

**DOMESTIC WASTE MANAGEMENT AND COMMUNITY AWARENESS
ABOUT ITS PUBLIC HEALTH IMPLICATION AT NAGONGERA TOWN
COUNCIL IN TORORO DISTRICT, EASTERN UGANDA.**

BY

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A RESEARCH REPORT TO BE SUBMITTED TO THE DEPARTMENT OF BIOLOGY
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AWARD OF THE BACHELOR OF SCIENCE EDUCATION OF BUSITEMA UNIVERSITY.

DECLARATION

I the under signed student do solemnly affirm that this project report is first and authentic as the outcome of my research at Nagongera Town Council Tororo district, Uganda. It consists of activities I personally participated in and has never been published and submitted to any University or other institution for award of Bachelor's degree.

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APPROVAL

Signature: ...  Date: ...31st January 2024.

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DEDICATION

This research report is dedicated to my beloved Mother Ms. Kiyai Vicky, who raised and educated me and has continuously supported me throughout this stage in life. I will always be grateful to my beloved Uncle Mr. Omome Brian, for all the encouragement and support he has always given me. Thanks to my brothers and sisters for standing with me. I thank you for your patience, perseverance through the hard times of financial crisis caused to achieve this great success of my study. To my friends, all for the encouragement, care and love. May the almighty God bless and take care of you

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I will not forget the management of Nagongera Town Council, the chairman LC3 of nagongera (Mr. Opio) for granting me permission to proceed with my research. My special appreciation goes to Mr. Okoth Samuel and Ms. Beatrice Awori (VHTs of nagongera town council) for providing the information that I badly needed in this research. Not forgetting all the participants and respondents for participating and making this research a success.

I with great pleasure show out my appreciation and gratitude to My Supervisor Associate Proff. Dr. Edward Andama for his tireless efforts, guidance, devotion and dedication towards the success of this research project, his concern was overly vital.

In another special way, am also obliged to appreciating my long time sponsor FAWE-Uganda who never got tired in supporting me financially throughout my Educational journey, God bless them indeed.

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Without their assistance, my own efforts alone wouldn't have yielded anything dependable.

All in the loving memory of my late father the Late Simon Peter Okiror. God bless you all.

ABSTRACT.

The study was conducted to investigate the different domestic waste management practices employed at Nagongera town council and the effects of the domestic waste management practices on the local people's general health, and also to find out the challenges faced by Nagongera town council in management of its wastes/garbage.

This study adopted a combination of qualitative and quantitative designs to get deeper understanding of underlying issues of domestic waste management in Nagongera town council. The study focused on the nature of domestic waste generated at Nagongera town council, practices employed in domestic waste management and the hindrances faced by the local people in managing the domestic waste. The objectives of the study were to identify the types of domestic waste generated, to examine the present domestic waste management practices, and to assess the community awareness about the public health implications of poor domestic waste management practices.

The study used random sampling technique to determine a sample size of 120 respondents. Mostly, qualitative data was obtained from questionnaires, observation schedules and interview guides which were coded, interpreted and entered into SPSS. Further data was analyzed to give it a broader and more meaningful picture of the sample in addition to generating frequency tables, pie charts and bar graphs for further interpretation. The study findings revealed that biodegradable materials (food remains), Ashes and dust, Paper and cardboard, Plastics, and unclassified debris like wood/leather were the types of domestic waste generated by Nagongera town council. Field findings also indicated that Nagongera town council employed various practices to control and minimize the domestic waste generated which included; recycle, reuse, energy recovery, dumping and other domestic waste management practices.

It was recommended that Nagongera town council improves employment conditions as well as access to support services. Markets of recycling industries need to participate in waste management by separating their waste at source point. build broad-based support for composting and recycling through the "garbage is money" poster campaign, Nagongera town council management authority needs to have a deliberate policy that encourages the community and various stakeholders to play a role in developing garbage-related policies, environmental education to the communities should be taken seriously authorities to work with private companies

in providing services to the people, links should be established between recycling companies and communities groups and. There is need to develop a policy that involves the community in waste management.

DEFINITION OF KEY TERMS

Local communities: A group of individuals that interact within their immediate surroundings

Environmental sanitation: Is intervention to reduce people's exposure to diseases by promoting a clean environment in which to live.

Hazardous waste: Is waste that poses substantial or potential threats to public health or the environment

Health: It is a condition of the body which makes the person not to perform actively

Diseases: Is an abnormal condition affecting a living organism.

Dumping: The disposal of waste in the sea or on land.

Waste: Is any substance which is discarded after primary use, or is worthless, defective and of no use

Stakeholders: A person, group or organization that has interest or concern in an organization

Domestic waste management: refers to the process of collecting and treating domestic wastes.

Reuse: To use again especially in a different way

Recycle: Is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products

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CHAPTER ONE. INTRODUCCION

1.1 Background

The generation of domestic wastes is indeed on the rise globally. Currently, cities around the world generate over 1.3 billion tons of waste annually, with this approximated to increase to 2.2 billion tonnes by 2025 (Mugembe., et al. 2011). This increase in the amount of domestic waste generated is estimated to be much higher in developing countries due to rapid urbanization. Today, Uganda is rapidly growing with annual urbanization and population growth rates of 5.1% and 3.3%, respectively (Mungyereza. 2017). However, the existing infrastructure for services such as domestic waste management does not cope with the increased urbanization and waste generation

Nagongera town council has experienced rapid urbanization and population growth, leading to an increase in waste generation (Diallo. 2011). Inadequate infrastructure and limited waste management practices have contributed to the accumulation of garbage in public spaces, posing health hazards and environmental degradation (McKerlie., Knight. et al. 2006.). This is due to overcrowding and the development of slums and informal settlements with poor waste management practices by the residents. According to (Wilson. 2007) waste management in these areas is hampered by multiple land tenure system with many tenants not having a right to the land and therefore not able to manage waste domestically and also the town council authorities are overwhelmed by the sheer volumes of garbage generated.

Domestic Waste collection is currently one of the most critical services, whose quality and coverage has caused serious public outcry in this area. Nagongera town council authority acknowledges that the amount of domestic waste generated overwhelms the capacity of the Authority to collect and dispose it given the fact that the cost of Waste collection is enormous. This implies that the domestic waste generated is not properly collected and disposed which is likely to be indiscriminately dissolved and this results into negative effects towards people's general health like unsafe ground water and disease such as cholera among others. The information about the effects of domestic waste management practices on the local people's general health is scanty of which this study intends to determine.

1.2 Research Questions.

- a. What are the current garbage management practices in Nagongera town council?
- b. What challenges hinder effective waste disposal in the community?
- c. How do current waste management practices impact the environment and public health?

d. What strategies can be implemented for sustainable garbage management in Nagongera town council?

1.3 Problem Statement.

Nagongera town council is rapidly growing in terms of population and urbanization, leading to overcrowding and the development of informal settlements with poor waste management practices. Urban dwellers generally consume more resources than rural dwellers, and so generate large quantities of domestic waste. Waste management in this area is hampered by multiple land tenure system with many tenants not having a right to the land and therefore not able to manage waste domestically and also the town council authorities are overwhelmed by the large volumes of domestic waste generated. Domestic waste collection is currently one of the most critical services, whose quality and coverage has caused serious public outcry in this area. Nagongera town council authority acknowledges that the amount of domestic waste generated overwhelms the capacity of the Authority to collect and dispose it given the fact that the cost of Waste collection is enormous. This implies that the domestic waste generated is not properly collected and disposed which is likely to be indiscriminately disposed and this results into negative effects towards people's general health like unsafe ground water and disease such as cholera among others. The information about the effects of domestic waste management practices on the local people's general health is scanty of which this study intends to determine.

1.4 Purpose of The Study.

This research was crucial for understanding the local dynamics of garbage management in Nagongera town council. The findings inform policy recommendations and community-driven initiatives for sustainable waste management, contributing to improved public health and environmental conditions.

1.5 General objective

The general objective of the study was to establish effects of domestic waste management practices on the local people's general health in Nagongera town council.

1.6 Specific Objectives

- i) To document waste/garbage generated and disposed at household level in Nagongera Town Council.
- ii) To assess the community awareness about the public health implications of poor domestic waste management practices.

ii) To find out the challenges faced by Nagongera Town Council in management of its wastes/garbage

1.7 Hypothesis.

HI. The residents of Nagongera town council implement suitable garbage/waste management practices.

HO. The residents of Nagongera town council do not implement the suitable garbage/waste management practices.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction.

Waste is most often defined as unwanted leftover or excess materials that are discarded and needs to be handled in a specific manner to avoid negative impacts like floods and diseases, Domestic waste may be in the form of household garbage, leftovers of food and other wastage that include papers or plastic waste among others (Munier 2011.). The management of domestic waste is one of the challenges facing the health sector in the world. The emergence of domestic waste can be dated back to the beginning of human civilization, when early man began to consume animal products and generated garbage in the form of bones and other parts of animals they used to slaughter. With the advancements in the human cycle of growth more and more products came into existence that included wood, metals and other items and the waste generated became more complex in nature. Hence an aggregation of human settlements with the potential to produce a large amount of solid waste; the collection, transfer and disposal of that waste has been generally assumed by municipality's authorities in the developed world (Hokkanen. and Salminen. 1997.).

2.2 Waste Management.

Domestic waste management is critical for the sustainable development of the global economy and society, and it should involve the whole life cycle process of waste generation and treatment as described by (Munir SM 2012), (Kang HY 2005).

(JK 2010.) argued that composting could be an effective option for dealing with the mounting waste problem in SIDS, especially in the US Virgin Islands, where organic wastes emanating from the tourism industry are high. This view is also shared by (PH 2001) who emphasized that composting is a potential solution to address the waste problems in Cuba while reports by SPREP and EU (2000) and SPREP (2000) also substantiated this fact. In the Caribbean SIDS, it is noted that composting is more prevalent.

Gathering information for the waste sector is required not only to facilitate better planning, but also to enable monitoring of successes and failures(Zake 2010). Developed appropriate strategies to enhance and promote recycling for various household types. This research found income and standard of living were factors determining the acceptability of new waste strategies.

2.3 Significance of Waste Management.

Ensure healthy lives and promote well-being for all ages- The effect of indiscriminate disposal of MSW described by (McKerlie., Knight. et al. 2006.), including hazardous substances

(Ihonvbere, 1994; Lipman, 2002; Mpanya, 1992, pp. 204–215), and investigated by (Nyakaana. 2009), reveals a significant health and environmental threat that calls for an increased awareness and management practices to ensure a sustainable outcome.

Make cities and human settlements inclusive, safe, resilient, and sustainable- The key to an inclusive strategy in domestic waste management is for everyone to have a stake and opinion on good waste management governance (Munir SM 2012), allowing for optimized allocation of resources(Munir SM 2012) and consequently transitioning the scenic view of the environment to a sustainable community.

Ensure sustainable consumption and production patterns- The huge amount of MSW generated and disposed in any economy places high demand on land and pollutes the environment (Wenheng and Shuwen. 2008)

CHAPTER 3: METHODS.

3.1 Study design.

The study adopted a combination of qualitative and quantitative designs to get deeper understanding of underlying issues of domestic waste management in Nagongera town council. Participants were selected purposively due to their essential knowledge and randomly to estimate the garbage amount generated in the area. Data was transcribed, edited, summarized and analyzed according to the objectives and variables set out in the Terms of Reference. The information was presented in chapters reflecting the key objectives of the study both in narrative, graphical and pictorial forms. The study scope was limited to household and commercial enterprises garbage generated in Nagongera town council, Tororo district in Uganda with special emphasis on the domestic waste management cycle from collection to ultimate disposal point. Hostels and commercial residences that are within the town council were counted each as one household.

3.2 Study Area.

Nagongera Town Council is a small residential area located in the Tororo District of Eastern Uganda. Its population has been growing rapidly for the past five years due to the presence of the university which accommodates most its students at the residence of the town council. Nagongera Town council also comprised of largely informal and substandard housing and small scale businesses. It has a population of about 7,000 people(Mungyereza 2017). It has a high population density, uneven terrain, and poor sanitation and hygiene conditions. Thus, it often experiences challenges in managing solid waste especially at household level.

Figure 1: A map of Tororo District.

been previously described (Zake, J.2010). Briefly, the sample size was distributed proportionately based on population size across the Nagongera Town Council. Households, defined by the Uganda Bureau of Statistics (UBOS) as a group of persons who normally live and eat together, were selected using systematic random sampling. In each zone, the number of households was divided by the number of households to be selected to create a sampling interval. The first household in a zone was selected randomly, while subsequent households were selected by skipping a number of households equivalent to the sampling interval until the sampled number of households in that zone was achieved. Within the household, the household head or an adult above 18 years in the absence of the household head was interviewed.

3.4 Data Collection.

Data was collected using a semi structured questionnaire (in appendix 1) and observational checklist. We asked respondents on whether they possessed domestic waste containers, categories of waste collected, whether they segregated their waste, how they transported it to the collection point, distance to the nearest collection point, and the cost of waste collection. Using an observational checklist, we recorded the type of waste container households used, alternative containers to facilitate segregation, presence of flies and any other vectors, and whether containers were full or not. The questionnaire was developed basing on reviewed literature on domestic waste management. Data collection tools were pretested in Nagongera Town Council which has similar characteristics with the study area. During pretesting, validity and reliability of individual questions in the questionnaire were assessed. Phrasing of some questions and their anticipated responses were revised to ensure generation of true responses.

3.5. Data Management and Analysis.

Data was examined and cleaned on a daily basis during data collection and entered in Epi Data version 3.02 (Epi Data association; Denmark). To determine the status of household domestic waste management (Outcome Variable), which was classified as proper or improper domestic waste management, a score was generated from five questions which assessed the domestic waste management practices at household level. These included (1) possession of domestic waste management containers (yes/no); (2) domestic waste management container which minimizes nuisances (yes/no); domestic waste management receptacle which minimizes nuisances is a latent variable that was based on manifest variables, possession of solid waste storage receptacle, and type of domestic waste storage receptacle used; the variable solid waste management container which minimizes nuisances was defined as receptacle that was well

covered and does not permit breeding of vectors such as insects and flies; (3) domestic waste which was segregated (yes/ no); (4) flies and other vectors not seen around containers (yes/no);and(5) waste storage container not overfilled(yes/ no). As described in previous studies, these questions highlight aspects of domestic waste collection and storage at household level typical in a slum setting. Each response to the questions that emphasizes appropriate practice was assigned code1 and the unsatisfactory practice done was assigned code 0. In order to generate the cut-off for the outcome variable, we calculated the mean and median of the 3.045 and 3, respectively. The fact that the mean and median were similar demonstrated that our outcome variable is normally distributed. Since our outcome variable is categorical, the cut-off cannot contain a decimal point. Therefore, we decided to choose the nearby whole number above the mean and median which is 4 as our cut-off. Households that had a score of at least 4 out of 5 were classified as having proper practices and households with score of 3 or less were classified as having improper waste management practices. Other key variables to our study including awareness of waste management laws were measured by asking respondents whether they were aware of any laws govern management of solid waste in their area with responses yes and no. Knowledge on dangers of poor solid waste management was measured using two manifest variables(questions),that is, “do you know the dangers associated with poor solid waste management with responses yes and no” and “mention the dangers associated with poor solid waste management, with responses such as attraction of vectors and vermin, smells, unsightliness, accidents, and fire.” Any respondent who mentioned yes on knowledge of dangers of poorly managing solid waste but did not know the actual dangers was scored “0” for the latent variable, knowledge on the dangers of poor waste management.

3.6 Ethical Considerations.

Ethical approval for the study was obtained from the management of Nagongera Town Council i.e. the Local Chairperson 3 of Nagongera sub county. Participation in the study was voluntary and household heads provided written informed consent.

CHAPTER FOUR: RESULTS AND DISCUSSION.

4.1. Socio demographic Characteristics of Participants.

A total of 120 respondents participated in the study out of the 237 households, resulting in a response rate of 50.1%. Majority of the participants/respondents were females 60% (72/120), were Christians 80% (96/120), attained post primary education 70% (84/120), and were aged 14–29years 65%(78/120). Most of the participants 50%(60/120) were engaged in business (Table 1).

Table 1: Sociodemographic characteristics of participants.

Characteristics	. Frequency(n= 120)	Percentage (%)
Sex		
Female	72	60
Male	48	40
Age in years		
14-29	78	65
30-44	22	18.3
45 and above	20	16.7
Education level		
None	10	8.3
Primary	26	21.7
Secondary	50	46.7
Tertiary	34	28.3
Religion		
Christian	96	80
Muslim	24	20
Occupation		
Business	60	50
Casual labour	15	12.5
Formal employment	18	15
Students	14	11.7
Others	13	10.8

4.2. Domestic Waste Management Practices.

The majority of the households 80% (96/120) owned domestic waste storage receptacles, most of which were sacs 60% (72/120) and minimizing nuisances 70% (84/120) and were not overfilled 75%(90/120). The main types of waste collected were biodegradable materials (food remains and vegetation) 55% (66/120) and ashes and dust 40% (48/120). The majority of the households 90% (108/120) did not segregate their waste. Domestic waste was mainly transported to the collection point by pulling the collecting sac 60% (72/120), carrying over the head 20% (24/120), and using wheel barrows 10% (12/120). The town council authority 70% (84/120) and private companies 25% (30/120) were the major entities collecting waste. Only 30% (36/120) of the households paid for domestic waste collection at a cost of less than 1 USD. Most of the respondents were aware of the domestic waste management laws 50% (66/120) and dangers of poor domestic waste management 65% (78/120). Overall, 45% (54/120) of the households exhibited proper waste management practices (Table 2).

Table 2: Domestic waste management practices at household level.

variables	Frequency(n=120)	Percentage(%)
Possession of a domestic waste storage container		
Yes	96	80
No	24	20
Type of domestic waste storage receptacle used		
Plastic bin	24	20
Sacs	72	60
Polythene bags	18	15
Others	06	05
Container which minimizes nuisance		
Yes	84	70
No	36	30
Waste storage containers not overfilled		
Yes	84	70
No	36	30
Vectors(flies) not seen around the container		
Yes	78	65

No	42	35
Waste management practices employed		
Dumping	88	73.3
Energy recovery	10	8.3
Recycling	08	6.7
Reuse	06	5
Others	08	6.7
Categories of wastes generated		
Biodegradable materials (food remains)	66	55
Ashes and dust	30	25
Paper and cardboard	07	5.8
Plastics	12	10
Unclassified debris like wood/leather	05	4.2
domestic waste was segregated		
Yes	12	10
No	108	90
Transportation of waste to collection point		
On the head	24	20
Wheel barrow	12	10
Truck	12	10
Pulling the sac	72	60
Entity collecting waste		
City authority	84	70
Private companies	30	25
Not collected	04	3.3
Do not know	02	1.7
Paid for domestic waste collection		
Yes	36	30
No	84	70
Aware of waste management laws		
Yes	66	55
No	54	45

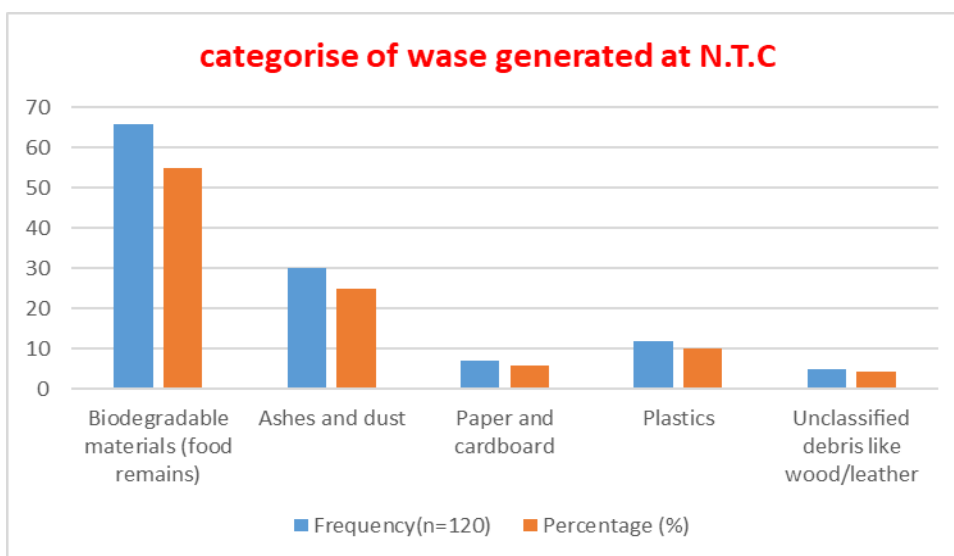
Knew dangers of poor waste management		
Yes	78	65
No	42	35
Status of household domestic waste management		
Improper	66	55
Proper	54	45

Domestic waste/garbage generated at Nagongera town council.

The following are the different types of waste generated at Nagongera town council.

- Biodegradable materials (food remains)
- Ashes and dust
- Paper and cardboard
- Plastics
- Unclassified debris like wood/leather and others

Figure 3: A bar graph showing the percentage and frequencies of categories of wastes generated at N.T.C.



Community awareness about the public health implications of poor waste management practices.

Most of the respondents were aware of the dangers of poor domestic waste management 65% (78/120).

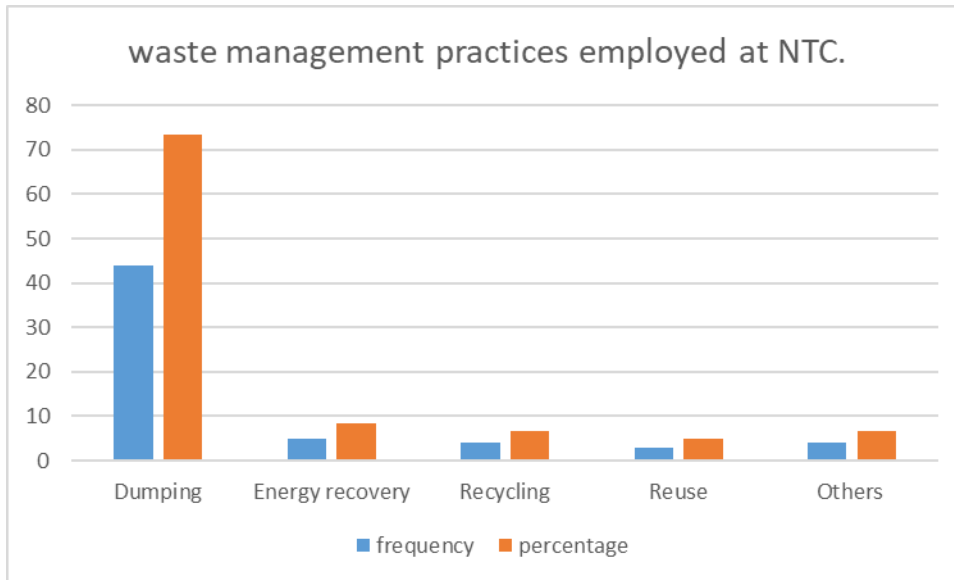
The respondents also mentioned some of the diseases related/caused by poor waste management practices. They mentioned the following.

- Cholera
- Diarrhea
- Typhoid
- Malaria

Figure 4: A pie chart showing the percentage of residents who are aware of the dangers of poor waste management.



Figure 5: A bar graph describing the different waste management practices employed at NTC.



Challenges faced by Nagongera Town Council in management of its wastes/garbage.

The participants/ respondents and the chairman LC 3 of Nagongera town council (Mr. Opio) mentioned some of the challenges faced by Nagongera Town Council in management of its wastes/garbage, which include the following.

- Limited space/land, and funds to facilitate the process of collection of garbage/wastes. This has limited the town council management authorities from performing their duties.
- The respondents also mentioned that there are no strict laws and policies to regulate the dumping of wastes along the roadsides.
- Some people are not aware of the right/ proper ways of managing domestic wastes and therefore they stick to the wrong/improper ways.
- Nagongera town council is also over crowded especially when the students of Busitema university are around. This becomes a challenge because large amounts of domestic waste are produced and it is poorly managed.

4.3 Factors Associated with Household Level Domestic Waste Management Practices.

Sex, age, education level, marital status, religion, and occupation of the household head were not significantly associated with their household's domestic waste management status. Households whose main storage container were plastic bags were 1.3 times more likely to exhibit proper solid waste management practices compared to those that used sacks (adjusted PR-1.27, 95% CI (1.04–1.55)). However, households whose main waste storage receptacle were polythene bags (adjusted

PR-0.26, 95% CI (0.14–0.47)) or other receptacles (paper bags and sacs) (adjustedPR-0.13,95%CI (0.03–0.49)) were 13.3%and 60%, respectively, less likely to exhibit proper solid waste management practices than those who used sacks. Household heads who were aware of solid waste management laws (adjustedPR-1.49,95%CI (1.20–1.85) were1.5 times more likely to exhibit proper waste management as compared to those who were not aware. Household heads who knew the dangers of poor solid waste management (adjustedPR-2.15,95%CI (1.51–3.09) were2.2timesmore likely to practice proper solid waste management as compared to those who did not know(RE. and . 2013).

4.4 Discussion of results.

This study sought to understand the status of household waste management and associated factors in Nagongera Town Council Tororo, Uganda. Our findings show that biodegradable waste was the major type of waste collected.

Majority of the households possessed domestic waste collection receptacles with sacks as the most used storage receptacle. Few households segregated and paid for collection of their solid waste. Less than half of households exhibited proper domestic waste management practices. Households that used plastic containers for waste collection and household heads that were aware of the solid waste management laws and the dangers of improper domestic waste management were more likely to properly manage their waste. On the contrary, households that used polythene bags, paper bags, or metallic containers were less likely to practice proper waste management practices. This implies that knowledge and domestic waste management utilities are very pertinent to proper management of solid waste in less resourced households. Biodegradable wastes such as food remains and vegetation were the major form of domestic waste generated by households. This is understandable as the community is largely a residential area, as such biodegradable waste from the kitchen is often generated. Our findings are similar to those of studies carried out in other parts of Uganda [10, 11, 24, 25]. However, it is clear from our findings that few households engaged in segregation of biodegradable waste from other types. Our findings are similar to those from studies in Ghana, Ethiopia, and Kenya where a small percentage of households segregated their waste [18,19,26]. Projects implemented in slum communities sensitize households on domestic waste management especially separation at the point of practice (Winkler and Bilitewski 2007), but many households may not afford multiple receptacles required to segregate waste. Our study found out that a relatively high number of households were willing to engage in waste segregation and in another, half of the respondents segregated their waste. domestic waste segregation allows further processing and value extraction through recycling and composting. However, in urban areas most

residents do not engage in such processing including composting attributed partly to absence of a garden. It is important that domestic waste management initiatives promote separation of waste at household level so as to facilitate proper domestic waste management. Most households in our study used sacks to collect and store their solid waste. Sacks allow for storage of more wastes for a relatively long period of time compared to other household domestic waste collection receptacles such as plastic containers and polythene bags. In addition, sacks are also relatively cheap compared to the plastic containers. However, sacks are not a suitable domestic waste receptacle storage as they are nonabsorbent, noncombustible, and not watertight as prescribed by the Kampala solid waste ordinance of 2000 [31]. Relatedly, a similar study reported polythene bags, a substandard waste storage receptacle as the main storage receptacle used in two slums in Uganda (Mulenga, Manase. et al. 2004.). This implies that waste collection in slums is conducted using substandard receptacles that could lead to nuisances around households. Therefore, waste management programmes in slums should encourage use of standard containers for waste collection. Majority of households did not pay for collection of their domestic waste. This implies that their waste might not have been collected by the town council authorities or other private companies that are involved in waste collection. So, these households were possibly disposing their waste indiscriminately. On the contrary, studies carried out in Nepal, Nigeria, India, and Ethiopia showed that urban households were willing to pay more for proper waste management [32–36]. Indeed, urban residents in Nepal, Nigeria, and Ethiopia where urban residents were paying 0.74, 2, and 1.07 USDs, respectively, for waste collection [33, 34, 36]. Unlike our study, these studies were carried out in more resourced communities. Our study also found that almost all households that paid for waste collection incurred less than 1 United States of American dollar (USD) per collection. Authorities should increase access to domestic waste management services and encourage households to utilize them. Households in our study that used plastic containers were more likely to properly manage their waste compared to those that used sacks. This is understandable as plastic containers usually have tight covering and eliminate nuisances unlike sacks. Covered plastic bins protect the waste from direct exposure to vectors and vermin, as well as mitigate bad odour and unsightliness consequently contributing to proper waste management (Klangsin and Harding. 1998). It is also possible that households that could afford plastic containers could also afford to pay waste collection fees furthering proper waste management practices. Indeed, in our study, use of substandard waste collection receptacles is corroborated with improper management of domestic waste with households that used polythene and paper bags more likely to improperly manage their waste. Our findings are similar to those from a Ghanaian

study which found that indiscriminate dumping of waste was practiced by households that used polythene bags (Gaye and Diallo. 1997.). This demonstrates that waste collection and storage receptacles are very instrumental in ensuring proper waste management and so should be availed at household level within slums. Among respondents, awareness of dangers of poor waste management and laws that govern management of waste were associated with proper waste management practices. Awareness of the dangers of poor waste management and existing laws and associated penalties increases individual's perceived susceptibility associated diseases and penalties and hence motivates them to adopt appropriate practices (Anschu 1996.). In fact, indiscriminate waste management has been associated with health challenges such as pollution of water and air as well as breeding of vectors among others (Almuneef and Memish. 2003). Our findings are similar to those in studies carried out in Kenya and Guinea that highlighted lack of awareness of proper waste management practices as well as laws and policies as drivers of poor waste management. Conversely, other studies have argued that awareness of legislation or good practices alone does not result into proper domestic waste management practices but must be followed with strict enforcement (Ikiara and Karanja. 2004.). So, there is need for domestic waste management promotion initiatives to boost slum dwellers' knowledge on associated health risks and penalties in order to facilitate proper domestic waste management. Although some practices were self-reported, status of domestic waste management was assessed through observation of waste management receptacles and practices. Given the similarities in slums settings in Uganda, our findings could be generalized to the entire slum community within Tororo and Uganda at large. In addition, the study makes a significant contribution to the understanding of waste management practices in slums which have not been well studied especially the use of observations. Although face validity and reliability of the questionnaire were carried out during pretesting, it was not done for individual questions.

CHAPTER FIVE: RECOMMENDATIONS AND CONCLUSION.

5.1 Introduction

This research study was aimed at establishing the different domestic waste management practices employed by the local people of Nagongera Town Council, and also it assesses the community awareness of the implications of poor waste management. This chapter is divided into two sections. The commencing section covers the conclusion against the objectives, and the second covers the recommendations.

5.2 conclusion.

The following is the summary and conclusion of the findings which were identified during the research study:

Proper domestic waste management was generally low with majority of households using sacks as their waste storage receptacles and not segregating their waste. Use of plastic containers, awareness of waste management laws, and danger of poor waste management were associated with exhibition of proper management practices, while use of substandard receptacles like polythene and paper bags was associated with improper waste management practices. Therefore, in order to improve the domestic waste management in slum household, there is need to employ a cascade of interventions that address the knowledge, physical, and behavioral aspects of domestic waste management.

It was found that from the different types of domestic waste management practices employed in Nagongera Town Council, majority of the residents used the dumping method mostly, and the recycle method. However, other practices like reuse, waste reduction and energy recovery were not commonly used. Findings also showed that inadequate and low standard of storage facilities combined with low frequency of domestic waste collection led to scattering of solid waste around the Town Council.

The research findings also indicate that majority of the residents of Nagongera Town Council (70%) are aware of the public health implications of poor domestic waste management. This implies that if the community is well sensitized about proper waste management practices, there will be an improvement of waste management at Nagongera Town Council.

5.3 Recommendations.

- i. It is recommended that Nagongera town council improves employment conditions as well as access to support services.

- ii. Markets of recycling industries need to participate in waste management by separating their waste at source point, build broad-based support for composting and recycling through the “garbage is money” poster campaign.
- iii. Nagongera town council management authority needs to have a deliberate policy that encourages the community and various stakeholders to play a role in developing garbage-related policies.
- iv. Environmental education to the communities should be taken seriously.
- v. Authorities should work with private companies in providing services to the people.
- vi. Links should be established between recycling companies and communities’ groups and.
- vii. There is need to develop a policy that involves the community in waste management.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE TO THE RESPONDENTS IN N.T.C

INTRODUCTION.

Dear respondents my name is **Akello Joan** student from **Busitema University** pursuing a bachelor's degree in Science Education. Am carrying out a research on waste/garbage management practices at Nagongera Town Council Tororo, Uganda

I request for your consent go get information which will be used for the above purpose only. I will be grateful for your acceptance. YES/NO?

SECTION A: DEMOGRAPHIC CHARACTERISTICS: USE A TICK TO MARK THE RESPONSE

Household head? (Mother or father? /children)

1. Age of respondents

a) 14-29

b) 30-44

c) 45 and above

2. Gender of respondent

a) Male

b) Female

3. Education level of respondents

a) No education

b) Primary

c) Secondary

d) Tertiary

4. Religion of respondent

a) Christian

b) Muslim

5. Occupation of the respondent

- a) Business
- b) Casual labour
- c) Formal employment
- d) Students

SECTION B: PRACTICES EMPLOYED BY RESIDENTS OF NAGONGERA TOWN COUNCIL TO MANAGE WASTES/GARBAGE

1. Do you have any practice in place to manage solid waste?

- a) Yes
- b) No

If yes, which of the following practices is employed by NAGONGERA TOWN COUNCIL to manage its waste?

- a) Reuse
- b) Recycle
- c) Reduction
- d) Energy recovery
- e) Dumping

2. Please describe how your household stores the garbage from your house.

- a) Closed Container
- b) Open Container,
- c) Plastic bags
- d) Pile in the yard
- e) Other,
- f) Don't Know

3. Do you have a waste/garbage Container which minimizes nuisance

a) Yes

b) No

Is your waste storage container overfilled?

a) Yes

b) No

Are vectors(flies) seen around the storage container?

a) Yes

b) No

What are the Categories of wastes generated at your home?

a) Biodegradable materials (food remains)

b) Ashes and dust

c) Paper and cardboard

d) Plastics

e) Unclassified debris like wood/leather

What is the means of Transportation of waste to collection point?

a) On the head

b) Wheel barrow

c) Truck

d) Pulling the sac

Do you Know the dangers of poor waste management?

a) Yes

b) No

Are you aware of waste management laws?

a) Yes

b) No

Do you pay for waste/garbage collection?

a) Yes

b) No

Which company collects your wastes/garbage?

- a) City authority
- b) Private companies
- c) Not collected
- d) Do not know

SECTION C: CHALLENGES FACED BY NAGONGERA TOWN COUNCIL IN MANAGING OF ITS WASTE/GARBAGE.

1. Are there any challenges faced by Nagongera Town Council as it manages its waste?

- a) Yes
- b) No

If yes, which Problems are related to poor waste management in Nagongera Town Council?

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2. What do you think should be done to improve solid waste management in Nagongera Town Council and the other areas within Tororo district?

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.....

SECTION D: IMPLICATIONS OF POOR WASTE MANAGEMENT ON PUBLIC HEALTH

1. Are some of the management practices carried out having impacts on human health?

- a) Yes
- b) No

2. What are some of the diseases associated with poor waste disposal/management in Nagongera Town Council?

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2. How can Prevention and control of environmental health diseases related to Waste management be done?

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What are your views and recommendation in relation to waste management in Nagongera town council?

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THANK YOU FOR PARTICIPATING IN THIS RESEARCH

APENDIX 2: PHOTOS SHOWING HE DUMPING SITE.



Figure 6: A photograph showing domestic wastes dumped at the roadside.



Figure 7: A photograph showing an overfilled plastic bin being used as a domestic waste storage receptacle.