

**THE ROLE OF COMMUNITY PARTICIPATION IN SOLID WASTE
MANAGEMENT: A CASE STUDY OF MBALE CITY COUNCIL**

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S22/MUC/BPAM/074

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DECLARATION

I WAMBI FELIX with Reg. No. S22/MUC/BPAM/074, humbly declare that this is an original copy of my research report from my own effort. It has never been presented to any Institution of higher learning for any academic award.

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DATE:.....*03/10/2024*.....

DEDICATION

I would wish to dedicate this research to my beloved Family for their brotherly support as well as charity rendered to me. All along from the beginning to this far which has enabled me to successfully complete this course.

May the Almighty God Bless You Abundantly?

ACKNOWLEDGEMENT

My great gratitude goes to God the Almighty who has enabled me to successfully complete this wonderful exercise.

I also wish to extend my great appreciation to my supervisor, Mr WATUWA ANTHONY KHAUKHA for all the guidance he has enkindled me with during this session amidst her busy schedules. I pray she may live to witness more great years on earth.

In a special way, I take this opportunity to recognize the principle of Uganda Christian University who is none other than Dr. Kigenyi Erisa and his staff to begin with College Secretary madam Amony Elizabeth, Academic registrar Mr. Akampulira Timothy among others for the wonderful service they offer to us.

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LIST OF ACRONYMS

| | |
|-------|---|
| BEUPA | Basic Education for Urban Poor Areas |
| COSE | Complementary Opportunities for Secondary Education |
| EMIS | Education Management Information System |
| EPRC | Economic Policy Research Centre |
| ESIP | Education Sector Investment |
| ESIP | Education Strategic Investment Plan. |
| ESRC | Education Sector Review Commission |
| ICT | Information and Communication Technology |
| IMSS | International Mathematics and Science Study |
| M & F | Monitor and Evaluation |
| MDGs | Millennium Development Goals. |
| MoES | Ministry of Education and Sports |
| NCDC | National Curriculum Development Centre |
| NCES | National Center for Education Statistics |
| NSDS | National Service Delivery Survey |
| PTA | Parents Teachers association |
| UNATU | Uganda National Teachers Union. |
| UNCST | Uganda National Chamber of Science and Technology |

ABSTRACT

Managing solid waste is one of the greatest challenge affecting urban authorities and communities in many countries and this has undermined UN effort of achieving clean and green cities. This study assessed the role of community participation in solid waste management– Mbale City Council. Specifically, the study examined the role of community participation in solid waste management and established the effects of poor solid waste management on the community in Mbale City. It also established strategies for managing solid waste in Mbale City. The study used cross-sectional design to present data with the help of both qualitative and quantitative methods. Data was collected from 80 study participants from the study area using self-administered questionnaires and interview guides. Simple random and purposive sampling techniques were used to select study participants. Qualitative data was from interviews was analysed thematically while quantitative data generated from questionnaires was analysed using inferential statistics (Mean and standard deviation). The study found that community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities AND communities participate in collection and transport of solid waste from the neighbourhood to a dumping site. Also findings show that communities make decision regarding solid waste management and communities provide resources necessary for solid waste management. Additionally, findings revealed that poor solid waste management can lead to emergence of diseases and creates bad odour for the communities. The study also found that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels and residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites. Also poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water. The researcher recommended that re-use and recycling programmes can help improve solid waste management as well passing and enforcing suitable legislation on waste management. Other recommendations included promoting bio waste treatment, under taking collection arrangements and creating community awareness about solid waste.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter is divided into eight sections which gave the reader a comprehensive overview of the study. The first section presents the subject matter by presenting the background of the study, this was followed by the statement of the problem, then the research objectives and this is divided into general and specific objectives, research questions, scope of the study, significance, and conceptual frame work of the study.

1.2 Background of the study.

Mbale City council's waste generation is greatly increasing and has put the inhabitants at a great risk due the increasing population of 53, 987 people (UBOS, National Population and Housing Census, 2022) due to the rapid urbanisation of Mbale City, government is unable to cope with the increasing demand for solid waste management which resulted garbage and sanitation in a chaotic state.

Globally, Cities around the world currently generate around 1.3 billion tonnes of waste annually and this value is expected to increase to 2.2 billion by 2025 (Hoorweg & Bhada-Tata, 2012). The increase is anticipated to be greatest in lower-income countries. Related to this is the annual global waste management cost which is expected to increase from \$ 205 billion to about \$ 376 billion in 2025, again with cost increases being most severe in low-income countries taking Uganda inclusive. In addition to costs increases, other global negative impacts of solid waste include it being a large source of emissions of methane, a particularly potent greenhouse gas, from the organic fraction of the waste stream. (Amoding, 2007)

Rapid population growth and urbanization in developing countries has led to people generating enormous quantities of solid waste and consequent environmental degradation. The waste is normally disposed in open dumps creating nuisance and environmental degradation. Solid wastes cause a major risk to public health and the environment. Management of solid wastes is important in order to minimize the adverse effects posed by their indiscriminate disposal.

Indiscriminate disposal of solid waste in dumpsites located within urban areas has proved to be a problem to nearby residents in most developing cities of the world, Freetown is no exception. Open dumps have environmental safeguards; they can pose major public health threats and environmental effects in urban cities (Adamtey& Forster, D. 2019).

Uganda, particularly Kampala about 28,000 tons of waste is collected and delivered to a landfill every month. Kampala Capital City Authority (KCCA) records show that this represents approximately 40% of the waste generated in the city. The remaining uncollected waste is normally dumped in unauthorized sites, causing health and environmental problems. However, the organic fraction of domestic waste can provide an opportunity to improve livelihoods and incomes through fertilizer and energy production. This study characterized the City waste generated in Kampala and delivered to Kiteezi landfill between July 2021 and June 2012, that is, covering the dry and wet months. On each sampling day, waste was randomly selected from five trucks, sorted and weighed into different physical fractions.

Samples of the organic waste from each truck were analysed for total solids, major nutrients, and energy content. During the wet months, the waste consisted of 88.5% organics, 3.8% soft plastics, 2.8% hard plastics, 2.2% paper, 0.9% glass, 0.7% textiles and leather, 0.2% metals, and 1.0% others. During the dry months, the waste consisted of 94.8% organics, 2.4% soft plastics, 1.0% hard plastics, 0.7% papers, 0.3% glass, 0.3% textile and leather, 0.1% metals, and 0.3% others. The organic waste on average had a moisture content of 71.1% and contained 1.89% nitrogen, 0.27% phosphorus, and 1.95% potassium. The waste had an average gross energy content of 17.3 MJ/kg. It was concluded that the organic waste generated can be a suitable source of some plant nutrients that are useful especially in urban agriculture. (AllanKomaketch, 2022)

Mbale town has been obviously recorded as the dirtiest in Uganda compared to the same town in 1990s, solid waste management is usually a City's single largest budgetary item (Hoornweg & Bhada-Tata, 2012). In the case of Mbale City council, is mandated by the Local Government Act 1997 to provide solid waste management services to all cells of Industrial Division (KCCA, 2012; Banadda et al., 2019). However, efforts to manage garbage in the city are continuously being overwhelmed and frustrated by the ever-increasing population of town

residents, increased levels of economic activity and reduced funding from central government. In an effort to alleviate this situation, the division has contracted private companies to assist it with the management of solid waste collection so as to improve the divisions cleanliness. However, in spite of this, less than half of the total waste generated, estimated to be 1,500 tonnes daily, is collected (District annual report 2016).

In Mbale, informal settlements are on the increase and are caused by rural-urban migration. Slum areas are characterized by absolute poverty and they include: Kikamba, Barracks, Mutukula, Kiteso, Bulago, Bujoloto, Namatala, and Kikaramoja. These slum areas are also characterized by inadequate services and inadequate waste management, lack of essential infrastructure, and inadequate access to clean water, safe sanitation facilities, and services. Slum residents need to be provided with secure land tenure in order to facilitate redevelopment and investment programs.(Mbale urban profile report project by Hannington Sengendo, et al, 2021). The uncollected waste is normally dumped in open areas, streams, open drainage channels and other areas inaccessible to waste collection vehicles, thus creating both an environmental and public health disaster for the inhabitants of the Town (District annual report 2016), (Dangiet al., 2021). Solid waste management is one of the major environmental problems facing Cities today (KCCA, 2012).

Despite government initiatives in solid waste management by providing waste collection trucks, implementation of bye laws, among others, less has been achieved to correct the situation and problem is on a high increase despite the City's continued efforts, Non-Government Organisations and private individuals have also tried initiatives like Keep Mbale Clean, there is still need by utilising the need of the role of community participation in solid waste management in Mbale City.(City Annual Report on Waste Management, 2016).However, the role of community participation in solid waste management has not been thought about.

Therefore given the above background and continuing concern in poor solid waste management the researcher seeks to establish the role of community participation in solid waste management in Mbale City.

1.3 Problem statement

Mbale City council's waste generation is greatly increasing and has put the inhabitants at a great risk due the increasing population of 53, 987 people (UBOS, National Population and Housing Census, 2022) due to the rapid urbanisation of Mbale City, government is unable to cope with the increasing demand for solid waste management which resulted garbage and sanitation in a chaotic state (Mbale Urban Profile Report, 2021)

Despite government initiatives in solid waste management by providing waste collection trucks, implementation of bye laws, among others, less has been achieved to correct the situation and problem is on a high increase despite the City's continued efforts, Non-Government Organisations and private individuals have also tried initiatives like Keep Mbale Clean, there is still need by utilising the need of the role of community participation in solid waste management in Mbale City. (District Annual Report on Waste Management, 2016). However, the role of community participation in solid waste management has not been thought about as best alternative to improve the chaotic poor solid waste management situation. Communities are the best grass root handlers of waste and therefore proper disposal will start right away from the grass root, hence improving solid waste management in future. This means households known to be the main causes of poor solid waste management can be game changers in same exercise of proper solid waste management. Therefore stakeholders of communities including private companies, households, factories, and other business operators are the best managers of good solid waste management. (KCCA, 2012). Therefore, if the role of community participation in solid waste management is thought about, there will be a great solid waste management practices right from the generation point. Thus the need by the researcher to establish a study on the role of community participation in solid waste management in Mbale City Council

1.4. Research objectives.

The objectives of the study were grouped under general and specific objectives as presented below;

1.4.1 General objective.

To establish the role of community participation in solid waste management– Mbale City Council

1.4.2 Specific Objectives.

1. To examine the role of community participation in solid waste management in Mbale
2. To establish the effects of poor solid waste management on the community in Mbale City
3. To establish strategies for managing solid waste in Mbale City

1.5 Research questions

1. What is the role of community participation in solid waste management in Mbale City?
2. What the effects of poor solid waste management on the community in Mbale City ?
3. What are strategies for managing solid waste in Mbale City?

1.6 Scope of the Study

The scope of the study was categorised into geographical, time and content scope as presented hereunder;

1.6.1 Geographical scope

The study was conducted in Mbale City Council.

1.6.2 Time scope.

The study considered the period between 2022 - 2016. This period has been considered because it is during this time that waste disposal has worsened leading to health problems in the community.

1.6.3 Content scope

The study shall contain the information on the role of community participation in solid waste management while aiming at identifying the benefits of community participation, effect waste management on community health, and sustainability of community participation in solid waste management.

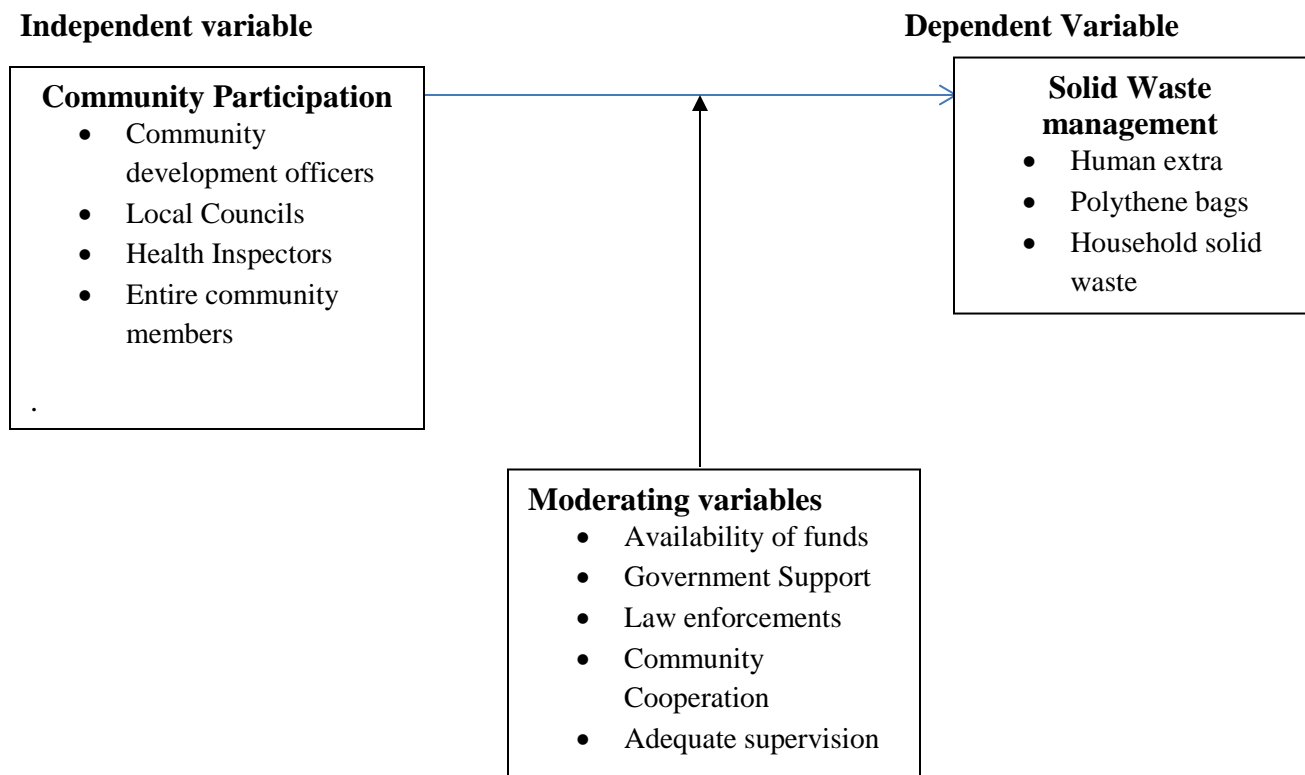
1.7. Significance of the study

- The study may be used as a basis for devising mechanisms for improving environmental degradation.
- The study may bring to light the effects of poor waste management on the environment.

- The study may avail different strategies that government can undertake to overcome waste disposal while improving the environment.
- The information gained may be used by government in advancing waste collection methods.
- The researcher’s findings may be used by companies and government personnel to improve on waste management facilities.
- The findings may be used as a guide to policy makers and other interested researchers to carry out more investigations on solid waste management.

1.8 Conceptual framework

Figure 1 showing the conceptual frame work.



Source, Primary Data (2024)

A community is a social group of any size whose members reside in a specific locality, share government, and often have a common cultural and historical heritage and the study shall focus on development officers, Local Councils, Health Inspectors, Entire community members. While solid waste Solid waste means solid or semi-solid, non-soluble material (including gases

and liquids in containers) such as agricultural refuse, demolition waste, industrial waste, mining residues, City garbage and sewage sludge, also including polythene bags, human extra, and solid waste. However, moderating variables are other factors in solid waste management that include government support, availability of funds, law enforcements, community participation and adequate supervision.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter highlights the review of the past literature which is related to the objectives of study. The review has been conducted according to the topical outlines presented in specific objectives.

2.1 Waste management

Waste Management University of West of England states that ‘waste management is broader than just the disposal of waste. It includes the generation, collection, processing, transport, minimization of the production, the reconceptualising of waste as an economic resource, mobilizing the communities in the process, and protection of human health and environment (Nyachhyon, 2016).Solid waste management practices in developed countries progressed from ‘no system’ to an increasingly centralized ‘City system’. The classical approach to solid waste management, considers solid waste management as an ‘urban planning’ problem or a public health issue. According to this approach, the City authorities are the main actors in the field (Baud et al. 2021 cited in Ahmed and Ali 2023). The same model was followed by the developing countries and it is deemed that the responsibility for managing solid waste primarily rests with the City authorities.

However, a number of private sector operators with varying capacity are adding valuable contributions to the SWM sector. The question then arises whether a synergy in the form of partnership between the two sectors may be achieved or not to deliver better SWM services? (Ahmed and Ali, 2023).Basically the residential households prefer to get the waste services that are effective and dependable. They are not much concerned with the dumping the waste as their environment is not much affected by the distant dump sites. In low income residential area people normally give priority other basic services like food, water supply, electricity and others but waste management does not come under the priority. It is because they can dump their waste nearby in the open areas or the rivers (Schubelerand countries, 2024).Other writers too put light on this issue. Most of the solid waste management works come under the public services, for example sweeping of the parks, streets and public goods are those which benefit

the public as a whole and not the individual. Thus, the responsibility (cost recovery) of waste management is also taken by the government. In developing countries the local government/authority may not have sufficient or may lack necessary budgets for the solid waste management in that case the people are charged with some amount. World Bank's World Development Report 1991 states that "private sector participation is not to be undertaken as end in itself but as a means to an end: to use resources more usefully" (Cointreau-Levine and Program 2020).

There are calls in both academic and donor level aiming for the policy to integrate the informal actors (people who are involved in the SWM indirectly like the rag pickers) in solid waste management. This is based on the idea that there cannot be an efficient management in SWM only with the City's involvement and that it is needed to have private informal, formal participants and the community based organizations as well. However, there are cases where the informal workers in SWM are viewed with a negative attitude. They are ignored on the basis of caste/ethnicity. The work in scavenging is treated as low work and the workers suffer a lot, some are even murdered. Government has a low priority of these works and sometimes there are collusion in SWM i.e., the political parties use the scavengers as muscleman in elections. The informal works in SWM in Addis Ababa and their contribution to recycle and reuse of materials are either ignored or unrecognized. On the other hand, even the workers kept distance with the government officials and worked secretly so that no one knew about their work and they did not have to face the legal matters and the heavy tax as well (Baudouin and Zelalem, 2020).

2.2 Role of community participation in solid waste management

Community participation is the sociological process by which residents organise themselves and become involved at the level of a living area or a neighbourhood, to improve the conditions of daily life (water, sanitation, health, education, etc.). It comprises various degrees of individual or collective involvement (financial and/or physical contributions, social and/or political commitment) at different stages of a project. Since it implies that residents set up management committees in charge of equipment

Community participation can be seen as a process in which community members are involved at different stages and degrees of intensity in the project cycle with the objective to build the capacity of the community to maintain services created during the project after the facilitating organisations have left. Community participation throughout the whole project, thus from project design and implementation to evaluation, ensures the reflection of community priorities and needs in the activities of the project and motivates communities into maintaining and operating project activities after the project is completed. Furthermore, community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities. Apart from various ways to participate, there are several degrees in participation of different community members. Not all members of the community, like the poorest or most marginalised groups, have equal access to information or are sufficiently represented by community leaders or organisations and this may obstruct the participation.

Waste (2024) defines community and community participation as –“A community consists of people living together in some form of social organization and cohesion. Its member share in varying degrees of political, economic, social and cultural characteristic as well as interest. Community Participation -is the process by which individuals and families assume responsibility for their own health and welfare and for those of community and develop the capacity to contribute to theirs and the community development. They come to know their own situation better and are motivated to solve their common problems. This enables them to become agents of their own development instead of positive beneficiaries of development aid.”

According to Anschutz (2024) community participation is taken as a crucial aspect of solid waste management. Community participation in solid waste management is always required because solid waste management is a continuous maintenance system, for example to store the garbage in a specific bag or bin, to bring it to an agreed point, to separate it in dry and wet waste etc. community participation may be even more important than in any other urban service. Only recently the management of solid waste services by communities themselves has received attention. But real community management means that community members, or their representatives, decide on what to do and how do it.

Community-based solid waste management projects are activities carried out by members of the community. However, these communities are concerned with the collection and transport of solid waste from the neighbourhood to a dumping site outside it. Secondary collection, i.e. transport of the waste to the final disposal site and operation of this site, is usually carried out by the City. Bulle (2019) in his study states that all Cities in the South find themselves confronted with management and organizational problems in the fields of sanitation and waste management:- Inability to comply with growing demands concerning waste dumps and waste collection,-Technocratic aspects in decision-making systems,-Lack of equipment, financial resources, City policies or legal frameworks. Craig and Mayo (2018) argue that community participation and empowerment are the widely advocated topic both in North and South when there is poverty, polarization and social exclusion.

World Bank sees community participation as a means for ensuring that third world development projects reach the poorest in the most efficient and cost effective way sharing costs as well as the benefits through the promotion of self-help (Paul 1987, cited in Craig and Mayo, 2018). Brundt and Commission also concluded that participation has an important role to play in sustainable development. Empowering the poor through participation has almost become a slogan (Thomas 2022, cited in Craig and Mayo, 2018). NGOs (Non-governmental Organizations) are historically identified with community participation and empowerment. It is believed that NGOs are committed to support the communities and empower them towards development. The community as a whole can exercise power through participation and empowerment but without any negative effects upon the powerful. They can help themselves in the development and gain tools for self-reliance (Thomas2022, cited in Craig and Mayo, 2018). But if power is conceptualized in zero terms empowerment has a negative impact. Increase in power of a certain group may lead to the decrease in power of the other group. Empowerment may have different meaning depending upon different ideologies. But long term empowerment through participation has to be dealt within the framework of economic, social and political perspectives.

Tyranny is the unjust exercise of power. The participatory approach developed out of the short comings of the top down approach. The aim of this approach was to make people central to development and encouraging the socially and economically backward marginalized people in

decision making over their own lives. The participatory approaches to development are justified in terms of sustainability, relevance and empowerment. Cornwall states that a community consists of both men and women. They hold different power relations in the society. She is curious about what it means to be a man or woman in a given context in a community (Cornwall 2019 cited in Cooke and Kothari 2021). Participatory approach fails to recognize the changing and the multiple identities of individuals, impact upon their choices about how to participate and overlook the potentials links between inclusion in participatory processes and subordination. Unless participatory processes take into account the relative bargaining power of so called stake holders they are in danger of merely providing opportunities to the more powerful

The success of community participation in solid waste management depends on other actors involved, such as the City, community-based organizations (CBOs), microenterprises, and local leaders. For instance, if the City does not collect the waste separately, it has no use for the community to separate their waste. The following factors are considered to favor the sustainability of community participation and hence of services, like waste collection and separation:

Communication strategies are essential to generate a broad-based understanding of solid waste issues among community members on the one hand and responsiveness of the stakeholders to the demands of the community on the other. (Laura Moninka, 2020). Representative local leaders and CBOs can stimulate community participation and ensure that community needs are taken into account and this will ensure that the campaign is sustainable.

Women play a determining role in waste management and they form important channels of communication. Community initiatives and CBOs are less durable if they are not, at some point, recognized and supported by the local authority (Colon, 2021). Cooperation between the CBO and the local authority to maintain and operate the service system according to formal agreements with stakeholders. Financial and operational viability to make community services less dependent on external support. (Sylvaine Bulle, 2019)

Follow-up support after project implementation to reinforce awareness and new practices and assist when required with operation and management of new organizations. Special attention

should be paid to the role of women. In many situations women are the first to be affected by a deterioration of the environment and are most willing to participate in projects that improve their living conditions. However, religious barriers, traditions, social hierarchy, low rate of literacy, or the burden of domestic tasks may impede their participation. (Laura Moningka, 2020)

According to Laura Moningka, (2010), Local leaders play another important role in community participation. The responsibilities of community leaders is to encourage people to subscribe for waste collection, to make sure that people pay the fees, to stimulate the separation of waste, and to monitor the performance of the service level. Furthermore, they should act as a negotiator for local authorities, supervise the performance of local authorities and private enterprises, and act as a pressure group to obtain services from the local authorities.

2.3 Effects of poor solid waste management on the community

There is a large body of literature on the potential adverse health effects of different waste management options, particularly from landfill and incineration. There is little on potential problems resulting from environmental exposures from composting and very little on recycling. Although much research has focused on the health of the general population, particularly those living near a waste disposal site, occupational health problems of the workforce involved in waste management are also important to consider. Much of the health literature on the toxicity of the individual substances highlighted above relates to occupational or accidental exposure and thus generally to higher levels of exposure than those expected from waste disposal methods. Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels.

Evidence that these substances cause cancer at environmental levels, however, is often absent or equivocal. In addition to carcinogenicity, many of these substances can produce other toxic effects (depending on exposure level and duration) on the central nervous system, liver, kidneys, heart, lungs, skin, and reproduction among others. (USAID, 2019). For other pollutants such as SO₂ and PM₁₀, air pollution studies have indicated that there may be effects on morbidity and mortality at background levels of exposure, particularly in susceptible groups

such as the elderly. Chemicals such as dioxins and organ chlorines may be lipophilic and accumulate in fat-rich tissues and have been associated with reproductive or endocrine-disrupting endpoints.

One of the mostly widely known and publicized landfill sites is that of Love Canal in New York State. Large quantities of toxic materials, including residues from pesticides production, were deposited in the 1930s and 1940s, followed by the building of houses and a school on and around the landfill in the 1950s. By the mid-1970s, chemicals leaking from the site were detected in local streams, sewers, soil and indoor air of houses. This site and the subsequent studies of the health of the population in the vicinity fuelled public opinion on the problems of waste disposal practices and raised public concern more generally. Since then there have been many studies of populations living near landfill sites, frequently carried out near one specific site in response to public concern. These studies have varied in design and include cross-sectional, case-control, retrospective follow-up and ecological studies. The last of these have often been initiated after apparent clusters of specific diseases have been reported near a site (USAID, 2019).

An interesting finding from this study was that 80% of the population in Great Britain live within 2 km of an operating or closed landfill site. The results of studies of congenital malformations are less convincing than those of low birth weight. In the two US multiple site studies, one found a small increase (1.5-fold) in heart and circulatory malformations but no increased risk for other malformations. The other found no association, although the response to the questionnaire used to collect data was relatively poor (63%) and it is unclear how congenital malformations were defined.

The UK study found significantly elevated risks for several defects, including neural tube defects, hypospadias and epispadias, abdominal wall defects and surgical correction of gastroschisis and exomphalos, although there was a tendency for there to be a higher risk in the period before opening compared with after opening of a landfill site, for several anomalies. A similar finding was also reported in the analysis of congenital malformation rates among the population living near the Welsh landfill of Nant-y-Gwyddon where nearly double the risk was

found in exposed areas both before and after the site opened. However four cases, a nine-fold excess, of gastroschisis, were observed after the site opened.

A study of 21 European hazardous waste sites found that residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites. Risk was raised for neural tube defects, malformations of the cardiac septa and anomalies of great arteries and veins. A study by the same group showed similar increases in chromosomal anomalies, even after adjustment for maternal.

The studies of congenital malformations described above have generally used residential proximity as a measure of exposure. A similar study was carried out in New York State but also attempted to investigate associations with off-site migration of chemicals and certain categories of chemicals present at the sites. A small (12%) statistically significant risk of congenital malformations was associated with maternal proximity to a site which increased with offsite chemical leaks. Significant associations were found for pesticides with musculoskeletal system defects, metals and solvents with nervous system defects, and plastics with chromosomal anomalies. However, a case-control study to follow-up these findings which established the probability of low, medium or high exposure for four potential pathways of exposure (groundwater ingestion and inhalation, air, vapour, particulates) found no increased risk for mothers assigned a medium or high exposure. Cancer several geographical comparison studies have investigated cancer mortality and incidence around waste sites. Increased frequency of cancers in counties containing hazardous waste sites was found in two US studies, particularly for gastrointestinal, oesophageal, stomach, colon and rectal cancer. These studies are, however, limited by a lack of chemical release data. No increase in cancer rates or the frequency of chromosome changes was found in relation to the Love Canal site. Two reports of cancer incidence among persons living near the Miron Quarry site, the third largest in North America found increased incidence of cancers of the liver, kidney, pancreas and non-Hodgkin's lymphomas. Once again no measurements of exposure were available, and there was a relatively short period from first exposure (1968) to cancer onset (1979–1985). (USAID, 2019)

The principal area of concern is wastewater with a high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water. Contaminated wastewater is produced by wards treating patients with enteric diseases and is a particular problem during outbreaks of diarrhoeal disease. Additionally Small amounts of chemicals from cleaning and disinfection operations are regularly discharged into sewers. If the recommendations of section 9.4 are not followed, larger quantities of chemicals may be present in wastewater. (World Bank, 2012)

In some developing and industrializing countries, outbreaks of cholera are periodically reported. Sewers of the health-care establishments where cholera patients are treated are not always connected to efficient sewage treatment plants, and sometimes City sewer networks may not even exist. Although links between the spread of cholera and unsafe wastewater disposal have not been sufficiently studied or documented, they have been strongly suspected, for instance during recent African outbreaks (Democratic Republic of the Congo, Rwanda), and during the 1991–92 cholera epidemic in southern America. Little information is Collection and disposal of wastewater available on the transmission of other diseases through the sewage of health-care establishments. (World Bank, 2012).

In developed countries, water use is commonly high and the sewage therefore greatly diluted; effluents are treated in City treatment plants and no significant health risks should be expected, even without further specific treatment of these effluents. Only in the unlikely event of an outbreak of acute diarrhoeal diseases should excreta from patients be collected separately and disinfected. In developing countries, where there may be no connection to City sewage networks, discharge of untreated or inadequately treated sewage to the environment will inevitably pose major health risks. The toxic effects of any chemical pollutants contained in wastewater on the active bacteria of the sewage purification process may give rise to additional hazards.(WHO, 2015)

Health risks associated with waste and by-products also include: radiation burns, sharps-inflicted injuries, poisoning and pollution through the release of pharmaceutical products, in particular, antibiotics and cytotoxic drugs; and, poisoning and pollution through waste water; and by toxic elements or compounds such as mercury or dioxins that are released during

incineration. Worldwide, an estimated 16 billion injections are administered every year (WHO, 2015). Not all needles and syringes are disposed of safely, creating a risk of injury and infection and opportunities for reuse. Injections with contaminated needles and syringes in low- and middle-income countries have reduced substantially in recent years, partly due to efforts to reduce reuse of injection devices. Despite this progress, in 2010, unsafe injections were still responsible for as many as 33 800 new HIV infections, 1.7 million hepatitis B infections and 315 000 hepatitis C infections¹. A person who experiences one needle stick injury from a needle used on an infected source patient has risks of 30%, 1.8%, and 0.3% respectively of becoming infected with HIV. (World Bank, 2012)

Additional hazards occur from scavenging at waste disposal sites and during the manual sorting of hazardous waste from health-care facilities. These practices are common in many regions of the world, especially in low- and middle-income countries. The waste handlers are at immediate risk of needle-stick injuries and exposure to toxic or infectious materials. In 2015, a joint WHO/UNICEF assessment found that just over half (58%) of sampled facilities from 24 countries had adequate systems in place for the safe disposal of health care waste. (WHO and UNICEF, 2015)

According to the World Bank, (2012) pointed out that treatment and disposal of healthcare waste may pose health risks indirectly through the release of pathogens and toxic pollutants into the environment. Landfills can contaminate drinking-water if they are not properly constructed. Occupational risks exist at disposal facilities that are not well designed, run, or maintained. Incineration of waste has been widely practiced, but inadequate incineration or the incineration of unsuitable materials results in the release of pollutants into the air and of ash residue. Incinerated materials containing chlorine can generate dioxins and furans, which are human carcinogens and have been associated with a range of adverse health effects. Incineration of heavy metals or materials with high metal content (in particular lead, mercury and cadmium) can lead to the spread of toxic metals in the environment.

Environmental sanitation envisages promotion of health of the community by providing clean environment and breaking the cycle of disease. It depends on various factors that include hygiene status of the people, types of resources available, innovative and appropriate technologies according to the requirement of the community, socioeconomic development of

the country, cultural factors related to environmental sanitation, political commitment, capacity building of the concerned sectors, social factors including behavioral pattern of the community, legislative measures adopted, and others. India is still lagging far behind many countries in the field of environmental sanitation.(UN-Habitat, 2018)

The issue is that, improper siting of solid waste disposal sites within the community engenders health risks among residents. Unauthorized open dump sites are located near houses of residents in the Sawaba community; this has an adverse effect on health especially those staying closer to these sites. Whether people who stay closer to where refuse disposal sites are located are at high risk or not, the study sought to verify. Also, it was realized that, 75% and 72% of the respondents whose houses are less than 5 minutes from the final disposal sites had cases of typhoid fever and skin infections respectively, while there were no cases for residents who are 11 to 15 minutes away from the disposal sites., implies that, there is a significant relationship between distance of final disposal sites and contraction of diseases. Hence, the rejection of the null hypothesis, there is no relationship between distance of solid waste disposal site and contraction of diseases.

Zhu et al noted that population living close to a waste dump have a higher risk of contracting diseases. This finding has validated the research output of Zhu et al. Observation, it implies that, respondents who stay closer to refuse dumping sites have cases of malaria, cholera, typhoid fever and skin infections and the farther away the lesser the risks. The implications for these outcomes are that, residents closer to these open dump sites are exposed to health risks especially children who play around these sites and also defecating like the ones depicted by UN-Habitat health data also show that diarrheal and acute respiratory infections are significantly higher for children living in households where solid waste is dumped, or burned in the yard, compared to households in the same cities that receive a regular waste collection service. The groups at risk from the unscientific disposal of solid waste include the population in areas where there is no proper waste disposal method, especially the pre-school children and waste workers. A female 35 years old petty trader (charcoal seller), Sissala (Northerner), who stays closer to the dumping site in Figure 5 was asked, what is your experience with this disposal site closer to your house? She expressed to the researcher that: “I wish you could wait

till evening time, to have a feel of the mosquitoes, flies and odour emanating from this site. It is worse when it rains but I look at this scene helplessly. I cannot control them especially that, residents do this at dawn and in the night". Again, the finding from the study supports the argument made by Zhu et al, (2018)

Flies and Mosquitoes breed in some constituents of solid wastes, flies and rats are very effective vectors that spread disease. Dangerous items such as broken glass, razor blades, needles and other healthcare wastes pose risks of injury or poisoning, particularly to children and people who are engaged in waste sorting and handling. Poor waste disposal practices lead to: The accumulation of harmful substances. A breeding ground for bacterial diseases. A place where pathogenic parasites can grow.(Environ, 2015)

A number of environmental factors influence the spread of communicable diseases that are prone to cause epidemics. The most important of these are: water supply, sanitation facilities, food and climate. A lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food can all cause diarrhoeal diseases. These diseases are a major cause of suffering and death in an emergency situation. Climate can affect disease transmission in a variety of ways. The distribution and population size of disease vectors can be heavily affected by local climate. Flooding after heavy rains can result in sewage overflow and widespread water contamination. In addition, there is some evidence to suggest that pathogens can be spread from one region to another along air streams or by wind.(Fischer and Crowe M, 2010)

Solid waste is often contaminated with human or animal excreta. Those who handle the waste and those who live or work where the waste accumulates, will therefore often be at risk from excreta-related infections. The specific health risks they will be exposed to will depend on their contact with the excreta. As drainage systems are frequently used for defecation, the solid waste that accumulates in the system is often contaminated, and is a health risk to those who have to handle it. (Fischer and Crowe M, 2017)

Refuse often includes materials which can collect rainwater, such as tin cans, jars, and old car tyres. Aedes mosquitoes, which transmit filariasis, urban yellow fever, dengue fever, and several other arboviral infections, can breed in these small water-filled vessels. (Environ,

2015). Poorly managed waste often ends up in ponds, reservoirs, or drainage systems. The refuse often blocks drainage channels, resulting in the ponding of water. As these surface waters are often polluted with organic waste, breeding sites for Culex mosquitoes and domestic flies are created

2.4 Strategies for solid waste management practices

Re-use and recycling, recycling in low-to-middle income (LMI) countries is mainly an economic activity of commodity extraction, upgrading and trading (Scheinberget al, 2021). Re-use and recycling of waste in many SSA cities is performed by a variety of groups as in most cases there is no central organised recycling scheme (Ketlogetswe&Mothudi, 2015). This is mainly because many authorities do not give it the attention it deserves (Ofori-Boatenget al., 2013; Kofoworola, 207). Coxet al. (2020) encourages behavior change in citizens, using the 4Es reported by to reduce the waste generated.

Passing and enforcing suitable legislation on waste management. As reported by Couth and Trois (2010), legislation should not be overly ambitious, but rather should be set towards meeting achievable targets. When these targets are achieved the legislation may then be revised with higher targets set, as happens in countries in the EU. In addition, City authorities/central governments should be encouraged to allocate significant resources for this purpose. Some suitable legislation to reduce waste at source and stimulate recycling includes the volume-based waste fee system (together with household waste sorting) which is working well in Korea and Taiwan. It should be noted, however, that this system works well when all generated waste is collected (Ayaa 2022).

Formalizing re-use and recycling. In many cities at present, re-use and recycling is being undertaken by informal groups, such as ‘scavengers’ or waste pickers, with little organization in some cities such as Kampala (Mugagga, 2016). It is likely if authorities, both City and central government, were more directly involved in this process, as is the case with their counterparts in high-income countries, it could have a greater impact on waste management in cities. Other stakeholders such as NGOs should be encouraged to intervene and complement the waste management efforts of the authorities, as is the case in Japan (Genget al.,2010)

Implementation of EPR, where the manufacturers of goods are responsible for the recycling of their products, has contributed significantly to recycling efforts elsewhere. Even though most of the goods used in SSA cities are imported from elsewhere, EPR could nevertheless still be implemented in these cities. In this case, the producer's responsibility would be passed on to the supplier/agent of the goods in question. However, as pointed out by Hughes (2005) for Scotland, it will also be necessary to involve the manufacturers of these goods if EPR is to be successful. In addition, as pointed out by Lu et al. (2006) for Taiwan, a modified EPR system where MIS are not directly involved in recycling, but rather pay disposal fees to the governmental agency responsible for recycling, may work out best for cities. (Coggins, C. 2021).

Promoting bio waste treatment, given that most of the waste generated is organic, this presents opportunities for biowaste to be treated using methods such as composting and anaerobic digestion to generate fertilizer and biogas, as is being done in countries such as Germany, Sweden, Denmark among others. Although the performance of large-scale compost and anaerobic digestion plants treating MSW in SSA cities has not been very successful, this scenario was also common in high-income countries when these technologies were initially being promoted. However the failures were overcome through having proper designs, adequate operator training and favorable economic incentives. It is highly likely that SSA cities will be able to solve the problem of high failure rates if they follow what has been done in high-income countries. SSA cities need to ensure in particular that there is an assured market for the fertilizer and energy produced. (Coggins, C. 2021).

In addition, according to Hoornweg and Bhada-Tata (2012), it is important that cities encourage source sorting of the waste so that the waste available for treatment is less contaminated. The largest waste stream generated in Mbale is organic waste. Presently some of it is collected and dumped in landfills, which in most cases operate like open dumps. However, most of it is dumped in illegal places such as open land and drainage channels, creating environmental and public health hazards for the inhabitants of cities. On the other hand, this organic waste stream is a resource whose management, if moved from disposal to higher up the waste management hierarchy, could have a beneficial impact.

Participatory approaches to waste management should involve stakeholders as they greatly contribute to sustainable productivity and conservation of the environment. It is prudent to support the greater involvement of farmers and other stakeholders in the participatory development of simple and cheap technologies and procedures to utilize manure and waste in a sustainable manner. In conclusion, the success of some of the best practices in dealing with the problem of City and animal waste in cities has been rooted in their contribution to household incomes, energy needs, the development of partnerships among farmers, an analysis of waste treatment methods via LCA, collaboration, synergies dialogue and institutionalization of key breakthroughs, the availability of markets for products, the cost effectiveness of operations and the bottom-up participatory process. Using Kampala city as a case study, the following chapter describes the methods that were used to investigate the benefits of moving the organic waste stream up the waste management hierarchy.

Compositing is another approach to solid waste management used in cities most especially in the affluent zones most in household with some land ownership and fenced off structures as somewhat more low-technology approach. However, the compositing has to follow the correct steps of composting. This approach has many advantages such as reducing the amount of waste requiring ultimate disposal, extending the life of the pit. (Kumar & Shweta 2021).

Another approach for waste management in Cities is incineration/Burning. It is observed though on a small scale at household level; it is illegal according to the NEMA Act and the Solid waste management ordinance of 2006. Some residents under took to burn garbage on deposal sites to reduce the amount of waste and subsequently create room for more garbage. This appears to be an extremely attractive option, however, with occasional exceptions; incineration is inappropriately done by most residents except for a few clinics. For example an incinerator is visible at one of the clinics but others decried of high financial and operational costs required implementing incineration facilities. In an attempt to close the solid waste management gap in the less affluent and informal settlements, individual community efforts have sprung up for purposes of waste management. Individuals either using their heads, bicycles and carts venture into the households calling for garbage to be disposed of at a fee that is manageable to the urban poor.

There is need to revise the solid waste ordinance of 2000 to include practical elements and arrangements towards imposition of solid waste fees and its collection to effectively manage solid waste in the areas. The Division should carryout massive sensitization of the local community on proper solid waste management from household level on issues such as solid waste avoidance, shorting, reduction and reuse.

The division authority should integrate, recognize and support income generation activities as part of the Cityity solid waste management strategy to effectively manage the problem of solid waste in the area. (Barton &Stentiford, 2008). The divisions should operationalize the SWM ordinance including the enforcement of theProvisions therein. The public should be sensitized on the provisions in the by-law and the role of the enforcement department in solid waste management.

Collection arrangements, section IV (2) of the Kampala City Council (Solid Waste Management) Ordinance 2000 places the responsibility of collection of solid waste in the hands of Council in this case the division,either by its agents, servants or licensed collectors to ensure that solid waste is collected andconveyed to treatment installations (sites/centers) or approved disposal sites to the extent required to satisfy both public health and environmental conservation requirements. However the divisions constrained to meet this role due to both financial and technical challenges leading to waste accumulation in the parish.

Frequency of collection, the same ordinance under section IV (7) stipulates that the frequency of collection of solid waste shall be in accordance with the regulations of the collection agency but shall be regular enough (at least once a week) not to cause a public health nuisance. The study however found that prescribed frequency of collection of solid waste was only maintained in very few places (road sides) due to both logistical like trucks and fuel which were overwhelmed by the amount solid waste generated.

Collection fees, the Council is also empowered to prescribe fees for the collection and final disposal of solid waste by the council under section IV (4) of SWM ordinance of 2000. However findings from the study show that the Council did not provide guidelines on the amount of fees to be collected for which quantity of solid waste generated. Respondents

reported that the amount of fees charged was at the discretion of the private waste collectors depending on the amount and un receipted in most cases. Generally the licensed private collectors charged between 1,000 shillings to 3,000 shillings which is quite exorbitant for the urban indiscriminately.

Community awareness about solid waste. According to the Solid Waste Management Strategy (SWMS) of 2006 Para.7, members of the public are supposed to be educated in matters of waste management such as; sorting/separation of waste according to their categories of organic and inorganic, efficient use of skips, waste recycling, home composting, waste minimization and adherence to waste management laws. It was observed in some community places that an effort towards sensitization and awareness of the local community about solid waste management. Others include Community integrated development initiatives (CIDI) for establishment of community solid waste management structures, Plan Uganda and AMREF who have been supporting community awareness campaigns and capacity building initiatives. (KCCA Act 2012)

Educating the masses of the importance of keeping the city clean and proper ways of collecting and disposing of the waste, Setting up adequate waste handling and disposal facilities and a proper disposal location with proper management. This will include installing garbage collection containers in all areas of the city, Sorting the garbage before disposing of it as part polythene, footwear, glass, cans and others can be recycled or used. Putting good incentives in place to attract private investors in the waste management system, Silent features of the waste management should be introduced in the education system

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter describes the methodology that was used in the study and some of the areas that were covered include: research design, area and population of the study, sample size, sample selection technique, sources of data, data collection instruments, data quality control methods, study variables, , measurement of study variable, procedure of the study, data processing, and limitation of the study.

3.1 Research Design

According to Yin (2019), “in the most elementary sense, the design is the logical sequence that connects the empirical data to a study’s initial research questions and ultimately, to its conclusions. The study used both quantitative and qualitative research methods while employing cross section survey design. Quantitative research involved calculations and measurement of the percentages and frequencies of respondents expressing different views about the study. The qualitative research approach was also be used to help the researcher to study selected issues, cases and events in details. This approach was used to gather view points, experiences, recommendation to the study. This gave analytical results about the situation on the ground. Qualitative method involves interviews and documentary analysis to uncover certain information.

3.3 Area of study

The study was carried out in, Mbale City Council.

3.2 Study Population

The research study target 10 respondents from City staffs, 05 local leaders and 85 local people. Therefore, it shall include 80 total populations of respondents and a sample was picked. The KCCA, (2012) and World Bank, (2021) identified these populations as the nearest and responsible people to health and waste management. The population study included both male and females to avoid gender bias. This study population was chosen because it has the characteristics that will provide information related to the study.

3.3 Sampling size and selection

For this research study, the sample size was drawn from 06 respondents from City staffs, 05 local leaders and 69 local people. Therefore. The researcher sampled 80 respondents while employing Yamane’s (1967), Umar, (2022) and Amin’s (2005) mathematical formula and table as below;

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n= sample size

N= population size

e= level of precision (at 95% confidence level)

From the formula $n = \frac{80}{1+80(0.05)^2}$

$$\frac{80}{1+160(0.0025)}$$

n=80

Table 3.1 Summary of the Sample Size and Sampling Technique

| Category | Target population | Sample size | Sampling technique |
|---------------|-------------------|-------------|------------------------|
| City staffs | 10 | 06 | Simple random sampling |
| Local leaders | 05 | 05 | Purposive sampling |
| Local people | 85 | 69 | Purposive sampling |
| Total | 100 | 80 | |

Source: Primary Data, 2024

3.4 Sampling Techniques

3.4 Sampling methods.

The researcher used stratified proportionate random sampling technique for it ensures the presence of key subgroups within the sample and also minimizes sample selection bias and ensuring that certain segments of the population are not over represented or under represented. Each respondent was given an opportunity of being chosen in the sample hence showing the problem of the variables under the study. It is the way of meeting the similar respondents and it maximizes the probability that they would not differ in any systemic way. The goal of stratified proportionate random sampling was to achieve desired representation from the participants and helped to reduce biases or prejudices in selecting samples (Enon, 2019). To get the number of respondents from the ward and stratified proportionate random sampling was used for each cell to get a sample size from the study population.

3.10 Research procedure

Before starting the research work, a topic of the study was formulated in the field of the interest. The researcher went ahead to draft questionnaires and interview guides that were used for collecting data on the topic. The researcher got an introductory letter from the university administration, which was used to get permission from City council administration to enable the researcher in data collection. Thereafter, the researcher personally moved to the respondents selected and presents the questionnaires, which was collected after a given period of s time. Selected respondents were then interviewed using the interview guide. The data collected was then be analysed, interpreted and presented in form of a report.

3.5 Data Collection Methods and Research Instruments.

3.5.1 Methods

The researcher used observations and interviews

Observation

Bryant and Wrighton (2018) view observation as a social research technique that involves the direct observation of phenomena in the natural setting. The main advantage of observational research is flexibility. The researchers can change their approach as needed. Also it measures

behavior directly, not reports of behavior or intentions. The main disadvantage is it is limited to behavioral variables. It cannot be used to study cognitive or affective variable (Bryant, 2008)

Interviews

An interview in qualitative research is a conversation where questions are asked to elicit information, interviews are used to uncover the meanings of central themes in the life world of the subjects from their own point of view.(Bryant and Wrighton, 2018). They helped to investigate issues in an in depth way , discover how individuals think and feel about a topic and why they hold certain opinions , investigate the use, effectiveness and usefulness of particular library collections and services ,inform decision making, strategic planning and resource allocation ,sensitive topics which people may feel uncomfortable discussing in a focus group ,add a human dimension to impersonal data ,deepen understanding and explain statistical data.(Bryant and Wrighton , 2019)

3.5.2 Instruments

The researcher used both questionnaires and interview guides.

Questionnaire

The researcher used self-administered questionnaire as research tool to collect data from the respondents. The questionnaire had three sections: Section A included the respondents' demographic information, Section B and C focused on the general and closed ended statements which was in accordance with the objectives of the study to measure. According to Fisher (2023), a face to face questionnaire is appropriate since it is flexible, not expensive, and not biased. The nature of the questions was in form of structured and close ended questions where by a 5 Likert scale of measurement was guided on close ended questions as illustrated:

Table 1: 5 Likert Scale, Coding, and Interpretation

| Scale | Coding | Interpretation |
|-------------------|---------------|-----------------------|
| Strongly agree | 1 | Very high |
| Agree | 2 | High |
| Unsure | 3 | Moderate |
| Disagree | 4 | Low |
| Strongly disagree | 5 | Very low |

Source: Primary Data 2024

Interview Guide

An Interview guide was constructed and administered in form of self-administered questionnaires. The nature of the questions were in form of structured and unstructured (closed and open ended) questions which was discussed with the key informants who participated in the study. It will help to conduct face to face discussions with the responds. According to Kinoti (2021), interview guide has an advantage of clarifying questions to the respondents as he/she gives relevant data. According to Patton (2022), Creswell (2017), viewed interviewing as a series of steps that include identifying interviewees based on purposive sampling. Interviews are used to uncover the meanings of central themes in the life world of the subjects from their own point of view. They helped to investigate issues in an in depth way, discover how individuals think and feel about a topic and why they hold certain opinions. However, they can be very time-consuming: setting up, interviewing, transcribing, analyzing, feedback, reporting, they can be costly, different interviewers may understand and transcribe interviews in different ways. (Neuman, 2015)

3.8 Quality Control methods

3.8.1 Validity

Validity seeks to establish whether the researcher has developed an instrument which tests the right issues. In words of Amin, (2015), validity tests whether an instrument used in research is accurate, correct and meaningful, therefore, validity was established using content validity tests. Validity was measured by calculating the extent to which content in instruments correlates with concepts set out to measure. This is also in line with Siegle (2023) whose study established that, the closer the content in an instrument to contents of theoretical concepts the more an instrument generates valid results. The validity of the questionnaire was tested using the content validity test (CVI).

$$CVI = \frac{R}{R+N+IR}$$

R+N+IR

Relevant (R), Neutral (N), to Irrelevant (IR).

The closer to one the CVI the more valid the instrument was. This was done for all questions and then an average was obtained. The overall CVI for the instrument was calculated by computing the average of the instrument and for the instrument to be accepted as valid the average index is expected to be 0.70 or above (Amin, 2015).

3.8.2 Reliability

The research instrument was examined for validity and reliability by using Cronbach's Alpha value. Data was collected, first pre-tested and analyzed using Cronbach's coefficient Alpha to establish clarity and dependability of the instruments. The principle of reliability in as far as research instruments are concerned, is clearly put forward by Amin (2015), an instrument is reliable if it produces the same results wherever it is repeatedly used to measure a trait or a concept from the same population and under similar circumstances. The reliability coefficients in all variables are expected to be adequate if they all indicate alpha coefficients of above 0.70 which according to Nunnally (2018) an alpha of 0.70 and above shows that reliability coefficient is adequate.

3.11 Delimitation and limitations to the study

3.11.1 Limitations

The study was affected by non-response rate. This is due to the fact that some respondents may be hesitant to give information. However, these were solved through having a dialogue with respondents and explaining clearly the purpose of the study. The problem of limited time, many respondents did not enough time to respond adequately to the questions while attending to their busy schedules. To solve this problem, questionnaires were distributed, filled and collected at a later time.

Some participants were not willing to provide information because they may be suspicious of where the information would be taken. This was solved by giving the respondents the consent form stipulating the terms and conditions, benefits and risks in the study and emphasis on confidentiality.

In adequate finances, the researcher had inadequate finances to move to and fro the field and more so buying the necessary requirements used in the study. However, friends and relatives contributed to solve the situation.

3.9 Data Processing and Analysis

Data processing was done through editing of the data which was coded for further data analysis. After data processing, quantitative data analysis was carried out by single frequency tabulation. Data was presented using different methods such as single frequency tables. This is because data presentation requires clear portrayal of the findings presented, and the listed methods above to clearly fulfil that purpose set forth. On the other hand, qualitative data gathered from closed-ended questions in the questionnaire and interview guide was summarized. A technique called content analysis was used to test the validity and authenticity for qualitative data while regressions were used for quantitative data. Then, data was categorized according to the sub-themes identified earlier.

3.10 Ethical consideration

The researcher sought approved consent from the respondents and explained to them the main purpose of the research as purely academic before engaging them in the study. Confidentiality, according to Babbie (2010), confidentiality in research refers to the researcher collecting data according to a given participant's responses in a private environment and making sure the information obtained is kept secret. One of ethical issues in this study was to ensure confidentiality of the respondents.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents information on data presentation, analysis and interpretation which based on the objectives of the research study

4.2 Questionnaires return rate

A total of 80 respondents were targeted with 69 teachers and 6 school administrators participated in the study. However, the questionnaire was used to collect data from teachers and school administrators. The results of questionnaire return rate were presented in the table 4.1 below:

Table 4.1 Questionnaire return rate

| Respondents | Returned | Not returned |
|-----------------------|------------------|---------------------|
| Teachers | 69 (100%) | 0(0%) |
| School administrators | 6 (100%) | 0(0%) |
| Total | 75 (100%) | 0(0%) |

Primary data, (2024)

The table 4.1 above shows that all the questionnaires were returned by teachers and school administrators. This shows that data was collected from all the intended teachers and school and therefore this was a good representation as proposed by the researcher. The researcher made a follow up of the distributed questionnaires so as to ensure that respondents returned them.

4.3 Background characteristics of the respondents

The first part of this chapter is a presentation and analysis of preliminary data obtained from the study. It includes the background information of the respondents and the variables involved

are age (in years), gender of respondents, educational level and marital status. Data obtained has been presented in tables below.

Table 4.2: Frequency and percentage distribution of respondents' background information

| Variables | Category | Frequency | Percent (%) |
|------------------------|-----------------|------------------|--------------------|
| Age | 21- 29 | 17 | 21 |
| | 30-39 | 20 | 25 |
| | 40-49 | 43 | 54 |
| Marital Status | Single | 18 | 23 |
| | Married | 26 | 55 |
| | Widow | 21 | 33 |
| | Separated | 15 | 19 |
| Education level | Primary | 31 | 39 |
| | Secondary | 38 | 48 |
| | Post-Secondary | 11 | 14 |
| Sex | Male | 51 | 64 |
| | Female | 29 | 36 |

Source: *Primary Data (2024)*

The respondents were asked to indicate their sex by ticking the appropriate column they belonged. The purpose was to find out the number of males and females who actually participated in the study.

Table 4.2 contains the age distribution of respondents who participated in the study. The purpose was to find out the average age of respondents in the study area. Table 2 show that the majority 54% of the study respondents were between 40 to 49 years of age. The findings of the study imply that since majority of the respondents were 40 years above, this mean that they were mature enough and information acquired from them was reliable and trustable.

Findings in table 4.1 above show that the majority (55%) of respondents were married. Marital status has an implication on data collected for the research study as married people gave their opinions from an informed point of view on issued associated with early child hood education.

Further, according to the findings of the study in table 4.1 shows that majority of the respondents have attained some level of education whose opinions and views regarding access to reproductive health can be trusted. This is in line with Umar (2021) who argued that it is important in social investigation research to involve people that have attained an acceptable level of literacy and numeracy in order to be in position to understand and interpret content in the questionnaire and give valid responses.

The study findings revealed that out of the 80 respondents who participated in the study, majority 64% were males. The finding means that there are more male than females who participated in the study, studies have revealed that males and females have different attitudes and views towards individual economic well-being and since females are home makers, they tend to remain at home and this explains their low level of access to reproductive health (Singer, 2020).

4.2 Role of community participation in solid waste management

The first objective in this study was to establish the role of role of community participation in solid waste management. The findings from respondent's opinion accompanying variables under this objective were summarized as follows:

Table 4.3: Showing the effect of income on teenage pregnancy

| Statements | SD (%) | D (%) | N (%) | A (%) | SA (%) | Mean | Std. Deviation |
|---|-------------------|------------------|------------------|------------------|-------------------|-------------|---------------------------|
| Community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities. | 3 | 9 | 16 | 49 | 3 | 3.500 | .8859 |
| Communities participate collection and transport of solid waste from the neighbourhood to a dumping site | 4 | 30 | 22 | 23 | 1 | 2.838 | .9473 |
| Communities make decision regarding solid waste management | 5 | 6 | 14 | 38 | 17 | 3.700 | 1.083 |
| Communities provide resources necessary for solid waste management | 2 | 12 | 22 | 41 | 1 | 3.387 | .8786 |
| Communities implement waste recycling activities and programmes | 1 | 3 | 5 | 49 | 22 | 4.100 | .7730 |
| Average Mean | | | | | | 3.60 | 0.806 |

Source: primary data, (2024)

Table 4.3 above shows a summary of respondent opinion on the role of role of community participation in solid waste management.. The finding from respondent’s opinion accompanying variables under this objective were discussed and explained as follows:

Community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.

The study investigated whether community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.. According to the findings in table 4.3 above, 49% of the respondents agreed that community participation can increase capabilities at the level of the community and it encourages cost sharing of project

activities, 3% disagreed, 16% were neutral, while 9% disagreed and 3% strongly agreed to the statement.

Therefore from the above findings, it is noticeable that community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities. In support of this finding Greinert (2019) opined that community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.

Communities participate in collection and transport of solid waste from the neighbourhood to a dumping site

The study also investigated whether communities participate collection and transport of solid waste from the neighbourhood to a dumping site and from the findings, 23% who were the majority agreed that communities participate collection and transport of solid waste from the neighbourhood to a dumping site, 1% strongly agreed, 22% were neutral and 30% disagreed while 4% strongly disagreed to the statement.

From the above findings it means that communities in participate collection and transport of solid waste from the neighbourhood to a dumping site. Even the data collected from interviews show that communities in participate collection and transport of solid waste from the neighbourhood to a dumping site. Greinert (2017) equally agrees with the findings that communities in participate collection and transport of solid waste from the neighbourhood to a dumping site.

Communities make decision regarding solid waste management

On whether communities make decision regarding solid waste management, 38% of the respondents agreed to the statement noting that communities make decision regarding solid waste management, 6% disagreed, 14% were neutral and 17% strongly agreed and 5% strongly disagreed.

This finding imply communities make decision regarding solid waste management as majority of the respondents (38%) agreed and data collected from interviews also show that communities make decision regarding solid waste management. In line with the above

findings, Bray, et al. (2019) opined that communities make decision regarding solid waste management with similar results from interviews.

Communities provide resources necessary for solid waste management

This variable investigated whether communities provide resources necessary for solid waste management and results show that 41% and 1% of the respondents agreed and strongly agreed to the statement noting that communities provide resources necessary for solid waste management while 22% were neutral. However, 2 % strongly disagreed to the statement.

Therefore, the findings of the study imply that communities provide resources necessary for solid waste management y. Even findings obtained from interviews show that communities provide resources necessary for solid waste management. This is in line with the findings of Okiiria and Okidi (2017) who opined that communities provide resources necessary for solid waste management

Communities implement waste recycling activities and programmes

Respondents were also asked to find out whether communities implement waste recycling activities and programmes. Table 4.6 above shows 49% of the respondents who agreed that communities implement waste recycling activities and programmes, 22% of the respondents strongly agreed and 5% were neutral. 3% agreed and 1% of the respondents strongly disagreed that communities implement waste recycling activities and programmes

The above findings of the study therefore imply that communities implement waste recycling activities and programmes and similar results were obtained from face to face interviews. In a related study, Gupta (2019) further commented that communities implement waste recycling activities and programmes.

4.3 Effects of poor solid waste management on the community

The second objective in this study was to investigate the effect of poor solid waste management on the community. The findings from respondent's opinion accompanying variables under this objective were summarized as follows:

Table 4.3: Showing the effects of poor solid waste management on the community

| Statements | SD (%) | D (%) | N (%) | A (%) | SA (%) | Mean | Std. Deviation |
|---|-------------------|------------------|------------------|------------------|-------------------|-------------|---------------------------|
| Poor solid waste management can lead to emergence of diseases | 3 | 15 | 10 | 50 | 2 | 3.5 | .8859 |
| Creates bad odour for the communities | 4 | 15 | 1 | 38 | 22 | 2.8 | .9473 |
| Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels | 5 | 3 | 14 | 51 | 7 | 3.7 | 1.0838 |
| Residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites. | 2 | 9 | 2 | 54 | 13 | 3.4 | .8786 |
| Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water | 14 | 7 | 8 | 40 | 22 | 3.5 | |
| Average Mean | | | | | | 3.5 | 0.871 |

Source: primary data, (2024)

Poor solid waste management can lead to emergence of diseases

The researcher investigated whether poor solid waste management can lead to emergence of diseases. From the study findings presented in table 4.3 above shows that poor solid waste management can lead to emergence of disease as majority of respondents (50%) of the respondents agreed to the statement noting that poor solid waste management can lead to emergence of diseases. 2% strongly agreed and 10% of the respondents was neutral, 15% disagreed and 3% strongly disagreed.

As evidenced from the above findings, majority of the respondents (50%) strongly agreed that poor solid waste management can lead to emergence of diseases and similar data was obtained from interviews. As Abagi (2017) noted poor solid waste management can lead to emergence of diseases.

Poor waste management creates bad odour for the communities

Respondents were asked whether creates bad odour for the communities and 38% of the respondents agreed noting that creates bad odour for the communities, 22% of the respondents agreed, while other respondents who constituted 1% were neutral, 15% who were the majority agreed and 4% strongly disagreed that creates bad odour for the communities.

Therefore from above findings, creates bad odour for the communities with similar results obtained from interviews. This is in support of the study done by Bayrak (2020) he opined that creates bad odour for the communities.

Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels

Also, respondents were asked on whether many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels, according to the findings, 8.8% of the respondents disagreed that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels, 28.8% of the respondents were neutral, whereas 48.8%

agreed and 13.8% strongly agreed that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels.

Furthermore, results from interviews also indicated similar opinions that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels. The above findings are in agreement with Khan (2021) where he observed that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels.

Residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites.

The study further investigated whether residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites and from the research findings in table 4.7, 54% of the respondents agreed noting that residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites, particularly for women, 13% disagreed, 2% were neutral, while 9% of the respondents disagreed and 2% of the respondents strongly agreed residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites

The findings of the study imply that residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites. This discovery is in line with the findings of Okumbe (2019) who opined that residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites.

Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water

The study also investigated whether poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water as strongly agreed and agreed by 12% and 40% of the respondents respectively. Only 7% of the respondents disagreed with 14% strongly disagreed to the statement that poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water and 8% of the respondents were neutral.

The above findings thus show that Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water. Kaplan (2023) equally agrees with the findings where he opined that Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water.

4.4 Strategies for managing solid waste

The third objective in this study was to establish strategies for managing solid waste. The findings from respondent's opinion accompanying variables under this objective were summarized as follows:

Table 4.3: Showing strategies for managing solid waste

| Statements | SD (%) | D (%) | N (%) | A (%) | SA (%) | Mean | Std. Deviation |
|---|-------------------|------------------|------------------|------------------|-------------------|-------------|---------------------------|
| Re-use and recycling | 9 | 6 | 5 | 67 | 3 | 3.4 | .8786 |
| Passing and enforcing suitable legislation on waste management. | 1 | 3 | 2 | 58 | 21 | 4.1 | .7730 |
| Promoting bio waste treatment | 17 | 16 | 11 | 44 | 22 | 3.6 | .7252 |
| Under taking collection arrangements | 3 | 2 | 5 | 42 | 28 | 3.5 | .8098 |
| Creating community awareness about solid waste. | 5 | 14 | 6 | 38 | 17 | 3.4 | 1.0838 |
| Average Mean | | | | | | 3.4 | 0.870 |

Source: Primary data (2024)

Re-use and recycling

Results in table 4.4 above show that 67% of the respondents agreed with the statement noting that re-use and recycling is a strategy used to manage solid waste, 3% agreed, 5% of the respondents were neutral and 6% disagreed while 9% of the respondents strongly disagreed that re-use and recycling is a strategy used to manage solid waste.

Thus from the above findings, it is true re-use and recycling is a strategy used to manage solid waste as majority of respondents (42.5%) agreed to the statement. Similar findings were obtained from face to face interviews where it was found out that re-use and recycling is a strategy used to manage solid waste. In support of these findings, research by Musaaazi, (2019) found that re-use and recycling is a strategy used to manage solid waste.

Passing and enforcing suitable legislation on waste management.

On whether passing and enforcing suitable legislation on waste management, the study found that 58% of the respondents agreed with the statement noting that passing and enforcing suitable legislation on waste management while 21% strongly agreed and 2% were not sure. Other respondents who constituted 3% disagreed and 1% strongly disagreed.

The findings therefore imply that passing and enforcing suitable legislation on waste management. Even the findings obtained from interviews show that passing and enforcing suitable legislation on waste management. Okojie (2020) also argued that passing and enforcing suitable legislation on waste management

Promoting bio waste treatment

It was agreed by 44% of the respondents that promoting bio waste treatment can help to manage solid wastes, with higher social competencies. 22% agreed while 11% were neutral. Other respondents who constituted 22% disagreed and 17% strongly agreed that promoting bio waste treatment can help to manage solid wastes.

The above findings thus imply promoting bio waste treatment can help to manage solid wastes. Results obtained from interviews also show that promoting bio waste treatment can help to manage solid wastes, with higher social competencies. Abdullah (2018) also opined that promoting bio waste treatment can help to manage solid wastes.

Under taking collection arrangements

Further, the study investigated whether under taking collection arrangements can help to manage solid wastes. It was agreed by 42% of the respondents noting that neglectful parenting style represented the parents who presented low control and low support for the teenagers, 2% disagreed, 5% were not sure, while 3% strongly disagreed to the statement that under taking collection arrangements can help to manage solid wastes.

From the research findings, the majority of the respondents (42%) agreed that under taking collection arrangements can help to manage solid wastes. and similar findings were found by Ojangole et al., (2020) that under taking collection arrangements can help to manage solid wastes.

Creating community awareness about solid waste

The researcher also investigated whether creating community awareness about solid waste can help to effectively manage solid wastes. From the findings therefore, 38% of the respondents agreed that creating community awareness about solid waste can help to effectively manage solid wastes, 17% of the respondents strongly agreed while 6% of the respondents were neutral, 14% of the respondents disagreed and 5% of the respondents strongly disagreed.

The study finding means that creating community awareness about solid waste can help to effectively manage solid wastes.as agreed by 38% and this is in line with the data collected from face to face interviews. Research by Maria (2018) also found similar results where she argued that creating community awareness about solid waste can help to effectively manage solid wastes.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion, and recommendations about the study. It also looks at areas for further research.

5.2 Summary

Role of community participation in solid waste management

Findings of the study revealed that community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.

The study also found that communities participate in collection and transport of solid waste from the neighbourhood to a dumping site

Study results show that communities make decision regarding solid waste management

Other findings of the study show that communities provide resources necessary for solid waste management

Findings further revealed that communities implement waste recycling activities and programmes

Effects of poor solid waste management on the community

Study findings show that poor solid waste management can lead to emergence of diseases
Creates bad odour for the communities

It was discovered during the study that many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels

Study participants also mentioned that residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites.

Findings also revealed that poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water

Strategies for managing solid waste

Findings show that re-use and recycling can help to manage solid waste

Additionally, passing and enforcing suitable legislation on waste management can also help to manage solid waste.

Further, findings show that promoting bio waste treatment

The study also found that under taking collection arrangements

It was also discovered during the study that creating community awareness about solid waste

5.3 Conclusions

From the findings of the study, the following conclusions were drawn:

Role of community participation in solid waste management

According to the study findings, community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.

Communities participate in collection and transport of solid waste from the neighbourhood to a dumping site and this was mentioned by study participants during the study.

It is true that communities make decision regarding solid waste management and this was revealed in the findings of the study.

Further, it also true that communities provide resources necessary for solid waste management as mentioned in the study findings.

As study findings show, communities implement waste recycling activities and programmes

Effects of poor solid waste management on the community

As revealed in study findings, poor solid waste management can lead to emergence of diseases
Creates bad odour for the communities

Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels and were discovered during the study.

Residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites and this mentioned by study participants

Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water and was revealed by study participants.

Strategies for managing solid waste

As the findings show, re-use and recycling can help to manage solid waste

Passing and enforcing suitable legislation on waste management can also help to manage solid waste and this was revealed in the findings of the study

Promoting bio waste treatment can help in solid waste management as revealed in the study findings

Further, as the study found, under taking collection arrangements

Creating community awareness about solid waste was discovered during the study

5.4 Recommendations

Form the study findings and conclusions, the following recommendations were made:

Role of community participation in solid waste management

Community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities.

Communities participate in collection and transport of solid waste from the neighbourhood to a dumping site

Communities make decision regarding solid waste management

Communities provide resources necessary for solid waste management

Communities implement waste recycling activities and programmes

Effects of poor solid waste management on the community

Poor solid waste management can lead to emergence of diseases

Creates bad odour for the communities

Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels

Residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites.

Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water

Strategies for managing solid waste

Re-use and recycling

Passing and enforcing suitable legislation on waste management.

Promoting bio waste treatment

Under taking collection arrangements

Creating community awareness about solid waste

REFERENCES

- Adu KK (2008) Assessment of Solid Domestic Waste Method among Community Health Workers in the AfigyaSekyere District-Ashanti Region, Ghana. Undergraduate Dissertation, KNUST.
- Asokore Mampong City Profile (2010) Profile and Current Situation of Asokore Mampong City Assembly (AMMA), Department of Geography and Rural Development, Kwame Nkrumah University of Science and Technology, Kumasi.
- Atiyeh, R et al (2000). Effects of vermicomposts and composts on plant growth in horticultural container media and soil. *Pedobiologia*44(5), 579-590.
- Ayaa, et al, (2022). Design and Computational Fluid Dynamic Modeling of a City Solid Waste Incinerator for Kampala City, Uganda. *American Journal of Energy Engineering* 2(3), 80-86.
- Bai, R. & Sutanto, M. (2002). The practice and challenges of solid waste management in Singapore. *Waste Management* 22(5), 557-567.
- Barton & Stentiford, (2008). Carbon – Making the right choice for waste management in developing countries. *Waste Management* 28(4), 690-698.).
- Begum Z (2012) Solid Waste Management, Dissemination Paper – 19. Centre of Excellence in Environmental Economics: Madras School of Economics, India.
- Chazan D (2002), A World drowning in litter, BBC.
- Coggins, C. (2021). Waste prevention - an issue of shared responsibility for UK producers and consumers: policy options and measurement. *Resources Conservation and Recycling* 32, 181-190.
- Couth, R. & Trois, C. (2010). Carbon emissions reduction strategies in Africa from

improved waste management: A review. *Waste Management* 30(11),2336-2346.

Elliott P et al ,(2021), Briggs .Risk of adverse outcomes in populations living near landfill sites. *BMJ*; 363–8

Environ Eng (5:202), Evidence from Sawaba, AsokoreMampong City Assembly..
doi:10.4172/2165-784X.1000202

Environment Agency, (2019–99), *Waste Statistics for England and Wales*.

Fischer C, Crowe M, (2000) *Household and City Waste: Comparability of Data in EEA Member Countries*, Copenhagen: European Environment Agency

Foray J (2012),*Solid Waste Management in Ghana; A comprehensive case for West Africa*.

Harrad and Harrison,(2000),WHO European Centre for Environment and Health *Methods of Assessing Risk to Health from Exposure to Hazards Released from Waste Landfills* . Lodz, Poland: WHO Regional Office for Europe

Hoorweg, D. &Bhada-Tata, P. (2012). *What a waste: a global review of solid waste management*. Urban Development Series, Knowledge Papers (15).

Johnson and De Rosa, (1997), *The toxicological hazards of superfund hazardous waste sites*. *Rev Environ Health*; 12: 235–51

KCCA (2012), *Kampala Capital City Authority official website*.www.kcca.go.ug/services. Accessed 11th November 2012.89.

Kharazi et al, (1997), *A community based study of adverse pregnancy outcomes near a large hazardous waste landfill in California*.*ToxicolInd Health*; 13: 299–310.

Kumar, R. &Shweta (2021), *Removal of pathogens during vermi-stabilization*. *Journal of*

Environmental Science and Technology 4(6), 621-629.

Maria Triassi et al,(2015) International Journal of Environmental Research and Public Health, Environmental Pollution from Illegal Waste Disposal and Health Effects: A Review on the “Triangle of Death”

National Academy Press, (1991), National Research Council. Environmental Epidemiology: Public Health and Hazardous Wastes, Washington, DC vol. 1.

Pépin et al, (2000-2010), Evolution of the global burden of viral infections from unsafe medical injections,.PLoSOne. 2022 Jun 9;9(6):e99677.

Pheby et al, (2002), Waste Management and Public Health: The State of the Evidence, Bristol: South West Public Health Observatory

Suleman et al, (2015) Solid Waste Disposal and Community Health Implications in Ghana: Zerbock, (2003), Urban solid waste management, waste reduction in developing nations.

Suleman Y, et al W (2015) Solid Waste Disposal and Community Health Implications in Ghana: Evidence from Sawaba, Asokore Mampong City Assembly. J Civil Environ Eng 5:202. doi:10.4172/2165-784X.1000202

UN-Habitat (2010) Solid Waste Management in the World's Cities: Water and Sanitation In the World's Cities 2010, Washington DC: Earthscan publications.

APPENDICES
APPENDIX I: CONSENT LETTER

Dear Respondents

Ref. Request to Complete Research Questionnaire

I am **Wambi Felix** student of Uganda Christian University pursuing Degree of Social work and social Administration) and is currently undertaking a research on a topic ‘**Role of community participation in solid waste management in Mbale City**. You are kindly requested to participate in this research and your selection to this effect has been based on random basis. Please feel free as you respond to the study questions because the information you are to give will only be used for academic purposes, confidential and finally held anonymous before any publication.

Thank you

.....

(RESAERCHER)

APPENDICES II

APPENDIX I: QUESTIONNAIRE GUIDE FOR LOCAL PEOPLE AND LOCAL LEADERS

SECTION A: REpondent's BIO – DATA

INSTRUCTIONS

Please fill in the blank spaces or tick (✓) in the boxes provided where necessary.

1. Name: (optional)

.....

2. Age: 15 – 30 31 – 45 46 – 60 60 +

3. Sex: Male Female

4. Marital status: Single Married Divorced Separated Widowed

5. Location:

Cell Parish

Sub – county

6. Levels of education:

None Primary Secondary Tertiary and above

Other (please specify)

.....

.....

7. Religion: Protestant Catholics Muslims Born again

Others (please specify).....

RESPONSE SCALE

| | | | | |
|-------------------|----------|-----------|-------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Disagree | Undecided | Agree | Strongly Agree |

| SECTION B: Role of community participation in solid waste management | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Community participation can increase capabilities at the level of the community and it encourages cost sharing of project activities. | 1 | 2 | 3 | 4 | 5 |
| 2. | Communities participate collection and transport of solid waste from the neighbourhood to a dumping site | 1 | 2 | 3 | 4 | 5 |
| 3. | Communities make decision regarding solid waste management | 1 | 2 | 3 | 4 | 5 |
| 4. | Communities provide resources regarding solid waste management | 1 | 2 | 3 | 4 | 5 |
| 5. | Communities implement waste recycling activities and programmes | 1 | 2 | 3 | 4 | 5 |
| SECTION C: Effects of poor solid waste management on the community | | | | | | |
| 8. | Poor solid waste management can lead to emergence of diseases | 1 | 2 | 3 | 4 | 5 |
| 9. | Creates bad odour for the communities | 1 | 2 | 3 | 4 | 5 |
| 10. | Many of the substances, such as cadmium, arsenic, chromium, nickel, dioxins and PAHs are considered to be carcinogenic, based on animal studies or studies of people exposed to high levels | 1 | 2 | 3 | 4 | 5 |
| 11. | Residence within 3 km of a site was associated with a significantly raised risk of congenital anomaly, with a fairly consistent decrease in risk with distance away from the sites. | 1 | 2 | 3 | 4 | 5 |
| 12. | Poor waste management leads to high content of enteric pathogens, including bacteria, viruses, and helminths, which are easily transmitted through water | 1 | 2 | 3 | 4 | 5 |
| SECTION D: Strategies for managing solid waste | | | | | | |
| 16. | Re-use and recycling | 1 | 2 | 3 | 4 | 5 |
| 17. | Passing and enforcing suitable legislation on waste management. | 1 | 2 | 3 | 4 | 5 |
| 18. | Promoting bio waste treatment | 1 | 2 | 3 | 4 | 5 |
| 19. | Collection arrangements | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|-----|--|---|---|---|---|---|
| 20. | Community awareness about solid waste. | 1 | 2 | 3 | 4 | 5 |
|-----|--|---|---|---|---|---|

THANK YOU FOR YOUR TIME

APPENDICES II
INTERVIEW GUIDE FOR CITY STAFFS

- 1) What is occupation?
- 2) Explain the challenges faced in solid waste management.
- 3) What is the role of community participation in solid waste management in Mbale City?
- 4) What the effects of poor solid waste management on the community in Mbale City ?
- 5) What are strategies for managing solid waste in Mbale City?

APPENDIX IV

Work plan schedule

APPENDIXES IV: WORK PLAN SCHEDULE

| Duration | J | F | M | A | M | J | J | A | S | O | N | D |
|--------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Activity | | | | | | | | | | | | |
| Developing Questionnaires | | | | | | | | | | | | |
| Data collection | | | | | | | | | | | | |
| Data processing and analysis | | | | | | | | | | | | |
| Writing Draft and Final Report | | | | | | | | | | | | |
| Submission of Report | | | | | | | | | | | | |

APPENDICE V
BUDGETARY ESTIMATES

| S/No | ITEM (S) | Quantity (qty) | Unit cost (Ugshs) | Total Coast (Ugshs) |
|-------------|--------------------------------|-----------------------|--------------------------|----------------------------|
| 01 | Printing/ photo copying papers | 1 ream | 20,000 | 20,000 |
| 02 | Ruled papers | 1 ream | 16,000 | 30,000 |
| 03 | Flash disk | 1 (2GB) | 40,000 | 40,000 |
| 04 | Pens, pencil and note book | Assorted | 10,000 | 10,000 |
| 05 | Photocopying expenses | 45 PAGES | @100 | 4500 |
| 06 | Word typesetting expenses | 45 PAGES | @1000 | 45,000 |
| 07 | Spiral binding expenses | 3 BOOKS | @5000 | 100,000 |
| 08 | Airtime | | 10,000 | 50,000 |
| 09 | Transport expenses | | 50,000 | 50,000 |
| 10 | Contingency | | 50,000 | 50,000 |
| 11 | TOTAL | | | 400,000 |