THE EFFECT OF WASTE DISPOSAL IN NAMATALA WARD, INDUSTRIAL DIVISION MBALE CITY

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UGANDA CHRISTIAN UNIVERSITY

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DECLARATION

I, **BUKHAKI IRENE**, do declare that this Research Report is my original work and has never been presented for examination to any University or Institution.

Signed…….Date……

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APPROVAL

I certify that **BUKHAKI IRENE, J23/MUC/BSW/040**, prepared this research Report is under my supervision and it has been submitted for further examination with my approval.

Signed…… ……..Date…. 27th - SEPT. 2024 …

RESEARCH SUPERVISOR

DEDICATION

This Research Report is dedicated to my beloved family members more so my husband and children for their words of encouragement, moral and spiritual support that has enabled me to complete this course.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank the Almighty God for the Gift of Life and protection that has enabled complete this entire work. Glory and Honor Remain His Forever. Amen.

I am highly indebted to Madam Pimer Jessica Ukoku as my lead supervisor, besides being busy with other duties; she always found time to offer assistance to my research work. He helped me sail through the difficult times of my study. May God bless him abundantly.

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The entire work of writing this research proposal requires full preparation and necessary support which therefore calls for collective responsibility. In this, I would like give thanks to my husband for always being there throughout.

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ABBREVIATIONS / ACRONYMS

ECD	Environment Control Department
EPR	Extended Producer Responsibility
LAWMA	Lagos Waste Management Authority
NEMA	National Environmental Management Authority
SWM	Solid waste management
SWM	Solid Waste Management
TPB	Theory of Planned Behavior
WTE	Waste to Energy

ABSTRACT

The study examined the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City. Study objectives explored the Different Methods of Waste Disposal that exist, determined the effects of Waste Disposal on the Environment and the appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City. The researcher adopted a cross-sectional survey design with a mixed-method paradigm that combines qualitative and quantitative methodologies. Key informants of the study were local leaders, industrial division officials and community. The sampling techniques were; census Inquiry and Simple Rando. A consideration of a study population of 60 respondents was considered out of which a sample size of 52 was considered for the study. Data was collected through a survey method, interviews and observations to compile data for the study. About the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City. Findings indicated that the recycling, composting, incineration, landfills, dumping on Open spaces, burning waste in Open Ares and the use of Waste Management services such as garbage collection are the many different methods of waste disposal that exist in Namatala Ward, Industrial Division, Mbale City. By examining the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City. It was found out that the waste disposal degrades the soil quality and water quality, open burning of waste contributes heavily to air pollution, dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem, Recycling reduces the amount of pollution entering the environment, Composting organic waste improves soil fertility and reduces the need for chemic fertilizers, Incineration of waste releases harmful gases that contributes to global warming and Proper waste management greatly reduces the negative impact on the environment while the appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City were implementing strict waste segregation policies, promoting community awareness campaigns on proper waste disposal, providing incentives for recycling and composting, establishing more recycling centers in the community, enforcing penalties for illegal dumping and open burning, investing modern waste treatment and disposal technologies and supporting public private partnerships in waste management. In conclusion, effective waste management involves a multifaceted approach that includes strategies such as proper waste segregation, recycling, composting, community awareness campaigns, and investment in advanced technologies. Supporting public-private partnerships and enforcing penalties for illegal dumping and open burning also play vital roles. These strategies collectively reduce environmental pollution, conserve resources, and promote sustainability. By integrating these practices, communities can achieve more efficient waste management, protect public health, and contribute to a healthier environment. It is recommended that there is need to implement and enforce strict waste segregation policies at the household and commercial levels. Establish more accessible recycling centers and provide regular collection services for recyclables to enhance recycling rates, reduces landfill waste, and promotes resource recovery. There is need to implement comprehensive waste segregation programs at the source, categorizing waste into recyclables, organics, and hazardous materials and reduces contamination of recyclable materials, improves waste processing efficiency, and minimizes environmental pollution.

CHAPTER ONE

Introduction

1.1 Background of the Study

This study examined of waste disposal on the environment in Namatala ward Industrial Division, Mbale City. Waste disposal in the context of this proposal is the process of managing and discarding waste materials that are no longer needed or are considered hazardous, Improvement in this study meant the enhancement of proper waste disposal. The proposal was organized in three chapters covering the background of the study, the problem statement, the research objectives and questions, justification and the significance of the study, the scope of the study, the conceptual framework of the research and the definitions of the key words used in the study.

1.2 Background to the Study

Human activities have always generated waste. This was not a major issue when the human population was relatively small and nomadic, but became a serious problem with urbanization and the growth of large municipalities. Poor management of waste leads to contamination of water, soil and atmosphere and to a major impact on public health. In medieval times, epidemics associated with water contaminated with pathogens decimated the population of Europe and even more recently, cholera was a common occurrence. Some of the direct health impacts of the mismanagement of waste are well known and can be observed especially in developing countries. Solid waste management (SWM) is a topic of universal concern for rural and urban areas in the developed and developing countries. Historically, countries dealt with waste by burying it, letting animals eat it and forgetting about it. This approach is no longer sustainable (Joseph, 2016).

1.2.1 The Global Status of Waste Disposal

The global status of waste disposal varies significantly across different regions, including Asia, Latin America, North America, and Europe. Each region faces unique challenges and adopts different strategies for managing waste. Countries like Japan and South Korea, have implemented advanced waste management practices, including strict recycling policies, waste to energy (WTE) plants, and public awareness campaigns

Hoornweg and Bhada-Tata (2012). However, less developed nations in Southeast Asia and South Asia often rely on informal waste sectors and face challenges with landfills and illegal dumping. There is a growing focus on improving waste management infrastructure and promoting circular economy practices, but the progress is uneven across the region.

In Latin America, there are cases of waste collection that have caused a lot of unhygienic environment, inadequate disposal methods, and the prevalence of informal waste pickers. Many urban areas are dealing with overflowing landfills and environmental contamination. Several countries, including Brazil, Chile, and Colombia, are working towards improving waste management systems by investing in recycling programs, sanitary landfills, and waste-to-energy projects. Community-based initiatives and the formalization of informal waste pickers are also important components of waste management strategies in the region. While progress is being made, the region still faces significant challenges in achieving sustainable waste management due to economic constraints and governance issues Pires, Martinho and Chang (2011).

Further still, North America generates large amounts of waste, particularly in the United States and Canada. The primary challenges include high levels of waste generation per capita, reliance on landfills, and the management of hazardous and electronic waste. Both the U.S. and Canada have well-developed waste management systems, with a strong emphasis on recycling, composting, and waste-to-energy. Policies such as extended producer responsibility (EPR) and landfill diversion targets are being implemented to reduce the amount of waste sent to landfills. There is a growing movement towards zero waste initiatives, increased recycling rates, and the development of circular economic models. However, challenges remain, particularly in addressing the recycling crisis caused by changes in global markets, such as China's restrictions on importing recyclable materials Pires, Martinho and Chang (2011). Across all regions, there is an increasing emphasis on adopting circular economic principles, which aim to reduce waste generation and promote the reuse and recycling of the materials. Europe and some parts of Asia and North America are making significant progress in waste disposal and management, Latin America and other parts of Asia still face considerable challenges. The global trend is

moving towards more sustainable waste management practices, with a focus on reducing waste generation and increasing recycling and resource recovery.

1.2.2 Africa Status on Waste Disposal

In Ghana, there are significant waste management challenges, particularly in its urban area of Accra Kaza, et al (2018). Rapid population growth and urbanization have led to increased waste generation, overwhelming the existing waste management systems. A large proportion of waste is disposed of in open dumps, which poses environmental and health risks. Informal waste collection and recycling play a significant role, but they are often unregulated. The Ghanaian government has made efforts to improve waste management through policies like the National Environmental Sanitation Policy, recycling and composting, particularly in Accra, the capital. Public-private partnerships have also been encouraged to improve waste collection and disposal. While there are ongoing efforts to improve waste management, challenges remain in terms of funding, enforcement of regulations, and public awareness. The government is increasingly looking into waste-to-energy projects as a solution to reduce landfill use.

Nigeria, Africa's most populous country, generates a vast amount of waste, much of which ends up in unsanitary landfills or is openly burned, contributing to pollution and health problems Vergara, and Tchobanoglous (2012). The country struggles with inadequate waste management infrastructure, insufficient funding, and weak enforcement of waste management laws. Lagos, the largest city, faces particularly severe waste management issues due to its size and population density. Various initiatives have been introduced to address waste management, including the establishment of state waste management authorities like the Lagos Waste Management Authority (LAWMA). There is also a growing focus on public awareness campaigns, community-based waste management programs, and the promotion of recycling and waste-to-energy projects. The Nigerian government is increasingly recognizing the importance of sustainable waste management practices Vergara, and Tchobanoglous (2012). However, the country still faces significant challenges, particularly in coordinating efforts across different regions and ensuring effective implementation of waste management policies.

Similarly in Kenya, the country faces challenges with waste management, particularly in urban areas like Nairobi and Mombasa. The rapid pace of urbanization has led to increased waste generation, with much of the waste ending up in open dumpsites or being burned. The Dandora dumpsite in Nairobi, one of the largest in Africa, is notorious for its environmental and health impacts. The Kenyan government has made strides in waste management through policies like the National Solid Waste Management Strategy and the ban on plastic bags, which has significantly reduced plastic waste. There are also efforts to promote recycling, composting, and waste segregation at the source. Kenya is gradually moving towards more sustainable waste management practices, with increasing interest in waste-to-energy projects and the development of new sanitary landfills. However, challenges remain, particularly in terms of funding, infrastructure development, and public awareness.

1.2.3 The National Status

In Uganda, waste disposal and management have become critical issues, particularly in urban areas, where rapid population growth and urbanization have significantly increased waste generation Busha. = and Harter (2015). The country faces several challenges, but there are also ongoing efforts to improve waste management practices. Many urban areas, including Kampala, the capital, lack sufficient waste collection and disposal infrastructure. The existing systems are often overwhelmed by the volume of waste generated. Most waste ends up in poorly managed dumpsites, such as the Kiteezi landfill, which is nearing its capacity and poses environmental and health risks. Uganda generates a large amount of solid waste, particularly in urban centers. Kampala alone generates approximately 1.500 tons of waste daily, and only about 60% of this is collected. The Ugandan government has implemented several policies aimed at improving waste management, including the National Environment Management Policy and the Solid Waste Management Strategy Vergara and Tchobanoglous (2012). These policies emphasize sustainable waste management practices, including recycling, waste reduction, and public education.

Many developing countries are experiencing problems caused by inappropriate and inefficient Solid waste management, and often short term solutions like uncontrolled dumping is practiced. The need for Solid waste management plans is widely recognized, but may not be feasible due to lack of funds or insufficient institutional capacity (Abrelpe, 2012). The pressure on SWM operations caused by a more interconnected global economy is growing due to increasing generation and complexity of waste. In a global perspective this can lead countries to unsound SWM practices and disposal operations. If waste is not managed in a sustainable way, meaning long-term solutions founded in local communities, the connected costs may grow to such an extent that the economy and public services fail to keep up (Barra, Portas, and Watkinson, 2012). Such a scenario is seen in many places in the world already, and especially in developing countries.

Waste is increasingly viewed as an imperative issue worldwide, although the residential challenges and impacts of general solid waste do not seem to have the highest priority. This may partly be due to the newer issues of e-waste and chemical waste that present immediate problems, while general solid waste is a well-known issue with few challenges, except continual growth. Chemicals and Waste, mainly concerning how hazardous wastes are mixed with solid wastes. The mixed waste is either dumped or burned in the open, raising issues of environmental and social justice, as "the people most affected by these dangerous practices are usually the poor who live and work close to dump sites" (Barra *et al,*2012).

Although chemicals are a threat to health and livelihoods when mixed with solid waste, the focus on "ordinary" household waste and its management is not prioritized.. Municipal waste constitutes a significant percentage of the total waste a country generates (OECD, 2018), with annual figure ranging from 0.4 to 0.8 tonnes per person, and solid waste generation increasing at an estimated rate of about 0.5–0.7 per cent per year. In addition, the sound management of municipal waste continues to be a sizable and continuously growing part of a municipality's budget (Barra *et al,* 2012). In developing countries, the cost of waste collection, disposal and treatment would be between 0.7- 2.6 % of income/capita/year, while in comparison the same numbers for high income

countries are 0.2-0.5%. In 2018, world cities generated approximately 1.3 billion tonnes of solid waste per year, with an expected increase of 2.2 billion tonnes by 2025. In lower income countries waste generation will more than double in the next twenty years, in a business as usual scenario.

Solid waste management costs will almost double globally, to around $375.5 billion in 2025 (Cointreau, 2018). A number of serious and highly publicized pollution incidents associated with incorrect waste management practices, led to public concern about lack of controls, inadequate legislation, environmental and human health impact. This in turn forced many governments to introduce new regulatory frameworks to deal with hazardous and unsustainable waste management operations. A waste management hierarchy based on the most environmentally sound criteria favors waste prevention/minimization, waste re-use, recycling, and composting. In many countries, a large percentage of waste cannot presently be re-used, re-cycled or composted and the main disposal methods are land filling and incineration (Barra *et al* 2012).

Similar in Namatala Ward, typically one to two thirds of the solid waste generated is not collected (Zerbock, 2016). As a result, the uncollected waste, which is often mixed with human and animal excreta, is dumped indiscriminately in the streets and in drains, contributing to flooding, breeding of insect and rodent vectors and the spread of diseases such as cholera. Solid waste encompasses generation, collection, transportation and disposal of urban waste. Urban authorities have the responsibility to ensure safe, reliable and cost effective removal and disposal of solid waste, which takes up a large proportion of available resources which are not adequate to cope with the magnitude of the problem (NEMA, 2010). According to (NEMA, 2010), public agents, and industrial division authorities do not have adequate capacity to handle the increased solid waste mainly due to limited public budgets. A consequence of failure to remove solid waste finally is health hazards like tetanus, water and sanitary as well as environmental problems such as contamination and pollution especially in urban centers (NEMA, 2012). To this end this study is undertaken with a focus to examine the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City.

1.3 Problem Statement

In the context of Uganda, the country is facing several garbage management related challenges and the recent one being in Kitezi where more than 50 households were covered and more than 30 people were confirmed dead. Garbage has become a catastrophe among majority of the households and communities in Uganda, many of these dumping grounds have become breading zones for diseases, poor sanitation and bad smell and these seem not to differ from what is happening in Mbale City and Namatala ward in particular, the amount of litter dumped has affected the nearby households and communities at large as these have become breading zones for unhygienic environment, poor sanitation and irresistible smells.

Despite the strategies by both the government and the Namatala ward representatives to manage waste disposal, preliminary results show that waste disposal in Namatala ward still presents significant challenge to maintaining clean, healthy and sustainable urban environments, the existing regulations and waste management systems continues to struggle with improper waste disposal practices among residents and businesses manifested in the consistent littering and illegal dumping in public spaces. The inadequate public awareness, weak enforcement of regulations, cultural and behavioral factors and economic constraint continue to reinforce this social problem (Mbale City Status Report 2023).

This has resulted into an un hygienic environment, outbreak of illnesses most especially malaria as these become breeding points for mosquitoes, over whelming smell and unbearable environment that has affected the health of the people living in Namatala ward, Industrial Division, Mbale City. Management of Namatala ward and Industrial Division in general have devised means to handle dumping of waste such as enhancing public education, improving waste disposal infrastructures, enforcing regulations to be more effective, fostering community engagement and securing adequate funding for waste management initiative but preliminary results show there is still ongoing littering and dumping of wastes in Namatala ward, Industrial Division in Mbale City. It is upon

this state of affairs that the researcher is curtailed to examine the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City.

1.3 Purpose of the Study

The main objective of the study was to examine the effect waste disposal on the environment in Namatala ward Industrial Division, Mbale City. This was explored under three specific objectives.

1.4 Objectives of the Study

The study objectives were as follows;

1. To explore the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.
2. To determine the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City.
3. To find appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

Research Questions

The research questions that were considered are as follows;

1. What are the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City?
2. What is the effect of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City?
3. What are the appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City?

1.6 Justification of the Study

People's behaviors significantly have an effect on the environment. By studying the effect of waste disposal, this research provided valuable insights into how waste disposal influences the environmental behavior. This understanding is crucial for developing effective and sensitive waste management strategies.

Effective waste management is a key component of sustainable development. By understanding and addressing the challenges of waste disposal, the study will contribute to the broader goals of environmental sustainability and public health.

Waste management programs are more likely to be successful when they actively engage the communities they serve. By examining the effect of waste disposal on the environment, the study will provide insights into how to engage communities more effectively, ensuring that waste management initiatives are both accepted and supported by the people they impact. As a partial requirement for the fulfillment of the Bachelor's Degree in social work and social development, this study will be justifiable.

1.7 Significance of the Study

This study may contribute to the academic field by providing new insights into the relationship between waste disposal and environmental behavior, specifically waste disposal. It may enhance our understanding of how cultural practices, beliefs, and values influence waste management, filling a gap in the literature where these factors are often overlooked.

The findings of this study may be instrumental in designing waste management programs that are culturally sensitive and tailored to the needs of specific communities. This can lead to more effective interventions that are better received and more likely to be sustained over time.

By highlighting the cultural factors that influence waste disposal practices, the study may inform policymakers about the importance of incorporating cultural considerations into waste management policies. This can lead to the development of more inclusive and effective policies that promote sustainable waste disposal practices across diverse cultural contexts.

The study has significant implications for public health, as it may identify cultural practices that may contribute to improper waste disposal and associated health risks. By addressing these practices through culturally appropriate interventions, the study can help reduce the spread of disease and improve overall community health.

By recognizing and respecting cultural differences in waste disposal practices, the study will promote greater community engagement and empowerment. Communities may feel more involved in waste management initiatives, leading to higher participation rates and greater ownership of environmental outcomes.

Non-governmental organizations and environmental groups can use the findings of this study to develop more effective community outreach and education programs. By understanding the cultural context, these organizations can better communicate the importance of proper waste disposal and encourage behavioral change in a way that resonates with the target audience.

The study may further serve as a requirement for the fulfillment of a Bachelor's Degree in Social Works and Social Administration of the Uganda Christian University.

1.8 Scope of the Study

This may include content scope, time scope and geographical scope of the Study.

1.8.1 Content Scope

The study may examine the explore the Different Methods of Waste Disposal, the effects of Waste Disposal on the Environment and appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

1.8.2 Time Scope

The study may be limited to a period of 2 years from 2022 to 2023, this period may be studied because it is within this period that waste disposal in Namatala ward has escalated the limits. This gave justification for this current study.

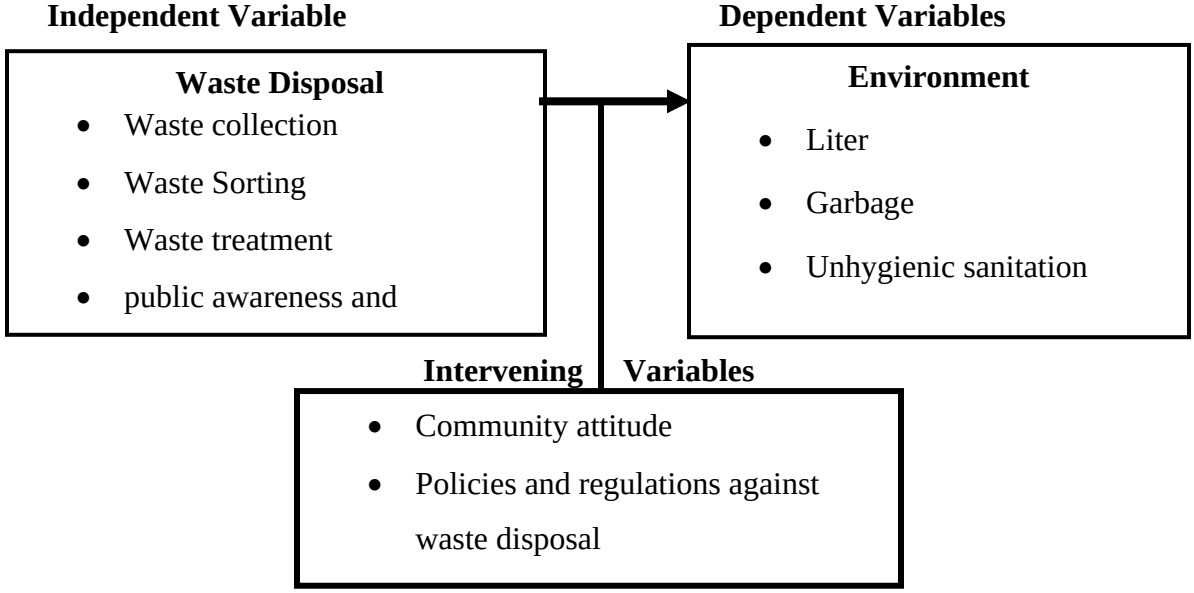
1.8.3 Geographical Scope

The study was carried out in Namatala Ward, Industrial Division. Namatala Ward is located in the Industrial Division of Mbale City, in Eastern Uganda. It is situated on the eastern side of the city and is one of the densely populated areas within the Industrial Division. Namatala is known for its informal settlements and vibrant local markets. The area is characterized by a mix of residential and commercial activities, with a diverse population that includes people from different ethnic backgrounds.

The ward is also notable for its challenges related to urbanization, including waste management, sanitation, and housing. As part of Mbale City, Namatala Ward is undergoing various urban development and improvement projects aimed at enhancing living conditions and infrastructure. However waste disposal remain a key challenge.

1.9 Conceptual Framework

The conceptual framework for this study describes the relationship between the independent variable and dependent variables.



Source: Figure 1:1: The Conceptual Framework Showing the Relationship between waste disposal and Environment

The above diagram explains the relationship between the independent waste disposal and dependent variable (environment). It indicates how the independent variable waste

disposal influences the dependent variable (environment) and its sub variables. For instance, if there are better values and belief, norms, practices and Behaviors, it is most likely that dumping of wastes will be overcome and vice versa.

1.10 Definition of Key Terms

The study described the conceptual understanding of the definitions of the study and the understanding according to the study as follows.

Waste Disposal: Waste disposal is the process of managing and discarding unwanted or unusable materials, substances, or products. It involves the collection, transportation, treatment, and final disposal of waste, which can include household garbage, industrial byproducts, hazardous materials, and recyclable items. The goal of waste disposal is to minimize the negative impact on the environment, human health, and wildlife by properly handling waste through methods like landfilling, incineration, recycling, composting, or waste-to-energy conversion. Effective waste disposal practices are essential for maintaining public health, protecting ecosystems, and conserving resources.

Health and Household: Health Refers to a state of complete physical, mental and social wellbeing while a household is a group of individuals who live together in a single dwelling or residence and share common domestic responsibilities. These group include family members, roommates and other individuals living together.

Attitudes Refers to the collective mindset, beliefs, and feelings that a group of people hold toward specific topics, behaviors, practices, or social norms. It encompasses how a particular individual views various aspects of life, such as work, family, religion, gender roles, education, and authority. These attitudes are shaped by a society's traditions, values, and historical experiences and influence how individuals

within interact with one another and with people from different cultural backgrounds.

Knowledge: Refers to the collection of facts, information, and skills that individuals acquire through experience, education, or learning. It involves the understanding and awareness of concepts, theories, or principles within various domains, such as science, art, history, or everyday life. Knowledge can be explicit, meaning it is easily communicated and shared through language or writing, or it can be tacit, meaning it is gained through personal experience and may be difficult to express. It serves as the foundation for decision-making, problem-solving, and innovation, and it plays a crucial role in both personal development and societal progress.

Awareness: Refers to the state of being conscious or knowledgeable about something. It involves recognizing and understanding particular issues, concepts, or situations, often leading to informed actions or decisions. Awareness can apply to a wide range of contexts, such as social issues, personal health, environmental concerns, or cultural diversity.

CHAPTER TWO

LITERATURE REVIEWS

2.1 Introduction Start with your topic

This chapter consisted of the review of literature on the effect of waste disposal on the health and household of people, how the different cultural attitudes and beliefs influence waste disposal practices among communities and the level of knowledge and awareness about waste disposal and environmental sustainability in communities of Namatala Ward, Industrial Division, Mbale City.

2.1 Theoretical Framework

The study was guided by the theory of Planned Behavior (TPB) by Lcek Ajzen.

This psychological theory posits that individual behavior is driven by behavioral intentions, which are influenced by three factors: Attitude which is the individual's positive or negative evaluation of performing the behavior. In terms of waste disposal, this could mean how people view the importance of proper waste management, Subjective Norms, the perceived social pressure to perform or not perform the behavior. Cultural norms around waste disposal play a crucial role here. In societies where waste disposal is seen as a communal responsibility, individuals may feel more compelled to engage in proper waste management practices and the Perceived Behavioral Control which involves individual's perception of their ability to perform the behavior.

This includes whether they believe they have the resources, knowledge, and opportunities to properly dispose of waste. Cultural factors, such as communal support and education, can enhance or limit this perception. In the context of waste disposal, cultural attitudes and norms significantly shape how individuals and communities approach waste management. For instance, behaviors that emphasize environmental stewardship and collective responsibility are more likely to promote effective waste disposal practices. Conversely, where waste is seen as an individual's problem or where there is a lack of awareness, improper waste disposal might be more prevalent.

Therefore, the theory of Planned Behavior supports the idea that cultural influences can significantly affect waste disposal behaviors, as these factors shape attitudes, social norms, and perceptions of control over the behavior.

2.2 Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

This section dealt with the Different Methods of Waste Disposal that exist in Namatala Ward.

Waste is a growing challenge due to increasing production and consumption, especially in urban areas where the waste problem is magnified by overpopulation Bolaane, (2016). According to the World Bank, poorly managed waste has an enormous impact on health, local and global environment, and economy; improperly managed waste usually results in down-stream costs higher than the cost of managing the waste properly in the first place. The environmental problems caused by inadequate waste management lead to negative repercussions for economic and human development through decline in health, loss of workdays and unnecessary municipal costs, to name a but few.

A study conducted by Busha, and Harter, (2015), on the impact and influence of waste on environmental and human health highlighted the sources of types, amount, disposal methods, and adverse effects of poor waste management on health. The liquid, excreta from community and households forms the dangerous health threats from wastes that contribute to causes and spread of infectious infections in the society as the findings illustrates. Busha, and Harter, (2015), researched on the implications of waste on human and environmental health, identified components of waste, types and quantity, disposal methodology of wastes, and the improper waste management effect on health. The results indicated infections and the risks that come with the wastes in the society and on human as well as environmental health.

According to Goldman, (2015), progress of modernization and industrialization has had its share of disadvantages and one of the main aspects of concern is the pollution it is causing to the earth be it land, air, and water. With increase in the global population and the rising demand for food and other essentials, there has been a rise in the amount of

waste being generated daily by each household. This waste is ultimately thrown into municipal waste collection centers from where it is collected by the area municipalities to be further thrown into the landfills and dumps. However, either due to resource crunch or inefficient infrastructure, not all of this waste gets collected and transported to the final dumpsites. If at this stage the management and disposal is improperly done, it can cause serious impacts on health and environment.

Mugisha (2010), direct health risks concern mainly the workers in this field, who need to be protected, as far as possible, from contact with wastes. There are also specific risks in handling wastes from hospitals and clinics. For the general public, the main risks to health are indirect and arise from the breeding of disease vectors, primarily flies and rats. In addition Mugisha (2010), noted that chemical poisoning through chemical Inhalation, Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community are a serious health hazard and lead to the spread of infectious diseases. Unattended waste lying around attracts flies, rats, and other creatures that in turn spread disease. Normally it is the wet waste that decomposes and releases a bad odour. This leads to unhygienic conditions and thereby to a rise in the health problems. The plague outbreak in Surat is a good example of a city suffering due to the callous attitude of the local body in maintaining cleanliness in the city. Plastic waste is another cause for ill health. Thus excessive solid waste that is generated should be controlled by taking certain preventive measures.

Certain chemicals if released untreated, e.g. cyanides, mercury, and polychlorinated biphenyls are highly toxic and exposure can lead to disease like cancer or to death. Cancer was reported among residents who were exposed. This study will be used to find out connection between health and hazardous waste in the world NEMA (2018).. Neurological disease is also one of the effects related to different waste management practices where the brain, spinal cord, and nerves can be impaired. Together they control all the workings of the body. When something goes wrong with a part of nervous system, there can be trouble moving, speaking, swallowing, breathing, or learning. There can also be problems with memory, senses, or mood.

Chronic respiratory diseases, incineration operators are at risk of chronic respiratory diseases. Organic waste poses a serious threat, since they ferment creating conditions favorable to the survival and growth of microbial pathogens. Direct handling of solid waste can result in various types of infectious and chronic diseases including cancers and respiratory infections resulting from exposure to dust and hazardous compounds Ntategize, (2010).

2.3 Effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City.

This section sought for literature on Effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City**.**

Another study conducted in Kenya found that much of the municipal budget for waste management is directed to pay for an over-staffed and under-qualified workforce Salman, (2016)., and not allocated to make improvements within their own infrastructure. The data suggests that the inadequacies of vehicles, supervisors, and solid waste collection crews were the major obstacles to the management of solid waste in the country. These problems were attributable to financial constraints and possibly to misappropriation of finances within the offices that manage waste.

In a study looking at solid waste management in the developing world, many sources of waste might only be reached by roads or alleys, which may be inaccessible to certain methods of transport because of their width, congestion, and elevation. This is especially critical in unplanned settlements such as slums or low-income areas and thus largely affects the selection of equipment Salman, (2016). Another study done in India found that poor conditions of containers and inadequate maintenance and replacement of worn-out collection vehicles contributed to behaviors such as littering and illegal dumping by citizens who felt they could not properly dispose of trash because trash bins and waste services were not properly maintained.

Based on the study targeting students of a selected hostel in Mbale City by Fearon, & Adraki, (2014) on the variables comprising of waste management knowledge, attitude and practices. The leading objective in the study was to establish the university student

attitude towards waste management, and sample of three students used and the questionnaire, self-administered as collection method, and t test to analyze the data findings. The finding indicated low, less favorable, and moderate in knowledge, attitude, and practice respectively; correlation of knowledge and attitude was absent, practice and knowledge indicated a substantial correlation.

A study on impact of community health awareness and intervention on knowledge, and disposal. The study adopted a questionnaire as a data collection instrument to gather data. The findings indicated vast knowledge on diseases and health risk associated with waste accumulation for the group that attended the training and education programs, positive attitude on managing wastes, and improved waste handling practices which include recycling household wastes. The observation showed an increase in community participation in cleaning and other environmental protection activities.4

Giusti, (2019), conducted a study on waste disposal and waste management. The study hypotheses tested at 0.05 level of significance. The implication of the results is that the residents of Calabar South have very negative attitude towards waste management and disposal, while the second hypothesis tested also showed a significant influence of indiscriminate disposal of waste and the health status of the residents of Calabar South Local Government Area. The study concluded that because of the negative attitude the residents of Calabar South have towards the management and disposal of their waste, it has some significant influence on their health status.

2.4 Appropriate Interventions and Strategies for Waste Disposal.

This section sought for literature on Appropriate Interventions and Strategies for Waste Disposal.

Adogu *et al*. (2015) conducted a study in Owerri municipal Imo state residents in Nigeria and found 90% of the respondents on the questionnaire were aware of the waste management with 97.55% showing a positive attitude toward managing wastes and protection of the environmental health. Further, the results showed a 97.1 % of the household wastes comprising of food residues as well as 95.4% being vegetable wastes.

Open dumping 66.3% of the sampled population, and burning 62.4% of the population practiced it forms the two poor waste management approaches illustrated in the study. Wheel barrow transportation stood out as the most famous means of waste transportation to the dumping site. The respondent's education and gender significant impact on attitude, practice, and knowledge, attitude and practice of waste management ($p < 0.05$).

According to Ngategize (2015), the solid waste study has established that on average the local area zones generates about 31 tons of solid waste daily and the division's effectiveness can only collect and disposes of only 30% of this waste leading to heavy accumulation of solid waste in the area. It is therefore commended that the local leadership in partnership with civil society undertake community cleanup exercises to reduce on the amount of solid waste accumulated in the area. This can be done on monthly basis where a day can be set aside with the division providing transport and the community to load and clean up the illegally established dumpsites in the area.

Studies by Nyakaana (2016) notes that the communities are found to have an "I don't care attitude" and limited knowledge about solid waste management which have lead to huge accumulation of solid waste in the area. The division which is also responsible for filing this gap was also limited in capacity to undertake these roles. Hence in order to immediately reduce the amount of solid waste and improve on solid waste management practices, there is need to undertake community sensitization and capacity building on proper solid waste management. This can be done through radio programmes, development and distribution of IEC materials and also undertaking community sensitization meetings about solid waste management in the area by both KCCA and non-governmental organizations.

Joshua (2018) noted that collection of metal scrap in form of aluminum, steel and plastics including PET bottles for sale to the recycling companies like Steel and Tube Industries, Roofings Uganda Limited for metal scrap and Nice house of plastics, poly fibers and Crest tanks for plastic materials while others sold to artisans to make finished products like students suitcases, charcoal stoves, metal works to mention but a few. Drinking

straws for art and crafts, Banana peelings for animal feeds and briquettes provide another classical example of solid waste re-use initiative.

Recycling and garbage reuse of inorganic materials from solid waste though not well developed. Such activities are seldom unrecognized, supported, or promoted by urban authorities as approaches to support SWM in the area despite having the advantage of: reducing costs of the disposal facilities, prolonging the site span, and also reducing the environmental impact of disposal sites. Tenywa (2017), notes that as practical example of waste avoidance to reduce the amount of plastic bottles and Kavera dumped indiscriminately is to introduce a deposit service fee in order to reduce the amount of plastic bottles and Kavera dumped. Practically the business owners/producers would be encouraged to integrate a deposit fee on the container. I.e. sale of juice, water and other merchandise is done and packed in returnable cups/bags where a fee as an incentive is placed on returning the cup/bag to the seller. This can be done in such a way that these cups/bags can be returned anytime and anywhere for a full refund, ensuring a service of maximum convenience to users. This can greatly reduce the amount of solid waste generated most especially from business enterprises.

CHAPTER THREE

METHODLOGY

3.1 Introduction

This chapter presents the methods that were used to conduct the study on the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City, the study focused on the Different Methods of Waste Disposal that exist, the effects of Waste Disposal on the Environment and appropriate interventions and Strategies for waste disposal in Namatala ward Industrial Division, Mbale City. It covered a description of the research design, study area, study population, sampling size and techniques, data collection methods, data collection tools, procedure of data collection, quality control, data analysis, data presentation and ethical issues.

3.1 Research Design

Research design is an arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance with the research purpose. It constituted of the blueprint for the collection, measurement and analysis of data (Kothari, 2014). The researcher adopted a cross-sectional survey design with a mixed-method paradigm that combines qualitative and quantitative methodologies. The study examined the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City. These methods were applied to mutually validate findings in order to create a more comprehensive and cohesive picture of the investigation domain. This strategy were taken into account since it allows for the approval and rejection of assumptions, captures a particular moment in time, and produces data that can be used for numerous types of investigations (Creswell, 2005). Therefore using a combination of approaches helped to compile data on the effect of waste disposal on the environment in Namatala ward Industrial Division, Mbale City

3.2 Area of Study

The study was carried out in Namatala Ward, Industrial Division. Namatala Ward is located in the Industrial Division of Mbale City, in Eastern Uganda. It is situated on the eastern side of the city and is one of the densely populated areas within the Industrial Division. Namatala is known for its informal settlements and vibrant local markets. The

area is characterized by a mix of residential and commercial activities, with a diverse population that includes people from different ethnic backgrounds.

3.3 Study Population

Mugenda (2013) defines a study population as a complete set of individuals, cases or objects with common observable characteristics. The study population constituted a total population of 60 respondents; these strictly included local leaders, members of the community, Industrial Division Staff

3.3 Sampling

This described the sample size and the sampling techniques.

3.3.1 Sample Size

Sample size is the number of respondents chosen to participate in the study, whose views shall be representative of the general population. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population (Kothari, 2003). The study selected 52 respondents and these included; local leaders, members of the community, Industrial Division Staff

Table 3.1 Showing the Organization, Category of Respondents, Population, Sample Size and Sampling Techniques

Category	Population	Sample Size	Sampling Technique
Local Leaders	03	03	Census Inquiry
Industrial Division Officials	03	03	Census Inquiry
Community	54	46	Simple Random
Total	**60**	**52**	

Source: Industrial Division Records (2023) for Population, Krejcie and Morgan for Sample Size (1970), and the Researcher for Sampling Techniques.

3.3.2 Sampling Techniques

The study considered both Census Inquiry and simple random sampling

3.3.2.1 Census Inquiry

Census inquiry refers to a study of all units in the population; it is also referred to as a complete count Cresswell (2005). 3 local leaders and 3 industrial division officers were selected using census sampling because they are the implementers of programs, knowledgeable and experienced cadres in the Division and the wards. Census survey is important in research studies because it reduces on the time needed for data collection, produces validated information, gives details of information about a unit and more detailed questions that can be asked**.**

3.3.2.2 Simple Random Sampling

Simple random sampling is defined as a sampling technique where every item in **the** population has an even chance and likelihood of being selected in the sample. Here the selection of items entirely depends on luck or probability, this sampling technique is sometimes known as a method of chances.

Simple random sampling is a fundamental sampling method and can easily be a component of a more complex sampling method. The main attribute of this sampling method is that every sample has the same probability of being chosen. Through the use of lottery method, the researcher gave each member of the population a number. The researcher drew numbers from the box randomly to choose samples. Simple random sampling was used to members of the community since they are many and generally spread.

3.4 Source of Data

The researcher used primary data from the respondents. Secondary data was obtained from Industrial Division reports, minutes and documents pertaining waste disposal and the environment in the community.

3.5 Data Collection Methods

Data was collected through a survey method, interviews and observations to compile data for the study.

3.6 Data Collection Instruments

The instruments/tools included; questionnaires and interview guides

3.6.1 Questionnaire

The researcher used semi-structured questionnaires. The questionnaires included both open and closed ended questions. A questionnaire was used to gather quantitative information from the respondents. This served as the primary tool for gathering information from respondents. To make the questionnaires simple for the respondents to understand, they were initially written in English. The use of questionnaires were favored because they are simple to administer and quick for respondents to complete because they can read and write, open-ended questions are simple for the researcher and the respondents to administer, respondents were given ample time, room, and opportunity to read and comprehend. Respondents had the chance to provide unique and genuine responses because the questionnaire guarantees anonymity. In this case, questionnaires were given to the community.

3.6.2 Interview Schedule

This refers to a one on one vocal questioning method of discussion. It involves face to face interaction between a respondent and the researcher. Structured questions were used to allow the local leaders and industrial division officials to freely interact with the researcher who may have chance to ask broad questions concerning the study. This enabled provision of high degree of clearing up the unknown information. The interview guide was used because of its advantages; such as simplicity, applicability, and flexibility in tapping information that can be acquired in details and in a well explained manner. The researcher interviewed respondents seeking their opinion as the interview schedule required. Interview method involved face to face interaction between the researcher and the respondents.

3.7 Data Quality Controls

Data quality controls was used to ensure that data is reliable and valid.

3.7.1 Validity

The researcher established the validity of the instrument through discussion of the instrument with colleagues, the supervisor and other experts. In order to compute the content validity index (C.V.I), the questions were developed and the opinions of three experts in the field of social works and social administration were put in consideration to ensure consistence of the instrument. The judges were selected to independently judge the relevance of the items in the questionnaire in relation to the research objectives. This was consistent with Creswell (2005).

To compute the Content Validity Index (CVI), the researcher used the formula below.

$$CVI = \frac{R}{K}$$

Where CVI = content validity index

R = No. of items rated as relevant

K = Total No. of items in the instrument

$$CVI = \frac{18}{23}$$

CVI = 0.78

According to Amin (2005), any score above 0.7 was deemed appropriate and valid as far as the instrument was concerned.

According to Amin (2005), any score above 0.7 is deemed appropriate and valid as far as the instrument is concerned.

3.7.2 Reliability

According to Ahuja (2000), reliability refers to the consistency of a measure of a concept. A pilot study was conducted from Northern Division and a sample of 20 respondents were selected. Local leaders and the community was selected to test the reliability of the instrument.

Experts were given a similar set of questionnaires and interviews to test the reliability of the instrument and Cronbach alpha coefficient was then used to provide an estimate of how consistent all the variables on a test instrument measure. Cronbach Alpha Coefficient was considered to be a fundamental measure of the reliability of research instrument since it was found greater than 0.7. Indeed, Ahuja (2000), argues that the research instrument is accepted as reliable, acceptable and worth being used for data collection if found above 0.7.

3.8 Research Procedure

The research process began with proposal writing, designing and pretesting tools and thereafter approval by the supervisor which enabled the researcher to obtain permission from the University to start the process of data collection.

Data collection, data processing, data analysis and a research report showing the study findings were then written and submitted to the supervisor for approval.

3.9 Data Analysis and Presentation

The researcher analyzed data after the process of data collection. The researcher summarized the data given by the respondents. Frequency distribution table and percentage were used to examine the effect of waste disposal and the environment. Thereafter data presentation and interpretation of the study findings were computed.

3.10 Ethical Consideration

Informed consent were sought from the respondents.

For the purpose of confidentiality and anonymity, names of the respondents were included in the questionnaires.

The respondents were informed that they are not obliged to participate in the study and that they are free to withdraw from the study.

The researcher obtained permission and authorization from relevant authorities before carrying out the study.

CHAPTER FOUR

Data Analysis, Presentation and Interpretation of Findings

4.1 Introduction

This chapter dealt with the presentation of data, analysis and discussion of the findings of the study. This was done according to the objectives of the study. The researcher used frequency distribution tables in presenting the data and use of themes in support of the qualitative data to examine the effect Waste Disposal on the Environment in Namatala Ward Industrial Division, Mbale City.

Questionnaire and Interview Guide Return Rate

The researcher distributed 46 questionnaires to the community (all members of the public), however on returning the questionnaires, all the 46 questionnaires were returned and these were considered for data analysis.

Statistically, the Number of Questionnaires Distributed

$$\frac{\textbf{Questionnaire Return Rate}}{\text{Number of Questionnaires}}$$

$$\frac{40}{46} \times 100 = 86.9\%$$

86.9% Questionnaires

$$\frac{\text{Response Rate}}{\text{Interview Guides distributed}}$$

$$\frac{06}{06} \times 100 = 100\%$$

100% Interview Sessions

Hendra and Hill (2018) also state that any survey that produces less than 100% survey response rate, can present nonresponse bias into the results.

4.2 Demographic Features of the Respondents

This section discussed the background information of the respondents Local Leaders, Industrial division officials and community who were relevant to the study. A case in

point is gender, age bracket, working experience and highest level of respondents were of great relevance to the study. Their analysis was done in frequencies and percentages which are presented in tables as follows: -

Respondents were asked about their gender and the responses that were obtained are reflected in table 4.1.

Table 4.1: Demographic Characteristics of Respondents

Characteristics	**Category**	**Frequency**	**Percent**
Local Leaders	Male	03	100
	Female	00	00
	Total	**03**	**100**
Industrial Division Officials	Male	03	100
	Female	00	00
	Total	**03**	**100**
Community	Male	18	39
	Female	28	61
	Total	46	
Sex Age Bracket	21-30 years	28	50
	31-40 years	15	27
	41 and above years	13	23
	Total	**56**	**100**
Work Experience	0-3 year	14	25
	4-7years	30	53
	8-11 above	12	22
	Total	**56**	**100**
Highest Education	Diploma	15	34
	Bachelors	20	45
	Post Graduate	05	12
	Masters' Degree	04	09

Total	**56**	**100**

Source: Field Data (2023)

In reference to table 4.1 on the Sex of respondents in the context of leadership, 03(100%) of the respondents were male while 00(00%) were female. It was noted that the male were in leadership position as compared to the female teachers. The implication was that leadership in Namatala ward is mostly occupied by male who are in charge of ensuring that peace and safety prevail. The relevancy of gender in this study is to provide equal representation for both genders to express their opinion as far as the study is concerned.

As for industrial division official, there were male 03(100%) as compared to the female 00(300%). Findings indicate that the male were more concerns about the willingness to exhaust the study under investigation as compared to the female respondents. These were having leadership position in Namatala ward.

Table 4.1 still shows the age bracket of respondents, 28(50%) were 21-30 years, 15(27%) were 31-40 years, were 13(23%) and above 41 years. It was established that majority of the respondents were 21-30 years. It was established that all respondents were adults since all were 18 years. Age was important in this study for purposes of acquiring information from various of different age brackets and of sound mind. The information they provided was reliable which hence helped to enrich the study.

In reference to the age of pupils in the upper class, all pupils were between 10-15 years. Findings indicated that age was relevant for the study for purposes of identifying the opinion of pupils based on their understanding on the study under investigation.

In reference to the table 4.1: it was noted that 14(32%) of the respondents had worked for 0-5 years, 18(41%) were for 6-11 years, 12(27%) have served for 12 years and above. Findings indicated that all teachers had the experience in the service, their experience only differed by years of service.

Work experience in this case was relevant for purposes of exhausting information from respondents on the effect Waste Disposal on the Environment in Namatala Ward Industrial Division, Mbale City.

Furthermore, it was noted that 15(34%) of the teachers were of Diploma level in the teaching profession, 20(45%) were of Bachelors level of education, 05(12%) were of post graduate level of education while 04(09%) were of Master's Degree. Findings indicated that all respondents were qualified and had the appropriate education experience. Educational level in this study was relevant for purposes of getting clarity (enhanced information) for the study on the effect Waste Disposal on the Environment in Namatala Ward Industrial Division, Mbale City.

Objective One: To explore the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

This section deals with the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

Table 4.2: Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

No	Response	SA	A	NOTSURE	D	SD	Total
		F(%)	F(%)	F(%)	F(%)	F(%)	
1	Recycling is a method for waste disposal	23(41)	15(27)	05(9)	07(13)	06(11)	56
2	Composting	20(36)	18(32)	03(5)	10(17)	05(9)	56
3	Incineration	15(27)	22(39)	08(14)	05(9)	06(11)	56
4	Land fills	28(50)	16(28)	07(13)	03(5)	02(4)	56
5	Dumping on Open spaces	15(27)	20(36)	05(9)	08(14)	08(14)	56
6	Burning waste in Open Ares	22(39)	18(32)	10(17)	04(7)	02(4)	56
7	Use of Waste Management services such as garbage collection	18(32)	18(32)	02(4)	06(11)	12(21)	56

Source: Field Survey, (2024)

Recycling is a method for waste disposal

In reference to 4.4 indicated that 23(41%) strongly agreed, 15(27) agreed, 05(09) were undecided while 07(13) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that Recycling is a method for waste disposal. It was noted that recycling is a method of waste disposal. It involves the process of collecting, processing, and converting waste materials into new products. By recycling, materials like paper, plastic, glass, and metal can be reused, reducing the need for raw resources, minimizing waste, and lessening environmental impact. Recycling helps manage waste more sustainably compared to other methods like landfilling or incineration.

Composting

It was noted in table 4.2 indicated that 20 (36%) strongly agreed, 18(32) agreed, 03(05) were undecided while 10(17) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that composting is a method for waste disposal. Finding indicated that composting is a method of waste disposal. It involves the decomposition of organic waste, such as food scraps and yard waste, into a nutrient-rich material called compost. This process occurs through the natural action of microorganisms, fungi, and bacteria. Composting is an environmentally friendly way to recycle organic waste, reducing the amount of waste sent to landfills and creating a valuable product that can be used to enrich soil.

Incineration

In reference to 4.2 indicated that 15 (27%) strongly agreed, 22(39) agreed, 08(14) were undecided while 05(9%) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that incineration is a method for waste disposal. It was noted that incineration is a method of waste disposal. It involves the combustion of waste materials at high temperatures, converting them into ash, flue gas, and heat. This process reduces the volume of waste significantly, making it easier to manage. Incineration is often used for disposing of hazardous, medical, and

municipal solid waste. The heat generated can also be used to produce energy, making it a form of waste-to-energy technology. However, incineration can have environmental impacts, such as air pollution, if not properly managed.

Land fills

In reference to 4.2 indicated that 28(50%) strongly agreed, 16(28) agreed, 07 (13) were undecided while 03(05%) disagreed while 02(04) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that incineration is a method for waste disposal. It was observed from the findings that landfills are a method of waste disposal. A landfill is a designated site where waste is buried under layers of soil. It is the most common method for disposing of solid waste, particularly in areas where space is available. Properly managed landfills are designed to minimize environmental impact by containing the waste, controlling the release of harmful substances, and managing landfill gas emissions. However, if not properly managed, landfills can lead to issues such as groundwater contamination, methane emissions, and long-term land use concerns.

Dumping on Open spaces

In reference to 4.2 indicated that 15(27%) strongly agreed, 20(36%) agreed, 05 (09%) were undecided while 08(14%) disagreed while 08(14) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that Dumping on Open spaces is a method for waste disposal. Study findings indicated that dumping waste in open spaces is technically a method of waste disposal, but it is considered an improper and environmentally harmful practice. This method involves discarding waste directly onto land without any containment or treatment, leading to serious environmental and health issues. Open dumping can result in soil and water pollution, attract pests, and create unsanitary conditions. It is illegal in many places and discouraged in favor of more controlled and environmentally responsible methods like landfilling, recycling, or composting.

Use of Waste Management services such as garbage collection

In reference to 4.2 indicated that 18(32%) strongly agreed, 18(32%) agreed, 02 (04%) were undecided while 06(11%) disagreed while 12(21) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that use of Waste Management services such as garbage collection is a method for waste disposal. It was found out that the use of waste services, such as garbage collection, is a method of waste management. These services involve the systematic collection, transportation, and proper disposal or processing of waste generated by households, businesses, and industries. Waste management services help ensure that waste is handled in a way that minimizes environmental impact and promotes public health. These services can include the collection of recyclables, compostable materials, and general waste, which may then be directed to appropriate facilities such as recycling centers, composting sites, or landfills.

In an interview, leaders noted that improper waste disposal, particularly illegal dumping, has led to soil contamination in certain areas. This contamination affects soil fertility and can harm local vegetation.

In addition, there is significant concern about water pollution from waste disposal practices. Waste dumped into rivers and lakes has led to increased levels of pollutants, affecting aquatic life and potentially contaminating drinking water sources

Further still, open burning of waste was reported to contribute to air pollution, releasing harmful gases and particulate matter that impact respiratory health and contribute to climate change.

Local leaders in an interview added that waste disposal is rising health concerns among residents due to exposure to pollutants from improper waste disposal. Common issues include respiratory problems and other illnesses linked to pollution from burning waste and contaminated water sources.

Objective Two: To determine the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City

This section dealt with the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City

Table 4.3: The effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City

No	Effects of Waste Disposal on the Environment	SA	A	Notsure	D	SD	Total
		F(%)	F(%)	F(%)	F(%)	F(%)	56/100
1	Degrades soil quality and water quality	17**(30)**	14**(25)**	10**(17)**	05**(10)**	10**(17)**	**56/100**
2	Open burning of waste contributes heavily to air pollution	15**(27)**	20**(36)**	10**(17)**	06**(11)**	05**(9)**	**56/100**
3	Dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem	14**(25)**	21**(38)**	10**(17)**	05**(9)**	06**(11)**	**56/100**
4	Recycling reduces the amount of pollution entering the environment	20**(36)**	17**(30)**	12**(21)**	05**(9)**	02**(4)**	**56/100**
5	Composting organic waste improves soil fertility and reduces the need for chemic fertilizers	15**(27)**	20**(36)**	05**(9)**	08**(14)**	08**(14)**	**56/100**
6	Incineration of waste releases harmful gases that contributes to global warming	18**(32)**	18**(32)**	06**(11)**	02**(4)**	12**(21)**	**56/100**
7	Proper waste management greatly reduces the negative impact on the environment.	22**(39)**	18**(32)**	04**(7)**	10**(17)**	02**(4)**	**56/100**

Source: Primary Data, (2024).

Degrades soil quality and water quality

In reference to 4.3 indicated that 17(30%) strongly agreed, 14(25) agreed, 10(17) were undecided while 05(10) disagreed while 10(17) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that waste disposal degrades soil quality and water quality. It was noted that improper waste disposal degrades soil quality by introducing harmful chemicals, heavy metals, and non-biodegradable materials that contaminate and disrupt soil structure. This contamination can alter the soil's pH, create nutrient imbalances, and harm essential microorganisms, leading to reduced soil fertility and impaired plant growth. Additionally, organic waste, if not managed properly, can contribute to nutrient pollution, further degrading the soil's natural health. Effective waste management is crucial to prevent these negative impacts and maintain healthy, productive soil.

In an interview with a local leader, He said, *"Dumping of waste products is a common behaviors among the members in the community in Namatala, the continuity of this behavior has affected the hygiene of Namatala ward and as a result, caused some outbreak of illnesses. As a leader, warning have been issued to the community but this behavior still persists."*

In an interview further still, *"it was observed that the environment is not safe in Namatala ward, there is a lot of litter and as a result of this litter the community has already raised concerns. This is likely to affect the health and sanitation of households in Namatala ward."*

Open burning of waste contributes heavily to air pollution

In reference to 4.3 indicated that 15 (27%) strongly agreed, 20(36) agreed, 10(17) were undecided while 06(11) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that open burning of waste contributes heavily to air pollution. Finding indicated that open burning of waste significantly contributes to air pollution. When waste is burned in the open, it releases a variety of harmful pollutants, including particulate matter, carbon monoxide, volatile organic compounds (VOCs), dioxins, and furans. These pollutants can have severe health

effects on humans, such as respiratory and cardiovascular problems, and they also contribute to environmental issues like smog formation, acid rain, and global warming. The uncontrolled nature of open burning makes it particularly dangerous as it lacks the pollution controls that are typically present in regulated waste incineration facilities.

In an interview, *"a local leader said open burning is not practiced in the communities which has contributed to huge accumulation of wastes and this continues to pose risks to the health and sanitation of the community."*

Dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem

In reference to 4.2 indicated that 14 (25%) strongly agreed, 21(38) agreed, 10(17) were undecided while 05(9%) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem. It was noted that dumping waste in rivers and lakes leads to the destruction of aquatic ecosystems. Waste materials, especially those containing toxic chemicals, heavy metals, plastics, and organic pollutants, can severely degrade water quality, deplete oxygen levels, and harm or kill aquatic life. This pollution disrupts the natural balance of the ecosystem, leading to the loss of biodiversity as fish, plants, and other organisms are unable to survive in the contaminated environment. Additionally, waste accumulation can block sunlight, affecting photosynthesis in aquatic plants and further destabilizing the ecosystem. The result is a significant decline in the health and functionality of the aquatic environment.

Recycling reduces the amount of pollution entering the environment

In reference to 4.2 indicated that 20(36%) strongly agreed, 17(30%) agreed, 12(21%) were undecided while 05(09%) disagreed while 02(04%) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that recycling reduces the amount of pollution entering the environment**.** It was observed from the findings that recycling reduces the amount of pollution entering the environment. By reusing materials, recycling lessens the demand for new raw materials, reducing the environmental damage caused by extraction processes like mining and deforestation. It also decreases the amount of waste that would otherwise be incinerated or sent to

landfills, where it could release harmful pollutants into the air, soil, and water. Additionally, recycling saves energy, which in turn reduces greenhouse gas emissions and other pollutants associated with energy production. In this way, recycling significantly mitigates pollution and helps protect the environment.

Composting organic waste improves soil fertility and reduces the need for chemic fertilizers

In reference to 4.3 indicated that 15(27%) strongly agreed, 20(36%) agreed, 05 (09%) were undecided while 08(14%) disagreed while 08(14) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that composting organic waste improves soil fertility and reduces the need for chemic fertilizers**.** It was noted that composting organic waste improves soil fertility and reduces the need for chemical fertilizers. Composting converts organic waste, such as food scraps and plant material, into nutrient-rich compost that enhances soil structure, increases its ability to retain moisture, and supplies essential nutrients to plants. This natural process enriches the soil with organic matter, promoting the growth of beneficial microorganisms that further improve soil health. By providing a sustainable source of nutrients, composting reduces the reliance on chemical fertilizers, which can have negative environmental impacts, such as soil degradation and water pollution.

Incineration of waste releases harmful gases that contributes to global warming

In reference to 4.3 indicated that 18(32%) strongly agreed, 18(32%) agreed, 02 (04%) were undecided while 06(11%) disagreed while 12(21) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that incineration of waste releases harmful gases that contributes to global warming. It was found out that incineration of waste releases harmful gases that contribute to global warming. When waste is burned, it emits carbon dioxide (CO2), a major greenhouse gas, as well as other pollutants like methane (CH4), nitrous oxide (N2O), and volatile organic compounds (VOCs). These gases trap heat in the Earth's atmosphere, leading to global warming and climate change. Additionally, the incineration process can release toxic substances like dioxins and furans, which not only harm human health but also contribute

to environmental degradation. Therefore, while incineration reduces the volume of waste, it has significant environmental impacts due to the release of these harmful gases.

Proper waste management greatly reduces the negative impact on the environment.
In reference to 4.3 indicated that 22(39%) strongly agreed, 18(32%) agreed, 04(07%) were undecided while 10(17%) disagreed while 02(04) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that proper waste management greatly reduces the negative impact on the environment**.** It was found out that proper waste management greatly reduces the negative impact on the environment. Effective practices, such as recycling, composting, and controlled waste disposal, minimize pollution, conserve natural resources, and reduce greenhouse gas emissions. Proper management also prevents harmful substances from contaminating soil, water, and air, thereby protecting ecosystems and public health. By ensuring that waste is handled and disposed of in an environmentally responsible manner, the overall environmental footprint is significantly reduced, contributing to a more sustainable and healthier planet.

In an interview with an industrial division official, "*it was noted by a local leader that the economic burden of managing the aftermath of illegal dumping and pollution cleanup is significant. Local authorities face high costs for waste management and environmental remediation and many residents are aware of the negative effects of poor waste disposal practices but feel limited in their ability to effect change due to lack of resources or enforcement."*

Further still in an interview with a local leader, "*there is need to increase monitoring and enforcement to prevent illegal dumping and open burning, implement stricter penalties and improve surveillance in problem areas and investing in better waste management infrastructure, including more recycling and composting facilities, to reduce the volume of waste that needs to be disposed of improperly."*

Objective Three: To Find Appropriate Interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

This section reveals the appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

Table 4.4: Showing the appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

No	Response	SA	A	NOTSURE	D	SD	Total
		F(%)	F(%)	F(%)	F(%)	F(%)	
1	Implementing strict waste segregation policies	15(27)	20(36)	05(9)	08(14)	08(14)	56/100
2	Promoting community awareness campaigns on proper waste disposal	20(36)	18(32)	03(5)	10(17)	05(9)	56/100
3	Providing incentives for recycling and composting	22(39)	18(32)	10(17)	04(7)	02(4)	56/100
4	Establishing more recycling centers in the community	28(50)	16(28)	07(13)	03(5)	02(4)	56/100
5	Enforcing penalties for illegal dumping and open burning	18(32)	18(32)	02(4)	06(11)	12(21)	56/100
6	Investing modern waste treatment and disposal technologies	15(27)	22(39)	08(14)	05(9)	06(11)	56/100
7	Supporting public private partnerships in waste management.	23(41)	15(27)	05(9)	07(13)	06(11)	56/100

Source: Primary Data, (2024).

Implementing Strict Waste Segregation Policies

In reference to 4.3 indicated that 15(27%) strongly agreed, 20(36%) agreed,05(09%) were undecided while 08(14) disagreed while 08(14) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that implementing strict waste segregation policies. It was noted that implementing strict segregation policies is an effective strategy for waste disposal. By separating waste at the source into categories like recyclables, organic waste, hazardous materials, and general waste, segregation makes it easier to manage and process different types of waste appropriately. This approach enhances recycling rates, improves the efficiency of waste

treatment processes, and reduces the risk of contamination. It also ensures that hazardous waste is handled safely, minimizing its impact on the environment and human health. Overall, strict segregation policies are crucial for optimizing waste management and promoting sustainability.

Promoting community awareness campaigns on proper waste disposal

In reference to 4.3 indicated that 20 (36%) strongly agreed, 18(32) agreed, 10(17) were undecided while 06(11) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that promoting community awareness campaigns on proper waste disposal. Finding indicated that promoting community awareness campaigns on proper waste disposal is a key strategy for effective waste management. These campaigns educate the public about the importance of proper waste separation, recycling, composting, and the impacts of improper disposal. By increasing awareness and understanding, such campaigns encourage individuals and businesses to adopt better waste management practices, leading to higher recycling rates, reduced littering, and more effective use of waste disposal systems. Community involvement and education play crucial roles in achieving successful waste management and fostering a culture of environmental responsibility

Providing incentives for recycling and composting

In reference to 4.3 indicated that 22(39%) strongly agreed, 18(32) agreed, 10(17) were undecided while 04(07%) disagreed while 02(04) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that providing incentives for recycling and composting. It was noted that providing incentives for recycling and composting is a valuable waste disposal strategy. Incentives, such as financial rewards, discounts, or recognition programs, encourage individuals and businesses to participate actively in recycling and composting efforts. These incentives can increase participation rates, improve waste separation practices, and enhance overall recycling and composting outcomes. By making these practices more attractive and rewarding, incentives help to reduce the volume of waste sent to landfills and incinerators, promote sustainable waste management, and contribute to environmental conservation.

Establishing more recycling centers in the community

In reference to 4.2 indicated that 28(50%) strongly agreed, 16(28%) agreed, 07(13%) were undecided while 03(05%) disagreed while 02(04%) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that establishing more recycling centers in the community**.** It was observed from the findings that establishing more recycling centers in the community is an effective strategy for waste disposal. By increasing the availability and accessibility of recycling facilities, communities can improve recycling rates and reduce the amount of waste that ends up in landfills or incinerators. More recycling centers make it easier for residents to sort and drop off their recyclables, and they can also facilitate the processing of a wider range of materials. This approach supports better waste management practices, encourages higher participation in recycling programs, and helps to conserve resources and reduce environmental impact.

Enforcing penalties for illegal dumping and open burning

In reference to 4.3 indicated that 18(32%) strongly agreed, 18(32%) agreed, 04 (04%) were undecided while 06(11%) disagreed while 12(21) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that enforcing penalties for illegal dumping and open burning. It was noted that enforcing penalties for illegal dumping and open burning is a strategy for effective waste disposal. By implementing and enforcing fines or other penalties for these activities, authorities can deter individuals and businesses from engaging in improper waste disposal practices. This strategy helps to reduce illegal dumping and open burning, which can otherwise lead to environmental pollution and public health hazards. Penalties, combined with education and accessible waste management options, create a comprehensive approach to managing waste responsibly and protecting the environment.

Investing modern waste treatment and disposal technologies

In reference to 4.3 indicated that 15(27%) strongly agreed, 22(39%) agreed, 08(14%) were undecided while 05(09%) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that

Investing modern waste treatment and disposal technologies. It was found out that investing in waste treatment and disposal technologies is a crucial waste management strategy. Advanced technologies, such as waste-to-energy plants, improved recycling systems, and sophisticated composting facilities, enhance the efficiency and effectiveness of waste processing. These technologies can help reduce the volume of waste sent to landfills, minimize environmental impact, and recover valuable resources from waste. Investing in such technologies supports sustainable waste management by improving resource recovery, reducing pollution, and promoting environmental protection.

Supporting public private partnerships in waste management

In reference to 4.3 indicated that 23(41%) strongly agreed, 15(27%) agreed, 05(09%) were undecided while 07(13%) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that supporting public private partnerships in waste management. It was found out that supporting public-private partnerships (PPPs) in waste management is an effective strategy. PPPs leverage the strengths of both the public and private sectors to improve waste management services. These partnerships can bring in private sector expertise, innovation, and investment while ensuring that public interests and regulatory standards are upheld. Through PPPs, communities can benefit from enhanced waste collection, recycling, treatment, and disposal services, as well as increased efficiency and reduced costs. Such collaborations can lead to more sustainable and effective waste management solutions.

In an interview with an industrial division official, *"most leaders reported that waste segregation is practiced in larger commercial areas but less so in residential zones and in addition, recycling programs are in place, but participation is limited due to insufficient awareness and accessibility."*

In an interview still with a local leader, "it was noted that community composting initiatives exist but are underutilized, with few residents participating and the lack of sufficient recycling centers and composting facilities, which limits the effectiveness of these programs.

Further still, low levels of public awareness and education about waste management practices hinder community participation and also there is a significant issue with illegal dumping and open burning of waste, particularly in less monitored areas.

In an interview with local leader, *"There is limited community involvement in waste management initiatives. Leaders suggested that more engagement is needed to improve outcomes and the educational campaigns on waste management are sporadic and need to be more widespread and consistent."*

CHAPTER FIVE

Discussion of Findings

5.1 Introduction

Objective One: To explore the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

In reference to 4.4 indicated that 23(41%) strongly agreed, 15(27) agreed, 05(09) were undecided while 07(13) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that Recycling is a method for waste disposal. It was noted that recycling is a method of waste disposal. It involves the process of collecting, processing, and converting waste materials into new products. By recycling, materials like paper, plastic, glass, and metal can be reused, reducing the need for raw resources, minimizing waste, and lessening environmental impact. Recycling helps manage waste more sustainably compared to other methods like landfilling or incineration. Bolaane, (2016) observed that poorly managed waste has an enormous impact on health, local and global environment, and economy; improperly managed waste usually results in down-stream costs higher than the cost of managing the waste properly in the first place. The environmental problems caused by inadequate waste management lead to negative repercussions for economic and human development through decline in health, loss of workdays and unnecessary municipal costs, to name a but few.

It was noted in table 4.2 indicated that 20 (36%) strongly agreed, 18(32) agreed, 03(05) were undecided while 10(17) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that composting is a method for waste disposal. Finding indicated that composting is a method of waste disposal. It involves the decomposition of organic waste, such as food scraps and yard waste, into a nutrient-rich material called compost. This process occurs through the natural action of microorganisms, fungi, and bacteria. Composting is an environmentally friendly way to recycle organic waste, reducing the amount of waste sent to landfills and creating a valuable product that can be used to enrich soil. This is in

relation to Busha, and Harter, (2015) researched on the implications of waste on human and environmental health, identified components of waste, types and quantity, disposal methodology of wastes, and the improper waste management effect on health. The results indicated infections and the risks that come with the wastes in the society and on human as well as environmental health.

Study finding in table 4.2 indicated that 15 (27%) strongly agreed, 22(39) agreed, 08(14) were undecided while 05(9%) disagreed while 06(11) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that incineration is a method for waste disposal. It was noted that incineration is a method of waste disposal. It involves the combustion of waste materials at high temperatures, converting them into ash, flue gas, and heat. This process reduces the volume of waste significantly, making it easier to manage. Incineration is often used for disposing of hazardous, medical, and municipal solid waste. The heat generated can also be used to produce energy, making it a form of waste-to-energy technology. However, incineration can have environmental impacts, such as air pollution, if not properly managed. Ntategize, (2010) noted that incineration operators are at risk of chronic respiratory diseases. Organic waste poses a serious threat, since they ferment creating conditions favorable to the survival and growth of microbial pathogens. Direct handling of solid waste can result in various types of infectious and chronic diseases including cancers and respiratory infections resulting from exposure to dust and hazardous compounds.

In reference to 4.2 indicated that 28(50%) strongly agreed, 16(28) agreed, 07 (13) were undecided while 03(05%) disagreed while 02(04) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that incineration is a method for waste disposal. It was observed from the findings that landfills are a method of waste disposal. A landfill is a designated site where waste is buried under layers of soil. It is the most common method for disposing of solid waste, particularly in areas where space is available. Properly managed landfills are designed to minimize environmental impact by containing the waste, controlling the release of harmful substances, and managing landfill gas emissions. However, if not properly managed, landfills can lead to issues such as groundwater contamination, methane emissions, and

long-term land use concerns. In a similar way Mugisha (2010), noted that chemical poisoning through chemical Inhalation, Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community are a serious health hazard and lead to the spread of infectious diseases.

Study findings in table 4.2 indicated that 15(27%) strongly agreed, 20(36%) agreed, 05 (09%) were undecided while 08(14%) disagreed while 08(14) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that Dumping on Open spaces is a method for waste disposal. Study findings indicated that dumping waste in open spaces is technically a method of waste disposal, but it is considered an improper and environmentally harmful practice. This method involves discarding waste directly onto land without any containment or treatment, leading to serious environmental and health issues. Open dumping can result in soil and water pollution, attract pests, and create unsanitary conditions. It is illegal in many places and discouraged in favor of more controlled and environmentally responsible methods like landfilling, recycling, or composting. In a similar study by Mugisha (2010), he said direct health risks concern mainly the workers in this field, who need to be protected, as far as possible, from contact with wastes. There are also specific risks in handling wastes from hospitals and clinics. For the general public, the main risks to health are indirect and arise from the breeding of disease vectors, primarily flies and rats.

Objective Two: To determine the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City

It was noted in table 4.3 indicated that 17(30%) strongly agreed, 14(25) agreed, 10(17) were undecided while 05(10) disagreed while 10(17) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that waste disposal degrades soil quality and water quality. It was noted that improper waste disposal degrades soil quality by introducing harmful chemicals, heavy metals, and non-biodegradable materials that contaminate and disrupt soil structure. This contamination can alter the soil's pH, create nutrient imbalances, and harm essential microorganisms, leading to reduced soil fertility and impaired plant growth. Additionally, organic waste, if

not managed properly, can contribute to nutrient pollution, further degrading the soil's natural health. Effective waste management is crucial to prevent these negative impacts and maintain healthy, productive soil. It was noted by Fearon, & Adraki (2014) on the variables comprising of waste management knowledge, attitude and practices. The leading objective in the study was to establish the university student attitude towards waste management, and sample of three students used and the questionnaire, self-administered as collection method, and t test to analyze the data findings. The finding indicated low, less favorable, and moderate in knowledge, attitude, and practice respectively; correlation of knowledge and attitude was absent, practice and knowledge indicated a substantial correlation.

According to table 4.3 indicated that 15 (27%) strongly agreed, 20(36) agreed, 10(17) were undecided while 06(11) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that open burning of waste contributes heavily to air pollution. Finding indicated that open burning of waste significantly contributes to air pollution. When waste is burned in the open, it releases a variety of harmful pollutants, including particulate matter, carbon monoxide, volatile organic compounds (VOCs), dioxins, and furans. These pollutants can have severe health effects on humans, such as respiratory and cardiovascular problems, and they also contribute to environmental issues like smog formation, acid rain, and global warming. The uncontrolled nature of open burning makes it particularly dangerous as it lacks the pollution controls that are typically present in regulated waste incineration facilities. Giusti, (2019), conducted a study on waste disposal and waste management. The study hypotheses tested at 0.05 level of significance. The implication of the results is that the residents of Calabar South have very negative attitude towards waste management and disposal, while the second hypothesis tested also showed a significant influence of indiscriminate disposal of waste and the health status of the residents of Calabar South Local Government Area.

Objective Three: To Find Appropriate Interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

In reference to 4.3 indicated that 15(27%) strongly agreed, 20(36%) agreed,05(09%) were undecided while 08(14) disagreed while 08(14) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that implementing strict waste segregation policies. It was noted that implementing strict segregation policies is an effective strategy for waste disposal. By separating waste at the source into categories like recyclables, organic waste, hazardous materials, and general waste, segregation makes it easier to manage and process different types of waste appropriately. This approach enhances recycling rates, improves the efficiency of waste treatment processes, and reduces the risk of contamination. It also ensures that hazardous waste is handled safely, minimizing its impact on the environment and human health. Overall, strict segregation policies are crucial for optimizing waste management and promoting sustainability. This is in line with Adogu et al (2015) who conducted a study in Owerri municipal Imo state residents in Nigeria and found 90% of the respondents on the questionnaire were aware of the waste management with 97.55% showing a positive attitude toward managing wastes and protection of the environmental health.

In reference to 4.3 indicated that 20 (36%) strongly agreed, 18(32) agreed, 10(17) were undecided while 06(11) disagreed while 05(09) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that promoting community awareness campaigns on proper waste disposal. Finding indicated that promoting community awareness campaigns on proper waste disposal is a key strategy for effective waste management. These campaigns educate the public about the importance of proper waste separation, recycling, composting, and the impacts of improper disposal. By increasing awareness and understanding, such campaigns encourage individuals and businesses to adopt better waste management practices, leading to higher recycling rates, reduced littering, and more effective use of waste disposal systems. Community involvement and education play crucial roles in achieving successful waste management and fostering a culture of environmental responsibility. Ngategize (2015) did a study on solid waste study has established that on average the

local area zones generates about 31 tons of solid waste daily and the division's effectiveness can only collect and disposes of only 30% of this waste leading to heavy accumulation of solid waste in the area. It is therefore commended that the local leadership in partnership with civil society undertake community cleanup exercises to reduce on the amount of solid waste accumulated in the area.

In reference to 4.3 indicated that 22(39%) strongly agreed, 18(32) agreed, 10(17) were undecided while 04(07%) disagreed while 02(04) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that providing incentives for recycling and composting. It was noted that providing incentives for recycling and composting is a valuable waste disposal strategy. Incentives, such as financial rewards, discounts, or recognition programs, encourage individuals and businesses to participate actively in recycling and composting efforts. These incentives can increase participation rates, improve waste separation practices, and enhance overall recycling and composting outcomes. By making these practices more attractive and rewarding, incentives help to reduce the volume of waste sent to landfills and incinerators, promote sustainable waste management, and contribute to environmental conservation. This is in line with Nyakaana (2016) who noted that the communities are found to have an "I don't care attitude" and limited knowledge about solid waste management which have led to huge accumulation of solid waste in the area. The division which is also responsible for filing this gap was also limited in capacity to undertake these roles.

In reference to 4.2 indicated that 28(50%) strongly agreed, 16(28%) agreed, 07(13%) were undecided while 03(05%) disagreed while 02(04%) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that establishing more recycling centers in the community**.** It was observed from the findings that establishing more recycling centers in the community is an effective strategy for waste disposal. By increasing the availability and accessibility of recycling facilities, communities can improve recycling rates and reduce the amount of waste that ends up in landfills or incinerators. More recycling centers make it easier for residents to sort and

drop off their recyclables, and they can also facilitate the processing of a wider range of materials. This approach supports better waste management practices, encourages higher participation in recycling programs, and helps to conserve resources and reduce environmental impact. This was in line with Tenywa (2017), who noted that recycling and garbage reuse of inorganic materials from solid waste though not well developed. Such activities are seldom unrecognized, supported, or promoted by urban authorities as approaches to support SWM in the area despite having the advantage of: reducing costs of the disposal facilities, prolonging the site span, and also reducing the environmental impact of disposal sites.

Study findings in line to table 4.3 indicated that 18(32%) strongly agreed, 18(32%) agreed, 04 (04%) were undecided while 06(11%) disagreed while 12(21) strongly disagreed with the statement. It was noted that majority of the respondents agreed with the statement that enforcing penalties for illegal dumping and open burning. It was noted that enforcing penalties for illegal dumping and open burning is a strategy for effective waste disposal. By implementing and enforcing fines or other penalties for these activities, authorities can deter individuals and businesses from engaging in improper waste disposal practices. This strategy helps to reduce illegal dumping and open burning, which can otherwise lead to environmental pollution and public health hazards. Penalties, combined with education and accessible waste management options, create a comprehensive approach to managing waste responsibly and protecting the environment. Tenywa (2017), notes that as practical example of waste avoidance to reduce the amount of plastic bottles and Kavera dumped indiscriminately is to introduce a deposit service fee in order to reduce the amount of plastic bottles and Kavera dumped. Practically the business owners/producers would be encouraged to integrate a deposit fee on the container. I.e. sale of juice, water and other merchandise is done and packed in returnable cups/bags where a fee as an incentive is placed on returning the cup/bag to the seller. This can be done in such a way that these cups/bags can be returned anytime and anywhere for a full refund, ensuring a service of maximum convenience to users. This can greatly reduce the amount of solid waste generated most especially from business enterprises.

CHAPTER FIVE

Summary, Conclusions and Recommendations

5.1 Introduction

This chapter consists of the summary, conclusions and recommendation of the study under study.

5.2 Summary of Findings

5.2.1 To examine the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

Findings indicated that the recycling, composting, incineration, landfills, dumping on Open spaces, burning waste in Open Ares and the use of Waste Management services such as garbage collection are the many different methods of waste disposal that exist in Namatala Ward, Industrial Division, Mbale City.

5.2.2 To examine the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City.

It was found out that the waste disposal degrades the soil quality and water quality, open burning of waste contributes heavily to air pollution, dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem, Recycling reduces the amount of pollution entering the environment, Composting organic waste improves soil fertility and reduces the need for chemic fertilizers, Incineration of waste releases harmful gases that contributes to global warming and Proper waste management greatly reduces the negative impact on the environment.

5.2.3 To find appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

Findings indicated that the find appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City were as follows; implementing strict waste segregation policies, promoting community awareness campaigns on proper waste disposal, providing incentives for recycling and composting,

establishing more recycling centers in the community, enforcing penalties for illegal dumping and open burning, investing modern waste treatment and disposal technologies and supporting public private partnerships in waste management.

5.3 Conclusion

In conclusion, effective waste management involves a multifaceted approach that includes strategies such as proper waste segregation, recycling, composting, community awareness campaigns, and investment in advanced technologies. Supporting public-private partnerships and enforcing penalties for illegal dumping and open burning also play vital roles. These strategies collectively reduce environmental pollution, conserve resources, and promote sustainability. By integrating these practices, communities can achieve more efficient waste management, protect public health, and contribute to a healthier environment.

5.4 Recommendations

Recommendation of the study were as follows;

5.4.1 To examine the Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City.

There is need to implement and enforce strict waste segregation policies at the household and commercial levels. Establish more accessible recycling centers and provide regular collection services for recyclables to enhance recycling rates, reduces landfill waste, and promotes resource recovery.

It is also recommended that there is need to promote community-based composting programs and provide training on composting techniques. Offer incentives for residents who participate to reduce organic waste in landfills, improves soil fertility, and lowers the need for chemical fertilizers.

It is further recommended that there is need to explore partnerships for waste-to-energy technologies to manage non-recyclable waste effectively. Conduct feasibility studies and pilot projects and reduces waste volume and generates energy, contributing to sustainability.

Further still, there is need to conduct regular community education campaigns on the importance of proper waste disposal, recycling, and composting and increases community participation, improves waste management practices, and reduces pollution.

There is need to enforce stricter penalties for illegal dumping and open burning. Increase monitoring and law enforcement in affected areas and deters illegal dumping and burning, reducing environmental pollution and health hazards.

5.4.2 To examine the effects of Waste Disposal on the Environment in Namatala Ward, Industrial Division, Mbale City.

It is recommended that

There is need to implement comprehensive waste segregation programs at the source, categorizing waste into recyclables, organics, and hazardous materials and reduces contamination of recyclable materials, improves waste processing efficiency, and minimizes environmental pollution.

There is need to increase support for recycling and composting initiatives by providing necessary infrastructure, education, and incentives and reduces the amount of waste sent to landfills, lowers greenhouse gas emissions, and recycles valuable materials.

Decreases landfill use, reduces methane emissions from decomposing waste, and provides an alternative energy source and invest in advanced waste treatment and disposal technologies, such as modern incineration and anaerobic digestion facilities.

There is need to strengthen enforcement of waste disposal regulations and impose penalties for illegal dumping and open burning and deters improper waste disposal practices, which can lead to soil, water, and air pollution.

Support Public Awareness and Education and conduct public education campaigns on the environmental impacts of improper waste disposal and the benefits of proper waste management such that Increase in community involvement and compliance with waste management practices, can lead to a cleaner environment.

5.4.2 To find appropriate interventions and Strategies for waste disposal in Namatala Ward, Industrial Division, Mbale City.

It is recommended that there is need to develop and implement clear guidelines for waste segregation at the source. Provide separate bins for recyclables, organic waste, and non-recyclables in residential, commercial, and public areas and facilitate efficient recycling and composting, reduces contamination, and simplifies waste processing.

The need to expand recycling programs by establishing more collection points and facilities. Offer incentives for participation and provide education on what can be recycled and Increases recycling rates, conserves resources, and reduces the amount of waste sent to landfills.

There is need to promote community and household composting initiatives. Provide composting bins and training on proper composting techniques and reduces organic waste in landfills, enriches soil, and decreases reliance on chemical fertilizers.

There is need to invest in waste-to-energy technologies, such as incineration with energy recovery or anaerobic digestion and evaluate and pilot these technologies to assess their feasibility and in addition, reduces landfill waste, generates energy, and minimizes greenhouse gas emissions from decomposing waste.

There is need to launch ongoing public education campaigns about waste reduction, proper disposal practices, and the benefits of recycling and composting and increases community involvement, improves waste management practices, and fosters a culture of environmental responsibility.

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He/ she is required to carry out academic research on the topic
THE EFFECT OF WASTE DISPOSAL IN NAMATALA WARD INDUSTRIAL CITY DIVISION MBALE CITY
and thereafter produce a well bound hard cover research report (**MAROON**) in color for undergraduate and three (**BLACK**)copies for Postgraduate students as a university requirement for the award of a degree/diploma in the academic discipline that he / she is pursuing.

We shall be grateful for the help you may offer to him or her accordingly.
Thank you.

Yours faithfully,

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Mr. Akampurira Timothy
Academic Registrar

Permission granted and pursuant information

TOWN CLERK 09 SEP 2024 MBALE INDUSTRIAL CITY DIVISION

P.O Box, Mbale, Uganda, email: academicregistrar@mbale.ucu.ac.ug

Appendices

APPENDIX I: QUESTIONNAIRES FOR THE COMMUNITY

THE EFFECT WASTE DISPOSAL ON THE ENVIRONMENT IN NAMATALA WARD INDUSTRIAL DIVISION, MBALE CITY.

Dear Respondent,

I **BUKHAKI IRENE, J23/MUC/BSW/040**, a student of Islamic University in Uganda carrying out a study the Effect Waste Disposal on the Environment in Namatala Ward Industrial Division, Mbale City. Please feel free to provide the information required as honestly as possible. The information you will provide to the researcher will be used for academic purposes only.

Part A: Background Information

Please tick [√] the most appropriate alternative that corresponds to items given.

A1. Gender: Male ☐ Female ☐
A2. Age bracket in years 21-30 ☐ 31-41 ☐ 41 and above ☐
A3. Work experience 0-3Years ☐ 4-7 Years ☐ 8-11 Years ☐ 12-15Years ☐ 16 Years and Above ☐
A4. Highest level of Education Diploma ☐ Bachelor's Degree ☐ Post Graduate Diploma ☐ Master Degree ☐ Others (Specify)…….

Indicate your level of agreement with each of the following items by ticking [√] in the corresponding boxes, using the scale that follows.

Likert scale: SD=Strongly Disagree D=Disagree N=Neutral A=Agree SA =Strongly Agree

Part B: Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City		**Agreement Scale**				
Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City		**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1	Recycling is a method for waste disposal					
2	Composting					
3	Incineration					
4	Land fills					
5	Dumping on Open spaces					
6	Burning waste in Open Ares					
7	Use of Waste Management services such as garbage collection					
Part C: Effects of Waste Disposal on the Environment		**Agreement Scale**				
Effects of Waste Disposal on the Environment		**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1	Degrades soil quality and water quality					
2	Open burning of waste contributes heavily to air pollution					
3	Dumping of waste in rivers and lakes leads to destruction of aquatic ecosystem					
4	Recycling reduces the amount of pollution entering the environment					
5	Composting organic waste improves soil fertility and reduces the need for chemic fertilizers					
6	Incineration of waste releases harmful gases that contributes to global warming					
7	Proper waste management greatly reduces the negative impact on the environment.					

Part D: Appropriate Interventions And Strategies For Waste Disposal		**Agreement Scale**				
Appropriate Interventions And Strategies For Waste Disposal		**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
1	Implementing strict waste segregation policies					
2	Promoting community awareness campaigns on proper waste disposal					
3	Providing incentives for recycling and composting					
4	Establishing more recycling centers in the community					
5	Enforcing penalties for illegal dumping and open burning					
6	Investing modern waste treatment and disposal technologies					
7	Supporting public private partnerships in waste management.					

Thank you for your time to fill this questionnaire.

APPENDIX III: INTERVIEW GUIDE FOR LOCAL LEADERS AND INDUSTRIAL DIVISION OFFICIALS

School……..

Place of Interview…….…….

Date of Interview……..……..

Time and Duration of Interview …….

Self-Introduction and Explanation of the Rationale of the Study

Part 1: Different Methods of Waste Disposal that exist in Namatala Ward, Industrial Division, Mbale City

1. Describe the differ methods of waste disposal that you are aware of?

2. Which method of waste disposal do you think is most common in your community?

3. Which waste disposal method is the most effective for protecting the environment?

Part 2: Effects of Waste Disposal on the Environment

1. Comment on the effect of waste disposal in Namatala Ward, Industrial Division, Mbale City.

2. What environmental issues are related waste disposal?

Part 3: Appropriate Interventions and Strategies for Waste Disposal.

1. What changes would you suggest to improve waste disposal practices?
2. How do you think the local government can support better waste management in your area?