

**KNOWLEDGE, ATTITUDE AND PRACTICE OF KASOKOSO COMMUNITY  
MEMBERS TOWARDS SOLID WASTE MANAGEMENT**

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## **DECLARATION**

I declare that this research report is my own original work and has not been submitted for any award of degree by any other person or university. There is a complete reference to all the sources of information used in the report.

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Signature:.....

Date:.....

## **APPROVAL**

This is to declare that this research report has been conducted under my supervision and assistance and is submitted to the University with my approval.

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## OPERATIONAL DEFINITIONS

- Attitude - The ways you think or feel about something or someone; a feeling or way of thinking that affect person behaviors.
- Community - A group of people living in the same place and having a particular characteristic in common.
- Hazardous waste - Is waste that can be a threat to human health and the environment sometimes known as hazardous waste that contains pathogens that are sufficient to cause to cause disease.
- Health - A state of complete physical, social and psychological well-being of an individual not merely the absence of disease.
- Household head - May be the father or any other member of the family who has been there during this period.
- Knowledge - Are facts, information, and skills acquired by a person through experience or education, the theoretical or practical understanding of a subject.
- Practice - This refers repetitive act of medical workers on medical waste management that encompasses collection, storage, processing and disposal.
- Solid waste management- is the process of collecting, storing, treatment and disposal of solid wastes in such a way that they are harmless to humans, plants, animals, the ecology and the environment generally (Kofoworola, 2007).
- Solid waste - Any garbage, refuse, sludge from the waste water treatment plant, supply treatment plant or air pollution control facility and

other discarded materials including solid, liquid, semi-solid, or contained gaseous material resulting from industries, commercial, mining, and agricultural operation and domestic activities.

## ACRONYMS

IHSU	-	International Health Sciences University
KAP	-	Knowledge, Attitude and Practices
KCCA	-	Kampala City Council Authority
LC	-	Local Council
MOH	-	Ministry of Health
NSWMA	-	National Solid Waste Management Authority
PEB	-	Pro-Environmental Behaviours
SON	-	School Of Nursing
SW	-	Solid Waste
SWM	-	Solid Waste Management
US	-	United States
WHO	-	World Health Organization

## ABSTRACT

**Background:** Solid waste management should be everybody's responsibility in the community if disease spread is to be minimized. However, in spite of these interventions, the problem of the poor disposal of solid waste still persists in Kasokoso village, Kampala district.

**Objectives:** The objective of the study was to assess the knowledge, attitude and practices of Kasokoso Community members towards solid waste management between June 2016 and July 2016

**Methods:** A descriptive cross sectional study involving both quantitative and qualitative was employed to assess the the knowledge, attitude and practices of Kasokoso Community members towards solid waste management between June 2016 and July 2016. A total of 395 households' heads in Kasokosoko were included in this study using probability, simple random sampling technique. A structured questionnaire was used to collect data. Data were entered and analyzed using SPSS version 20.

**Results:** From the assessment done 52.4% of the respondents admitted that improper waste management pollutes the sources of water thus causing typhoid fever, cholera and dysentery. 65.6% that improperly managed waste attracts rodents such as rats and mites, which transmit diseases like plaque and Lassa fever, 75.5%) reported that accumulation of solid waste is linked to health hazards, 51.9% of the respondents disagreed that solid waste is dangerous to human and human health, 54.7% agreed that solid waste management is the work on the government, 51.4% were dissatisfied by the way solid wastes are handled by KCCA, 51.9% of the respondents disagreed that solid waste is dangerous to human and human health, 86.5%) collected their waste in a polythene bag (kavera), 87.6% of the respondents did not segregate solid waste compared to only 12.4% who segregated waste during generation, 78.7% of the respondents reported disposing their waste in open land fill while open burning of waste

**Conclusion:** The findings highlight the need for going educational, informational and improving on the solid waste management of the respondents to address the knowledge gaps and poor practices of solid waste in order to improve on the way solid waste is managed in the area.

## CHAPTER ONE

### 1.0 Introduction

The researcher proposed to study the “knowledge, attitude and practice of Kasokoso Community members towards solid waste management”. This chapter includes the background to the study, problem statement, study objectives, research questions, the significance of the study and the conceptual framework.

### 1.1 Background information

Waste are substances or objects which are disposed of, intended to be disposed of, or are required to be disposed of, by the provision of national law (The Basel Convention, 2015). Wastes are materials for which the initial users have no further use in terms of purposes of production, transformation or consumption and of which wants to dispose both by-products of human and animal activities (Chalmin and Gaillochet 2009). They can be classified in terms of their original use (such as packaging waste), the material (glass, paper, or plastics), their physical properties (combustible or biodegradable), their origin (domestic, commercial, industrial or agricultural), and the safety parameters (hazardous or radioactive). Solid waste management therefore is the process of collecting, storing, treatment and disposal of solid wastes in such a way that they are harmless to humans, plants, animals, the ecology and the environment generally (Kofoworola, 2007).

Globally, a staggering 3.4 to 4 billion tons of municipal and industrial solid waste and up to 300 million tons of hazardous waste are annually produced (Chalmin and Gaillochet, 2009). The production of waste has practically doubled over the past ten years and is expected to reach 2.5 billion tons per year in 2025 as a result of the combined effect of urban development and changes in consumption patterns (Périou, 2012). Sub Saharan Africa generates over 3.5 million tons of solid waste a tenfold increase over the past century.

In East Africa as the urban population in Nairobi and elsewhere in East Africa grows, so does the solid-waste management burden, a situation worsened by poor funding for urban sanitation departments and a lack of enforcement of sanitation regulations. At least 100 million people in East Africa lack access to improved sanitation (Troschinetz and Mihelcic, 2009). Thirty to 40% of all solid waste generated in urban areas is uncollected and less than 50% of the population is served (Otieno, 2010). Up to 80% of collection transport is out of service or in

need of repair and if the issue of sustainable solid waste management in Kenya is not considered urgently, all the towns in Kenya will be engulfed in waste. The urban solid waste composition is 37.8% (food waste), 33.6% (yardwastes), 6.7% (paper), 0.8% (metals), 7.8% (plastics), 8.6% (stones & debris), 1.3% (textiles), 0.7% (glasses) and 2.7 (miscellaneous) which is typical of the East African urban areas like Nairobi Kenya (Rotich et al., 2006) and Dar es Salaam-Tanzania (Kaseva & Mbuligwe, 2005). Being predominantly biodegradable (72-86.5%) the urban wastes are suitable for composting. Most low-income households (82.5%) disposed of wastes daily because of poor and improvised storage, while 85.3% high and middle income people dispose twice a week and 60% of commercial premises dispose of wastes daily.

In Uganda, waste generation is between 1.2 and 3.8 kg/day (NEMA (2007)). Households are the major solid waste generators as in other developing countries like Cameroon (Achankeng, 2003), Tanzania (Kaseva & Mbuligwe, 2005), Kenya (Rotich et al., 2006) and Indonesia (Supriyadi, Kriwoken, & Birley, 2000). This converts to about 1,580 tonnes of solid waste generated per day, but only 40% of it is collected (KCCA, 2014). A significant amount of solid waste is either burnt on the streets or ends up in drainage channels, marshy areas and empty plots. It is estimated that 84% of the solid waste generated in Kampala is organic matter (Ssemwanga, 2006). Much of this waste comes from residential areas. It is further estimated that residential areas (the residential source) contribute about 53% of the total solid waste generated (Banga, 2008).

Residents living close to the dumpsite are therefore exposed to environmental and disease risks (Al-Khatib et al, 2015). The disposal sites are, in most cases, located in environmentally sensitive, low-laying areas such as wetlands, forest edge or adjacent to bodies of water. They often do not have liners, fences, soil covers and compactors which put the people at risk of diseases (Troschinetz and Mihelcic, 2009). KCCA has contracted private companies to manage solid waste collection so as to improve the cleanliness of the city (Toloko, 2008). It is estimated that the per capita generation of garbage is one kilogram per day. With a population of about 1.5 million, this works out to about 1500 tons. The council can only manage to dispose off 40%-50% of this. About 80% of this garbage is organic matter which makes it very bulky to handle (Toloko, 2008).

## **1.2 Problem statement**

Solid waste management should be everybody's responsibility in the community if disease spread is to be minimized. Attempts to improve solid waste management in Uganda have focused on the technical aspects such as the procurement of waste collection vehicles, the privatizing of waste collection services and the maintenance of the landfill. It is estimated that over 35% of the Kampala City Council Authority (KCCA) budget is devoted to such waste management activities (KCCA, 2010/2011). However, in spite of these interventions, the problem of the poor disposal of solid waste still persists in Kasokoso village. High piles of solid waste are scattered all over the area. Local statistics show that 82% of the households do not have personal dustbins and 76% of households with dustbins do not properly manage them (Kasokoso LC 1 Health Report, 2015).

As a result, the community members of Kasokoso village are at risk of contracting different food and waste borne diseases which predisposes residents to diarrhoeal diseases especially among children less than 5 years. For instance, health reports from Kiswa Health Centre III indicate that in August 2015, diarrhoeal diseases accounted for 112 patients of 678 total patients with communicable diseases making 16.5%, in October 2015 they were 179 (651) making 27.5%, and in November they were 190 (654) which is 29.1% (Nabukwasi, 2016). This has also resulted into increased health care sector expenditure, infant mortality, and stagnant growth in children and family income constraints due to loss of time for work, co morbidities, and high expenditure on health.

The factors behind this poor solid waste management are yet unknown. It is likely that, the adult residents who are caretakers of these children, lack the right knowledge, attitude and practices on solid waste management. There was therefore need to study the community members' knowledge, attitude and practice towards solid waste management which formed the basis for the researcher's interest in this study.

## **1.3 General Objective of the study**

The study assessed the knowledge, attitude and practices of Kasokoso Community members towards solid waste management between June 2016 and July 2016.



#### **1.4 Specific objectives of the study**

The specific objectives included.

- To examine the knowledge of Kasokoso Community members towards solid waste management
- To assess the attitude of Kasokoso Community members towards solid waste management
- To determine the practices of Kasokoso Community members towards solid waste management

#### **1.5 Research questions**

- What is the level of knowledge of Kasokoso Community members towards solid waste management?
- What are the attitudes of Kasokoso Community members towards solid waste management?
- What are the practices of Kasokoso Community members towards solid waste management?

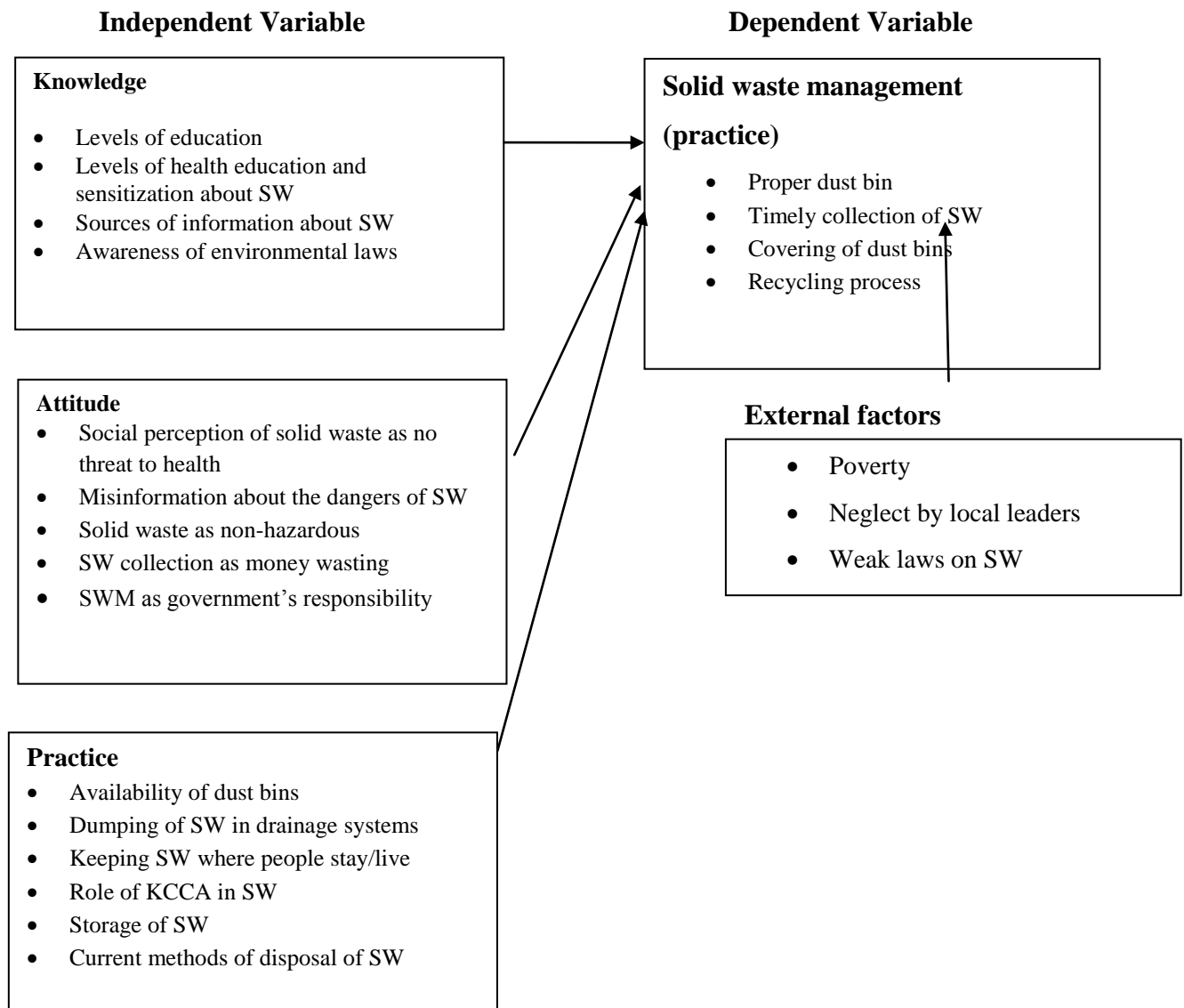
#### **1.6 Significance of the study**

The findings of the study will:

- Help the government and Ministry of Health to identify the knowledge, attitude and practice gaps of community members towards solid waste management. This will be based upon to design education, and other information/dissemination programmes that will improve SWM among communities.
- Assist health care providers to address weaknesses that predispose community members that visit health facilities with diarrhoeal and other hygiene related complications.
- Be useful for the local administrators as they will use it to address key solid waste management loopholes in the areas.
- Help the stakeholders in the implementation of interventions that would reduce the burden of solid management in the area of Kasokoso village.
- Facilitate the researcher in the attainment of the award of Bachelor's degree in Nursing Science of International Health Sciences University for which this study is a requirement.

## 1.7 Conceptual framework of the study

Figure 1: Showing the conceptual framework of the study



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter presents literature related to the study at hand. This information was reviewed in relation to the study specific objectives that include; the knowledge of Community members, attitude of Community members and practices of Community members towards solid waste management.

### **2.1 Solid Waste Management**

The business of keeping our environment free from the contaminating effects of waste materials is generally termed waste management. From a scholarly point of view, Gbekor (2003) refers to waste management as involving “the collection, transport, treatment and disposal of waste including after care of disposal sites”. Similarly, Gilpin (1996) has defined waste management as “purposeful, systematic control of the generation, storage, collection, transportation, separation, processing, recycling, recovery and disposal of solid waste in a sanitary, aesthetically acceptable and economical manner” while Schubeller et al. (1996) focus on municipal solid waste management which they define as “the collection, transfer, treatment, recycling, resource recovery and disposal of solid waste in urban areas”. It can be deduced from these definitions that waste management is the practice of protecting the environment from the polluting effects of waste materials in order to protect public health and the natural environment. Thus, the priority of a waste management system must always be the provision of a cleansing service which helps to maintain the health and safety of citizens and their environment (Cooper, 1999).

Further, Gilpin (1996) regards the business of waste management as a professional practice which goes beyond the physical aspects of handling waste. It also “involves preparing policies, determining the environmental standards, fixing emission rates, enforcing regulations, monitoring air, water and soil quality and offering advice to government, industry and land developers, planners and the public” (Gilpin, 1996). Waste management, therefore, involves a wide range of stakeholders who perform various functions to help maintain a clean, safe and pleasant physical environment in human settlements in order to protect the health and well-being of the population and the environment. Effective waste management is, however, a

growing challenge to all municipal governments, especially in developing countries. There are many factors that have been thought to be associated with this phenomenon in these regions.

## **2.2 Knowledge of Community members towards solid waste management**

The knowledge possessed by a community refers to facts, information, and skills acquired by a person through experience or education, the theoretical or practical understanding of a subject which for this study, is management of solid waste. The researcher hereby discusses this under: levels of education, health education and sensitization about SWM, sources of information about SWM and awareness of environmental laws regarding SWM.

### **2.2.1 Level of education**

Toyawareness et al. (2011) in a survey study in Turkey, showed that awareness and sensibility levels of campus people about environmental problems including SWM, was found to be 64.4%, which may be taken as moderate. Another study by Ayodeji Ifegbesan (2010) in Nigeria examined the level of awareness, knowledge and practices of secondary schools students with regard to waste management in Nigerian educational institutions. Findings revealed that secondary school students from the sampled zones were knowledgeable about waste problems on their school compounds, but still possessed poor waste management practices. Interesting to note, Malgorzata Grodzinska et al., (2003) showed that the environmental knowledge of the students can improve the knowledge of their parents. According to the parents' reports, the majority of students (70%) had discussed the program with their parents, and just over one third of them (34%) had made suggestion to their parents regarding the ways in which they could improve their waste management practices at home.

On the other hand, Wahid et al (2012) analyzed the relationship between knowledge of the urban poor households concerning solid waste management systems and education. It was found that the urban poor communities with low education were proven to behave in ways matching with and conducive to environment-friendly solid waste management, for instance, by practicing recycling and waste source reduction than their educated counterparts.

Here in Uganda, the results of a study by Banga & Margerat (2013) on household knowledge, attitudes and practices on the separation and recycling of solid waste indicated that although the public is aware of solid waste separation and recycling practices, they did not participate in such initiatives.

### **2.2.2 Health education and sensitization**

Knowledge about solid waste management is highly influenced by participating in the health education sessions. Increases in knowledge about types of diseases spread and types of hazardous waste are particularly pronounced among health educated population compared to groups without health education. For example in a study in Indonesia, respondents' awareness of hazardous medical waste rose from 0.6% to 91.4% (Ratni et al, 2014). Another study by Mukui et al, (2013) on Solid Waste Management in Urban Nyeri, indicated that the majority of the respondents were aware about the health hazards associated with incorrect solid waste management (94.2%) with the level of awareness being high in all the estates. However there was a discrepancy between knowledge and correct practice, as only 26.2% of households practiced correct methods of solid waste disposal (separated, stored into a receptor, deposited into a garbage chamber/compost pit or used kerb side services).

However, awareness and knowledge of waste disposal is influenced by many factors as pointed out in a work done by Margaret, (2013) on household knowledge, attitudes and practices in solid waste segregation and recycling in urban Kampala. It indicated that the participation in solid waste separation activities depended on the level of awareness of recycling activities in the area, household income, educational level and gender (Baga et al, 2013). Ayodeji Ifegbesan also studied the waste management awareness knowledge and practices of secondary school teachers in Ogun state, Nigeria and showed that teachers were aware and knowledgeable about waste management even though they possessed negative waste management practices. Although there seemed to be appreciable awareness and knowledge about waste disposal among the respondents, most of them were only aware of the crude and traditional methods and are oblivious of the modern methods such as incineration and recycling (Ayodeji et al, 2012).

A few other studies (Wollebaek et al, 2001) and the findings of Hines, Hugerford and Tomera (1986) showed that the level of consistency between environmental attitudes and behavior is affected by a person's knowledge and awareness, and his/her sense of responsibility. For instance, in Malaysia, whilst the National Recycling Program has contributed to a greater awareness of the need to preserve resources, public response, the lack of awareness and knowledge among Malaysian community about solid waste management (SWM) issues, and

being ignorant about the effect that improper SWM has to the community has definitely worsened the problem (National strategic plan for solid waste management, 2005).

### **2.2.3 Sources of information about SWM**

In a study carried out by Gakungu, (2011), the majority of the respondents (81.6%) indicated that they had heard about SWM in particular, recycling. The main source of information for 39.3% of the respondents was scrap (metal, plastics, paper, polythene and glass) dealers; followed by relatives and friends, radio, newspapers and magazines estimated at 32.8%, 15.1% and 6.4% respectively. Only 6.4% had heard about recycling from school (Gakungu, 2011). In a related study on the Economics of Solid Waste Management of Kampala City, it was established that 60% of the respondents had ever heard of the segregation of solid waste. They even gave examples of what is segregated into plastic bags, glasses, peelings (banana and potatoes) and metal. The report revealed that 39% of the households had heard of solid waste segregation from friends and relatives, 30% from the itinerant buyers, 27% from newspapers and magazines and 4% from schools (Banga, 2008).

### **2.2.4 Awareness of environmental laws**

In sub Saharan Africa, community participation in waste management is mostly informal and there are no clear avenues for active formal participation. Waste pickers work in informal groups with no clear control and do not follow safety and health regulations. The councils are also unable to enforce existing waste management laws because of lack of resources and political interference (Wang, Han, & Li, 2008). People's perceptions and attitudes towards waste management are that it is the sole responsibility of urban councils and that being a waste worker is socially degrading.

Environmental knowledge and attitudes of households' heads should be examined in order to understand their behaviour and how to encourage the waste separation and recycle at waste generating sources. Most recyclers are more likely to get one or more sources of information for example friends, newspaper, television, etc. Various sources of recycling knowledge coming from public education and information through public campaigns are expectedly showing a positive correlation with recycling rate (Nixon and Saphores, 2009).

In Uganda many community members in slum areas are not aware of modern recycling method. Few of them know that, recycling and reuse may reduce the use of raw materials and

energy, and minimize the footprint of production and consumption (KCCA, 2015). However, it has only achieved limited success in the U.S. As demonstrated in a cost-benefit analysis of waste management options (Ai, 2006), waste management policies are largely designed on the basis of economic considerations. Thus, an economic characteristic of waste management from an economic sector's perspective deserves a careful study.

### **2.3 Attitude of Community members towards solid waste management**

Attitude refers to the ways you think or feel about something or someone; a feeling or way of thinking that affect person behaviors to their feelings toward recycling, as well as any preconceived ideas they may have towards it.

Many community members have poor attitude toward solid waste management, according to nationwide studies in developing countries. In a study by households by Chin-Chance, (2007) were also asked what they thought about solid waste separation in their homes. Forty percent said it was a good idea while 60% said they did not support it because it is time wasting and a dirty job, and, therefore, should be done at the collection points or at the landfill.

In a study carried out in South Africa, community members felt it normal to dispose solid waste anyhow. People throw garbage on the streets and in the drains and gullies because they have no other means of getting rid of (disposing of) their garbage and do not feel irritated by the behavior (Blakely, and Leigh, 2010).

Environmental attitude of young people appears to be crucial as they ultimately play a direct role in providing knowledge-based solutions to in- coming environmental problems (Bradly et al., 1999; Eagles and Demare, 1999). Furthermore, school environmental program, although addressed to students can also influence upon the environmental knowledge, attitude and behavior of adults (parents, teachers and local community members) through the process of intergenerational influence (Gallagher et al., 2000).

The attitude of people towards waste management can be affected by their level of knowledge and awareness of waste management and it has been reported that homes with waste bins engage more in proper way of storing waste than homes without waste bins (Adeyemo et al, 2013). A Ghanaian study about attitude towards recycling and waste management showed no significant effect of gender, employment and educational statuses, on willingness to practice proper waste management (segregation and recycling) (Asuamah et al, 2012)

Awopetu et al (2013) focused on public attitudes towards reducing, reusing and recycling solid waste in the Makurdi Metropolitan area of Nigeria. The researchers found that local authority

strategy towards a sustainable hierarchy and federal government funding be forthcoming to make necessary infrastructure improvements and embrace public attitudes to solid waste reduction, reuse and recycling.

Some community members prefer engaging in other personal issues like crime, unemployment, and managing the cost of living are more important to community members than a garbage-free community. Majority revealed that they would not waste their time collecting and disposing waste instead of engaging in income generating activities (Giusti, 2009). Some revealed that they would not even waste time engaging in village meeting aimed at garbage management as many said they would rather go boozing.

In terms of environmental psychology, researchers found the link between pro-environmental attitudes and recycling behaviour. A number of theories attempted to explain the recycling activities as pro-environmental behaviours (PEB). The theory of Planned Behaviour assumes that “attitudes have a causal impact on behaviours through the mediation of behavioural intention (Ajzen, 1988, 1991, 1996; Ajzen & Madden, 1986; Godin & Kok, 1996). This intention is determined by attitudes towards the behaviour, subjective norms, and perceived behavioural control (Mannetti et al, 2004). People might also get motivated to recycle and their behavior can be regulated by an adequate manipulation of rewards and punishments (Mannetti et al, 2004). Some norm and peer pressure are useful for predicting recycling behaviour. The proposed model basing on the Theory of Reason Action highlights that the demographic, situational and psychological factors could be also responsible for recycling behaviour. (Nixon and Saphores, 2009).

On the contrary, Adogu et al (2011) found that large number of the respondents had a positive attitude towards waste management as 275 (97.5%) of the respondents agreed that proper waste disposal can better their health and 279 (98.9%) believed that the practices of waste management is of great importance. Also 280 (99.3) of respondents specified that waste management promotes good health and healthy environment. Another study carried out by Adeyemo et al. (2013) which showed that respondents in university area of Ogbomso had a positive attitude towards waste management as 82.0% agreed that waste disposal into drains and around the surroundings is unhealthy and can be disastrous to health.

Similarly, in a study aimed at turning waste into resources, community members in rural areas of Uganda, have a positive attitude towards organic solid waste (Ordonez, and Hogskola, 2014). They use it as mulches in their gardens especially banana plantations, cereal gardens



and coffee plantains. This adds a lot of value to their land through soil fertility from the decayed organic matter.

## **2.4 Practice of Community members towards solid waste management**

Practice refers to the ways in which they demonstrate their knowledge and attitudes through their actions (Eckman, K., 2008). Unsanitary disposal of wastes is a major environmental concern in the world and the current legislation system and waste management practices require numerous improvements and modification in order to meet the required standards. It is contended that such changes need to be accompanied by a community environmental education program designed to improve citizens' knowledge, attitudes and behavior (McGarity and Wojcik, 2000; Grodzinska and Jurczak, 2001).

### **2.4.1 Current Methods of Disposal of SW**

A study carried out by Abel, (2009) on an analysis of solid waste generation in a traditional African city: Ogbomoso, Nigeria showed that, several regions in the country use various means of waste collection initiated by both public and private sectors, although the effectiveness of this is largely a function of location. Where the collection is done by private sectors, it is a function of income of the owner of the waste to be able to pay the amount charged. Several systems of solid waste collection in Onitsha, though modern solid waste management systems were still solicited for.

Another study by Obionu et al, (2012) of poor waste management practices among residents of Owerri Municipal indicated that 66.3% of respondents practiced open dumping while 176 (62.4%) preferred to burn their wastes. These are not ideal since they constitute potential sources of infection, air pollution as well as constitute aesthetic blithe. Modebe et al. In a related study, showed that majority of the respondents in Awka (73%) disposed their waste through government waste management agency and only 27% dumped theirs in unauthorized area. This is an indication that the community members enjoy the benefit of existing strong and functional government waste management agency. A number of other studies in Nigeria and South Africa shown that majority of the respondents have a centralized place for dumping solid waste and the commonest means of transports of waste was by wheel barrow (Obionu et al, 2012)

In many cases non organic solid waste is improperly disposed because it does not decade or rot to produce stench. These mainly include; broken bottles, polythene bags, metallic material,

and other forms of fiber. Such waste is normally thrown in pit latrines or unused areas. Whole bottles are sold. Plastic bags are burnt. Less than 1% of the households reported selling broken bottles (Abel, 2009). The main reasons for this are that the quantities are too small to be traded and households do not know where to sell them. This practice is done because the community members are not aware of the dangers and the consequences of this bad practices couple with bad attitude towards the practices of solid waste management.

A number of studies found that the most popular methods of waste disposal known to the respondents were open dumping followed by burning while the least known method was incineration. This scenario is not very different from findings in other studies. Open dumping remains the simplest and the most commonly used method for disposing municipal solid waste (Aderemi et al, 2012). In most low to medium income developing nations like Nigeria, almost 100 percent of generated waste goes to landfills (Tarlор et al, 2006).

In spite of the recycling and composting of greater amounts of municipal solid waste in the United States in the last couple of years, the majority of waste generated still end up in landfills. While wastes are deposited in open dumps in developing nations; these have become obsolete in the developed countries. Sanitary landfills which are well engineered facilities (with liners, leachate collection/ treatment system, and gas collection system) are now used to ensure the protection of human health and the environment. These modern landfills are often under strict federal and state regulations and are therefore specially sited, designed and operationalized to ensure environmental performance (National Solid Waste Management Association, 2011).

However, it is different in some parts of Nigeria, where the unsanitary landfills are not subject to regulations, and are usually sited for convenience, such as the presence of a pre-existing hole (created from sand mining activities) into which waste could be deposited (Tarlор et al, 2006). In Lagos, Nigeria, some of these open pits are located near residential housing and therefore represent a threat to human health and the environment. Also a South African study has found that out of the 5 million tons of waste produced every year, only 5% is disposed of in designated sites, which implies that most of the waste in that country is deposited in environmentally unsafe sites (ogola et al, 2011).

A study showed that the major type of waste generated from households was food residues 271 (97.1%), followed by vegetable 269 (95.4%) (Adogu et al. 2011). Modebe et al. (2011) on household solid waste management in Awka found that the commonest type of waste

generated was garbage (100%), followed by cellophane bags (99%). In South Africa, household waste generated in the City of Johannesburg, 67% were household wastes, 23% from commercial activities and 10% industrial activities (Ogola et al, 2011).

#### **2.4.2 Availability of dustbins**

Czajkowski et al (2014) explored the two major ways in which solid waste can be sorted and recycled at the household level into different bins in accordance to the rules of waste management, when household are required to sort waste into a given number of categories, or in specialized sorting facilities. They also found that indicate that most respondents preferred to sort waste themselves if given the choice but they don't have the bins for sorting or they can have access to waste management bins.

The knowledge of participants did not lead to practice, so 66% of them did not segregate the solid wastes in differences bins, which agrees with studies carried out in Kermanshah and Industrial University of Isfahan (Rego Rde et al., 2002).

Communities in developing countries often turn to waste disposal methods that have proven to be destructive to human health and the environment, such as open dumping and burning (or unregulated landfills) because they feel they have no other options to manage their solid waste because they don't have the bins for putting the waste (Moghadam, et al., 2009 and Al-Khatib, et al., 2015).

Some households practice waste separation into different types of bins before disposal in different garbage bags (some of the separated solid waste is put in different corners not necessarily in plastic bags/bins or containers) (Castaldi, Kwon, et al. 2007). Waste is not separated after it's mixed up. Items which are thought that can be re-used or recycled are not mixed with the rest of the garbage. However, those households with adequate space normally throw waste in the backyard and remove plastics when the garbage is dry

In a study carried among town in Uganda, it was found out that, households mostly separate banana and potato peelings (81.7%), broken and whole bottles (18.3%), and plastic bags (17.6%). The bottles do not include beverage bottles (beer and soda) because households do not consider them as waste. The banana and potato peelings are either sold to urban farmers, or given out in exchange for taking away the solid waste. The peelings are also sometimes fed to their own animals. Only 4.7% of the households put the peelings in a pit (Toloko, 2008). The separation of peelings and making good use of them is a sign that with time there will be no peelings in the waste streams

### **2.4.3 Dumping of solid waste in drainage system**

Open dump of solid waste especially in the drainage is a common practice in Nigeria. While some employ the service of streams to transport their solid wastes out of their sight, some directly dump their solid wastes by the road sides or the tunnels in a drainage lines (Igoni, et al., 2007). Several Nigerians have considered it a cheap way of disposing off their solid wastes by setting the mixed wastes on fire in a little corner in their backyard or in a very open place or putting them on the drainage system.

### **2.4.4 Keeping of solid waste where people live/stay and Storage of SW**

Recent research on environmental concern and its implication to household waste separation and disposal in Ethiopia shows that a proper understanding of the relationships that exist between the environment, waste separation and disposal can contribute to good waste management and therefore, a cleaner and healthier environment (Tadesse, T., 2009). There are a number of factors that have been found to contribute to individual's behaviors concerning waste. The education level of household members, shorter distance to waste containers and household income are found to increase the probability of proper disposal of waste into containers (Tadesse, T., 2009). One common method that city households in developing countries use to get rid of their wastes is dumping in an unauthorized area and sometimes keeping with them since their disposal method is unlawful. This is done to allow them disposed it at a wrong place when the authority cannot see it (Tadesse, T., 2009).

Human wastes are great contributors of environmental health hazards. About 1.3 billion tons of waste are generated globally, 0.035% being generated by Nigeria. About 85.8% of Nigerian waste is generated by households (Izugbara et al, 2004). It is estimated that an average Nigerian in the urban or rural areas generates about 0.49 kg of solid waste per day with household and commercial centres contributing almost 10% of total urban waste burden. Of this about two thirds of wastes are dumped indiscriminately on the streets and in the drains thus posing serious environmental health hazards (Lawal et al, 2004)

One of the greatest challenges facing Malaysia is despite the massive amount and complexity of waste produced; the standards of waste management are still poor. These include outdated documentation of waste generation rates and its composition, inefficient storage and collection systems, disposal of municipal wastes with toxic and hazardous waste, indiscriminate disposal or dumping of wastes and inefficient utilization of disposal site space as most of the people keep the waste in the house as they wait for the waste collectors which is insufficient to cover

all the area at the rate fast enough to reach the rate at which the waste is produce (Agamuthu et al, 2007)

In practice, waste management interacts with city planning fundamentally from the source of waste generation: people and built environment. City planners' involvement in waste management, however, has been largely limited to the environmental field, with a focus on facility siting in particular (Farhan and Murray, 2006). In other words, waste management is commonly perceived as the "end-of pipe" of socioeconomic activities. Thus, current waste management programs have focused on disposal of the waste generated, instead of examining the sources of waste generation and the entire life cycle of waste materials and products.

#### **2.4.5 Role of authority/KCCA**

Traditionally, the municipalities have been in charge of providing SWM services in developing countries (Al-Khatib et al., 2009). Responsibility is to organize and manage the public sanitation system, including providing the infrastructure for the collection, transportation, treatment and disposal of wastes. However, with ever increasing population and economic growth, many municipalities in developing countries are struggling to keep SWMS working in a sustainable manner. Often they are ill managed or even cease to exist because of various social, institutional, and technical constraints which have resulted in hygiene and sanitation related diseases; such as diarrhoeal diseases (United Nations Environment Programme, 2011).

However in South Africa where domestic waste is collected weekly from households by the Municipality trucks. About 91.4% of our study respondents do not have licensed waste management firm in their area. To worsen an already bad situation, almost all the respondents (96.1%) have not had any formal training on waste management and 95.0% of respondents do not have waste management plan/policy provided by the local government area/council (Ogola et al, 2011).

Solid waste management should be everybody's responsibility in the community if disease spread is to be minimized. Attempts to improve solid waste management in Uganda have focused on the technical aspects such as the procurement of waste collection vehicles, the privatizing of waste collection services and the maintenance of the landfill. In spite of these interventions, the problem of the poor disposal of solid waste still persists in Kasokoso village. This has also resulted into, infant mortality, and stagnant growth in children and family

income constraints due to loss of time for work, comorbidities and high expenditure on health, and increased health care sector expenditure. The factors behind this poor solid waste management are yet unknown. There is therefore need to study the community members' knowledge, attitude and practice towards solid waste management which prompts the researcher to carry out this study.

## **CHAPTER THREE: METHODOLOGY**

### **3.0 Introduction**

This chapter describes the methods that were employed to carry out the study. It highlights the research design, study area, study population, sample size determination and sampling technique, the data collection tools, data management and analysis procedure, as well as quality control issues, limitation of the study, and plan for dissemination of study findings

### **3.1 Research Design**

The study was a descriptive cross sectional study design involving both quantitative and qualitative methods in assessing the knowledge, attitude and practice of Kosokoso community members towards solid waste management. A cross-sectional study design is preferred because it enables collection of data from the research respondents in a single and relative period and allows the researcher to elicit information about a given phenomenon from the respondents' perspective. The quantitative methods was selected as convenient in assessing the knowledge of the respondents while the qualitative method enhanced the quantitative methods

### **3.2 Study setting**

The study area was Kasokoso village located in Mbuya, Wakiso district, in the eastern part of Kampala, which is Uganda's capital city. The village lies approximately 6 kilometers, East of Kampala's central business district, and is bordered by Bweyogerere, Nakawa, Mutungo and Kirinya. The area is occupied by people from different tribes with a lot of economic activities. The area is mostly slums, with very poor drainage systems and flooding during the rainy periods.

### **3.3 Study population**

This consisted of residents of Kasokosoko village, Kireka parish. It has a mixed population made up of different tribes such as the Buganda, Acholi, Busoga, Bukiso, Madi, Bikiga among others; with the major activities in the area being both small scale and large scale business, industrial work, building, gambling. Generally the community has low level of education and most of the community is low income earners.

### 3.4 Selection criteria

#### 3.4.1 Inclusion criteria

The study included all household heads of residences of Kasokosoko village who were be above 18 years of age, those found at home during the time of study and who consented to participate in the study.

#### 3.4.2 Exclusion criteria

The study excluded those household heads of residences of Kasokosoko village who did not suit the above criteria and those who blind or deaf or too sick to participate in the study and those who did not consent to take part in the study.

### 3.4 Sample Size and Selection

Sample size was determined by the Slovenes formula.

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

Where; n = number of Sample

N = Population size, Kasokoso village has an estimated adult population of 30,000 people (David Mugalya et al, 2013).

E = standard margin of error at 95% CI

$$n = 30,000 / \{1 + (30000 \times 0.05^2)\}$$

$$n = 30000 / \{1 + 75\}$$

$$n = 30000 / 76$$

$$n = 394.7368$$

$$n = 395$$

### 3.5 Sampling Technique

Simple random sampling used in order to give an opportunity to every village member who meets the inclusion criteria to have equal chances of being selected for participation and take part in the study without any preference. The participants were obtained by going to local council getting the list of total number of members whereby random sampling was done by listing all the household heads in the village. After that, pieces of papers were folded and put into bucket from where each name was picked and recorded. The pieces of paper containing



the names of the households were folded and put back for another to pick then picked name is repacked. The process is repeated until the required sample size is reached.

### **3.6 Data Collection Instruments**

The study used structured researcher-administered questionnaires, a Focus Group Discussion Guide and observation checklist as the tools to collect data for the study. Structured questionnaires were used because they are straight forward to analyze, and simple to administer. The questionnaire was mainly be in English language since most of the respondents are well conversant with the language. For those who were not able to understand English, the questionnaires were verbally translated to the respondents during the interview.

The study also used focus group discussions guide during the interviews to rate respondent reaction on the face and not verbal cues, there were three focus group of at-least 8 people

The study also administered some interview guide to some of the local leaders. This was done through administering interview guide to the key informant interviews.

Management of solid waste in the household was confirmed by visual check by the interviewer. Items of interest included; waste collection, storage and disposal.

### **3.7 Data Collection Procedure**

Prior to data collection, two research assistants were hired and trained to help in data collection, translation of tools and identifying information from respondents to ensure confidentiality. The researcher first sought for the approval from Local council 1 Chairperson before the data collection; the research team was then move around the homes of the randomly selected participants. On reaching the home, the household head was selected; the purpose of the study explained and then consent to participate in the study sought. A structured questionnaire with closed ended questions was administered to get the required information from the respondents. Strict confidentiality of all information received were assured to the respondent before interviewing. There were three focus groups made up of at-least 8 members. The groups were formed according to the three sub-village in the area. The information from each group was tape recorded and some of the point were noted down. The recording was done after asking for consent.

### **3.7 Data sources**

#### **3.7.1 Primary data sources**

The study involved primary data which was gathered with the use of structured researcher-administered questionnaires from the respondents.

#### **3.7.2 Secondary data sources**

The information was got from textbooks, periodicals, internet, SWM related articles and news coupled with SWM among other sources.

### **3.8 Study Variables**

#### **3.8.1 Dependent Variables**

The dependent variable in this study was solid waste management.

#### **3.8.2 Independent Variables**

The independent variables include; knowledge, attitude toward solid waste management.

### **3.9 Data Management**

The completed researcher-administered questionnaires were cross checked at the end of each day to ensure correctness and completeness of the data. Coding was made for each questionnaire.

The qualitative data from focus group discussion was transcribed, coded into themes. It was developed a thematic framework from the priority themes and emergent themes. This was then be applied to the data to sort the data according to the themes and objectives.

### **3.10 Ethical considerations**

An introductory letter from International Health Sciences University (IHSU), School of Nursing (SON) was obtained. Permission was sought from the University' Research and Ethics Committee, the local administration of Kasokosoko village as well as from the respondents with explanations on how the research contribute towards a healthy population. Privacy, confidentiality and dignity of the respondents were considered during the research. Codes were used in the questionnaires. A study informed consent form was signed by each respondent to ensure voluntarism and acceptability to participate in the study. No

compensation either financially or materially was given to the respondents for their participation in the study.

### **3.11 Quality Control Issues**

Before data collection, the questionnaires was pre-tested among residents known to the researcher, of Namuwongo Zones where there is also a problem of solid waste management. This was done to ensure that all the research related questions are adequately covered by the questionnaires. And this helped to make necessary adjustments before study is carried out.

### **3.12 Data analysis**

After data collection, the data was stored and a backup made. Data was first be entered in Epiinfo then further analyzed using Statistical Package for the Social Sciences (SPSS) version 20 software, to provide a detailed analysis and cleaned to minimize errors. Descriptive statistics was then used to summarize the data where by it was presented by mean of frequencies, percentages, pie charts and bar graphs. Uni-variate analysis was done to have different statistical methods of interpretation that helped in coming up with better recommendations and conclusion from the study.

### **3.13 Limitations of the study**

The research anticipates facing the following challenges during the course of the study

- Some respondent may withhold information due stigma due to poor waste management in the households
- Unreliable weather conditions may also hinder the researcher's movements and thus could delay the study completion.

### **3.14 Dissemination of the study results**

After report writing, the study findings were submitted to International Health Science University, School of Nursing as a partial fulfilment for the award or bachelor's degree in nursing, to the local administrators of Kasokosoko village and other important stakeholders.

## CHAPTER FOUR: PRESENTATION OF RESULTS

### 4.0 Introduction

This chapter presents the findings following the critical analysis on the data collected. It specifically presents the findings related to knowledge, attitude and practices of Kasokoso Community members towards solid waste management between June 2016 and July 2016.

### 4.1 Demographic characteristics of the respondents

*Table 1: Demographic characteristics of the respondents (N=395)*

	<b>Frequency, N</b>	<b>Percentage, %</b>
<b>Gender</b>		
Male	156	39.5
Female	239	60.5
<b>Age</b>		
18-24	99	25.1
25-34	207	52.4
35-44	82	20.8
>45	7	1.8
<b>Education level</b>		
No education	71	18.0
Primary	205	51.9
Secondary	95	24.1
Tertiary	24	6.1
<b>Religion</b>		
Catholics	186	47.1
Anglican	96	24.3
Moslems	89	22.5
Others	24	6.1
<b>Region of origin</b>		
Central	147	37.2
Eastern	103	26.1
Western	82	20.8
Northern	63	15.9
<b>Number of members in the household?</b>		
1 to 4	225	57.0
>4	170	43.0
<b>Duration of residency in the area</b>		
≤1 year	80	20.3
>1 to ≤5 years	204	51.6
>5 years	111	28.1
<b>Occupation</b>		
Formally employed	90	22.8
Unemployed	171	43.3
Informally employed	124	31.4
Students	10	2.5

As shown in Table 1 above, a total of 395 respondents consented and were recruited into the study. Females constituted a majority of study population with 60.5%. The mean age of the

respondents was 34.5 years, with the age group of 25-34 constituting the majority (52.4%) while age group of 18-24, 35-44 and 45 years and above comprised of 25.1%, 20.8% and 1.8% respectively. In regard to level of education, 51.9% of the respondents had attained primary level of education, 24.1% had attained secondary level of education, while 18.0% had not attended to schools and only 6.1% had attained tertiary and university level of Education. In regard to religion, 47.1%, of the respondents were Catholics compared to 24.3% who were Anglican, 22.5% who were Moslem while other religions comprised of 6.1%.The study also indicated that 37.2% of respondents originated from central Uganda, 26.1% from eastern Uganda, 20.8% from western Uganda and 15.9% from the northern part of the country. In addition, from the results, more than half of respondents, (57%) had one to four members in the household while 43% of respondents' households were occupied by >4 members. The analyses on duration of residency revealed that the majority, 51.6% had stayed in the area for >1 to ≤5 years, while 20.3% and 28.1% had stayed for less than one year and more than five years respectively. Finally, majority of the respondents (43.3%) were unemployed, while the informally employed were 31.4%, formally employed were 22.8% and 2.5% reported to being students.

## 4.2 Level of Knowledge of Kasokoso Community members towards solid waste management

Table 2: Knowledge of the Respondents toward solid waste management (N=395)

Variable	Frequency, n	Percentage, %
<b>Heard about solid waste:</b>		
Yes	211	53.4
No	184	46.6
<b>Heard about solid waste management</b>		
Yes	148	37.4
No	247	62.6
<b>Water pollution causes typhoid fever, cholera and dysentery</b>		
True	207	52.4
False	188	47.6
<b>Accumulation of toxic substances in food chain through the plant and animal that feed on it.</b>		
True	184	46.6
False	211	53.5
<b>Breeding place of flies</b>		
True	192	48.6
False	203	51.4
<b>Flies cause the occurrence of intestinal worms</b>		
True	193	48.9
False	202	51.1
<b>Occurrence of air pollution thereby causing respiratory diseases</b>		
True	270	68.4
False	125	31.6
<b>Rodent attractions</b>		
True	259	65.6
False	136	34.2
<b>Multiplication of microorganisms, fungi, bacteria viruses</b>		
True	259	65.6
False	136	34.2
<b>Chemical and radioactive hazard exposure</b>		
True	172	43.5
False	223	56.5
<b>Cause Hepatitis</b>		
True	174	44.1
False	221	55.9

Table 3 above shows that slightly more than half of the respondents (53.4%) had heard about solid waste, as (62.5) reported having not heard of solid waste management. Regarding knowledge on consequences of poor solid waste management, 52.4% of the respondents admitted that improper waste management pollutes the sources of water thus causing typhoid fever, cholera and dysentery. However 53.5% of the respondents reported as false that direct

dumping of untreated waste in water bodies results into toxic substances in food chain, and 51.4% did not know that dirty environment breeds flies which precipitate the occurrence of dysentery and diarrhea. The study further revealed that 68.4% knew that improper waste management results into air pollution thereby causing respiratory diseases;. 65.6% that improperly managed waste attracts rodents such as rats and mites, which transmit diseases like plaque and Lassa fever; as the same percentage agreed that improper waste management causes the multiplication of microorganisms, fungi, bacteria viruses which affects human health. Finally, a considerable majority of the respondents (55.9%) did not know that improperly managed waste when washed into sources of water causes hepatitis as 51.1% of the respondents did not know that flies cause intestinal worms. This is confirmed further from the FGD:

*“Yes, we have heard about solid waste management, according to the sensitization on TV and radio as well as local leaders have been giving us such information; they say that solid waste can be very dangerous to the environment as much as to human health. If not proper managed”*

*(Respondent in FGD)*

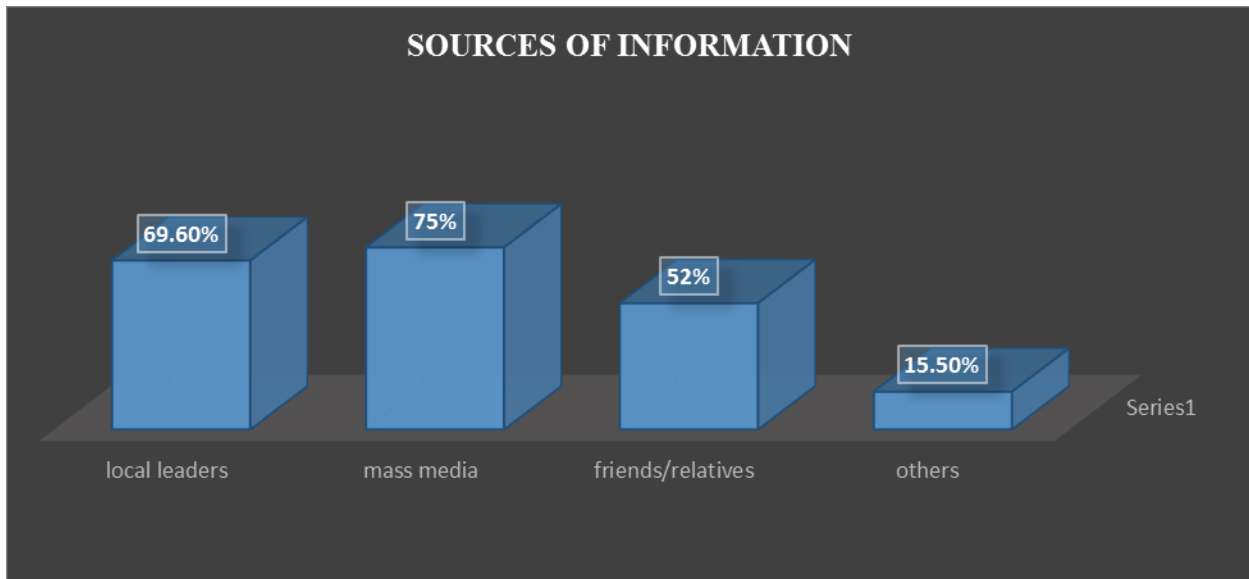
Likewise, another respondent had this to say:

*“Poor waste management is very dangerous especially to the environment and because of its bad smell. Here all the waste are carried on a bicycle and we pay the person some little money.”*

*(Respondent in FGD)*

#### 4.2.1 Sources of information on solid waste management

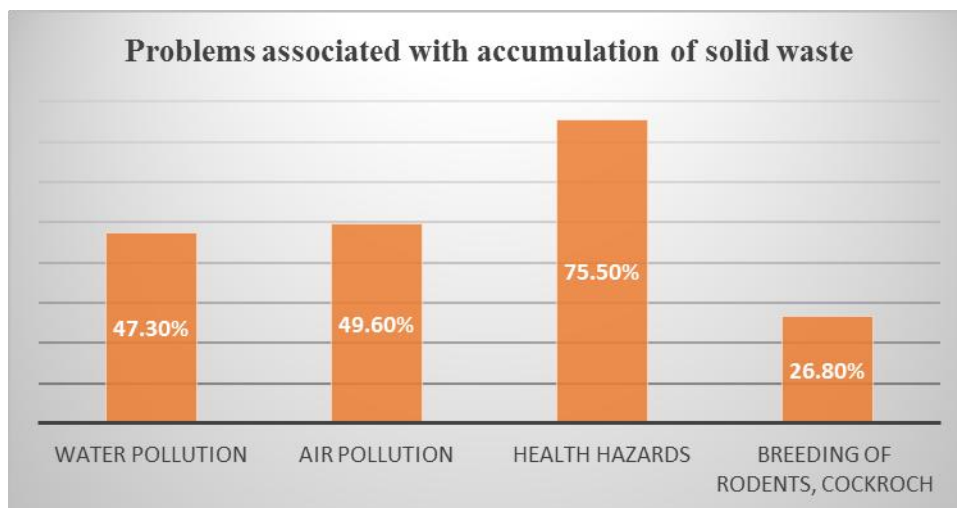
Figure 2: Sources of information on solid waste management to the Respondents



In regard to sources of information, among the respondents who heard about solid waste management, the results show that 75% of them got the information from mass media such as radio, TV, newspapers, 69.6% got information from local leaders, 52% from friends/relatives and 15.5% from other unspecified sources.

#### 4.2.2 Knowledge on Problems associated with solid waste accumulation

Figure 3: Knowledge on Problems associated with accumulation of solid waste



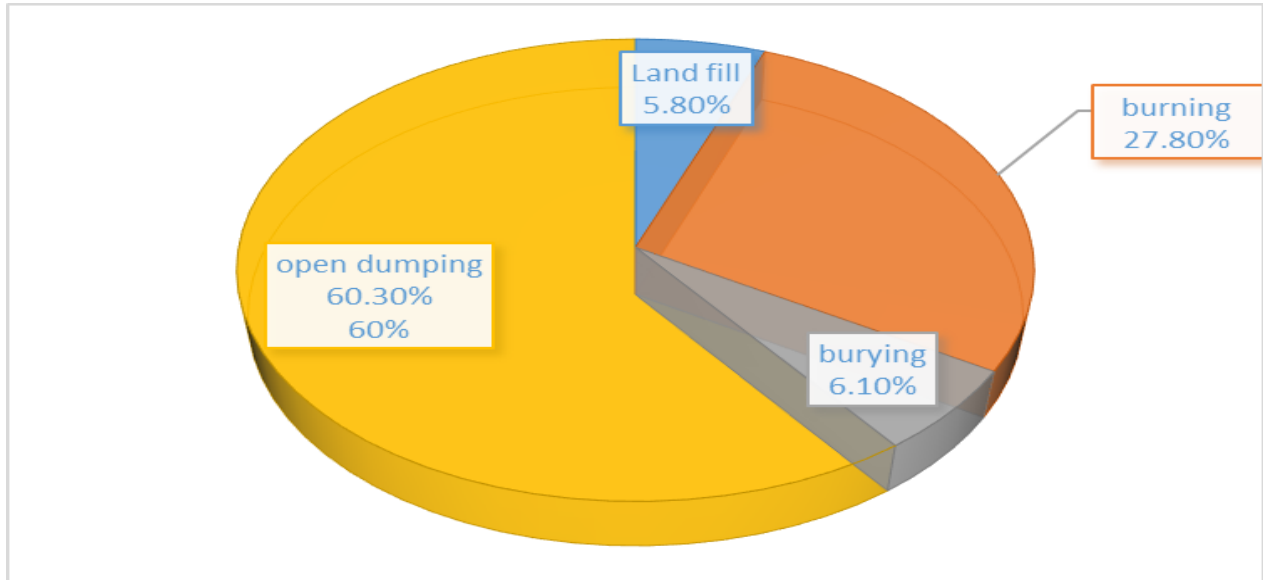
From figure 2, a significant numbers of respondents, (75.5%) reported that accumulation of solid waste is linked to health hazards, 49.6% linked solid waste accumulation with air



pollution, 47.3% said accumulation of solid waste cause's water pollution and only 26.8% mentioned that accumulation of solid waste attracts rodents, and cockroaches.

#### 4.2.3 Knowledge on Waste management methods

Figure 4: Knowledge of respondents on different methods of solid waste management



In regards to knowledge of the commonest solid waste management methods, 60.3% of the respondents knew about open dumping, 27.8% knew about burning of waste, 6.1% knew about burying and 5.8% knew about land fill method.

### 4.3 Attitude factors of Kasokoso Community members towards solid waste management

Table 3: Attitude of the respondents towards solid waste management

	Frequency, n	Percentage, %
<b>Proper solid Waste Management is important</b>		
Disagree	177	44.8
Not sure	50	12.7
Agree	168	42.5
<b>Solid waste is dangerous to human health and the environment</b>		
Disagree	205	51.9
Not sure	41	10.4
Agree	149	37.7
<b>Solid waste management is government responsibilities</b>		
Disagree	179	45.3
Agree	216	54.7
<b>Worry about solid wastes in your environment</b>		
not worried	116	29.4
Worried	212	53.7
Very worried	67	17.0
<b>Interested solid wastes management</b>		
Not interested	115	29.1
Interested	227	57.5
Very interested	53	13.4
<b>Neighbors ways of managing solid waste importance to me</b>		
Not important	134	33.9
Important	219	55.4
Very important	42	10.6
<b>Satisfied with the way neighbors dispose their solid wastes</b>		
Very dissatisfied	124	31.4
Dissatisfied	212	53.7
Satisfied	59	14.9
<b>Satisfied with the way solid wastes are handled by Authority, Kiira town council</b>		
Very dissatisfies	80	20.3
Dissatisfied	203	51.4
Satisfied	89	22.5
Very satisfied	23	5.8

According to Table 3, 44.8% disagreed that proper solid waste management is important while 42.5% agreed that solid waste management is important. On the same aspect, 51.9% of the respondents disagreed that solid waste is dangerous to human and human health. The majority of the respondents (54.7%) agreed that solid waste management is the work on the

government. Furthermore, most of the respondents (53.7%) were worried about solid waste issues in their area, 57.5% mentioned that they were interested in solid waste management. 55.4% said it is of importance, as 53.7% were dissatisfied with the ways their neighbors disposed of their solid waste. In addition, the study revealed that as many as 51.4% were dissatisfied by the way solid wastes are handled by Kiira Town Council.



*Photo showing collection bags and on the right is street dumping of waste*

#### 4.4 Respondents' practices of solid waste management

Table 4: Practices towards solid waste management among residents of Kasokosoko

	Frequency, n	Percentage, %
<b>Household solid waste collection method</b>		
In a bag inside closed container	7	1.8
In a bag inside open container	9	2.3
In a closed container	11	2.8
In an open container	26	6.6
In a bag	342	86.5
<b>Elimination of household solid waste</b>		
Throw it in the nearest container/drainage /street	110	27.9
Place it outside door when collectors pass	260	65.8
Place it in the street when bag is full	25	6.3
<b>Segregate solid waste</b>		
Yes	49	12.4
No	346	87.6
<b>Kind of waste separated from other household</b>		
Metal	12	3.0
Glass bottles	41	10.4
Paper and cartons	28	7.1
Batteries	14	3.5
Plastic containers	289	73.2
Organic materials	5	1.3
Medical waste	5	1.3
Textiles	1	.3
<b>Waste reuse (multiple Responses)</b>		
Glass bottles	27	6.8
Computer CDs	78	19.7
Paper and cartons	69	17.5
Plastic containers	65	16.5
Organic materials	60	15.2
Textiles	96	24.3
<b>Current method of disposing solid waste</b>		
Open burning of waste	60	15.2
Landfill site	311	78.7
Composting waste	23	5.8
Incinerator	1	.3
<b>Frequency of waste disposal in a week</b>		
Every day	15	3.8
Every alternate day	156	39.5
Once a week	224	56.8
<b>Centralized dumping site</b>		
Presence of centralized dumping site	291	73.7
Absence of centralized dumping site	104	26.3
<b>Method of transportation of solid waste</b>		
Hand carrying	46	11.6
Wheel barrow	20	5.1
Others (bicycle )	329	83.3

As shown in the table 4 above, a vast number of respondents, (86.5%) collected their waste in a polythene bag (kavera). The commonest way of elimination of waste (65.8%) was placing the waste outside the door when the rubbish collectors' passed; only 6.3% of the respondents reported placing the waste in the street when the bag was full.

Regarding segregation, 87.6% of the respondents did not segregate solid waste compared to only 12.4% who segregated waste during generation. Most of the respondents (73.2%) reported that they separated plaster containers such as water bottles from other wastes. Concerning the methods of disposal, 78.7% of the respondents reported disposing their waste in open land fill while open burning of waste, composting waste and incineration of waste were 15.2%, 5.6 and 0.3% respectively. 56.8% said they dispose of the waste once a week compared with 39.5% who dispose of their waste every alternate day and 3.8% dispose of the waste every day. The analysis also revealed that 73.7% of the respondents had a centralized dumping point compared to 26.3% who said there was no centralized dumping point and that the main methods of waste transportation was bicycles (other) 83.3% while hand carrying and wheel barrow were 11.6% and 5.1% respectively

This is confirmed from a FGD:

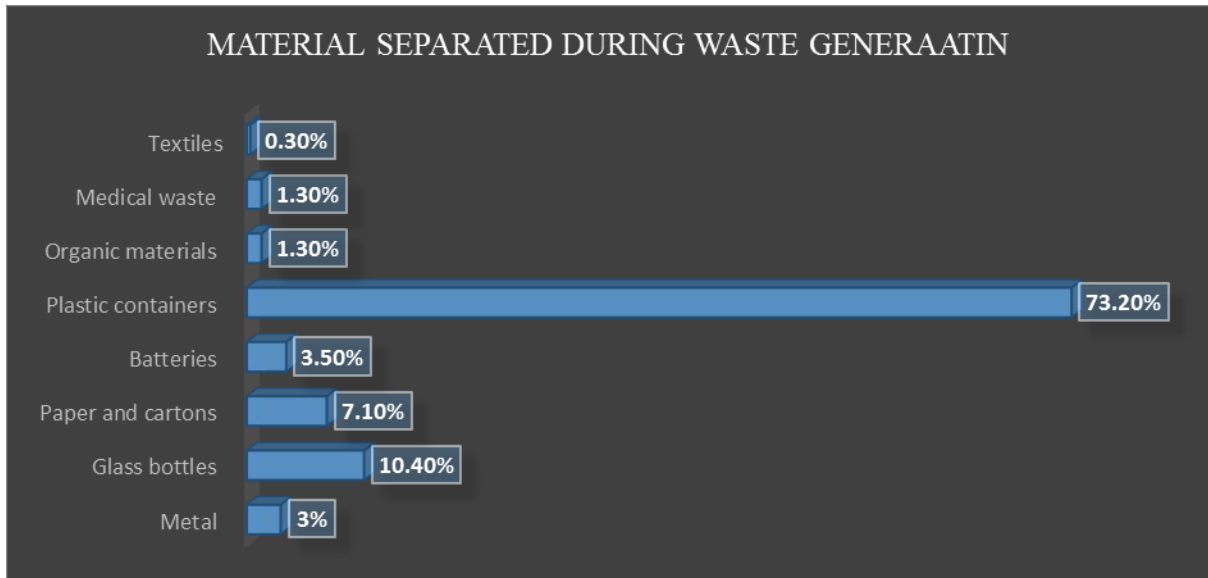
*‘There were no bins in any form, the waste are put in the bags and mostly transported on a bicycle’*



*Photo showing how solid waste is transported in Kasokosoko, Kiira Town council*

#### 4.4.1 Kind of waste separated from other household

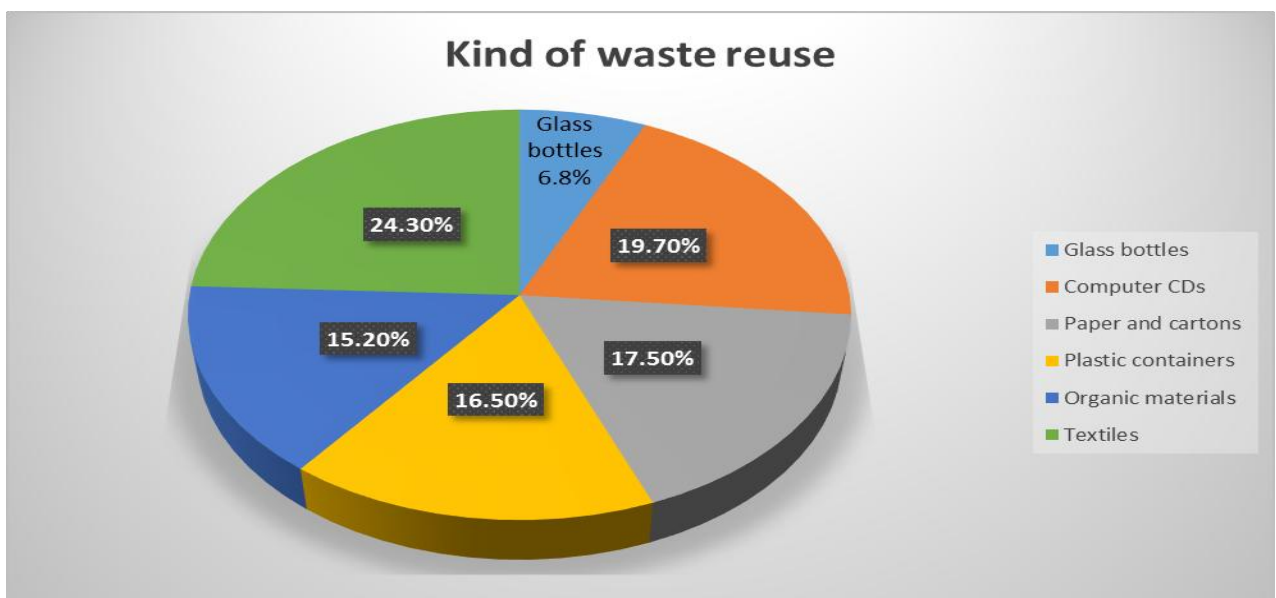
Figure 5: showing the kind of waste separated from other household



The majority of the respondents (73.3%) separated plastic containers from other waste. The other solid waste that was separated comprised: glass bottles, batteries, metals organic waste, medical waste, and textiles each comprising of 10.4%, 3.5%, 3%, 1.3%, 1.3, and 0.3 respectively.

#### 4.4.2 Waste reused

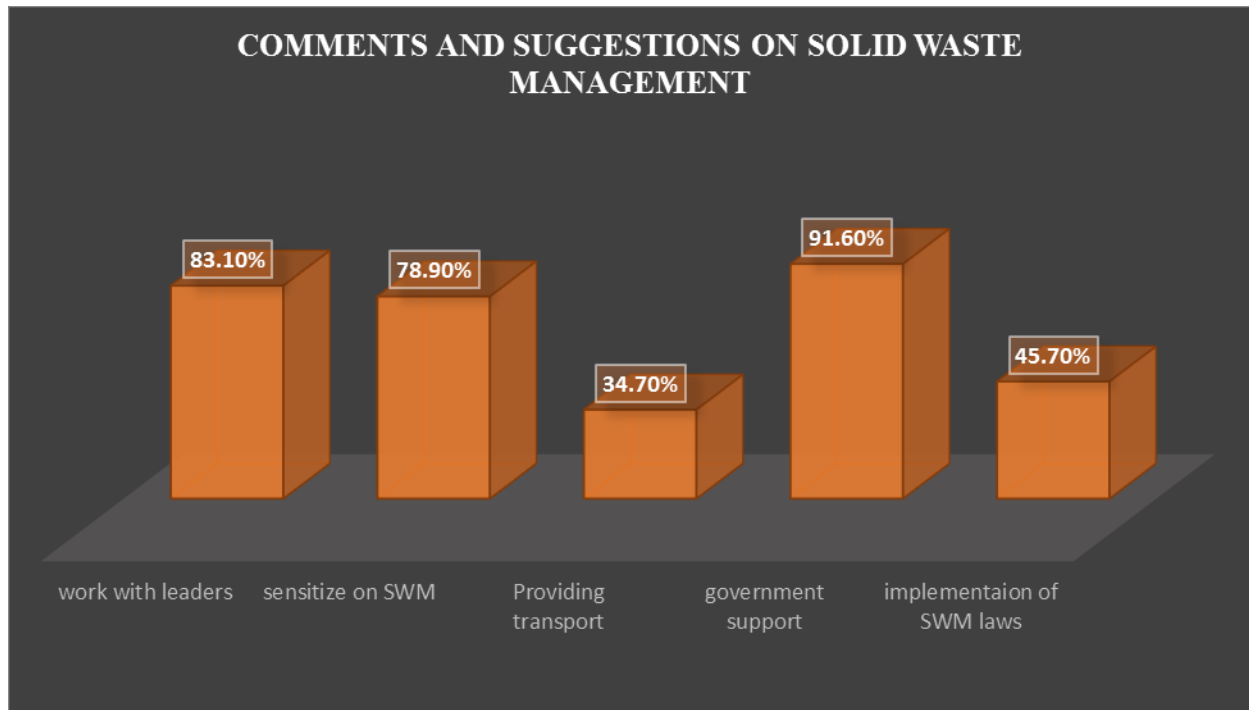
Figure 6: Waste reused by the residents in Kasokosoko village



According to figure 5, 24.3% of the respondents reported that they reused organic materials. The other materials reported to be reused among the respondents were computer CD, paper and cartons, plastic containers, and glass bottles each composing of 19.7%, 17.5%, 16.5%, 15.2% and 6.8% respectively

#### 4.4.3 Suggestion to improve solid waste management

Figure 7: Respondents' suggestions on ways to improve solid waste management



When asked for suggestions on solid waste management in Kasokoso, almost all the respondents (91.6%) stated that the government through the local government should support the community on solid waste management, while 83.1% of the respondents said the local community should work hand in hand with the local authority in such ways as organizing meetings and sharing ideas. Over three quarter of the respondent suggested that the community should be sensitized and given health education on solid waste management and importance of proper solid waste management as well as dangers of improper solid waste management. On the other hand, 45.7% of the respondents wanted strict laws to be implemented on those who put their household waste any how in the drainage and streets as 34.7% of the respondents wanted the government to provide closed trucks to pass around picking waste from the homes

One respondent emphasized this issue further;

*“We also know that waste is not managed well, people place waste in the drainage and street in the night. Trucks used to come and pick waste, but they stopped. KCCA said that they will continue to send their trucks but since then we have not seen any truck”.*

*(Respondent in FGD)*

### **Final dumping of waste at Kasokosoko village**



**Photo showing open burning of solid waste and a landfill dumping site**



## **CHAPTER FIVE: DISCUSSION**

### **5.0 Introduction**

This chapter discusses the research findings in relation to the problem statement, specific objectives, and literature review of studies conducted elsewhere.

### **5.1 Knowledge on solid waste management**

From the study, only four in every ten of the respondents had ever heard about solid waste management, which includes segregation, recycling and reuse. This could probably be because of low level of sensitization of the community on solid waste management. This finding is not in line with a study by Gakungu, (2011) whereby 81.6% of the respondents had heard about solid waste management including recycling; and Banga (2008) which stated that 60% of the respondents had ever heard of the segregation of solid waste in the SWM procedure. The difference in the study findings is likely to be due to the different settings within which the studies were undertaken. Whereas, this current study was done in a slum area, the other two studies were done in urban settings where most the occupants were elite.

Out of the respondents who heard about solid waste management, a significant 75% of them got the information from mass media such as radio, TV, newspaper which makes it clear that mass media is the main source of information for most of the people in Kasokosoko, Kampala and the surrounding areas. This however, does not concur with Gakungu, (2011) that the main source of information was from scrap dealers with the least being relatives and friends, radio, newspapers and magazines. This different may be due to the fact that most of the respondents do not take waste management as a serious matter and even those who buys scrap do not talk much about the waste management. Relatedly, Banga (2008) found out that, 39% of the households had heard of solid waste segregation from friends and relatives, 30% from the itinerant buyers, and only 27% from newspapers and magazines. Although it is suprising that none of the respondents directly mentioned health workers as the sources of information, (and yet these are the guardians of the health of the community), the use of mass media such as radios, televisions, newspapers, magazines and teaching SWM in schools if done by health workers, may facilitate better the change of the attitudes, practice and perception of the community towards SWM.

Regarding the level of awareness about solid waste management methods, there seemed to be appreciable awareness and knowledge about waste disposal among the respondents as a considerable 60.3% of the respondents knew about open dumping, although only 27.8% knew about burning of waste. This somehow concurs with a study by Ayodeji et al, (2012) which found that moderate awareness and knowledge about waste disposal among the respondents, was only limited to the crude and traditional methods and not the modern methods such as incineration and recycling. This implies that the level of awareness is moderate but there is still need to sensitize the residents more. Environmental knowledge and attitudes of households should further be examined through surveys in order to understand their behaviour and how to encourage the waste separation and recycle at waste generating sources.

Concerning the problem of household accumulation of solid waste, 75.5% of the respondents said it is linked to health hazards with diseases like cholera, dysentery among others mentioned, 49.6% linked solid waste accumulation with air pollution, 47.3% said accumulation of solid waste causes water pollution and finally 26.8% agreed that accumulation of solid waste attracts rodents, cockroach. This is similar to Mukui et al, (2013) whose study indicated that the majority of the respondents were aware about the health hazards associated with incorrect solid waste management. Similarly, Ratni et al, (2014) also stated that increased knowledge about types of diseases spread and types of hazardous waste among the respondents implying that knowledge of the respondents is good. This implies that people will be exposure to illness associated with poor waste management as waste accumulation create breeding place for flies that transmits diseases such as diarrhea in the area.

## **5.2 Attitude towards solid waste management**

The study established that the majority of the respondents had negative attitudes towards solid waste management. Firstly, a significant 54.7% actually remarked that solid waste management as the work of the government through the local leaders, meaning that the participants had wrong attitude on solid waste management. This is not surprising as Nixon and Saphores, (2009) concurred that waste management was sole responsibility of urban councils. Similarly, Al-Khatib et al., (2009) urged that traditionally, the municipalities have been in charge of providing SWM services in developing countries. Secondly, the majority of the respondents agreed that solid waste management is not important and that they would not

waste their time collecting and disposing waste or attending garbage meetings instead of engaging in income generating activities as well as boozing. These findings are similar to a study by Giusti, (2009) that indicated that there was negative attitude towards solid waste management, as community members preferred engaging in other personal issues like crime, unemployment, and managing the cost of living as more important than a garbage-free community.

The above findings could probably be because most people in the community are generally of low economic status and somehow feel there are a lot of more serious issues with immediate impact compared to solid waste management which has a long term effect. This implies that the community members need to be educated on the fact that regardless of KCCA's responsibility to organize and manage the public sanitation system, including providing the infrastructure for the collection, transportation, treatment and disposal of wastes, they as residents have a major contribution in the process on solid waste management.

Furthermore, more than half of the respondents disagreed that solid waste is dangerous to the health and to the environment. This is detrimental to human health. Although the reasons for this negativity were beyond the scope of the study, low level of education and insufficient health education on solid waste management among the residents of Kasosoko could be having direct influence on their attitudes. In contrast however, Adoguet al (2011) and Ordonez and Hogskola, (2014) both reported different findings that indicated that respondents had positive attitude towards solid waste management with 97.5% of the respondents agreeing that proper waste disposal can better their health while 98.9% reported that the practices of waste management was of great importance and 82.0% indicated that waste disposal into drains and around the surroundings is unhealthy and can be disastrous to health respectively. The difference in the findings could be due to the differences in the level of education of the two study populations, whereby while the Kasokoso study population had low of education limited to attainment of only primary level of education, in comparison the other studies comprised of participants who had attained higher level of education.

Nevertheless, poorly managed waste especially in Kasokosoko community has serious consequences as it not only brings bad smell, becomes a breeding place for flies and rodents that cause disease but is the reason why, the community members of Kasokoso village are at

risk of contracting different diarrhoeal diseases especially among children less than 5 years (Nabukwasi, 2016). This has also resulted into increased health care sector expenditure, infant mortality, and stagnant growth in children and family income constraints due to loss of time for work, comorbidities and high expenditure on health. Eckman, K., (2008) concurs with this, that unsanitary disposal of wastes is a major environmental concern.

In spite of the wrong attitudes, it is interesting to note that more than a half of the respondents mentioned that they were worried about solid waste in the environment, were dissatisfied by the way their neighbors managed the solid waste; and the way solid wastes are handled by KCCA in Kosokoso in Kireka. This implies that if there was increased sensitization of individuals as well as the community at large by health workers and/or government about the poorly managed waste this could make the Kasokoso residents improve the way waste is managed in the area.

### **5.3 Practices of solid waste management**

From the study, the commonest practice of solid waste management included disposal of waste in land fill (open dumping) and waste generated from each household being taken by waste collectors at a small fee. This implies that there was presence of centralized dumping points and bicycle was the means of solid waste transportation. As Tadesse, T., (2009) observed, this finding is one common method that city households in developing countries use to get rid of their wastes mainly by either dumping in an authorized area, unauthorized open area, drainages and/or sometimes keeping with them until a waste collector comes to pick it. This is in spite of the fact that they perceive fairly well that some of the disposal methods are unlawful.

As analyzed by Blakely and Leigh, (2010), people throw garbage on the streets and in the drains and gullies because they have no other means of getting rid of (disposing of) their garbage and do not feel irritated by the behavior. In Uganda, it is also likely that many community members in slum areas are not aware of other modern SWM methods including recycling method. For instance, few of them know that, recycling and reuse may reduce the use of raw materials and energy, and minimize the footprint of production and consumption (KCCA, 2015). Similarly, Aderemi et al, (2012) and Igoni, et al., (2007) concur that open dumping of solid waste especially in the drainage is a common practice followed by burning while the least known method was incineration. This implies that the government through

KCCA should ensure the provision of readily available authorized ‘dumping sites’ or vessels for residents to act as recognized means of dumping their waste, as by this, waste disposal practices would have been improved.

Solid waste segregation was the least practiced process among the respondents and only plastic containers were the only waste which was segregated. As previously observed by Castaldi, et al. (2007), most households do not practice waste separation into different types of bins before disposal in different garbage bags; as in reality some of the separated solid waste is even put in different corners not necessarily in plastic bags/bins or containers. This implies there is no waste segregation and the community need to be taught the importance and purpose of waste segregation. Of course the ideal alternative to enhance waste collection is, as reported from the FGDs, for communities to be provided trucks for collecting waste.

*“We request the government to provide trucks to help collect the waste and the strict Rules should be put on people who just place the waste in the streets.”*

(Respondent from FGD)

Ogola et al, (2011) concurs that domestic waste is collected weekly from households by the Municipality trucks and taken to a central dumping point. The problem incurred was the breakdown and non-replacement of the KCCA trucks. To make matters worse, even the private trucks that used to pick waste once you a fee was paid were stopped. Furthermore, according to observation checklist and FGD, most of the respondents mentioned that the government does not care about them and so their suffering is because they are staying there illegally, after the government several attempts to get them evicted from the area.

If the above factors are not addressed, there continues to be poor solid waste management in Kasokoso, the residents especially those living close to the dumpsite are exposed to environmental and disease risks. This concurs with Al-Khatib et al, (2015). Worse still, the disposal sites are, in most cases, located in environmentally sensitive, low-laying areas such as wetlands, forest edge or adjacent to bodies of water. They often do not have liners, fences, soil covers and compactors which put the people at risk of diseases (Troschinetz and Mihelcic, 2009). As urged by Toloko, (2008), KCCA should contract private companies to manage solid waste collection so as to improve the cleanliness and community health of not only Kasokoso area but the city at large. This also means that there should be a proper place to segregate,

disposed of the solid waste and carry out waste treatment. As a matter of urgency, in Uganda, the current legislation system and waste management practices require numerous improvements and modification in order to meet the required standards.

## **CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS**

### **6.0 Introduction**

This chapter presents the researcher's conclusion and recommendations from the study.

### **6.1 Conclusions**

Knowledge:

Knowledge of the respondents on environment effect of poor solid waste management was low as most of the respondent reported as false that direct dumping of untreated waste in water bodies results into toxic substances in food chain, and more than half did not know that dirty environment breeds flies which precipitate the occurrence of dysentery and diarrhea

The knowledge on the solid waste effect on human was fair as majority of the respondents mentioned atleast a danger of solid waste accumulation.

Attitudes:

The attitude of the respondents in general was good since most respondents think that solid waste management is important and solid waste can be dangerous to human health.

Solid waste management was considered a worrying problems and the respondents had interest in the way solid was managed at the neighborhood.

Practices:

Solid waste management practices in the area was very poor as there were no bins to put the waste and waste were not segregated during generation and waste was also transport in an open bicycle and dumped in an open dumping site.

### **6.2 Recommendations**

The following recommendations were derived from the study and are classified in relation to important stakeholders that are in position to affect them. The researcher recommends that:

#### **6.2.1 Community leaders**

- Increase the level of the sensitization throughout the country in different languages to enhance knowledge on SWM and related topics even by the community to their masses.
- Sensitize their community on the poor culture regarding solid waste management as some community perceptions discourage proper SWM among the local community.

- Provide trucks and other means of domestic waste collections from the community in slum areas such as Kasokosoko for free or at a subsidized cost, to allow for all the waste be managed the authority of Kiira municipality
- With the help of the government should encourage and provide waste collection bins to the community to allow for proper segregation of waste at the generation process

### **6.2.2 Health department (health workers)**

- include a complete information on solid waste management that will allow them to make informed decision about the SWM in the community
- Carry out assessment on the effect of the SWM methods in the area and explain to the members the effects of the improper SWM to the environment and their health.

### **6.2.3 Policy makers**

- The ministry of health and other policy makers should properly implement laws concerning=unhygienic SWM methods such as dumping waste in the drainage and street among the community in Kasosoko.
- The use of private sectors in waste management is very important to effectively manage solid wastes in Kasokosoko and Kiira municipality since it has been proven to work well in those areas which private sectors are in practice.
- The use of mass media (radios, televisions, newspapers, magazines) and teaching SWM in schools will facilitate the change of the attitudes, practice and perception of the community towards solid waste handling.
- More research be done on factors that influence the solid waste management especially among slum community.



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## APPENDIX I: CONSENT FORM

### QUESTIONNAIRE ON ASSESSMENT OF THE KNOWLEDGE, ATTITUDE AND PRACTICES OF KASOKOSO COMMUNITY MEMBERS TOWARDS SOLID WASTE MANAGEMENT

**Interview code.....**

#### **Introduction**

My name is Kwagala Rhoda, a student from International Health Sciences University, Namuwongo pursuing a Bachelor's degree in Nursing Science. I am conducting a study on assess the knowledge, attitude and practices of Kasokoso Community members towards solid waste management. Basing on the fact that solid waste management is an important practices in preserving the environment and control spread of, it is important to assess the community k assess the knowledge, attitude and practices towards solid waste management to explain the challenges involved in the waste management.

You have been chosen to participate in the study and I request you to feel free in answering the questionnaire. You can drop out if you so feel like. Any information taken will be treated with maximum confidentiality. There is no risk in participating in this study.

This questionnaire is intended to find out responses to the issues raised above in an effort to establish the practices of solid waste management among community members in Kasokosoko village. By participating, you will have contributed to proper planning and provision of essential necessities in the management of solid waste in this community. Your response to the questions below will be highly appreciated.

#### **Statement of consent**

This is to certify that to the best of my knowledge, I have read and understood the contents of the above information and I have willingly accepted to participate in the study freely

**Respondent's** **signature.....**

**Date.....**

**Researcher's** **signature.....**

**Date.....**



S/N	Variables	True	False
5	Improper management of waste pollutes the sources of water and cause typhoid fever, cholera and dysentery		
6	Direct dumping of untreated waste into rivers, seas and lakes results in accumulation of toxic substances in food chain through the plant and animal that feed on it.		
7	Dirty environment breeds flies which precipitates the occurrence of dysentery and diarrhea		
8	Flies cause the occurrence of intestinal worms		
9	Improper waste management precipitates the occurrence of air pollution thereby causing respiratory diseases		
10	Improper managed waste attracts rodents such as rats and mites, which transmit diseases such as plaque and Lassa fever		
11	Improper waste management attracts the multiplication of microorganisms, fungi, bacteria viruses which affects human health		
12	Co-disposal of industrial waste with municipal waste exposes people to chemical and radioactive hazard		
13	Improper managed waste when washed into sources of water causes hepatitis		

What do you think can be done to improve the knowledge on SWM?

.....

**PART THREE: ATTITUDE OF THE RESPONDENTS ON SOLID WASTE MANAGEMENT**

S/N	Variables	Disagree	Not sure	Agree
1	Proper solid Waste Management is important			
2	Waste management leads to good health			
3	Waste management leads to healthy environment			
4	Have waste management plan/policy by the LGA			

5. To what extent do you worry about solid wastes in your environment?  
 Not sure [ ]      not worried [ ]      Worried [ ]      very worried [ ]
6. How interested would you say are in solid wastes in your environment?  
 Not sure [ ]      not interested [ ]      Interested [ ]      very interested [ ]
7. How important do you regard the way your neighbours do away with solid wastes?  
 Not sure [ ]      not important [ ]      Important [ ]      very important [ ]
8. Are you satisfied with the way neighbors dispose their solid wastes?  
 Very dissatisfies [ ]      dissatisfied [ ]      satisfied [ ]      very satisfied [ ]
9. How satisfied are with the way solid wastes are handled by Authority in KosoKosko in Kireka?  
 Very dissatisfies [ ]      dissatisfied [ ]      satisfied [ ]      very satisfied [ ]
10. What is your opinion on solid waste management in your area?  
 .....

11. What do you think can be done to improve the attitude towards SWM?  
 .....

**PART FOUR: THE PRACTICES OF SOLID WASTE MANAGEMENT BY THE RESPONDENTS**

1. In which way do you collect household waste?  
 In a bag inside closed container [ ]      In a bag inside open container [ ]  
 In a closed container [ ]      In an open container [ ]  
 In a bag [ ]
2. How do you eliminate household waste?  
 Throw it in the nearest container [ ]      Place it outside door when collectors pass [ ]  
 Place it in the street when bag is full [ ]
3. Do you segregate you waste before dumping it?  
 Yes [ ]      No [ ]
4. Which kind of waste do you separate from other household waste?  
 Metal [ ]      Glass bottles [ ]      Paper and cartons [ ]  
 Batteries [ ]      Plastic containers [ ]      Organic materials [ ]  
 Medical waste [ ]      Textiles [ ]
5. Which kind of waste do you reuse?  
 Glass bottles [ ]      Computer CDs [ ]      Paper and cartons [ ]  
 Plastic containers [ ]      Organic materials [ ]      Textiles [ ]

6. If you reuse some waste how do you reuse them?

Put the remaining of vegetables as agriculture fertilizers for plant [ ]

Offer the remaining of food (fish, meat, chicken, rice, bread) for domestic animals [ ]

Keep grains such as rice, lentil and wheat in plastic containers [ ]

Reserve liquids such as oils, syrup in glass bottles [ ]

Make decorative rugs from remaining clothes and textiles [ ]

Make decorative items and trash boxes from computer [ ]

CDs and cartons [ ]

7. Do you participate in solid waste management?

Yes [ ]

No [ ]

8. What is the current method of disposing solid waste?

Open burning of waste [ ] Landfill site [ ] Composting waste [ ]

Incinerator [ ] Recycling [ ] Don't know [ ]

9. Frequency of waste disposal in a week

Every day [ ]

Every alternate day [ ]

Once a week [ ]

10. How is the liquid waste disposed?

Waste water [ ] Non-water carriage [ ] Water carriage [ ]

Sewage [ ] Pit [ ] Bucket system [ ]

Water closet [ ] others.....

11. Is there presence of centralized dumping site for the final dumping of the waste?

Presence of centralized dumping site [ ]

Absence of centralized dumping site [ ]

12. What Method of waste is used to transport SW to final disposal site

Hand carrying [ ] Closed trucks [ ] Open truck [ ]

Wheel barrow [ ] Pick up [ ] Others.....

13. What do you think can be done to improve the SWM practices?

.....

..

## **FOCUS GROUP DISCUSSION GUIDE**

**Name of the facilitator**.....

**Date of the discussion**.....

**Study topic:** Knowledge, Attitude and Practices of Kasokoso Community members towards Solid Waste Management

### **Questions**

1. Have you ever heard of solid waste? If yes, where did you hear it from?  
Briefly explain what it is?  
.....
2. What are the dangers of improper SWM?
3. Do you believe SW can be properly managed? If yes, how?
4. Have you ever heard about solid waste management? If yes, who does it?
5. What facilitated you to take up the SWM at your households?
6. What do you think are some of the reasons some people do not manage their solid wastes properly?
7. What are the benefits for proper SWM?
8. What do you think should be done to improve SWM in the area?
9. Before we close, is there anything else you want to add to our discussion?

**Thank you for taking your time for the interview**

## OBSERVATIONAL CHECKLIST

1. Types of collection container

Colour coded

Undefined (improvised)

Not available

2. Condition of the containers if available leak proof

Yes

No

3. Presence of bin liners

Yes

No

4. Over filling of the waste collection container/waste collection containers are overfilled and waste is scattered on the floor

Yes

No

5. Evidence of improper waste mgt/ while moving in the family, is there evidence of improper waste management

Yes

No

6. Final method of Waste Management in the household

Burning in a pit

Open burning outside the building

Dumping in unprotected open space

Collected by higher authority

7. During waste collection, is the waste taken to final stage or the waste accumulated from the resident takes long to be collected.

Yes

No

8. Does the household practice solid waste management?

Yes

No

### APPENDIX III: INTRODUCTORY LETTER



*making a difference in health care*

**Office of the Dean, School of Nursing**

Kampala, 23<sup>rd</sup> June 2016

To LCI Kasokosoko Zone  
Kiira Town Council  
Wakiso District

Dear Sir/Madam,

**RE: ASSISTANCE FOR RESEARCH**

Greetings from International Health Sciences University.

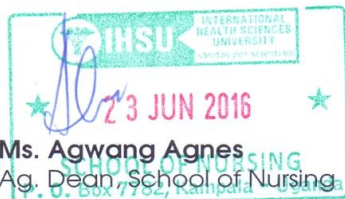
This is to introduce to you **Kwagala Rhoda**, Reg. No. **2013-BNS-TU-047** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of her award.

Her topic of research is: **Knowledge, attitude and practice of Kasokoso Community members towards solid waste management**

This therefore is to kindly request you to render the student assistance as may be necessary for her research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,



Received & Permission granted - Makumbi H. Hassan  
Uchumi - 0774-72782.  
KASOKOSO ZONE  
KIIRA TOWN COUNCIL  
WAKISO DISTRICT  
28<sup>th</sup> 6/2016

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