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PLANNING FOR SOLID WASTE MANAGEMENT IN INFORMAL SETTLEMENTS, CASE STUDY KAGUGUBE WARD IN KAMPALA CENTRAL DIVISION.

DONE BY

BOONABAANA BONNY

REG No :17/U/18732

BACHELOR OF URBAN AND REGIONAL PLANNING

SUPERVISOR: MR. CHARLES NYAKKWEBARA

A dissertation submitted to the college of Engineering Design Art and Technology, department of Architecture and physical planning in partial fulfilment for the award of the Degree in Bachelor of urban and Regional planning at Makerere university.

May, 2021

DECLARATION

I Boonabaana Bonny hereby declare to the best of my knowledge that this report contains work through my own effort and that it had never been submitted for assessment in completion of any undergraduate degree in urban and regional planning at Makerere University.

.....

Boonabaana Bonny

APPROVAL

Supervisor's declaration

This dissertation has been submitted for review with my own approval as the university supervisor

Signature .....

Date ... 12/01/2022 .....

Mr. Charles Nyakwebara

Department of architecture and physical planning

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I would like to express my heartfelt appreciation to the Lord almighty for his providence, guidance and love through my stay at Makerere university.

I acknowledge with much gratitude the guidance, tireless efforts from my supervisor Mr. Charles Nyakwebara who provided guidance, valuable critics for constant encouragement throughout the preparation of this dissertation report.

I am also grateful to the residents of kagugube ward for their hospitality and allowing to give me the required information I needed from them for this research study in their area.

LIST OF ACRONYMS

KCCA :Kampala Capital City Authority.

NEMA:National Environmental Manangement Authority

CBO’s:Community Based Organisations

NGO’s:Non Government Organisations

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ABSTRACT

Solid waste management and planning is both an urban and rural problem. Almost every person is a generator of solid waste and thus a contributor to this problem. To generate waste is one thing, the type of waste generated is another and yet also the way the generated waste is managed or disposed off is quite a different issue.

Hall (2002) defines planning as a process concerned with deliberately achieving some objectives and it proceeds by assembling some actions into some orderly sequence.

Waste refers to unwanted materials and objects that people have thrown away, it is often called trash, garbage, junk or rubbish.

Solid waste management is all the activities and actions required to manage waste from its inceptions to its final disposal.

Main groups of waste management include source reduction and reuse, recycling, composting, landfills and incineration.

Planning for solid waste management brings benefits like reducing pollution, conserving energy, creates employment for example those involved at different stages

This study was carried out in kagugube ward in Kampala central division. The main objective of this study was to findout possible ways in which solid waste management practices in informal settlements like kagugube ward can be improved through physical planning .

Most of the informal settlements in Uganda face challenges with solid waste manangemnet due to reasons like the high birth rates associated with informal settlemnts thus increase volume of solid waste generated per household .Also the nature of housing in informal settlements whereby many people stay in temporary houses with less facilities and knowledge regarding solid waste management is a reason the solid waste management problem in informal settlements like kagugube ward .

The researcher applied various techniques of data collection which include ; interviewing ,questionarres ,observation ,photography ,field investigation and sketching .

Some results from the field indicate that the methods of solid waste management in kagugube ward are still not improved for example from the use of questionarres ,it was found out that

18% of the people collect solid waste in sacs ,01% use dustibins ,06%use composite pits ,56% throw on the ground whereas 18% burn the solid waste .

With the results above the researcher came to recommend the following to be done in kagugube ward .

Recycling of solid waste .

Green vegetable matter like banana peels, pineapple and cabbage plus food left overs should be reused .

The government should provide sanitary facilities such as dumping sites, in the neighboring areas so as to improve on the way people collect the solid waste.

Encouraging the community members to find where they can put pits and impoundments to dispose the biodegradable wastes .

Operators and regulators need to do much more to reduce the impact of the problem of solid waste management in kagugube ward.

CHAPTER ONE

1.0 introduction.

Hall (2002) defines planning as a process concerned with deliberately achieving some objectives and it proceeds by assembling some actions into some orderly sequence.

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Planning for solid waste management brings benefits like reducing pollution, conserving energy, creates employment for example those involved at different stages

1.1 background

Kagugube is one of the informal settlements in Kampala central division ,it is regarded as an informal settlement because as Kampala city centre is growing faster from a rapid increase in the urban population ,the pressure on land increases and due to a complex system of land tenure ,the residents of kagugube are left with weak rights facing the threat of evictions that normally follow this development .Kagugube parish is a residential area with small scale businesses and has other informal subsections like kivulu,kagugube ,industrial area and kitamanayangamba .

It is a low-income community dealing with a lot of informalities and lack adequate sanitation facilities in regards to management of solid waste since they lack proper management to install and plan for the solid waste management.

1.2 problem statement

The major challenge in kagugube ward concerning solid waste management is due to the way people handle and dispose the solid waste for example littering the corridors of houses ,throwing solid waste in drainage channels ,putting solid plus collection in sacs that usually result into houseflies and other insects being attracted on those collection areas that may lead to other issues like easy spread of diseases to the residents .

The sources of solid waste in the area include commercial activities, residential, construction activities and institutions like clinics.

Solid waste management is the greatest environmental health challenges and continues to overwhelm local authorities and national governments as the local populations continue to rise and consumption patterns change.

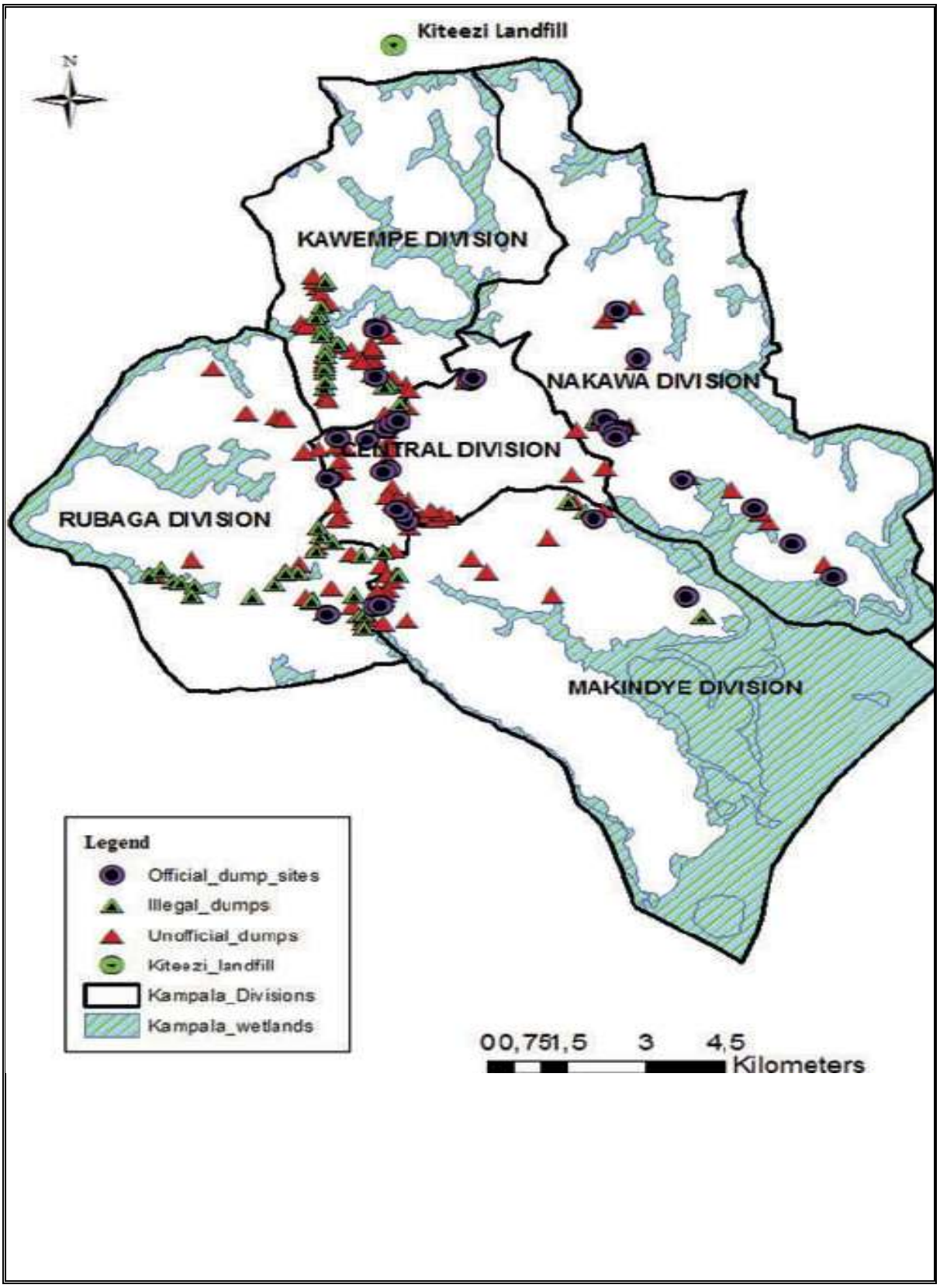
The existing practices of solid waste management are not good in a way that they may act as the reasons for the spread of some diseases relating with poor solid waste management.

These practices also lead to land. air and water pollution since the ways of managing include burning, throwing in wager sources, drainage channels.

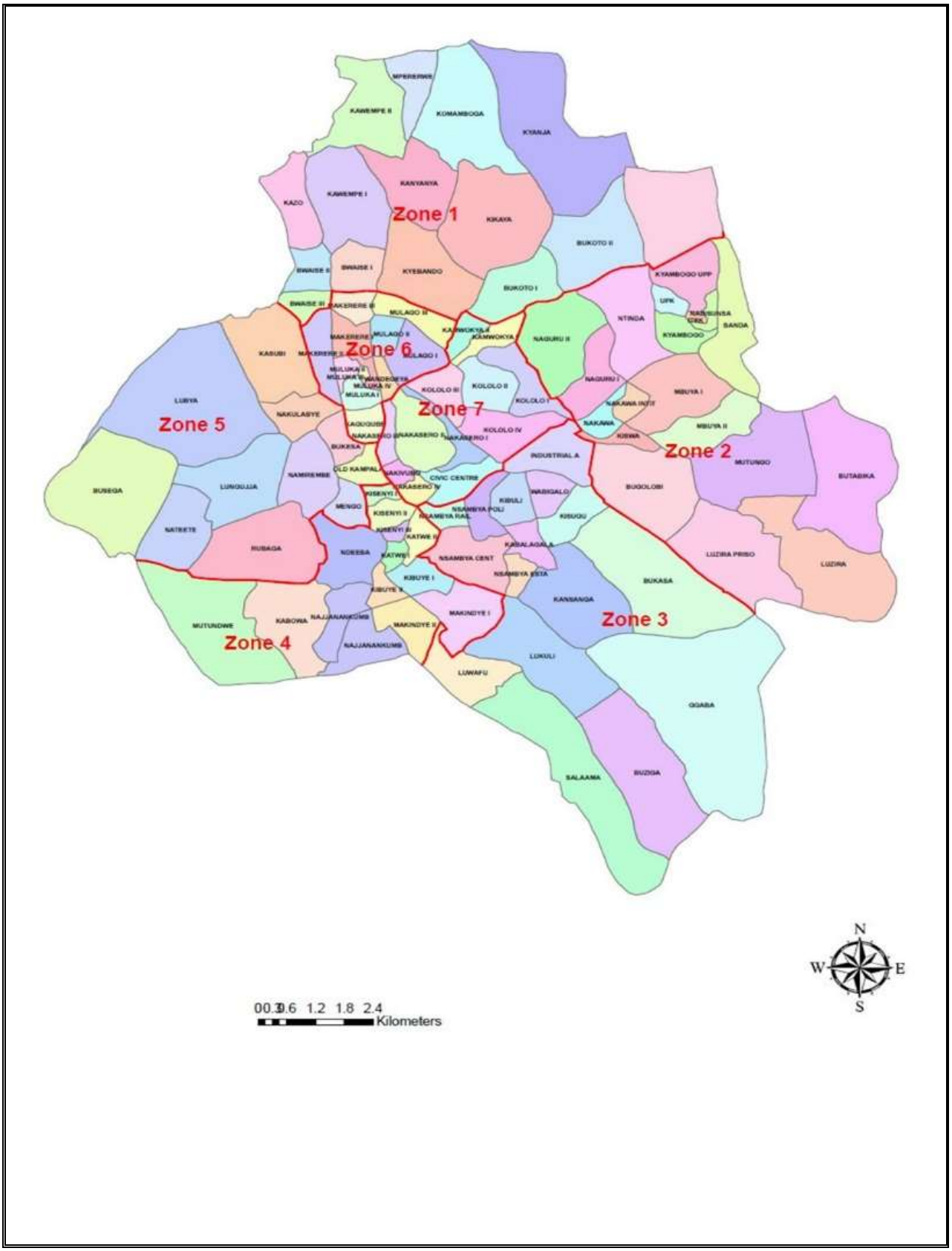
The solid waste management practices in kagugube ward result in problems like flooding, gives rise to social and economic losses and the collection is one of the things lacking in kagugube ward.

It is for this case that this research intends to bring about some ways of planning for solid waste management. Therefore, this result is majorly towards improving the solid waste management practices in kagugube ward through methods like sensitization of the people on good solid waste management practices, increasing investment in solid waste management by the concerned actors and agencies.

MAP SHOWING THE LOCATION OF DUMPING SITES IN KAMPALA CITY



MAP OF KAMPALA SHOWING WASTE COLLECTION ZONES



1.3 objectives

1.3.1 **General objective**

To find out the ways in which solid waste management can be improved in kagugube ward

1.3.2 specific objectives

1. To identify the types of solid waste generated in kagugube ward
2. To find out the existing methods of solid waste management practices.
3. To find out the factors that have contributed to poor solid waste management in kagugube ward.
4. To identify the extent to which solid waste management practices can be improved through physical planning.

1.4 research questions

1. What are the types of household wastes generated in kagugube ward?
2. What are the existing methods of solid waste management practices?
3. What factors have contributed to the poor solid waste management in kagugube ward?
4. What are the problems arising due to the inadequate solid waste management planning?
5. Which measures can be applied to improve planning for solid waste management practices?

1.5 Scope.

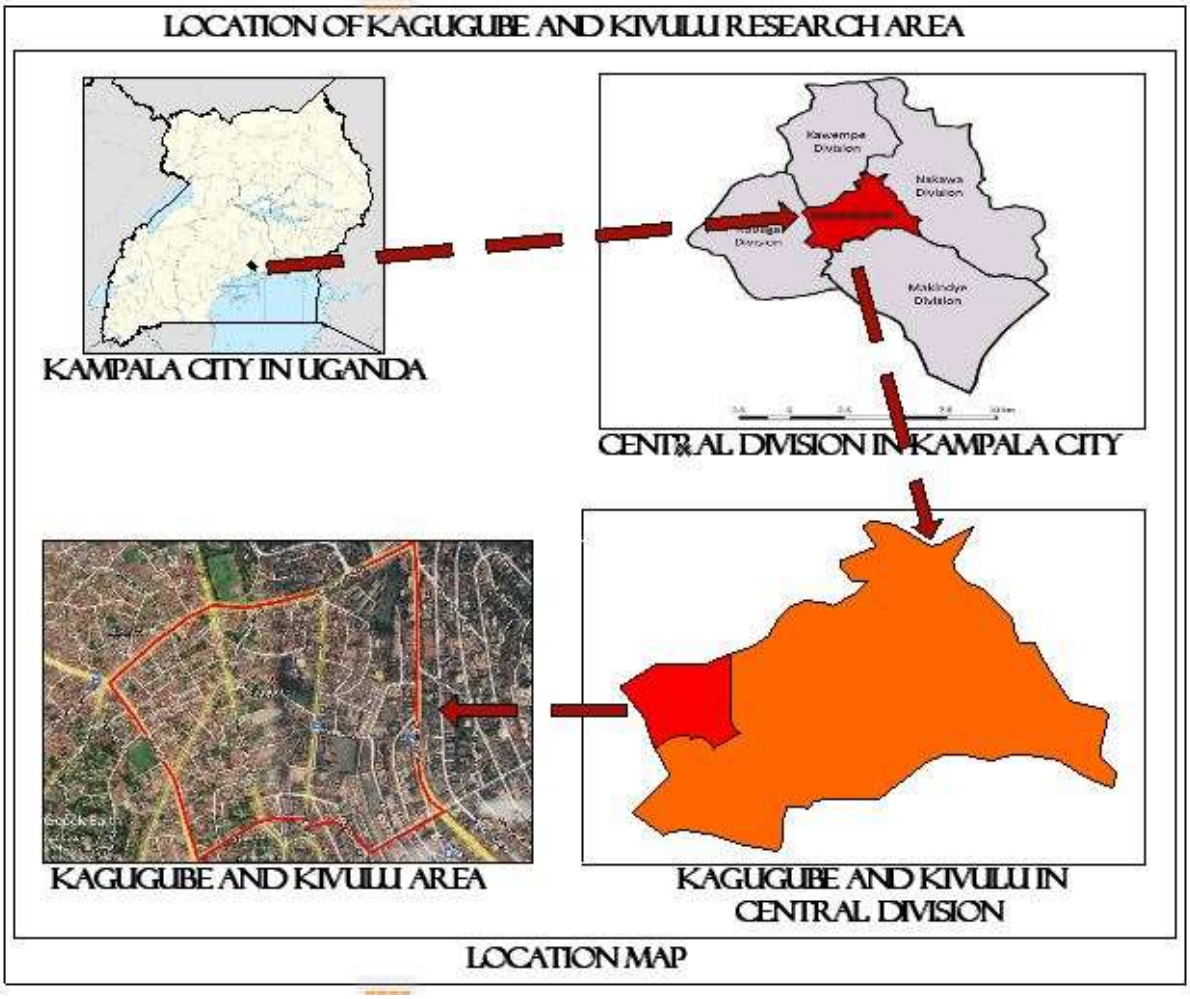
Kagugube ward is located in Kampala central division in Kampala district neighbouring with Makerere, nakasero hill, old Kampala and nakulabye.

It has a population of 6229 people, 2983 males and 3246 females.(information got from Uganda Bureau Of Statistics).

It is comprised of seven villages some of which include: Kivulu1, Kivulu 2, kitamanayangamba, law development centre and kagugube.

Figure 1, showing the area of study

LOCATION MAP OF KAGUGUBE WARD.



1.6 significance

This study will equip planners, architects, students and whole of Uganda at large, the importance of maximizing the use of good waste management practices in such areas. It is also a guide to planners in designing areas whereby environmental quality is achieved.

1.7 justification.

With the current increase in waste in Kagugube ward, it is an urgent necessity to provide measures on how waste can be put into the correct disposal areas or some re-used through planning interventions.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

Chapter 2 has a detailed understanding of the concept of the research topic and the objectives in the arguments as stated by researchers. It presents the literature-based objectives and the research questions as explained in the previous chapter.

2.1 Defining planning.

Planning

Hall Peter (2002)defines planning as a process concerned with deliberately achieving some objectives and it proceeds by assembling some actions into some orderly sequence .It is also common for people to imagine that planning requires a physical representation of design which guides planning .This applies to physical planning .However it may not always be inform of words ,or diagrams and never involve an exact physical representation of the entity in question .The representations may also be in the form of figures and tables and the bottom line is that there is a sequence of executing the desired situation and attaining the identified goal ,its representation is equally important .

Planning is the process of thinking about the activities required to achieve a desired goal. It is the first and desired activity to achieve desired results (

It involves the creation and maintenance of a plan, such as psychological aspects that require conceptual skills. There are even a couple of tests to measure someone's capability of planning well. As such, planning is a fundamental property of intelligent behaviour

2.2 Need for planning

According to Levy (2011), the need for planning arises manly due to the impact of two factors interconnectedness and complexity. Interconnectness is mainly on choices made as land is developed: for example, housing and traffic flow, traffic flow and air quality, water drainage and traffic, housing and health.

On the other hand, complexity arises due to the nature of relationships between that varying spatial aspects mentioned and their known dynamism. If all suggested relationships were simple, complexity would not arise.

2.3 Defining waste

As noted by palmer (2005): online. “The term is frequently left undefined primitive in spite of its critical importance and frequently a list of types of waste is substituted for the underlying definition. “Definitions of waste are rather commonly found in such documents as dictionaries, encyclopaedia and technical reports of governments and organizations .For example ,the Longman dictionary of contemporary English (p.1612) defines waste as “the unwanted material or substance that is left after you have used something “ while new shorter oxford English on historical principles defines it as “the un usable material left over from the process of manufacture ,the use of consumer goods or the useless by products of a process “

Gilpin (1996) provides a more elaborate definition of the term waste. According to him, the concept of waste embraces “all unwanted and economically unusable by products or residuals at a given place and time, and any other matter that maybe discarded accidentally or otherwise into the environment.” (Gilpin, 1996:228). Gilpin also suggests that what constitutes waste must “occur in such a volume, concentration, consistency or manner as to cause a significant alteration in the environment.” Thus, apart from waste being unwanted substance that is discarded, the amount of it and the impact it makes on the environment also become important considerations in defining waste.

McLaren(1993:online)has also referred to waste as the “unwanted materials arising entirely from human activities which are discarded into the environment “.This notion that waste results entirely from human activities is carbonated by Jessen (2002:online)who has noted that “waste is human creation “and “there is no such thing as waste in nature where cut-offs of one species become food for another “.On his part ,Palmer argues that “there is no constellation of property inherent in any lump, object or material which will serve it as a waste …….An item becomes waste when the holder or owner does not wish to take further responsibility for it”. As a default definition, Palmer (1998) suggests that “any subject that is without an owner is a waste.”

Davies (2008) also describes waste as “…. unwanted or un usable materials …. That emanate from numerous sources from industry and agriculture as well as businesses and households

….and can be liquid, solid or gas in nature and hazardous or nonhazardous depending on its location and concentration (Davies, 2008:4)

Davies (2008:5)further notes that "what some people consider to be waste materials or substances are considered as a source of value by others ".This relative attribute of waste can be compared with the concept of resource which has been defined as material that has use value(Jones and Hollier ,1977:20)and a" reflection of human appraisal ."(Zimmermann ,cited in Jones and Hollier ,1997:20).Just as a material becomes a resource when it gains use value ,it also becomes a waste when it loses its loses the use value .Like resources ,waste is also a relative concept or human appraisal what constitutes waste can vary from one person to another ,one society to another and over time .As noted by Jessen (2002:0nline) our waste stream is actually full off resources going in a wrong direction .

Drawing from the views expressed above, the definition of waste to be used in this study is any substance (liquid, solid, gaseous or even radiative) discarded into the environment because it is unwanted, which shows significance nuisance or adverse impact in the environment.

2.4 The classification of waste

The number of criteria is usually employed to classify wastes into types including their source, physical state, material composition and the level of risk associated with waste substances. Such classification of waste provides a basis for development of appropriate waste management practices.

Table 1: shows classification of waste

Criteria for waste classification	Examples of waste types
Sources or premises of generation	Residential, commercial, industrial, municipal services, building and construction, agriculture.
Physical state of waste materials	Liquid, solid, gaseous, radioactive
Material composition of waste	Organic food waste, paper and card, plastic, inert, metal, glass and textile.
Level of risk	Hazardous, non-hazardous

The source classification is based on the fact that waste emanates from different sectors of the society such as residential, commercial and industrial sources. A good example of source classification was provided by the World Bank (1999) in a study in Asia which identified the sources of waste as residential, commercial, industrial, municipal services, construction and demolition, processing and agricultural sources.

In the stakeholders ' Guide :sustainable waste management ,the UK environment council(2000) also employed resource classification to identify the major sources of waste as municipal sources ,commerce and industry ,agricultural sources ,demolition and construction activities ,dredged spoils ,sewerage sludge and mining and quarrying operations .Classifying wastes by their sources is a useful way of determining the relative contribution of different sectors of society to the east stream and how plan for their collectionn .

Types of solid waste generated in slums and their composition.

Comprehensive classification of wastes is described below (Manual on municipal solid waste management 2000). The classification of solid wastes their sources and description give it as in the table below.

Table 2: shows types of waste

Form of solid waste	Description	Sources
Garbage	Wastes from the preparation, cooking and serving of food, markets reuse,	Households, commercials like shops, hostels and restaurants.
	Combustible paper, cardboards, plastics, wood, rugs, grass and yard trimmings Non combustibles (inorganic) metals, cans, tins, stones bricks, ceramics, glass bottles.	Institutions like schools, hospitals
	Residues used from materials used for cooking.	Households, restaurants

Bulky wastes	Large auto parts, tyres, stoves fridges, televisions furniture, metals	Households, shops
Street wastes	Street sweeps, leaves, dead animals, receptacles, animal droppings	Streets, side walks
Dead animals	Cats, dogs, birds	Sidewalks, streets, cycle ways,
Construction and demolition wastes	Roofing materials, lumber broken concrete, rubber plaster, broken wood pipe wire insulation	Construction and demolition sites
Industrial wastes	Solid waste resulting from industrial processing and manufacturing operations like food processing wastes, plastics and metals	Industries
Hazardous wastes	Pathological wastes, explosives and radioactive materials	Hospitals, industries and households

Source :(Manual on Municipal Solid Waste Management ,2000)

2.4.1Municipal waste:

Municipal waste includes waste resulting from municipal activities such as street wastes, dead animals, market wastes and abandoned vehicles. However, the term is commonly applied to a wider sense to incorporate domestic wastes and commercial wastes.

2.4.2 Domestic (residential waste).

This category of waste comprises the solid wastes that originate from single and multi-family household units. These wastes are generated as a consequence of house hold activities such as cooking, cleaning, repairs, hobbies, redecoration emptying containers, old books, paper and old furnishings.

Commercial waste.

Included in this category are solid wastes that originate in offices, wholesale and retail stores, restaurants, hostels, markets, warehouses and other commercial establishments. Some of these wastes are further classified as garbage and others as rubbish.

2.4.3 Garbage

This is the term applied to animal and vegetable waste resulting from sale, cooking and serving food.

2.4.4 Rubbish

It is a general term applied to solid wastes originating in households, commercial establishments and institutions excluding garbage and ashes.

Institutional waste.

Institutional waste are those arising from institutions such as schools, hospitals research institutes. It includes wastes which are classified as garbage and rubbish as well as wastes which are considered to be hazardous to public health and to the environment.

2.4.5 Ashes

Ashes are the residues from the burning of wood ,coal ,charcoal and other combustible materials for cooking and heating in houses ,institutions and small industrial establishments .When produced in large quantities at power generation plants and factories ,these wastes are classified as industrial wastes .Ashes consist of a fine powdery residue ,mixed with small pieces of metal and glass .

2.4.6 Bulky wastes

In this category are bulky house hold waste which cannot be accommodated in the normal storage containers of households, for this reason the require special collection. In developed countries, residential bulky wastes include appliances such as tires, auto parts, tree and brush debris.

Commercial bulky wastes include packaging and containers in a wide range of sizes including corrugated cardboard and wood boxes, fibre, plastic and street drums usually 40 gallons, loose and bundled paper (office, printouts), bundles of textiles and plastics, furniture and equipments.

2.5 The disposal of waste

It gives directives and instructions on the safe waste disposal from an individual to a grouped (waste management company) to ensure safety on the environment and maintain proper health of the people.

The national environment (standards for discharge of effluent into water or land), regulations, 2020.

Under section 179 of the national environment act, 2019, prescribe the environmental standards and measures for the treatment of effluent before discharge from various sources into water and land.

Also, Godfrey Barongo in his work titled assessment of knowledge, attitude and practices of slum dwellers towards integrated solid waste management gave the following information on solid waste management practices;

Solid waste management is one of the most neglected areas of development in most developing and transition economies of the world. Solid waste management constitutes one of the most crucial health and environmental problems facing governments of African cities and towns due to poor institutional arrangements, poor technologies and the capacity to handle wastes

He added that the reason for the existing solid waste management in many towns is that the residents do not enough sensitization on solid waste management practices and thus have little knowledge and poor attitude about waste collection .Also the residents dispose of their waste by burning ,scattering and without sorting it and with this information strict surveillance ,sensitizations ,supervisions ,sensitization and timely removal for disposal of solid waste by management should be the key factors in managing and reducing on the solid waste related problems .

The business of keeping our environment free from contaminating effect of waste materials is generally termed as waste management .Gbekor (2003:18)for instance as referred to waste management as involving “the collection ,transport ,disposal of wastes including after care of disposal site “.Similarly Gilpin (1996:201) as defined waste management as purposeful ,systematic control of the generation ,storage ,collection ,transport ,separation ,processing, recycling ,recovery and disposal of solid management in sanitary ,aesthetically acceptable and

economical manner while Schubeller,1996:7)focus on municipal solid waste management which they define as “the collection ,transfer ,treatment ,recycling, resource recovery and disposal as 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)

2.6 Causes of solid waste problem in developing countries.

Researchers have identified several factors that militate against solid waste management efforts in poor country cities. In a GEF/UNDP/IMO regional program report for instance Linden et al (Eds) (1997) identified 10 common constraints to be militating against solid waste management efforts in Asia countries and they include;

Inappropriate technologies or processes. This limits the rate at which planning for solid waste management is done due to the fact that the technology applied does not the suit the problem at hand thereby lagging the process behind resulting into poor solid waste management in informal settlements.

Enforcement inefficiencies /non-existent, illegal dumping .This is because in informal settlements ,most of the activities are low based and thus the people engaged in such activities do not earn much and end up not getting enough for putting the solid waste management into proper disposal and collection thus results into poor solid waste management in informal settlements .

Lack of financing. This results from the fact that most informal settlements do not have proper governance thus this results into less concerns being put on the needs of the residents for example if the people leading in these areas cannot contact the concerned stakeholders in solid waste management to let them know of the challenges faced thus limited financing is a result of poor governance in informal settlements and this results into poor solid waste management in informal settlements.

Lack of training /human resource .Lack of training is a result of the nature of the people staying in informal settlements because most of them did not study much and thus limited awareness on how solid waste management should be collected, disposed or managed .This is a reason

for the increased solid waste management problem in informal settlements of most urban areas like kagugube ward in Kampala central division.

Lack of political support. Lack of political support is a common reason for most developments to delay for example solid waste management moves could be done or having people like the mayor taking part in it but instead most political people take part in solid waste management based on their own selfish interests or seeking political support and after some time they withdraw the support maybe because they failed to get what they expected or they found out that some other intelligent people could get to know about their interests thus cannot continue taking part in the planning for solid waste management on informal settlements

Failure to implement the existing policies .This is because even the policies, laws governing proper solid waste management that were put are not being followed and therefore it is hard to keep making solid waste management planning a big issue to deal with in informal settlements since even most of the activities carried out in informal settlements are illegal and not easily recognized for example they cannot be taxed to get enough funds to foster the legislation strategies.

Policy conflict among levels of government /over lapping responsibilities .Different levels of the government may conflict towards solid waste management planning for example those engaged in environmental protection will refuse to take up some solid waste management practices where as other government employees or people responsible will accept so as to either win public support or even achieving their own interests.

Rapid increase in waste generation .This is due to the rapid increase in population in informal settlements and this comes as a result of issues like increased migrant population ,high birth rates in informal settlements thus the population exceeds the planned population and on limited area there by putting pressure on the land without more land for expansion and putting the required infrastructure like waste collection areas or widening roads for easy transportation of solid waste disposal areas or treatment areas .

Lack of awareness among the public. Many people in informal settlements lack adequate information on the better ways of solid waste management and therefore cannot put the waste in the right place thus resulting into poor solid waste management practices.

Limited land area; land tenure issues. Most residents in informal settlements lack security of tenure therefore become reluctant in proper solid waste management since most of them are squatters on the land therefore with this, there is poor solid waste management in informal settlements in most African urban areas like kagugube in Kampala.

Inadequate personnel for waste management. This results into a vacancy in planning for solid waste management agencies in informal settlements.

Poor waste disposal situation in poor country cities has also been attributed to the general dearth of qualified personnel in the waste sector(Onibokun ,1999;Ogawa,2002).According to Onibokun ,1999,most municipal authorities are unable to attract suitably qualified personnel for the various aspects of waste management such as planning ,operations and monitoring .Ogawa (2002 corroborate this observation when he notes that developing countries characteristically lack the technical expertise required for solid waste management planning and operation and this is usually the case at both local and national levels .He argues that many officers in charge of solid waste management have little or no technical background training in engineering or management .Without sufficiently trained personnel ,however ,solid waste management projects cannot be effective and suitable .Ogawa (2002)has observed that in many cases ,solid waste management programs initiated by external consultants have collapsed in the hands of local management due to lack of expertise and loss of funding .

2.7 The definition of waste management.

Defines waste management as activities relating to the collection, transportation, storage, treatment and disposal (any substance or object which is dumped, abandoned, discarded or disposed of or intended or required by law to be disposed of including management of the waste at source and during decommissioning of waste management facilities or infrastructure used in the management of waste.

Hoornweg ,Perinaz , World Bank ,Washington ,DC,2012 termed solid waste management as one just about every city government provides for its residents .While service levels ,environmental impacts and costs vary dramatically ,solid waste management is arguably the most important municipal action .As the hustles towards its urban future ,the amount of municipal solid waste (MSW),one of the most important by-products of an urban life style ,is growing faster than even the rate of urbanization .

Ogwueleka ,2009,Journal of environmental Health sciences and engineering 6(3),173-180,2009 ,Municipal solid waste management has emerged as one of the greatest challenges facing environmental protection agencies in developing countries .Solid waste management is characterized by inefficient collection methods ,insufficient coverage of the collection system and improper disposal .The common constraints faced environmental agencies include lack of institutional arrangement ,insufficient information on quality and composition of waste ,and inappropriate technology ,the study on institutional ,political ,social ,financial ,economic and technical aspects of municipal solid waste management can help to a sustainable and effective solid waste management .

2.8 The situation of solid waste management in informal settlements.

Modern metropolitan centers consume a great deal of resources including energy ,water ,food and raw materials and they also generate large quantities of solid waste products .The success with which a city can manage these wastes is one of the indicators of the ability of the organization within the city to work together to solve major urban environmental problem (Middleton ,1995).

There is no single best solution to waste disposal but a wider range of possibilities exist.

Solid waste is at the core of urban environmental problems .In Uganda ,the rapid and un authorized growth of urban areas has in many cases outgassed the ability of the urban authorities to provide adequate housing ,roads ,water supplies ,sewers and collection of solid waste .Although the environmental associated with garbage and do not disappear with collection ,uncollected garbage acerbates many of the environmental hazards associated with urban centers ,such hazards include fire ,pests ,and disease vectors which create human health problems .Uncontrolled disposal by burning and dumping adds to atmospheric and hydrologic pollution loads and increases the danger of flooding .This has been experienced in informal settlements of Katanga ,Bwaise,kisenyi and kalerwe .The most persuasive impression of Kampala is that upswept streets ,and lanes ,scattered dumps of accumulated trash and refuse whose removal and disposal appear to be beyond the capability the authorities who are currently in charge .The state of waste management in Kampala just like in other urban centers in the country is unhygienic and unsatisfactory .

Inadequate collection and disposal of municipal solid waste is a persistent urban problem in developing countries .Uncollected wastes end up in the neighborhood dumps where disease

carrying insects and vectors plus rodents proliferate or in the street drains where they can cause flooding and subsequent road damage and traffic obstructions (Berstein ,1995,UN,1987,Douglas ,1986) Even where solid waste solid waste is collected ,environmentally safe disposal facilities really exist .

Wastes disposed in open dumps are major sources of surface and ground water contamination, as well as air pollution (Nyakaana, 1995. Brunn and William ,1987, Goudie ,1986)

2.9 The disposal of waste

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He added that the reason for the existing solid waste management in many towns is that the residents do not enough sensitization on solid waste management practices and thus have little knowledge and poor attitude about waste collection .Also the residents dispose of their waste by burning ,scattering and without sorting it and with this information strict surveillance ,sensitizations ,supervisions ,sensitization and timely removal for disposal of solid waste by management should be the key factors in managing and reducing on the solid waste related problems .

2.10 The causes of poor solid waste management.

Anthony Baabereyir in his work on a case study of social and environmental injustice in solid waste management in Accra and Sekondi-Takoradi described the unsustainable urbanization to be the cause for poor environmental conditions in in urban settlements in the country .Solid waste disposal in particular becomes a daunting task for the city authorities who seem to lack the capacity to tackle the mounting waste situation .he explains that the causes of the problem from the perspective of key stakeholders in the waste management sector ,the delivery of solid waste collection services across different social –economic groups of the urban population and the siting of waste disposal facilities are also examined in relation to the concepts of social justice and environmental justice respectively .The key issues identified is that many cities are experiencing worsening solid waste situations but the municipal governments lack the capacities in terms of financial ,logistical and human resources to cope with the situation ;that while several causes of urban solid waste crisis can be identified as the lack of political commitment to urban environment as the root cause of the worsening solid waste management situation in Ghanaian cities and that social and environmental injustices are being perpetuated against the poor in the delivery of waste collection services and the siting of waste collection facilities in the cities .

He identified some of the causes of the urban solid waste crisis as the lack of political commitment to urban environmental management, lack of capacities in terms of financial, logistical and human resources to cope with the situation.

2.11 Impact of inadequate planning for solid waste management to public health and the environment

Lack of proper solid waste disposal creates many environmental and health issues for slum dwellers (Noor, 2014).

Children and adults are mostly affected by the bad conditions of solid waste and other environmental problems and thus they perpetually registered their complaints and many of them were suffering from different types of skin allergies. (Arshad , 2013).

2.12 Hindrances to good solid waste management practices

Pius and Sylvester (corruption and waste management in Mbarara municipality, Uganda), Journal on environmental and public health 2020, 2020.

Leaders in this municipality have mainly attributed this persistent problem to poor financing, failure to enforce the existing solid waste management laws and regulations, limited community participation, deprived attitude by the public towards waste collection, and tendency of municipal dwellers to litter. No in-depth academic study has ever been done to expose and illustrate how corruption directly happens and influence solid waste management.

Municipal technical officials ,garbage truck drivers ,their turn boys ,garbage sorters ,factory owners and private land grabbers all involved in different forms of corruption have directly and indirectly turned solid waste collection and disposal into a very costly problem to the municipal council and the general public .The article recommends that fighting all forms without fear or favor ,encouraging them to play their role particularly in sorting waste ,adoption of smart technologies and putting in place measures that attract private investors while protecting the public can help in the effective management of solid waste management in Mbarara municipality.

2.13 Recommendations for improvement on solid waste management

The problems facing developing countries in handling municipal solid waste are a bit impossible to solve but they need concerned effort from all sectors of society .Solid waste management is the responsibility of every resident .An all-inclusive approach should be adopted in order to achieve any meaningful and lasting solution .Important areas which might bring about these are discussed below :

Recyclable solid waste in kagugube ward just like in other urban areas in developing countries, materials considered as refuse should be reused. Forexample old tires should be made

2.14 summary.

Hall (2002) defines planning as a process concerned with deliberately achieving some objectives and it proceeds by assembling some actions into some orderly sequence.

Levy, (2011), the need for planning arises manly due to the impact of two factors interconnectedness and complexity.

Gilpin, (1996) provides a more elaborate definition of the term waste. According to him, the concept of waste embraces "all unwanted and economically unusable by products or residuals at a given place and time, and any other matter that maybe discarded accidentally or otherwise into the environment.

The business of keeping our environment free from contaminating effect of waste materials is generally termed as waste management. Gbekor, (2003:18) for instance as referred to waste management as involving "the collection, transport, disposal of wastes including after care of disposal site ".

Lack of proper solid waste disposal creates many environmental and health issues for slum dwellers (Noor , 2014).

Pius , Sylvester (corruption and waste management in Mbarara municipality, Uganda), Journal on environmental and public health 2020, 2020.

CHAPTER THREE: METHODOLOGY

3.0 Introduction.

This chapter covers the research design, strategy adopted and the various tools to be used in the research process to collect relevant data

"Methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based" (Brown, 2006).

According to Rajasekar, research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out.

Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is needed is gained. Its aim is to give work plan of research.

Denzin and Lincoln, (2005) argued that research methodology or strategy is determined by the nature of the research question and the subject being investigated .As a result ,the research format used in an investigation should be seen as a tool to answer the research question .Therefore this study was guided by the following research questions .

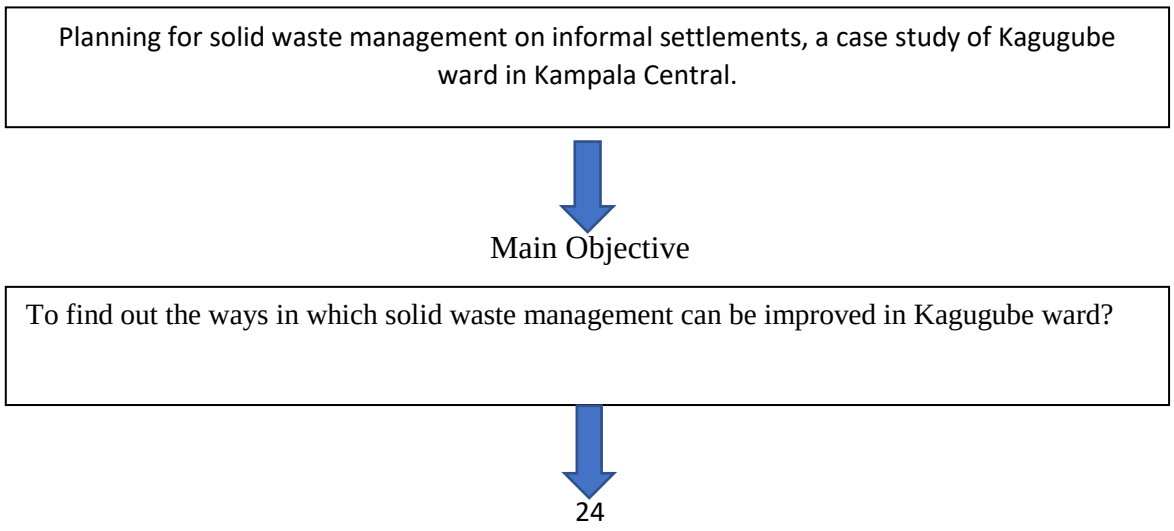
3.1 Research design.

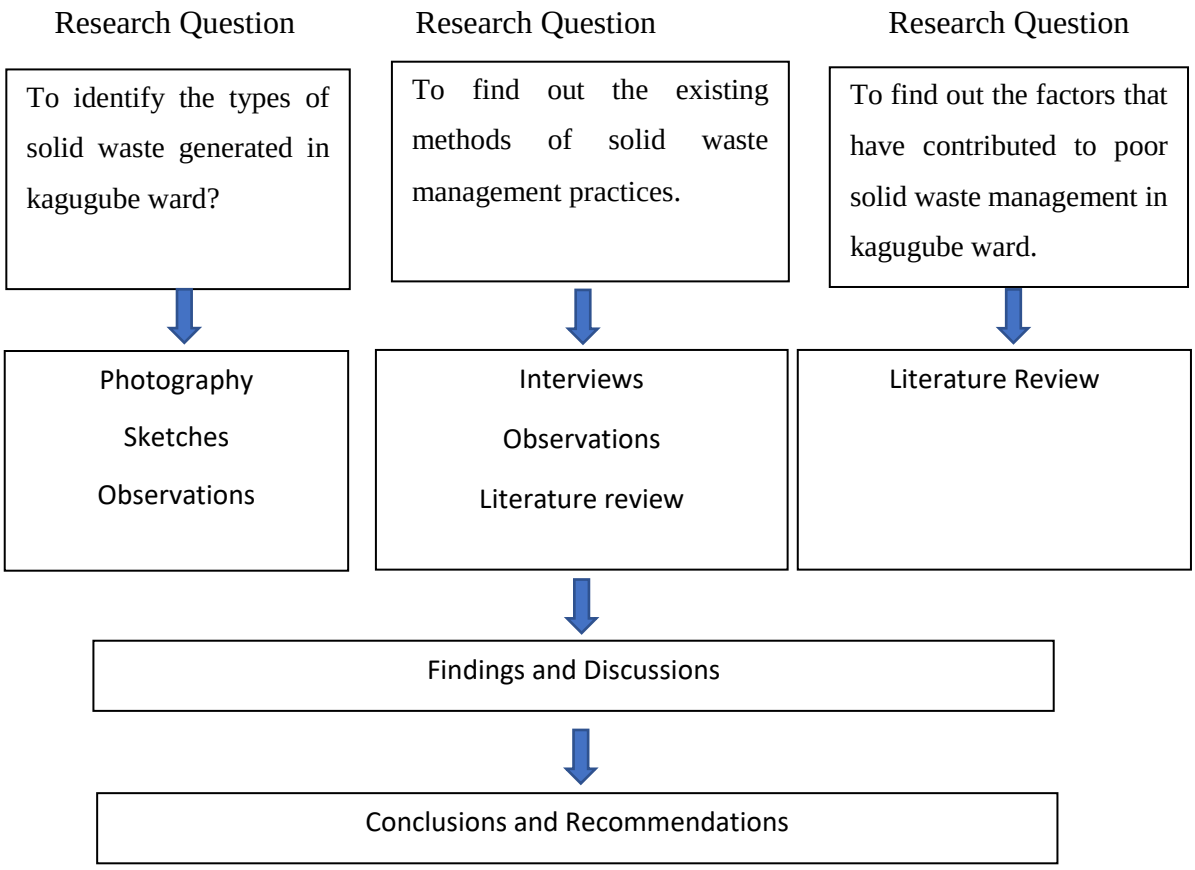
As already explained above ,the researcher employed both qualitative and quantitative methodologies .This research took on a descriptive survey design seeking to describe the phenomena accurately "(Blanche ,2006).not only using quantitative data but also qualitative research data .This design also corresponded to what Bryman describes as cross sectional research design that aimed at getting data from multiple cases at a given point in time so as to analyze relationships across a number of variables of interest (Bryman ,2004:42).

This study was based on such a design because ;its quantification characteristic helped in consistent benchmarking (Bryman ,2004).However ,cross sectional studies usually lack internal validity (Bryman ,2004)and the researcher will try to respond to this concern through the qualitative component of this study .In this study therefore ,the qualitative data and thus build the picture of household waste management in the study area ,better in doing so ,aspects of a phenomenal study design to research were employed to guide qualitative and quantitative data collection and analysis .

Since the researcher was interested in finding out the beliefs and perceptions of the people regarding household waste management ,phenomenology was a paramount component to inform this research's study design .The researcher's knowledge was interpreted with inclination and intention to understand the way people "make sense of the world around them then this made the researcher to understand the phenomenon (Bryman ,2004 :13).and basing on that then this allowed the researcher to interpret the people's interpretation in light of the related concepts and literature .

Methodology Table





3.1.1 A combination of both qualitative and quantitative approaches.

In this study, the researcher applied both qualitative and quantitative methodologies to research. The objectives for this study (in chapter one) show that one of the intentions was to find out the different solid waste generated, the different sources of the solid waste.

Using a combined approach therefore enable the researcher to collect numerous forms of data and examine them from various angles to construct a rich and meaningful picture of complex ,multifaceted situation "(Leedy and Ormrod ,2005 :133).This decision was based on the conviction that for this study to yield meaningful conclusions which drew on the advantages of using both qualitative and quantitative methods as explained below;

3.1.2 Quantitative research

Quantitative research applauded for the fact that "the findings are generalized and the data are objective "(Blanche ,2006).It hoped that the findings from this study helped in reflecting what is happening in the whole of kagugube ward .At the same time ,it was important to have an amount of objectivity to dismiss the concern to the effect that qualitative research maybe biased .Quantitative data and statistical analysis also helped in testing some hypotheses and increased on validity of the findings from this study

3.1.3 Qualitative research

In this study, there needed for the researcher to dig deep in order to get a complete understanding of the situation from the stakeholders in the household waste management sector (Blanche ,2006).Making statistical conclusions that would not suffice in unveiling the picture of solid waste management in kagugube ward from different perspectives .the perspectives of people can only be appreciated with collection and analysis of qualitative data

Qualitative data permits "understanding in context "(Blanche, 2006).In this study ,the researcher tried to find out the different forms of solid waste generated to find out the factors and problems that result due to poor solid waste management and the strategies to improve solid waste management in kagugube ward .

In general terms, scientific research consists of an investigation that:

a) seeks answers to a question or group of questions

b) systematically uses a predefined set of procedures to answer the question

c) collects evidence

d) produces findings that were not determined in advance

e) produces findings that are applicable beyond the immediate boundaries of the study

The study majorly focuses on the waste management practices in kagugube ward as a case study.

This section offers an overview of the main application and tools implemented in the study.

3.2 Methods of data collection

3.2.1 Sampling procedures

Sampling procedures are methods for specifying how a sample was selected in the study area and reasons as to why they were chosen .Sampling in the case of qualitative research focuses on getting to know as much as possible about different aspects of an individual on the assumption that the individual is typical of the group and hence will provide insight into the group.(Kumar, 2011).

3.2.2 Purposive sampling.

This was directed more to the technical persons who are involved in the construction industry. They include physical planners, architects. In this case the researcher made it a point of consideration to meet different stakeholders concerned in solid waste management for example physical planners, at KCCA.

The target population of this study was 15 people drawn from the cells like Kivulu, kagugube, kitamanayangamba and this included 12 of the residents affected by the problem of solid waste, 2 from the local councils 1 physical planner and an engineer or architect.

3.2.3 Simple random sampling and target population.

According to Amin, (2005:235) a target population is the population to which the researcher ultimately wants to generalize the results.

This form of sampling was directed to individuals directly interfacing the sample space. This was directed to the users and tenants of the selected case studies. For example, the researcher used simple random sampling in areas like Kivulu to understand more about the sources of the solid waste especially one that is always thrown in roads and drainage channels.

3.2.4 Sampling size.

The sample size for the research study generally will include the technical personnel involved in the design and everyday user like the residents in Kivulu, kagugube and kitamanayangamba cells where the problem of solid waste is worse. My sample size for example was a group of 12 people that the researcher interviewed.

3.3.5 Onsite observation.

According to sobowale, (2008), participant observation also referred to as “field research “is an intensive and more involved way of gathering information through observation.

Berger, (2010) defines participant observation as a qualitative research technique that provides the opportunity to study people in real life situations.

Observation is one way to collect primary data. According to Allen, observation is purposeful, systematic and selective way of watching and listening to an interaction or phenomena as it takes place.

Erlandson, Harris, Skipper and Allen, (1993) notify that observation enable the researcher to describe existing situations using the five senses, providing a “written photograph “of the situation under study.

Denmuck and Sobo, (1998) describe participant observation as the primary method used in doing field work. It involves active looking, improving memory, informal interviewing, writing detailed notes and perhaps most importantly, patience. (De Walt and De Walte, 2002, p.vii)

Is a technique that involves systematically selecting, watching and recording behavior and characteristics of living beings, objects or phenomena (Chaleunvong, (2009).

This is important for the purpose of getting acquainted with the general design of the case study in relation to the subject matter in this case their response to the existing waste management practices .This technique was helpful as part of the analysis of the occupant’s reactions and the way they react to the waste .

It involved using the senses like eyes, ears, nose to get the information on ground for example the state of the solid waste whether sorted or not, degradable or non-degradable, the smell of the solid waste using the nose.

The researcher continued to use observation for getting on ground data like the main categories of solid waste in the area, major sources of the solid waste plus where the solid waste is usually thrown.

3.3.5.1 Sketches.

Sketches are mainly used in areas where photography may not apply such as site plan, section through the site. This is a quick response to the analysis of the situation in terms of quality of the space.

Analytical sketches made were helpful in the analysis of the waste source, collection, disposal and management

The sketches of roads, major areas of concern for example where the largest source of the solid waste is located plus the simple site sketch of the area of study (kagugube ward)

3.3.5.1 Photography.

Photography is an indispensable tool for one to document the current situation on the site because photographs store information about the context and the mood of a place. (Li, 1985)

The photographs were crucial in backing up the information captured in the analytical sketches and also help to give a detail account of what is actually on ground.

Photographs of the housing facilities, solid waste collection sites, disposal areas, road pattern of other infrastructure and utilities in the area were taken, this helps in backing up information by understanding what exists where and in which form so as to find measures on how to improve some parts for example a photograph of a narrow corridor or wide corridor helps to understand how to design turning radii for solid waste collection trucks that may come to pick the solid waste.

3.3.6 Interviews.

According to Monette ,(1986:156),"an interview involves an interviewer reading questions to respondents and recording their answers ."However according to Burns, (1997:329),"an interview is a verbal interchange ,often face to face ,though the telephone maybe used ,in which an interviewer tries to elicit information ,beliefs or opinions from another person".

Interviews are to be conducted in the form of both formal and informal interviews.

Potter, (1996) argues that interviews are valuable tools for collecting data in qualitative research .He continues to emphasize that a one -on- one interview method allows the researcher

to interact with the participants and to observe non -verbal cues during the interview process .In this research interviews are to be conducted in the form of both formal and informal interviews

These were crucial in getting the views of residents in regards to the waste and ways to which it can be done to improve the waste management practices.

Planners were also be interviewed in order to get a professional perspective as regards to proper solid waste management.

Denzin and Lincoln argue that unstructured interviews allow the researcher to understand the complexity of the situation without imposing any prior categorizations therefore in this study, unstructured interviews will be used to allow open, in -depth discussion of the research topic.

Forexample the researcher used interviews to ask some questions from respondents from cells like kagugube and Kivulu 1 for instance on the ways of managing the solid waste, the information got from Gerald a resident of Kivulu 1 was that the methods include burning, collection and sometimes disposing in drainage channels.

Also, another interview with Mrs.Robinah a resident of kagugube cell gave information on the places the residents know whose solid waste being planned for that include Muyenga, Bweyogerere.

In an interview that was done with Mr. Alex ,a physical planner at KKCA ,he gave an information that solid waste in the parts of Kagugube is managed by private companies like Nabugabo up deal joint ventures .They charge an amount 3000-30000 shs per month and it is always in good terms with the dwellers in slums who can not afford the money since their levels of income is always low that is the reason as to why they end up dumping the solid waste in drainage channels or using illegal garbage collectors thus poor solid waste disposal .

He added that currently there are no serious fines being executed on those who misuse the available spaces with solid waste disposal except the ones always written on the walls which are always violated .He said most of the solid waste collected ends at kitezi landfill though due to increased urbanization ,the state of the waste presents a healthy risk to the people staying next to the area .

He further said that KKCA has acquired more land at Ddundu site (located 30km from kitezi landfill) where most solid waste will be collected since it is bigger in size (140acres).Also that one of the future plans is to undertake community sensitization and undertaking of community cleaning exercises in informal settlements with local leadership and the recent initiative of smart city championed by the Executive director Dorothy Kisaka .

3.3.7 Using the available information.

This involved the review of the existing reports, journals and some other work about waste management in the area of study and other informal settlements at large.

3.3.8 Literature based research

To provide qualitative and quantitative research data by use of available written literature .Reviewing the written concepts help create a solid narrative of the actual situation of kagugube zone .For example following the information from Kampala Capital City Authority (KCCA) reports, the researcher got a basis on some of the intervention for improving the solid waste management practices in kagugube ward.

Also, under literature-based research, some examples on the planning interventions on solid waste management were analyzed in a way that the most effective for kagugube ward was to be found.

Through literature-based research, a clear indication of the social economic characteristics of the residents were found for example in most informal settlements, people are low income earners and therefore may not manage some of the planning interventions for solid waste management.

3.3.9 Questionnaire method

The questionnaires were used to gather comprehensive data from the respondents through answering questions related to the research topic and the objectives .Here the main respondents for this method were the residents of Kivulu,kagugube and kitamanayangamba cells since they were the people mainly affected by the problem of poor solid waste management and thus could provide the required information

Table showing how I used a questionnaire to get information from 50 people on how they manage the solid waste .

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Practice	frequency	Per
Collect in sacs	9	18
Use dustbins	1	01
Use composite pits	3	06
Throw on the ground	28	56
Burn the waste	9	18

3.3.10 Field investigation.

This method of collection of primary data included rapid field appraisal and reconnaissance surveys of the study area in order to facilitate thorough understanding of the real situation on ground and further availed more understanding of the study area. Under this method, the researcher conducted different visits to the area of study thus increased on the knowledge of the researcher concerning the area of study.

3.4 Ethical consideration.

In the process of data collection techniques and conducting the research, there is need to consider whether the research procedures are likely to cause any physical or emotional harm (Chaleunvong, 2009).

Babbie and Mouton, (2001)note that several ethical ;considerations need to be taken into account to ensure that the study is conducted in an appropriate manner .To comply with these ethical considerations in conducting my research ,all participants will be provided with both verbal and written consent before carrying out the research .The purpose of the research will be explained to them and permission to withdraw at any point of the interview will be permitted .Permission to record the interviews will also be obtained from the participants .

For the purpose of the research, the researcher has to first introduce himself to the respondents and also explain the purpose of the research in order to build rapport with them before beginning any interview. This was important in gaining the respondents'' consent and trust.

The other issue was assuring that the information given by the respondents would be treated with at most confidentiality. The researcher will also try not to explore issues that may become uncomfortable for the respondents.

In this research, I will not use methods that can cause physical harm for example the use of heavy machines for data collection and this will not cause any harm either physically or psychologically.

CHAPTER FOUR: FINDINGS

4.0 INTRODUCTION

This study was aimed at assessing the ways on how to plan for the management of solid waste in kagugube ward.

4.1 The types and composition of solid waste in kagugube ward

One of the objectives of the study was finding out the types of solid waste in the stud area, this formed the basis on which the study was carried out after learning what types of solid waste are produced.

According to the study survey, the categories of solid waste in the study area into majorly degradable and non-degradable:

4.1.1 Bio-degradable wastes:

These are solid waste that can be decomposed or decay when dumped on the ground due to pressure exerted on them. The biodegradable wastes are composed of peelings from bananas, food left overs plus rubbish that includes leaves, banana fibres.

According to the field survey, the biodegradable wastes are the most dumped solid waste in


Figure 1, showing **biodegradable wastes**

Kagugube ward and this was discovered from the interviews and questionnaires.

4.1.2 Non-biodegradable wastes

These are wastes that cannot be easily decomposed or decay when dumped on the ground.

These are mainly composed of plastics, metals, polythene bags and wood

Figure 2, showing the major components of waste

4.2 The types of solid waste in kagugube ward.

4.2.1 Table: showing some of the solid waste categories that are generated in Kagugube ward

Types of solid waste	Frequency	Percentage
Polthene bags	12	24
Plastic bottles	13	26
Metallic objects and broken glasses	4	8
Food leftovers and other organic components	19	38
Residues from construction activities	2	4

Figure: showing solid waste categories

The findings indicate that kagugube ward has mainly two types of solid waste generated by different kinds of communities and these include commercial and residential.

The different types of solid waste include biodegradable and non-biodegradable solid waste with biodegradable solid waste taking the biggest percentage of 66% and this is because it is mostly generated from the residential parts of the study area and since it is the biggest part.

However, the percentage of non-biodegradable is low because they are generated from the shops, garages and other simple businesses in kagugube ward.

4.3 The major sources of solid waste in kagugube ward

According to the field survey, the major sources of solid waste was households, commercial and others like institutions.

Table showing the response of major sources of solid waste in kagugube ward

Table 4.3.1: showing solid waste categories

Source	Frequency	Percentage (%)
Household /residential	20	40
Commercial	15	30
Institutional	10	20
Construction activities	5	10
Total	50	100

4.4 Stages of solid waste management

4.4.1 Generation

It is generated from the residents who dump wastes like peelings from bananas, polythene bags, plastic bottles and old clothes, commercial areas along the roads.

Figure 3, showing where waste is showing from

4.4.2 Storage

In kagugube ward, waste is managed in a way that in the first stage, the primary producers of the wastes are required to get sacs so as to ease the work of its transfer for collection points commonly known as skips and the common dumping grounds.

Figure 4, showing the storage of waste

4.4.3 Collection

The garbage and solid waste is collected by KCCA trucks as well as privately contracted trucks that come in at a cost .The dumping areas in this area includes open places within residential areas ,drainage systems and open spaces along road sides .The dwellers in this area are ignorant of the best way to manage the solid waste as there is little initiative to take collective action .This uncontrolled disposal of garbage all over the area puts the lives of the people at stake .

Figure 5, collection of solid waste

4.4.4 Burning of solid waste:

This is a way some people in kagugube handle their solid waste .Substances like paper ,plastic bottles and others that can be burnt for example wood ,old clothes are always put to fire .This however results into air pollution ,land pollution for example the smoke produced to burning of the solid waste can result into public health and human health problems through production of unpleasant air for the consumption of the residents .

4.5 Factors that have contributed to poor solid waste management in kagugube ward.

The factors that have contributed to poor solid waste management were related to the lack of financial facilities, no waste collection service available, payment to waste collection, poor equipments for waste collection, uneven planning schemes, disregard for aesthetics.

Although inadequate management of solid waste was attributed to many, it was essential to emphasize the role of community residents, their attitudes, and their interaction with one another towards solid waste collection.

4.5.1 Lack of financial facilities

Due to the increased level of volume of household solid waste generated, more financial facilities were needed for their management and smooth running of household wastes in transportation, collection, disposal and equipments like trucks, workers, garbage skips involved in solid waste management.

4.5.2 Lack of enough equipments for solid waste collections.

Recommendations for the best solid waste management practices in kagugube

The residents should improve and well maintain drainage channels because these affects accessibility to different parts where solid waste is collected for example the trucks do not have enough access into most parts of the area.

Increasing the number of times, the trucks come to pick the solid waste because when it accumulates, it results into some problems like easy spread of diseases.

Sensitization of the community about the challenges of poor solid waste management to the people and the negative impacts related so as to discourage them from disposing solid waste wherever they find.

Enactment and enforcement of by laws in kagugube on the issues concerning solid waste management such as to provide a safe neighborhood to them and this will help to address the issue of solid waste management.

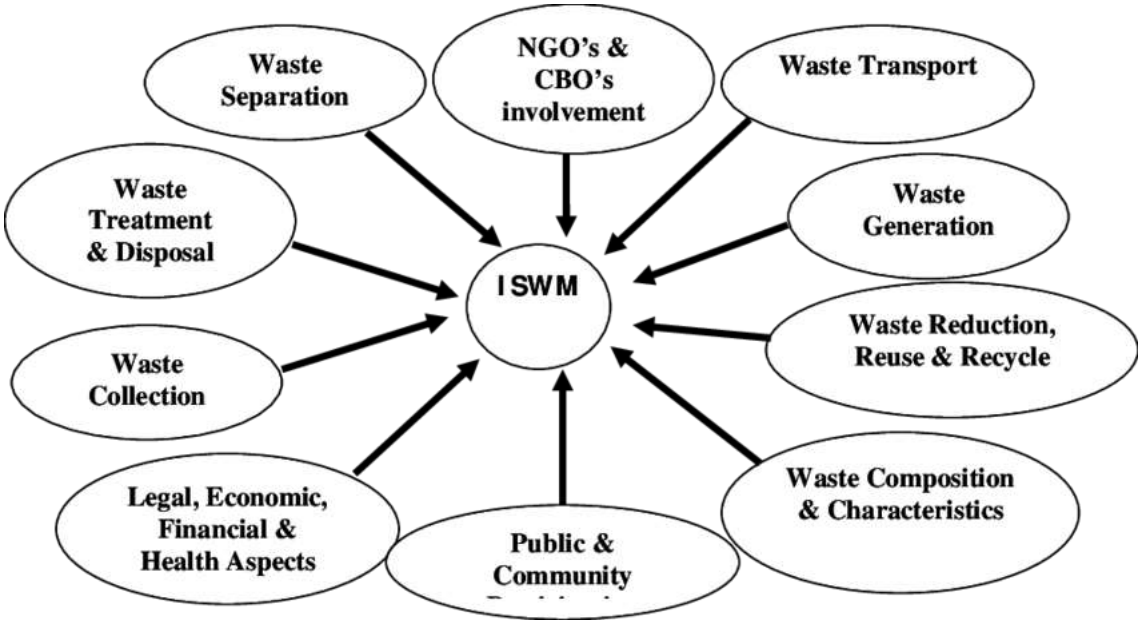
The problems or some of the causes of the existing practices of solid waste management include lack of enough space for the best disposal of the waste .This is because the area is informal having many temporary and informal settlements densely populated thus the existing facilities and space is not enough for the ever increasing population in the area thus resulting into people resorting to putting the solid waste in drainage channels ,burning and disposing everywhere in the area .

There is also lack of adequate machinery in regards to solid waste management for example in kagugube it is rare for the trucks to collect the solid waste and that is among the reasons why the solid waste usually accumulates and sometimes results into unconducive surroundings to the people in the area.

Summary of the main findings.

Solid waste is one of the components which have to be dealt with in order to attain a healthy community thus solid waste management in kagugube ward needs to be improved though the existing methods like waste skips, sacs or taking to the landfill are being used but not effective therefore other methods like source reduction should be encouraged among the community members so as to reduce on the effects of the problem.

AN INTEGRATED SOLID WASTE MANAGEMENT PROGRAM



5.0 CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

The aim of this research was to find ways in which the problem of poor solid waste management in kagugube ward can be dealt with for example through calling upon the responsible people to put the solid waste in the right order.

In order to solve the problem to poor solid waste management and improve the sanitation of kagugube ward and Kampala as a whole and other urban centers of Uganda ,the local government in close cooperation with the statutory bodies like KCCA and NEMA should turn to strategies of incorporating more private enterprises into the system in relation to the solid waste management and draw in local communities so as to make the process of managing waste as effective as possible for it is their communities that are living with the related solid waste related challenges and also contribute to the generation of solid waste .

The collection, transportation and disposal of solid waste in kagugube ward are the responsibilities of house owners, and private companies.

The ward is required through its agents, servants or licensed collectors to ensure that the solid waste is collected and conveyed to treatment installation or to landfills.

The responsible person, like householders and inhabitants of kagugube ward should take the initiative for the collection and disposal plus management of the solid waste.

Inadequate physical planning and land use planning resulting into construction of informal ,temporary settlements and this has resulted into inaccessibility in the area in relation to collection of solid waste by the vehicles .In addition to this , many people find it hard to take planning for solid waste management as a big issue and thus do not register for the payment fee towards proper solid waste collection ,storage since even the trucks for waste collection cannot find way through the temporary houses to collect the waste .

5.1 Recommendations for improvement on solid waste management

The problems facing developing countries in handling municipal solid waste are a bit impossible to solve but they need concerned effort from all sectors of society .Solid waste management is the responsibility of every resident .An all-inclusive approach should be adopted in order to achieve any meaningful and lasting solution .Important areas which might bring about these are discussed below .

Recyclable solid waste in Kampala just like in most other urban centers in developing countries, material considered refuse by the western standard in reused for example old tyres should be made into sandals ,old tin containers into candle holders ,plastic containers into feeding troughs for chicken and metal scrub fabricated into house hold utensils like charcoal stoves ,metal doors and windows, paper should be recycled into toilet tissue and wrapping paper .

A lot of scrap metal should be recycled industrially for example at the jinja steel milling and the Nakawa scrap metal facility.

Green vegetable matter like banana peels, pineapple and cabbage plus food left overs should be sold to farmers for example those keeping cattle to act as feeds. This also creates employment opportunities for the potentials employees through recycling of solid waste.

The government should provide sanitary facilities such as dumping sites, in the neighboring areas so as to improve on the way people collect the solid waste.

The residents should also increase on the number of times they collect the solid waste so that it can be easily identified for further collection by the responsible bodies.

Encouraging the community members to find where they can put pits and impoundments to dispose the biodegradable wastes so as to reduce on the amount of the solid waste in the area .This will also help to act as feeds for cattle and chicken rather than leaving it to be wasted

Operators and regulators need to do much more to reduce the impact of the problem of solid waste management in kagugube ward for example through increasing on the number of times the trucks come to collect the solid waste from the areas like Kivulu and kagugube cells.

Some equipments and interventions that can be introduced

Clear demarcation of land to be used for construction of the department incharge of solid waste management so that all the issues concerning solid waste can easily be dealt with .

Proper packaging of the sorted waste so that re use can easily be done forexample using plastic bottles to refill them with fresh liquid .

Naming of different litter bins so that people can easily identify which one is for a certain kind of waste as a way to easily do the sorting of the solid waste which will allow easy transportation or reuse and recovery innterventions to be done .

Separation of solid waste for example biodegradable from non biodegradable solid waste sothat it can easily be used for further purposes like to be used in agricultural farms or factories .

APPENDIX 1

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APPENDIX 11

QUESTIONAIRES I USED IN DATA COLLECTION

Questionnaires directed to community members

Bio data information and other information

1.Sex

Male ☐ Female ☐

2.Age

15-24 ☐ 25-34 ☐

35-44 ☐ 45+ ☐

3. Education level

Primary ☐ None ☐

University ☐ Secondary ☐

4. Occupation

Employed (private organization) ☐

Street vendors ☐

Unemployed ☐

Civil servants ☐

If others specify

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5. Were you born from kagugube

Yes ☐ No ☐

6.If no ,name the place of birth

……

……

……

7.For how long have you stayed in kagugube?

1 year ☐

2 years and above ☐

1 month ☐

Just days /visitor ☐

8. How do you manage your solid waste

Dump in the drainage channels ☐

Use of dustbins ☐

Use of polythene bags for collection ☐

Use of a dug rubbish pit ☐

If others specify

……

……

……

9. Which of the following do you consider the most common source of the solid waste

Commercial activities ☐ Residential activities ☐

Education institutions ☐ Plant shedding ☐

Construction activities ☐ Due to erosion ☐

All the above

If others Specify.

……

……

What are some of the wastes produced around kagugube ward?

Green wastes like banana peelings ☐

Paper

Polythene bags

Plastics

Metals

Wood

Old clothes

Section B

Questions directed to the technical team

1. Do you consider planning for solid waste management?

Yes ☐ No ☐

2. In your own view, do you think there are enough and strict laws regarding solid waste disposal.

Yes ☐ No ☐

3. If no, do you think that the absence of these laws has affected the health of the residents of kagugube ward?

Yes ☐ No ☐

4. Why do you consider planning for solid waste management in informal settlements? (Tick on the answer)

I. To save the environment from pollution. ☐

II. To improve on people's health. ☐

III. To reduce on global warming by reducing on gas emissions realized by burning of solid waste.

If others Specify.

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5. What form of waste management practices would you wish to be incorporated

Recycling ☐

Recovery ☐

All the above

If others Specify.

……

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…….

6. If waste recovery specify to which percentage

100% ☐ 80% ☐

60% ☐ 50 % ☐

30% ☐ 20 % ☐

If others Specify.

……

7. Do you think planning for solid waste management will be effective in kagugube ward

Yes ☐ No ☐

8. To what percentage is it effective in your own view?

100% ☐ 80% ☐

60% ☐ 50 % ☐

30% ☐ 20 % ☐

9. If others Specify.

……

……

10. What do you think could be the reason as to why the effectiveness of planning for solid waste management is at such percentage? (Tick on the answer)

I. Architects, Planners and engineers are well equipped with knowledge about the design of better facilities for solid waste management

II. Architects, Planners and engineers seem not to be well equipped with knowledge about the design of better facilities for solid waste management i.e. well know the design parameters of waste management facilities

III. Inadequate knowledge on the use of software to check the effectiveness of the solid waste management facilities during design phase

IV. Adequate knowledge of the design software used to check on the effectiveness during design.

If others Specify.

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11. How best do you think the effectiveness of planning for solid waste management can be improved? (Tick on the answer)

I. Coming up with strict laws that ensure the incorporation of planning for solid waste in the deep core spaces of urban areas.

II. Encouraging Architects, Planners and engineers to be well equipped with knowledge about the design of areas specifically meant for solid waste management for example landfills and dumping sites.

III. Encouraging Architects, Planners and engineers to be well equipped with knowledge about the software that check the effectiveness of planning for solid waste management.

IV. Coming up with reports to concerned stakeholders and agencies concerned with solid waste management like KCCA for assistance

If others Specify.

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…….

12. Do you check on the effectiveness of the mode solid waste management practices during the design stage?

Yes ☐ No ☐

Section C

Questions directed to local council leaders

13. In your own view, do you think the existing habits of managing solid will totally be banned from being used by the community members?

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14. What challenges do you face by staying in the area where solid waste management is not yet planned for?

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15. How best do you think these challenges can be improved?

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16. What could be hindrances to better planning for solid waste management

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17. Is there any area you know whose solid waste management is planned for?

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18. What are some of the facilities that you would wish to see being included in your area in regards to planning for solid waste management?

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