbish than the dumpsite can handle. In addition, from IBM outputs results, we found a positive relationship between community practices and solid waste management ($R=0.863$). Some difficulties encountered were the shortage of vehicles (mean score 2, SD: 1.31), lack of enough recycling bins (mean score 2, SD: 0), and few dumpsites (mean score: 3.38, SD: 1.51). For sustainable solid waste management in Musanze District town, this study suggests that all people receive training, encouragement, and involvement, particularly in waste sorting, reusing, and waste minimization procedures and Local leaders may attempt to enforce plans, regulations, and appropriate penalty penalties for those who may attempt to commit an offense against it.

KEYWORDS: The contribution of community practices, composting, solid waste management (SWM), Solid waste sorting, Solid waste recycling, and dumping site.

I. INTRODUCTION

Most cities in developing nations have struggled to manage their massive amounts of solid waste, and doing so costs a sizable sum of money. Therefore, improper waste management has a significant impact on environmental safety, human health, and human security. Poor garbage management breeds disease-carrying organisms, pollutes water, releases methane and carbon dioxide into the atmosphere, and may even promote urban sanitation-related violence (Lenkiewicz, 2018; Wilson & Webster, 2018).

Community practices refer to the beneficiaries' active and significant participation in solid waste management. However, the survey has revealed that a sizable portion of community

members lack a sufficient awareness of their role as stakeholder in solid waste management. The majority of communities have a bad attitude toward solid waste management because they think that only the government has that responsibility (Anirudh, 2019).

Communities can participate in the collection and transportation of solid waste from the point of generation to the disposal sites thanks to the practices (Ibrahim & Mohamed, 2016); for instance, they can store their trash in a specific bag or bin, bring it to a predetermined location at the right time, separate it into dry and wet waste, pay collection fees, separate recyclable materials, participate in awareness-raising activities, and so on (Kabera, 2020; Khadija & Hadiza, 2018). It takes extensive participation from families by taking an active role in solid waste management for household solid waste management to be successful (Mudzengerere & Chingweya, 2012; Woodson, 2012).

A study conducted in Jasin Malacca (Malaysia) from 2015 to 2017 found that the community's involvement in the solid waste segregation and recycling program was still at a low level due to a lack of knowledge, a negative attitude, and exposure to the long-term benefits of recycling.

To manage garbage, Singapore placed a strong emphasis on long-term collaborations between the public and private sectors. When it confronted severe disagreements over where to locate waste management facilities, Japan discovered the need of community and government involvement in garbage management. Since then, it has placed a strong emphasis on three fundamental ideas: comprehension, collaboration, and contribution (Ministry of Environment, Japan 2005).

The Kathmandu Metropolis in Nepal has established a separate unit which encourages and educates students to take part in various environmental and waste reduction activity. Communities also receive the technical and educational support they need to engage with environmental matter. The National Waste Management Policy was also created to support local governments and encourage NGO involvement and privatize certain stages of the waste management process (Gotame, 2012).

According to a study conducted by Mukama et al., 2016 in two urban slums in Uganda, respondents expressed interest in taking an active role in waste management. They expressed concern about the diseases caused by incorrect waste management and comprehension of their involvement in waste management.

The aforementioned examples show that local governments around the world have

recognized the value of community involvement and are highlighting their active participation in policy-making and execution.

The struggle of managing household solid waste is present in Rwanda (Gakungu, Gitau, Njoroge, & Kimani, 2012). The incapacity of local cities to forge collaborative relationships with communities to deepen their commitment to SWM is one of the factors causing this issue (Guerrero et al., 2013).

The variations of quantity of household solid waste produced in Musanze District town per person per day is important. The community's contribution to solid waste generation and management in the town of Musanze District is still unknown. This inquiry is necessary because it is one area that requires actual implementation. What can be done about SWM in Musanze District town is the question. This research then examines communities' practices, including their contributions to SWM and their understanding of where responsibilities and opportunities for SWM improvement lay, using a case study of the town of Musanze District in Southern Rwanda.

II. METHODS AND MATERIALS

II.1. Description of the study area

The 4 Selected Sectors of Musanze District Town make up the study area. It consists of the sectors Muhoza, Kimonyi, Cyuve, and Musanze, among others. They are chosen because these are main sectors of Town of Musanze with more corporate activity and a growing population and they surround the main dumpsite of Kiguhu, hence they are considered as the main source of waste.

The town of Musanze District, which has 15 Sectors, 68 Cells, and 432 Villages, is situated in the Northern Province of Rwanda. One of Rwanda's top five or secondary cities with the highest priority is Musanze City (RDDP, 2013). Statistics show that there are 466,944 people in the district, with an average density of 243 people per square kilometer (Census, 2012). There are 20,260 households and 99,387 people living in the city of Musanze (NISR, 2012).

Musanze city is around 110 kilometers away from Kigali and is situated in the volcanic region. With 99,387 residents, the city has a high population density and is surrounded by relatively advanced agricultural areas (NISR, 2012). However, the city is rapidly growing mostly as a result of the rising activity related to the tourism sector (MININFRA, 2016).

Urban centers in Musanze City are experiencing significant growth, which has led to urban sprawl with inadequate basic services and

KIMONYI	2281	11.26	44
Total	20260	100	393

Source: NISR, 2012

These sectors from the town of Musanze District were selected by the researcher based on their fact of high corporate activity, a growing population and being main source of solid waste that are dumped at the big site of Kiguhu. we selected Kimonyi, Cyuve, Musanze and Muhoza sectors.

II.3. Data collection tools and Results analysis.

Data were acquired from primary sources from respondents and field observations.

The validity and reliability of the questionnaire was pre-tested, before the beginning of data collection. Using Cronbach's Coefficient alpha, the questionnaire was pretested to 16 respondents of sector of Musanze District town. The IBM software was used to compute the reliability Alpha coefficients, and the findings were assessed. While a low coefficient suggests low reliability, a high value signifies good reliability (Sekaran, 2003). Table 2 below provides the outcomes.

Variables	Alpha	Number of Questions
Community Practices	.769	26
Solid waste management	.822	38
Total	1.591	64

Table 1 Reliability outcomes

Source: Primary Data (2022)

The sum of the alpha scores (1.591) divided by the number of variables (2), or the "alpha" factor, yielded the average value of 0.796. In accordance with Amin (2005), reliability can be demonstrated with an alpha of 0.5 or greater. The reliability of the questionnaire was confirmed throughout this testing technique, and it is high because it exceeds the threshold value of 0.7, suggesting a high level of internal consistency.

III. RESULTS

III.1 Demographic features of participants

The information received from the questionnaires and field observations was used to build a master sheet made of 5-point likert with a score range of 1 to 5, where their means and standard deviations were prepared for each statement of the pertinent variables. The output from IBM software, linear regression analysis, and descriptive tables were all used by the researcher to discuss the study's findings.

The demographic features of the respondents (community) are summarized in Table 2, along with further details and a description.

Table 2 Age group and sex of respondent (Average age is 30)

	10-20	21-30	31-40	41-50	51-60	61-70	Total	%
	years	years old	years old	years old	years old	years old		
Sex	8	88	48	10	1	0	155	39.44
Male (frequency)								
Sex	13	144	58	19	3	1	238	60.56
Female (frequency)								
Total	21	232	106	29	4	1	393	100.00
%	5.34%	59.03%	26.97%	7.38%	1.02%	0.25%		

Source: Primary Data (2022)

Table 2 shows that 144 respondents, or 60.56%, were female and aged between 21 and 30. Up to 59% of respondents in this age group stated to be between the ages of 21 and 30. This age group actually had the highest percentage of respondents. The younger age category (10-20 years) and older age category (41-50 years, 51-60 years, and 61-70 years) recorded few respondents with only 5.34%, 7.38%, 1.02% and 0.25% respectively.

According to the results in table 2 above, 86% of all respondents were in the ranges of 21-30 and 31-40 years old. This is due to the fact that those age groups contribute the largest workforce because they are the most active in producing waste and managing it as well; in contrast, the younger ages are primarily in school, and the older ages are skilled at assigning tasks to the active age groups.

III.2 Community practices in solid waste management

The information that was gathered in the form of tables and figures for the purpose of examining and debating the extent to which community practices in the town of Musanze District contribute to solid waste. In this study we used a 5-point Likert with scores ranging from 1 to

5, the relative contribution of community practices to solid waste management was ranked, and the mean scores and standard deviation were computed. It denotes that the range of events with mean scores includes: The most significant or problematic levels are regarded as 4.21-5.00. High importance or high problem levels range from 3.41 to 4.20. Medium important or medium problem levels are categorized as 2.61 to 3.40. Less significant issues are those rated between 1.81 and 2.60. The least significant or problematic levels are regarded as 1.00 to 1.80.

III.2.1 Cleaning of surroundings and public space

As a result of daily cleaning in houses and participation in Umuganda (monthly), the community's practice of keeping its surroundings and public spaces clean was strongly implemented, it is a highly appropriate contribution to solid waste management with mean score of 4.37, which is higher than three (>3) and its Standard deviation value of 1.103 or higher (>1) show some minor differences.

III.2.2 Minimize waste production

The household replies to the question of reducing waste generation are shown in the following table.

Table 3 Community Practice: Waste minimization

Statement	Likert mean score	Standard deviation	Contribution level to SWM
I use clean cooking (e.g. I use biogas) and produce low waste	3.32	1.21	Medium contribution
When I take part in solid waste management reduction, I get rewards	1.9	0.91	Less appropriate contribution
I receive incentives when I participate in separation of solid waste management	1.8	0.9	Less appropriate contribution
I recuperate most of reusable material from waste	3.23	1.129	Medium contribution
I sale the reusable material taken from waste	4.18	0.387	High important contribution

Source: Primary Data (2022)

Inadequate individual participation in household waste reduction practices is one factor contributing to the continual rise in waste creation worldwide (Bortoleto et al., 2012). According to the findings in the above table 3, level of contribution to solid waste management was deemed medium for recycling waste from their

homes or shops (mean scores for reusing waste material and waste reduction were 3.23 and 3.32, respectively); however, the majority of households disagreed that they receive rewards for taking part in waste separation and reduction (Mean scores for participation in waste separation and reduction, respectively, were 1.8 and 1.9); as a result, their

level of contribution to solid waste management is viewed as less appropriate. This low degree of contribution to SWM may be brought on by a lack of the right technology, money, commitment, or understanding of how to lessen the waste produced on their premises. As a result, assistance and training are required.

III.2.3 Separation of waste into organic and non-organic

The responses from households about whether they separate their waste into organic and non-organic materials and if they keep it in a separate bag or special container are shown in the table below.

Table 4 Community practice: Waste separation

Statement	Likert mean score	Standard deviation	Level of contribution to SWM
I have different bins /containers for organic and non-organic waste	3.29	1.103	Medium contribution
I sort my waste before putting them in collection bins	2.58	1.16	Less contribution
I put biodegradable waste in a distinct container from non-biodegradable waste	2.74	1.25	Less contribution

Source: Primary Data (2022)

Sorting the waste improves waste management (Hao.et al., 2015). The results in the above table imply that households have a lessened contribution to waste sorting(mean scores of 2.58; Std Dev=1.58) and were unable to use various containers for biodegradable non- and biodegradable garbage (mean score of 2.74; standard deviation, 1.25); This is a significant problem for the management of waste at dumpsite since households that do not sort, segregate, or dispose of waste in any other way mix wastes together at the dump, making it difficult to reuse or treat them.

As evidence, Figure 1 depicts mixed waste discovered in bags used by households at home in the Kimonyi Sector.



Figure 1 Mixed Waste found in bags used by households at home in the Kimonyi Sector

As seen in Figure 1, poorer people continue to adopt the conventional approach of collecting waste using any open, exposed container like a bag or box. Typically, this approach is unsanitary and consequently unsustainable (Roberts et al., 2009). All Musanze City citizens are urged to adopt and implement environmentally friendly waste collection methods.



Figure 2 Mixed waste biodegradable (papers, woods) together with nonbiodegradable

waste(plastic bottles): Picture taken at collection point before transport to dumpsite in the Muhoza sector

The researcher's observation of waste sorting activity at the Kiguhu dumpsite provides much more evidence that most residents of the Musanze District Town who produce waste do not sort it; instead, sorting was carried out at the dumpsite by employees or by individuals who want to have profit financially from the waste items. For instance, street kids sort plastic bottles at the dump and sell them to recycling companies. The Solid Waste Management Officer and dumpsite employees claim that solid waste is packed without being sorted. This suggests that after waste is collected at the dumpsite, either the disposal manager or private scavengers sort it. The researcher's field observation demonstrates the need of sorting and separating waste (see below photos taken from Kiguhu dumpsite Site: figure 3).



Figure 3 Mixed waste: Broken glass mixed with metals, wood, cloths, papers(picture taken at Kiguhu dumpsite).

Discussions with local authorities revealed that campaigns encouraging the segregation of non-organics from organics by individuals have not been introduced to the majority of homes. If households had been encouraged to separate non-organics from organics, waste collection pickup would have been easier and they could have sorted the more valuable recyclables out of the non-organic bags without having to deal with mixed waste that was generated from residences till dump sites. One of the explanations given by the respondents for not performing solid waste segregation and recycling was that a significant percentage of them cited the lack of and inadequate containers for doing so, but on the other hand, cultural norms and knowledge could still encourage waste separation.

3.2.4 Description of the status of Kiguhu dumpsite site and its surroundings

Kiguhu dumpsite is located in Cyuve sector within Musanze City. The waste is discharged at the site, and no controls are implemented to manage the waste or safeguard the environment. As a result, the location has turned into a scavenging area for wild animals.

An overview of the description of the current state of the Kiguhu dumpsite site and its surrounds is shown in table 5.

Table 5 Description of Current condition of the Kiguhu dump site and its surrounding

Condition	Description
Design and technique of disposal	The trucks offload non-separated solid wastes (no selection of dumping area!). The ground is where all garbage is dumped.
Security	The dumpsite is not covered and no fences (illegal dumping may occur and security is not ensured)
Water Leachate	There is no infrastructure in place to collect and treat leachate
Waste management practices	The staff at dumpsite try to make some waste separation for making some fertilizers, but not regularly
Observations	Some waste is deposited on farmland, fire and smoke were seen at the dumpsite, and scavenging was seen there as well
Waste collection data	No one
Adverse Impact on surroundings	Within a 1km radius of the dumpsite, there are buildings. Flies and an unpleasant odor are a complaint from nearby homes. Also people are cultivating plantation near leachate from dumpsite site which may results to health effects on consumers.

Source: Field observation 2022

III.2.5 Solid Waste Recycling/recovery

The responses from households regarding their recycling/recovery of solid waste are shown in the table below.

Table 6 Community Practice: waste recycling/recovery

Statement	Likert mean score	Standard deviation	Level of contribution to SWM
I am involved in the design and implementation of recycling programs	2.72	1.34	Medium contribution
I use combustible waste material for cooking at home (energy recovery)	3.19	1.15	Medium contribution
I use most of my compost to make fertilizer	2.83	1.21	Medium contribution
The community uses food wastes for animal feeding	4	0.926	High important contribution
At dumpsite, the reusable waste material like bottles, metals, wood and others, are Separated and will be reused or recycled	2.38	1.06	Less appropriate
I am aware of need to reduce waste production and facilitate waste recycling	3.23	1.129	Medium contribution

Source: Primary Data (2022)

This was asked for finding out the possibility of adopting reusing approach in waste Management (UNEP,2020) in Sectors of Musanze City. The results indicate that the majority of respondents (mean score: 2.72) were not in favor of waste recycling. In Musanze District town, households still don't reuse bottles or papers very often(mean score: 2.38). Efforts are therefore required to encourage the reuse of bottles and paper. Organic waste collected in Musanze City are used for animal feeding and production of an average amount of combustible waste materials, compost, and fertilizers (mean scores of 4, 3.19, 2.83 for animal feeding, combustible and compost respectively). As a result, some waste is still

dumped in sites, where it continues to decompose.

Even though there isn't a formal recycling system in place at the Kiguhu dumpsite, the researcher discovered that organic fertilizer recycling is still taking place there. However, because there isn't a formal recycling program or technology in place yet, it's difficult to easily recover the full value of biodegradable materials from this resource base. As a result, only domestic items can be reused or recycled throughout the city.

III.2.6 Waste collection fees

The following table 6 displays the feedback from households regarding the regular fee payment for solid waste collection.

Table 7 community practice: Payment of waste collection fees

Statement	Likert mean score	Standard deviation	Level of contribution to SWM
Waste pickers collect the separated waste or ask it to be done before	1.88	0.99	Less appropriate
There are enough trucks and bins used for solid waste collection	2	1.31	Less appropriate
To better the management of solid waste, I am willing to pay any monthly charge for the waste collection service	4.67	0.623	Most important contribution
The fee is affordable	4.16	0.37	High important contribution
I pay on time the required amount for solid waste collection service	4.78	0.448	High important contribution

Source: Primary Data (2022)

The results from Table 7 show that the trucks and bins used for waste collection are not enough, which will need the support/fund from Musanze District (mean scores 2 and 1.88 which are both less than 3) and respondents who paid a waste collection fee had higher mean scores (4.78, 4.67, and 4.16) and very low standard deviations (0.623, 0.37, and 0.448, respectively), indicating that the majority of households in Musanze City paid regularly for solid waste collection from their homes or shops and that the cleaning fee was affordable (fees range is between 1500 and 5000 Rwandan francs per month for households

compared to 5000 to 10,000 Rwandan francs paid by business owners).

Household waste is removed for disposal, and waste collectors are compensated for their work. According to sector officials and waste picker businesses, middle-class individuals are willing to pay while low-income individuals are not paying well due to their limited capacity.

III.2.7 Solid waste compost and disposal

Table 8 below shows the responses from households regarding how they dispose of or compost waste.

Table 8 waste disposal

Statement	Likert score	mean	Standard deviation	Level of contribution to SWM
Most of my organic waste is composted	3.28		1.2	Medium contribution
Solid waste is properly disposed of by the community people	2.75		1.04	medium contribution
I follow the regulators to see how waste is disposed of	4.05		0.225	High important contribution
There are enough dump sites	3.38		1.51	medium contribution

Source: Primary Data (2022)

According to households, waste is composted (Mean score: 3.28; an average number of households is not actively contributing to composting activity). This demonstrates that the level of community involvement in this effort in solid waste management is moderate. Many of the households we spoke with, they stated that they lacked sufficient green space for the construction or upkeep of their own composting systems. Along with structural limitations, households generally lacked a strong motivation to learn how to set up and manage a home composting system.

The open dumpsite is favored when there aren't enough or any waste management facilities, people don't know enough about eco-friendly disposal options, the law isn't enforced with sufficient penalties, and offenders are motivated by a desire to save money (Roberts et al., 2009). Because Musanze City does not yet have designed dumpsites, the majority of the solid waste produced

there, according to the researcher, is officially dumped at open dumpsites. The remainder of the solid trash that was not gathered for disposal at officially permitted dumpsites is sometimes buried or burned by waste generators. According to this data above, the community does not properly dispose of its solid waste because the practices used are neither hygienic nor environmentally friendly (mean score is less than 3).

III.2.8 Public/private partnerships in waste Management

The availability and effectiveness of private and/or public waste management including collection, recovery, and disposal make up the Solid Waste Management Administration component. The SWM plan factor refers to the existence and efficacy of a comprehensive, integrated, long-term SWM strategy (UNEP, 2015).

Table 9 Public/private partnerships in waste Management

Statement	Likert mean score	Standard deviation	Level of contribution to SWM
There is a scheduled day for cleanup	4.38	0.518	Most important contribution
The strategy of solid waste management involves community and local leaders	3.13	1.25	medium contribution
There is consultation with community on issues pertaining to solid waste programs	3.63	1.06	High important contribution
Planning for solid waste management takes the public's opinions into account.	3.38	1.51	medium contribution
Local authorities encourage contribution from the community and give them official training in solid waste management	2.75	1.04	medium contribution

Source: Primary Data (2022)

In the table above 9, the local leader's contribution through community mobilization and training is still viewed as medium based on their feedback (Likert mean score =2.75, less than 3).

In Musanze District town, the researcher found that community opinions on planning and resolving solid waste management issues are still at a medium level; this fact was supported by the mean scores found from households' feedback about planning (mean score:3.13), community consultation (mean score:3.63), and public view consideration (mean score:3.38) and they consistently take part in the monthly waste collecting activity known as UMUGANDA(mean score: 4.38). These numeric findings can be supported by information obtained from interview where one sector officer stressed that,“Before planning meeting regarding waste management, the local people give their proposal on what they want to be done. However, their proposals are analyzed and taken if they rank highest”.

The other sector leader said,“We

normally seek for views from many households and technical team from different cells before our yearly planning meetings”. While another interviewee sector official lamented that, “There is no regular formal training/awareness on wastes management issues because of not giving enough funding due to competing priorities”. Informal and formal training should be given to households, in schools and others institutions or through local radios and television, to help message transmission on how to manage solid wastes and the effects of poor habits of illegal waste handling and disposal. Therefore, improvement is required to provide a high-impact contribution.

III.2.9 Correlation outcomes for community practice and solid waste management

The Pearson product correlation moment approach bi-variate correlation in particular was used to determine whether community practices have an impact on solid waste management.

Table 10 Correlation outcomes for community practice and solid waste management

	Community Practices	Solid waste Management
Community Practices:		
Pearson Correlation	1	.863**
Sig. (2-Tailed)		.000
N	393	393
Solid waste Management		
Pearson Correlation	.863	1
Sig. (2-Tailed)	.000	
N	393	393

**Correlation is significant at the 0.01 level (2-tailed)
 Source: IBM output 2022

The results of correlations between community practices and solid waste management are shown in Table 9 above. The results (Pearson product correlation coefficient = 0.863**) show a positive correlation between the two variables, indicating that encouraging the use of more solid waste management practices will result in a cleaner environment and controlled wastes, which will improve the local community's quality of life.

3.2.10 Linear regression results considering community practices and solid waste management

The relationship between the dependent and independent variables were investigated using regression analysis.

The researcher employed a linear regression technique to assess the variation in local solid waste management techniques in the Cyuve, Musanze, Muhoza, and Kimonyi Sectors of Musanze District Town. The results are shown in the table below.

Table 11 Linear regression results considering community practices and solid waste management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863	.774	.743	.654

Source: IBM output 2022

The model summary in Table 11 includes R, R², adjusted R², and when comparing the R square values of models with different numbers of independent variables, the adjusted R square is a valuable tool since it provides a population estimate that is more accurate. We found an adjusted R² value of 0.774, reflecting a 7.74% variance in solid waste management caused by community practices. Other factors were responsible for the remaining proportion, 92.26%. This reveals that community practices benefited solid waste management

Research Hypothesis: Community practices significantly contribute to Solid Waste Management.

According to the results (Pearson product correlation=0.863), it was found that community practices had a significant impact on solid waste management; as a result, the alternate was accepted and the null hypothesis was rejected

III.2.11 Communities and local governments' problems and strategies for enhancing their involvement in solid waste management

Similar to what has been found through the study of Kabera, 2020, on status and challenges on solid waste management in Rwanda, during this research, we found also number of challenges faced by local leaders on involving the community to solid waste management.

The challenges experienced in Musanze City's Cyuve, Musanze, Muhoza, and Kimonyi Sectors included the absence of waste sorting at the

source, a lack of facilities (such as few dumpsites and collection points), a lack of recycling and composting services, dumps that were poorly maintained, and a lack of training and awareness of SWM programs.

These challenges were not far from what has been found by Asmawati D. et al, in their study on "the Knowledge, Attitudes, Awareness Status and Behaviour Concerning Solid Waste Management School of Psychology and Human Development in Malaysia in 2010".

When looking for crucial activities that can encourage community involvement in solid waste management, one should take into account a number of strategies, including reducing the quantity of waste generated, recycling, and reusing waste. This is referred to as the 3Rs Approach to Waste Management.

In addition to planning to grant licenses to more private businesses so they can operate in the Sectors of Musanze City, the local leader and dumpsite staff also have plans to designate more nearby waste collection centers so that community members can transport waste from their properties to the centers.

There are plans to increase the number of trucks available to collect rubbish at collection centers as well as to organize young people to collect, sort, and deliver waste to collection centers in exchange for payment. Additionally, regular waste pickup is planned. Therefore, all of these officials in Musanze City confirm to the existence of plans to enhance community involvement in

solid waste management.

IV. CONCLUSION

The study was about the contribution of community Practices to solid waste management in Musanze District town.

This study has revealed that the current level of community contribution to solid waste management in Cyuve, Musanze, Muhoza and Kimonyi Sectors of Musanze City area is low. In Musanze City's Sectors, we found that waste collection strategies are effectively applied as evidenced by their clarity at homes and the affordable and paying fees for waste collection but most households are not reducing waste generated in their homes and are not capable of managing them. Mostly they do not reuse the waste they generate but there is a need to sort waste for recycling especially plastics, papers, and metals which complicated waste management at dumpsites. This relationship between community practices and solid waste management was proved by a positive Pearson correlation factor (0.863) which indicated that for sustainable waste management the community' practices is contributing a lot, then to improve solid waste management, households must work with local authorities, dumpsite employees, and other groups. We found a number of challenges including few trucks, smaller number of waste collector companies, lack of awareness on waste programs and others, but appropriate measures, training, regulations must be taken right away to prevent the risks to public health brought on by ineffective solid waste management.

The researcher wishes to encourage further study to focus not only on the role/way of recycling plastic bottles, paper, and glasses for combating poor solid waste collection and management but also on identifying factors influencing household waste reduction and separation behaviors in Musanze City and other cities in Rwanda.

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