

**THE INFLUENCE OF URBAN POPULATION BEHAVIOUR ON SOLID
WASTE MANAGEMENT IN JINJA TOWN**

BY

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**A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF HUMANITIES AND
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DECLARATION A

"This thesis is my original work and has not been presented for a degree or any other academic award in any university or institution of learning".

Name and Signature of Candidate

Date

DECLARATION B

"I/We confirm that the work reported in this thesis was carried out by the candidate under supervision".

Name and Signature of the supervisor

Date

DEDICATION

I dedicate this work to my mother, Mrs. Jidda Mwami for the financial support and my brothers Ssugujja Farouk and Ssegujja Abubaka for the financial and moral support. I cannot also forget my lovely sisters who have been part and partial of my humble time during school.

ACKNOWLEDGEMENT

I would like to thank the Almighty Allah for the gift of knowledge; for giving me love, hope and propelling me to my destiny. Where would I be if Allah didn't guide me?

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I can't ignore my respected lecturers who are the members of the department committee for their kind support to this level. This work has come to the end by the help of respected teachers and friends. So, the contribution of this report is highly remarkable.

ABSTRACT

The study investigated the “Influence of Urban Population Behaviour on Solid Waste Management in Jinja Town” and it was revealed that waste management is still one of the biggest problems that is affecting development and reorganisation on Jinja town. Following history, Jinja used to be one of the cleanest towns due to its influence in Uganda’s development process. The town however now has one of the worst pictures known to the country. Although the town is noted for being infamously spilled with waste as shown in the research, this picture portrays the set of Uganda’s town set up. The study questionnaires and interview guides were highly responded to by women who composed of 66.9% of the total respondents. In terms of increased population, the study revealed that population grew due to the central location of Jinja town which was reflected with a total percentage of 61.3%. Respondent’s opinion on population behaviour revealed that there was no careful dumping of waste which was reflected by 141 respondents representing 43.3%. The study on this ground concluded that waste management still remains a very disturbing element in management of the city’s development. The study therefore recommended that there is a need for creating more dumping stations and clear laws on management of waste if population cannot be controlled in the city.

TABLE OF CONTENTS

DECLARATION A.....	i
DECLARATION B.....	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x

CHAPTER ONE..... 1

PROBLEM AND ITS SCOPE..... 1

1.0. Introduction.....	1
1.1. Background of the Study	1
1.2. Statement of the Problem.....	2
1.3. Purpose of the Study.....	3
1.4. Specific Objectives	3
1.5. Research Questions.....	3
1.6. Conceptual frame work (schema of work).....	4
1.7. Justification of the Study	4
1.8. Scope of the Study.....	5
1.9. Operational definitions	6

CHAPTER TWO 7

LITERATURE REVIEW 7

2.1 Introduction.....	7
2.2 Influences of urban population on Solid Waste Management	7
2.2.1. Urban population growth and solid waste management.....	7
2.2.1.1. Natural population growth	7
2.2.1.2. Rural urban migration.....	8
2.2.2. Urban Population Behaviour and Solid Waste Management.....	8
2.2.2.1. Feeding habits	8
2.2.2.2. Public awareness and sensitisation	9
2.3. Solid Waste Collection	9
2.3.1. Solid Waste Transportation	9
2.3.2. Solid Waste Disposal	10
2.4. Solid Waste Recycling and Re-use:.....	10

2.4.1 Composting	11
2.5. Community Participation in Solid Waste Management.....	12
2.6. Current Legislation for Solid Waste Management.....	12
2.7. Related Literature	13

CHAPTER THREE 16

METHODOLOGY 16

3.0. Introduction.....	16
3.1. Research Design	16
3.1.1 Study area.....	16
3.1.2 Study population	16
3.2. Sample Selection and Size	17
3.2.1. Sampling Procedures	18
3.3 Research instruments.....	18
3.3.1The Interview Schedule	19
3.3.2 Direct Observation	19
3.3.3. Document Review	19
3.3.4 Questionnaires.....	20
3.3.5. Reliability and Validity of Research Instruments	20
3.4 Measurement of Variables	20
3.5 Data Analysis.....	21
3.6 Reliability and Validity Of Research Instruments.....	21
3.6.1. Validity	21

CHAPTER FOUR..... 23

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS 23

4.0. Introduction.....	23
4.1. Socio –economic characteristics of respondents	23
4.2 respondent’s opinion in relation to the questionnaires	26
4.2.1 Respondents opinion of urban population growth.....	26
4.2.2 Respondent’s opinions on population behaviour.	28
4.3.0 Verification of hypothesis.....	32
4.3.1 Urban population growth and solid waste management.	33
4.3.2 Urban population behaviour and solid waste management.	34

CHAPTER FIVE	36
SUMMARY DISCUSSION, CONCLUSION AND RECOMMENDATIONS	36
5.0. Introduction.....	36
5.1 Summary.....	36
5.2 Discussions.....	37
5.2.1 Relationship between urban population growth and solid waste management in Jinja Town	37
5.2.2. Relationship between population behaviour and solid waste management in Jinja Town.....	38
5.3 Conclusion.....	39
5.4 Contribution of the study.....	41
5.5. Area of further research	41
REFERENCES.....	42
Appendix 1: QUESTIONNAIRE FOR RESIDENTIAL/COMMERCIAL PREMISES.....	45
Appendix II: INTERVIEWS GUIDE FOR FOCUS GROUP DISCUSSIONS FOR TECHNICAL OFFICERS, GARBAGE COLLECTORS AND ELECTED LEADERS	51
Appendix III: OBSERVATION CHECK LIST	52

LIST OF TABLES

Table1 Distribution of heads of house holds, heads of business operators.....	18
Table 2 Reliability coefficients of independent variable &dependent reliability...	22
Table 3 Demographic characteristics of respondents (Cn=326).....	24
Table 4 Respondent's opinions on the population growth.....	26
Table 5 Respondent's opinion on population behaviour.....	28
Table 6: effect of urban population growth on solid waste management.....	33
Table 7: Effect of urban population behaviour on solid waste management.....	35

LIST OF FIGURES

Figure 1 showing the age category of the respondents	23
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CHAPTER ONE

PROBLEM AND ITS SCOPE

1.0. Introduction

This chapter is devoted to the influence of urban population growth, funding and of urban population behaviour towards solid waste management in urban local authorities in Uganda with particular reference to Jinja Town. It presents the background to the study, statement of the problem, purpose of the study, objectives of the study, scope of the study, justification of the study and operational definitions, research questions, hypothesis, conceptual framework and significance of the study. The European Council defines Waste Management as the collection, transport, recovery and disposal of waste including the supervision of such operations and after care of disposal sites. Third world cities are faced with an inability to manage solid waste from the point of generation to the point of disposal, transforming these cities into so called garbage cities, Feachem, (1996)

1.1. Background of the Study

The term "waste" generally refers to "unwanted" for the person who discards it; a product or material that does not have a value anymore for the first user and is thus thrown away. But "unwanted" is subjective because the waste could have value to another person in a different circumstance or even in a different culture. Today, there are many large industries that operate primarily or exclusively using waste materials like paper and metals as their industrial feed stocks (Scheinberg, 2001). Waste can be classified as solid and liquid. Liquid waste is sometimes referred to as human waste or excreta but this paper primarily explores the socioeconomic value of solid waste to persons involved in Solid Waste Management (SWM) practices.

Cities have provided an avenue for upward mobility and which has remained a magnet for rural migrants (Freire and Strein, 2001). One obvious consequence of rapid urbanisation is the growing generation of solid waste and many city authorities face unprecedented challenges in managing solid waste collection and disposal. Despite the importance of adequate solid waste management to urban environment, the performance of many city authorities in this respect leaves much to be desired (Ogu, 2002).

It is believed that in poorest communities many of which are in sub-Saharan Africa, 80 to 90 percent of wastes generated are not collected for safe disposal. They usually and act as illegal dumps of streets, open spaces and wet lands as illegal dumping sites (Ogu, 2002).

Jinja town has a lot of business opportunities because of status of being a one of the biggest towns with many industries in Uganda hence a lot of solid waste is generated daily. This waste has become a menace to the town with multiple counts of strong stench, blocked drainage systems and stained streets. This has made it impossible for the town's planning committee come up with a systematic plan that can make the town attain a city status.

1.2. Statement of the Problem

Urban population generate a lot of solid waste and this may pose a number of problems depending on the level of population density and consumption behaviours.

The worst heat area is the central division of Jinja district which is the central business district which is the point of concentration of business, industries, residential and institutional premises, characterized by consumption of food stuffs that generate a lot of garbage like food peelings, home waste materials and industrial wastes which are indiscriminately dumped on city streets which

may lead to the outbreak of diseases and blockage of drainage system, flitting and garbage odour.

This kind of situation has negatively left Jinja district as one of the dirtiest areas especially that the town is infested with huge piles of dirt and garbage. There is a threat that the district will befall victim of many diseases especially that human wastes often combined with industrial wastes that eventually make it hard for the district to manage. This fluctuation in waste has been attributed the growing population in Jinja as a whole.

It is therefore for this reason that the research will investigate the influence of urban population behaviour on solid waste management in Jinja town

1.3. Purpose of the Study

The purpose of the study was to assess the influence of urban population behaviour on solid waste management in Jinja Town.

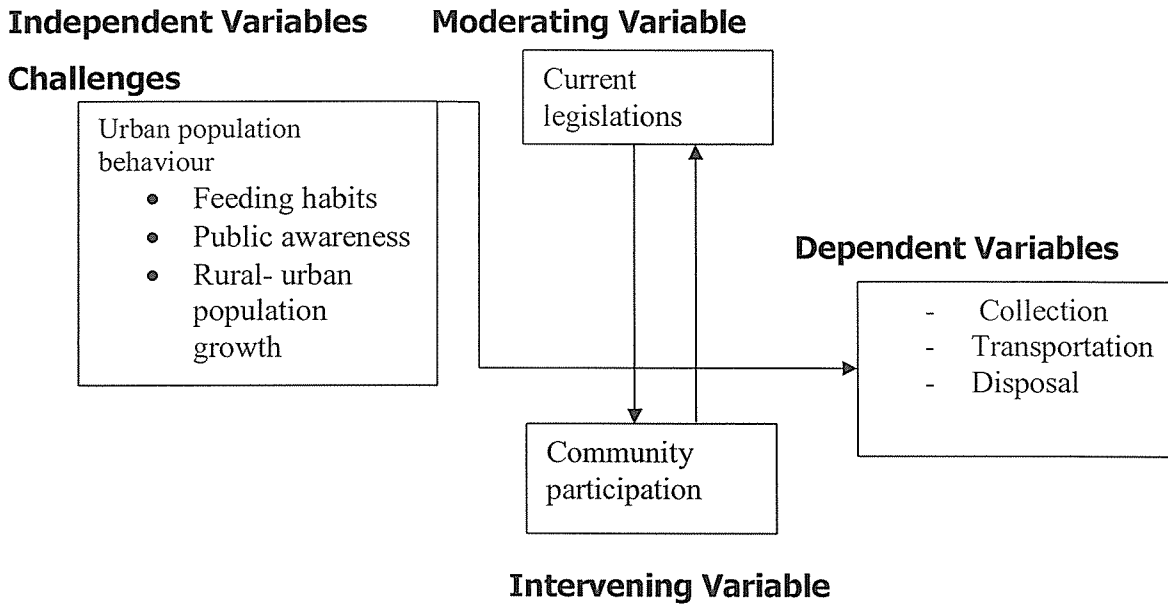
1.4. Specific Objectives

- i. To assess the effect of urban population on solid waste management in Jinja Town.
- ii. To establish the pattern of solid waste management in Jinja Town.
- iii. To determine the relationship between urban population behaviour and solid waste management in Jinja Town.

1.5. Research Questions

- i. To what extent does urban population affect solid waste management in Jinja Town?
- ii. What is the pattern of solid waste management in Jinja Town?
- iii. What is the relationship between urban population behaviour and solid waste management in Jinja Town?
- iv. What is the influence of current legislations on and solid waste management in Jinja Town?

1.6. Conceptual frame work (schema of work)



Source: Constructed 2015

Figure 1. Conceptual framework showing the effects of urban growth and urban population behaviour on solid waste management.

From the above conceptual framework, the dependant variable is solid waste management while the independent variable is the challenges from the above model, the assumption is that population behaviour pose serious challenges on solid waste management if not properly handled. However, the extent to which the independent variables influence solid waste may be intervened by community participants and moderated by current legislation.

1.7. Justification of the Study

The study findings will help policy makers in strengthening solid waste management policies and designing appropriate methods of managing solid waste in urban local authorities. The findings of the study will help raise awareness on issues pertaining to solid waste management at community level.

This awareness will help build initiatives to reduce the solid waste management problem in Jinja Town. It will contribute to the body of knowledge on the studies already conducted on management of solid waste in developing countries.

1.8. Scope of the Study

This study basically specifies the boundaries of research that are categorized under:

Geographical scope

Jinja lies in Jinja District, Busoga sub-region, in Eastern Uganda, approximately 81 kilometres (50 mi), by road, east of Kampala, the capital of Uganda, and the largest city in that country. It sits along the northern shores of Lake Victoria, near to the source of the River Nile. The nearby Nalubaale Dam and adjacent Kiira Dam, regulate the flow of the White Nile and generate electricity. According to the 2014 national population census data, Jinja is the largest metropolitan area in Jinja District, and is the 14th-largest town in the country.

Nearby towns and villages include Njeru Kimaka Mpumudde Masese, Walukuba, Bugungu and Bugembe.

Schema of work (conceptual framework)

The study was guided by a conceptual framework which was constructed. It identifies key issues to be assessed in this study that is population behaviour as the independent variables and solid waste management as the dependent variable. The study assessed influence of urban population behaviour on solid waste management. It concentrated on solid waste from commercial and residential areas from 2008 to 2011.

Content of the scope

Time scope

The study on urban population behaviour and solid waste management was conducted between January 2010-september 2011.

1.9. Operational definitions

Solid waste institutional, commercial and house hold garbage

Policy The government purposive line of action at national and local level

Solid waste disposal This refers to a incineration compositing, burning and dumping of garbage

Waste tax. Tax paid by the generator or producer of garbage for disposal of solid waste

Culture the set norms or rules as prescribed by a given society

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter will review related literature relevant to the problem under study in order to answer research questions. This review will focus on three sub-themes namely; urban population growth, funding and urban population behaviour and how they affect solid waste management. This chapter is arranged into sections (sub themes) that correspond to the objectives and variables of the study. Also reflected is the researcher's commentary on the views and findings of others' studies in both the developed and developing countries especially Uganda on the subject. The gaps there in are the focus of this study.

2.2 Influences of urban population on Solid Waste Management

There are numerous influences to solid waste management. The review of available literature on the above theme was guided by three themes namely: urban population growth, funding and urban population behaviour.

2.2.1. Urban population growth and solid waste management

Vitkovic and Godin (1997) pointed out that the urban population is growing at a rate of more than six percent per year in the capital cities of West Africa as a result of both a natural increase in the cities and the continuing influx from the country side. The review of the available literature was guided by sub themes namely: Natural population growth and rural urban migration.

2.2.1.1. Natural population growth

Mwesigye (2003) pointed out that there is a growing urban population in Uganda. He observed that, the proportion of the urban population has been on the increase for the last several decades between 1959 and 1969 with the population growth rate of 8.2 percent, 1980-1991 was 5.8 percent and 1991-

2002 was 4.6 percent. He further observed that a growing urban population has led to a lot of challenges to urban solid waste management. Ecaat (2003) pointed out that urban population growth has a direct effect on waste generation rate.

2.2.1.2. Rural urban migration

Fay and Opal (2003) pointed out that migration whether circular, seasonal or permanent, is often a response to economic incentives according to this model, migrants compare expected wages in the city to alternative rural income; if urban wages are higher, rural people will be attracted to the city. Mushabe (2002) pointed out that increased accumulation of solid waste has been associated to rapid population growth in Mbarara municipality. He notes that Mbarara has been affected by rural urban migration because of employment prospects. He pointed out that, increased population growth leads to increased solid waste generation in Mbarara municipality. This will assess the effect of urban population growth on solid waste management in Jinja Town.

2.2.2. Urban Population Behaviour and Solid Waste Management

Ecaat (2003) pointed out that where as it is true that the problem of urban waste manifests itself as an environmental concern requiring putting in place sound environment practices, it is also true that the waste problem to an extent is a function of irresponsible behavioural tendencies associated with an urban population whose behaviour in terms of solid waste disposal leaves much to be desired.

2.2.2.1. Feeding habits

Mugenyi (2007) observed that, traditional feeding habits of local communities that emphasise eating of food stuffs such as bananas with high potential to generate wastes (peelings) is partly responsible for the high volumes of organic wastes generated. Mushabe (2002) pointed out that big volumes of solid waste in developing countries and Uganda in particular is largely dependent on their

traditional eating habits whereby a lot of food stuffs are acquired from markets in their unprocessed form as opposed to processed food stuffs consumed in developed countries' cities.

2.2.2.2. Public awareness and sensitisation

Mugenyi (2007) pointed out that limited awareness and consciousness on the need for sound environmental care and proper solid waste disposal as well as on associated dangers of improper waste disposal is one of the causes of the urban solid waste management problems. Ecaat (2003) observes that there is an urgent need for awareness creation among key stakeholders in order to bring about change in waste management practices. This study will assess the effect of urban population culture on solid waste management in Jinja Town.

2.3. Solid Waste Collection

Achankeng (2003), pointed out that municipal solid management constitutes one of the most crucial health and environmental problems facing local governments of African cities. The uncollected or illegally dumped wastes constitute a disaster for human health and environmental degradation. Nyakana (1997) and National Environmental management Agency (1998) pointed out that in Uganda capital city Kampala, 70-80 percent of the solid wastes produced remain uncollected. This study will assess the effectiveness of solid waste collection in Jinja Town in order to address solid waste dilemma.

2.3.1. Solid Waste Transportation

According to National Environmental Management Agency (2005), almost 80 percent of the households are not served by Jinja Town Council because they are hardly accessed by Jinja Town Councils waste collection facility due to a combination of bad roads and absence of vehicle pass ways.

Gombya and Mukunya (2004) pointed out that many sources of waste management only be reached by roads of alleys which might be inaccessible to

certain methods of transport because of their width, slope, congestion or surface. This is especially critical in unplanned settlements such as slums or low income areas. This study will assess the appropriateness of solid waste transportation in Jinja Town in order to address solid waste crisis.

2.3.2. Solid Waste Disposal

The methods of solid waste disposal have been handled differently worldwide. Some standard disposal methods can be applied in combination to produce a waste management system which includes recycling, compositing, incineration, land fill and ordinary burning and each is reviewed below:

2.4. Solid Waste Recycling and Re-use:

Solid waste and re-use are approaches to solid waste management that basically reduce the already generated solid waste volumes recycling, is the practice of using waste materials as inputs in the process of producing new products while reuse in the conversion of waste materials, (Beede.D.1995), Environment Protection Agency [2001], reveals that since re-use doesn't entail re processing of the item before it can be used again it there for more referred over re cycling which involves costs .

Remashetal (1995) pointed out that recycling of solid waste reduces the pressure on the collection, disposal and handling of waste. At the same time the activity of recycling creates further economic benefit such as employment creation and income generation.

Mawanda (1997), and Mugisha (1995), point that recycling and re-use of solid waste are still limited in Uganda's urban area but admitted that the potential exists. Mawanda (1997), points out that in Jinja Town, it is the poor at times who engage in scavenging of the waste discarded by the envious high-income group.

Mugisha (1995) similarly noted that in Kabale Town some wastes have been put to profitable use such as Coventry some waste to manure and animal feeds in the farming sector and some food tins where being converted to small light heaps.

2.4.1 Composting

According to environment protection Agency (2001), compositing is a form of re cycling integrating and re- use compositing is a form of re cycling organic waste into new solid used in vegetable and flower gardens, land scope and many other applications.

Casey (1987), noted that increased use of compositing in Denmark was between 1987 and 1997 where by after the introduction of the waste tax, compositing increased by 580 percent. It should there fore be noted that waste taxes play a big role in boosting composition.

Land fills

Land fill is the major method of disposal of domestic waste in Jinja Town , landfills are dug within the city divisions to help in the absorption of solid waste gathered form various house holds and business premises

Burning and Incineration of Solid Waste

Burning and incineration according to environmental protection Agency (2001) are also a method to reduce solid waste volume. When properly equipped burning and incineration can covert water into steam to fuel heating systems or generate electricity at the same time reducing the amount of waste by up 90 percent in volume and 75 percent in weight. Burning of waste at extreme high temperature also destroys harm ful chemical compounds and diseases causing bacteria.

Bamukwasha (1998) indicates the burning of solid waste in Kampala Uganda is done on a small scale at the house hold level as one way of reducing the amount of the produced garbage and this is common in a dry season and where the city collection service is insufficient.

2.5. Community Participation in Solid Waste Management

Ecaat (2003) pointed out that, the involvement of instituting deliberate waste management practices such as segregation and compositing of compositable organic wastes could go a long way to reducing the bulk of waste available for eventual transportation while waste reduction could also lead to reduced transport costs as well as longer life span of land fills.

Gombya and Mukunya (2004) pointed out that the community needs to be included in waste management efforts as both public and private sectors are unable to provide waste services to low income areas of the city. They observed that community involvement is an effective way of increasing access of the poor to urban services including solid waste management. This study will establish the intervening efforts of community participation on solid waste management in Jinja Town.

2.6. Current Legislation for Solid Waste Management

According to Mushabe (2002), inadequate legislation in some countries has proved to be a contributory factor to the problem of solid waste management. Mugenyi (2007) observed that lack of a deliberate policy and framework for solid waste management at community and institutional level is one of the causes of urban waste management problem in Uganda.

Mugenyi (2007) in agreement with Ecaat (2003), point that the existing byelaws are no longer applicable to the current situation and require revision. This study will assess the moderating effect of current legislation on solid waste management in Jinja Town.

2.7. Related Literature

Baldismo (1988) while analysing scavenging of municipal solid waste in Bangkok, Jakarta and Manila, observed that the quantities and characteristics of solid waste produced vary from country to country and identifies the factors that influence it as the average level of income, the sources, population, social behaviour, climate, industrial production and the market for the waste materials. Jenkins (1993) in his study on American municipalities and found that waste generation increased with increase in the percentage of population in the age group between 18 and 49. She also developed a model where households maximize utility, which positively depends on the consumption of goods and negatively on the quantity of recycling. The budget constraint included a disposal charge for municipal solid waste collection. The quantity of municipal solid waste generated was found to be sensitive to the price of municipal solid waste collection. Analysing data for in American municipalities, she found that a \$1.00 dollar fee per 32-gallon trash bag would reduce waste generation by 15 percent. She estimated that such a pricing system would improve social welfare by \$650 million per year ie around \$3 per person per year. The average price elasticity for municipal solid waste collection was -0.12.

McLain (1995) identified the changes in lifestyle in the last 50 years as the main cause for the increased solid waste generation in the U.S.A. The increase in nuclear families, increase in women's participation in work and the usage of modern kitchen equipment has increased the need for packaged foods which has accelerated the rate of after consumption waste. It was found that, in the U.S about 33% of the waste consisted of containers and packaging materials.

Beede and Bloom (1995) assessed the relative importance of growth in real per capita income and population in determining municipal solid waste generation rates. Analysing data from a cross section of 36 countries the income elasticity of was estimated as 0.34 and population elasticity as 1.04. Again using time series data for the U.S. (1970-1988) and for Taiwan (1980-1991), they found the

income elasticities as 0.86 and 0.59 and population elasticities as 0.63 and 1.63. Using data set for households, they found that household waste generation as income inelastic and an approximately unit elasticity with respect to population. De Konning H et al (1995) surveyed 21 Latin American countries and showed that the per person generation rate of industrial hazardous waste sludge and solids is a function of the country's industrialization. Countries like Brazil and Mexico had high rates of over 0.3tons/person/year and countries like Bolivia and Equador had lower rates of less than 0.1tons/person/year.

Dennison et al (1996) while conducting a survey of household waste characteristics in the city of Dublin, Ireland, showed the relationship between socio-economic factors and the composition of the waste generated in Dublin. Using a sample of 857 households, the study identified prosperity and household size as the important variables. The data showed substantial differences in the relative composition of the waste stream as compared with the earlier studies undertaken in the late 1970s. The proportion of organic waste was found to be in excess of 45% by wt. in the study as compared with 34% in 1977/78. The results showed a big difference between the prosperous and the less prosperous section of the city's population with regard to individual and overall waste generation.

Martin Medina (1997) analysed the relationship between the municipal solid waste generation rates and income for 123 countries. A curvilinear shape was found for the relationship between the two variables which shows that as a country develops its waste generation rate increases but as it reaches the middle income and upper income range the generation rate decreases.

Podolsky and Spiegel (1998), analysed municipal waste disposal, unit pricing and recycling opportunities on 149 municipalities in New Jersey in the U.S and identified a negative relation between average household size and waste

generation rates indicating a possibility of household diseconomies of scale in waste generation. They also found that urban households generated less solid waste when compared with rural households mainly due to the space constraint in the urban areas.

CHAPTER THREE

METHODOLOGY

3.0. Introduction

This chapter will describe the procedural framework within which the research will be conducted. The researcher will explain how the research will be conducted in terms of research design, study population, sample size and selection, sampling techniques and procedure of data collection instruments: validity and reliability of research instruments, procedure of data collection and analysis.

3.1. Research Design

This study will be carried out using a Descriptive research survey designs which is defined as the procedure for gathering information from a large number of population by collecting information from a few of them (Black and Chapman, 1976) in selecting this research the researcher considered both practical and theoretical aspect of the study.

3.1.1 Study area

The study was carried out in Jinja Town council which is made up of five divisions namely; Nakawa, Makindye, Kawempe, Central and Rubaga the Makindye and central division were chosen as the area of study because of the increasing urbanization. Random sampling was used to select the divisions.

3.1.2 Study population

The study consisted of heads of families, business operators, elected leaders, heads of departments and garbage collectors

3.2 Sample Selection and Size

A sample size is the proportion of the population whose results can be generalized to the active population. A sample is obtained from accessible population and contains elements known as subjects or respondents or interviewers (Mugenda and mugenda1999) a sample size of 491out of 7881 will be selected

A sample size of 391 out of 7881 was selected. These shall include 287 heads of households, 72 business operators, 12 elected leaders, 10 heads of departments and 10 garbage collectors. Purposive sampling will be used to identify subjects among elected leaders, heads of departments and garbage collectors. The above categories of respondents are expected to be knowledgeable on issues of solid waste management and therefore are major sources of information. 360 operational shops will be contacted out of which a sample of 72 business operators will be used. The sampling interval will be determined by calculating

$$\frac{N}{n} \quad \text{where } N= 360 \text{ and } n = 72,$$
$$\frac{360}{72} = 5$$

The first respondent will be number five (5). Systematic sampling will be used to select 287 households thus $N = 7443$, $n = 287$

$$\frac{N}{n} = \frac{7443}{287} = 26 \quad \text{first respondent will be number 26.}$$

$$N = 287$$

The sampling interval was determined by calculating N/n where $N=7443$ and $n=287$. The sampling interval was $7443/287=26$. The first respondent was number 26. Systematic sampling was used because it is good procedure for sampling large population.

Table1 distribution of heads of house holds, heads of business operators, elected leaders and heads of department and garbage collectors in Jinja Town council.

Category of respondents	Population	Sample size	Sampling techniques
Heads of house holds.	7443	287	Stratified sampling
Business operators	360	72	Systematic sampling
Elected leaders	48	12	Purposive sampling
Heads of departments	20	10	Purposive sampling
Garbage collectors	10	10	Purposive sampling.
Total	7881	491	

Source (Uganda bureau of statistics 2010 Jinja Town council records 2010)

3.2.1 Sampling Procedures

Systematic random sampling was employed because random selections are done with out personal bias of the researcher stratified sampling method was also used during data collection by the researcher, sample representatives was estimated and statistical test used to analyze data.

3.3 Research instruments

The researcher intends to use several techniques were employed in data collection which included: Questionnaires, interview schedules, observation and photography which were used to various category of respondents.

3.3.1The Interview Schedule

The interview schedule will be administered on the following categories of respondents like political leaders for example local leaders chair persons, technocrats for example engineers House holds residents , business enterprises and owners and Garbage collectors in the five divisions of Jinja Town The Interview method is an oral questionnaire where the investigator gathers data through direct verbal interaction with respondents (Amin, 2005). Interviews provide in-depth data, are more flexible, yield more information by using probing questions (Mugenda and Mugenda, 1999). They also provide opportunity to observe non-verbal behaviour and record spontaneous answers (Sarantakos, 1998).

3.3.2 Direct Observation

This was used in the location of garbage collection sites; nature of roads indiscriminate dumping and efforts made by council to collect the volumes of solid waste from collection sites. Observation is a method of data collection that employs vision as it is a means of data collection, 1998). It approaches events in their natural structure and studies events as they evolve. It offers first hand information without relying on reports of others (Amin, 2005).

3.3.3. Document Review

A study employed the use of photographic mechanism as a tool for collecting information as pertaining to solid waste management in the area of study. photographs of garbage sites were taken as shown (plates 1 and 2)

3.3.4 Questionnaires.

Questionnaires are commonly used to obtain important information about the population each item in a questionnaire is developed to address a specific objective, research question or hypothesis of the study (Mugenda and Mugenda, 1999). In this study close ended questionnaires will be used. These refer to questions which are accompanied by a list of all possible alternatives from which respondents select the answer that best describes the situation. Questionnaires will be administered on heads of households and business operators.

3.3.5. Reliability and Validity of Research Instruments

Reliability is the measure of the degree to which a research instruments yields consistent results or data after repeated results while validity is the accuracy and meaning fullness of inferences which are based on research results (Mugenda and Mugenda 1999). The researcher pre-tested questionnaires on purposely selected respondents. This enabled the researcher to make some adjustment Kothari (1990) and Kakos (1996) observed that instruments are revised for purposes of making them reliable, valid and flexible for respondents to cope with. They point out that pre-testing enables the researcher to resist Difficult and ambiguous questions for both respondents and research assistant.

3.4 Measurement of Variables

Variables for quantitative data were measured in form of numbers using Likert scale. The numbers in a Likert scale are ordered such that they indicate the presence of or absence of the characteristics being measured (Mugenda and Mugenda, 1999) while under quantitative data codes or labels will be assigned to emerging themes

3.5 Data Analysis

Raw data was sorted and coded in order to get numbers and summarised to facilitate quick interpretation (Mugenda and Mugenda 1999). Qualitative data were presented using words to make narrative statements on how categories or themes of data were related. Quantitative data was generated, coded and analysed by the computer. Descriptive statistics was used to summarise and describe data. In addition graphic presentation specifically the pie charts, histograms and line graphs was used.

CHI-SQUARE

This will be used to analyse the correlation between urban population growth, behaviour and solid waste management

ANOVA

This will be used to determine the relationships between dependent and independent variables.

Pearson Product-Moment Correlation

This was for the dependent variable. Data was analysed using Pearson-product moment correlation co-efficient of correlation to establish relationship between urban population behaviours and solid waste management.

3.6 Reliability and Validity Of Research Instruments

3.6.1. Validity

This the ability to produce findings that are in the agreement with theoretical or conceptual values or to produce accurate results to measure what is supposed to be measured Amin (2005) copies of questionnaires and objectives of the study were given to two judges to find out whether instruments measured what it was supposed to measure and check the phrasing, understanding, and working of statements.

Content validity index was used to measure whether the questionnaire measured what it was supposed to measure

Content validity is the degree where to which research instruments yields consistent results or data after the repeated results Mugenda and Mugenda(1999) in this study quality control was done by carrying out a pre-test of research instruments to test reliability. Responses were entered in Spss program to compute the reliability this was determined using Cranach's Alpha coefficient which gives average correction of items in Instruments.

Table 2 reliability coefficients of independent variable & dependent reliability coefficient based on Alpha Cranach's test is more than 0.7 which measure internal consistency

Variables	Cranach's Alpha
Urban population growth	.881
Population behaviour	.768
Solid waste management	.754

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0. Introduction

This study aimed at assessing challenges to solid waste management in urban local authorities in Uganda with specific reference to Jinja Town. The central focus was on two independent variables namely:-Urban local authorities in Uganda with specific reference to Jinja Town. The central focus was on two independent variables namely: urban population growth and urban population behaviour and how these affect solid waste management in order to accomplish the above, two hypotheses were posed and the results are presented in this chapter. The chapter is derived in three parts namely socio-economic characteristics of respondents, the frequency counts of respondents answer per each of the items relating to a particular objective and the study's findings according to the hypotheses cited in chapter one

4.1. Socio –economic characteristics of respondents

The following demographic characteristics formed part of the study age, gender, religious affiliation, educational qualifications and employment status.

A bar graph showing the age category of respondents.

Frequency 200

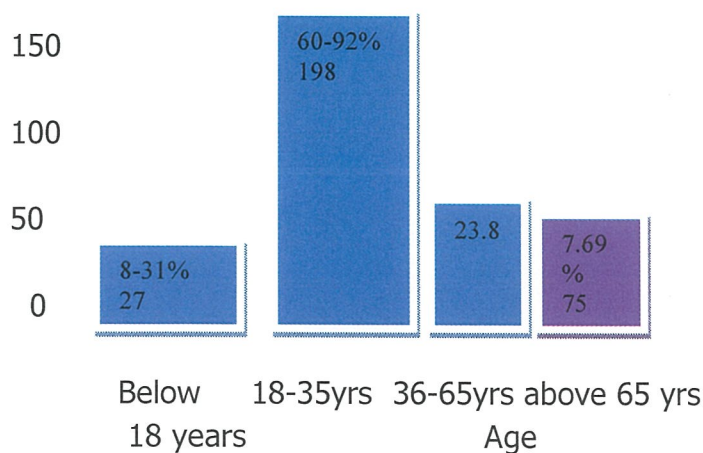


Figure 1 showing the age category of the respondents

The graph (figure 1) shows the categories of respondents from the above figure 8.3 percent of the respondents from the above figure 8.3 percent of respondents were below 18 years, 60.9 percent were in the age bracket of 18-35 years 23.1 percent from 36-65 years and 7.7 percent from 65 years and above this shows the majority of respondents were aged between 18-65 years , the above age category mostly consists of the youth especially those who have dropped out of school, some are engaged in inform activities such as carpentry, metal fabrication and they like such informal activities in their nature gave potential to generate waste this poses a challenge to solid waste management in Jinja Town. Other demographic characteristics are shown in table 2 below.

Table 2

Demographic characteristics of respondents

Table 3 demographic characteristics of respondents (Cn=326)

socio economic characteristics		Frequency	Percentage
Gender	Male	108	33.1
	Female	218	66.9
Total		326	100.0
Religion	Protestant	42	12.9
	Catholic	72	22.1
	Moslem	200	61.3
	Seventh day Adventist	5	1.5
	Others	7	2.1
Total		326	100.0
Level pf education	O. level	87	26.7
	A. Level	61	18.7
	Diploma	1	.3

	Bachelor	11	3.4
	Masters	3	.9
	Less than secondary	163	50.0
Total		326	100.0
Employment	Public servant	12	3.7
	NGO employee	3	.9
	Private sector	29	8.9
	self employed	151	46.3
	Not employed	131	40.2
Total		326	100.0

The finding in Table 2 above shows that most respondents 66.9% were females while only 33.1% were males. This scenario is associated with the fact that in the area of study majority of males were working in town thus many of them not easily reached. On the other hand a greater section of the female respondents were un employed house wives. The type of food prepared like potatoes, bananas generate a lot of waste in Jinja Town .

It can also be noted that the majority of the respondents were Moslem with the percentage of 61.3% this is associated with the fact that the town is mostly inhabited by Moslem since most of them are business oriented. This tend to increase waste accumulation in Jinja Town

With regard to level of education 50% of the respondents didn't attain ordinary level of education these poses serious challenges to solid waste management because the above category are not aware of good hygienic practices thus indiscriminately dump garbage without due regard of its consequences

Concerning the employment status of the respondents , a significant number were either self employed (46.3)or un employed (40.2%) the later mainly stay at home to undertake domestic duties like cooking where a lot of waste is generated ,this poses serious challenge to solid waste in Jinja Town

4.2 respondent's opinion in relation to the questionnaires

In this section description of respondent's opinion per the items of the questionnaires relating to the objectives of the study are presented. Respondents were requested to react on the item by ticking the option that best describes their opinion s on a five point like scale ranging from disagree to strongly agree.

4.2.1 Respondents opinion of urban population growth.

Several items in the questionnaires were presented to the respondents and the respondents are shown in Table 3

Table 4 respondent's opinions on the population growth.

		Frequency	Percentage
There is low population in Jinja	Strongly disagree	136	41.7
	Disagree	118	36.2
	Un decided	22	6.7
	Agree	31	9.5
	Strongly agree	19	5.8
Population growth is not responsible for increased waste generation	Strongly disagree	35	10.7
	Disagree	188	57.7
	Undecided	23	7.1
	Agree	50	15.3

	Strongly agree	30	9.2
Population growth in Jinja is not associated with rural urban migration	Strongly disagree	65	19.9
	Disagree	190	58.3
	Undecided	22	6.7
	Agree	31	9.5
	Strongly agree	18	5.5
The population of Jinja increases due to her central location	Strongly disagree	12	3.7
	Disagree	35	10.8
	Undecided	26	8.0
	Agree	200	61.5
	Strongly agree	52	16.0
Rural-urban migration is not responsible for solid waste problems in Jinja Town.	Strongly disagree	32	9.8
	Disagree	197	60.4
	Undecided	36	11.0
	Agree	44	13.5
	Strongly agree	17	5.2

Source: primary data

As seen in table 3, high population growth seems to be one of the major problem in Jinja Town this depicted by percentage of 41.7 and 36.2% of the respondents who strongly disagreed and disagreed with the first statement respectively. The finding also revealed that as a result of this increase in population. It has led to an increase in solid waste generation in the city 68.4%b (thus 10.7% +57.7) majority of the respondents 190 (58.3) also maintaine4d

that rural urban migration has a significant role in the rise of the population nevertheless bulk of individuals 200(61.5) that were sampled accepted the claim that increase in population has been attributed to Jinja's central location in Uganda thus this increase in population is due to rural-urban migration and natural procreation.

4.2.2 Respondent's opinions on population behaviour.

The following item on the questionnaire on the urban population behaviour were presented to the respondents and the results are given in table 4

Table 5 respondent's opinion on population behaviour

Alternatives	Response	Frequency	Percentage
Careful dumping of waste is common in Jinja Town	Strongly disagree	141	43.3
	Disagree	99	30.4
	Undecided	18	5.5
	Agree	40	12.3
	Strongly disagree	28	8.6
There are few food stuffs in Jinja Market and other markets	Strongly disagree	55	16.9
	Disagree	151	46.3
	Undecided	16	4.9
	Agree	85	26.1
	Strongly disagree	19	5.8
Most food stuffs solid in Jinja have no potential for solid waste generation.	Strongly disagree	15	4.6
	Disagree	157	48.2
	Undecided	46	14.1
	Agree	87	26.7
	Strongly disagree	21	6.4
Sensitization has led to a reduction in solid waste accumulation	Strongly disagree	27	8.3
	Disagree	74	22.7
	Undecided	19	5.8
	Agree	91	27.9
	Strongly disagree	115	35.3
Jinja Town council carries out sensitization to avoid	Strongly disagree	22	6.7
	Disagree	100	30.7
	Undecided	35	10.7
	Agree	155	47.5

indiscriminate waste disposal	Strongly disagree	14	4.3
Jinja Town council carries out regular sensitization on solid waste management	Strongly disagree	36	11.0
	Disagree	215	66.0
	Undecided	34	10.4
	Agree	37	11.3
	Strongly disagree	4	1.2

From table 4 above the findings revealed that despite the presence of garbage collection points, the population is still careless when it comes to disposing of wastes as 240 (73.3%) respondents mentioned. The careless disposal of garbage is done by another considerable number 206 (63.2%) of population mainly dealing in food stuffs in the central market. However, the large would not have been a problem but worst of all is that these foodstuffs have high potential of 172(52.8) for solid waste generation if not carefully handled. On a view of this Jinja Town

Has embarked on a wide sensitization of masses in order to reduce indiscriminate disposal of waste as depicted by 169 (51.8%) respondents who strongly agree or simply agree with this item. In fact majority of the respondents were optimistic that these programmes play a significant role in reducing accumulation of wastes –however the study noted that despite their importance , these sensitization programmers were irregular. 215 (77%) during the interview 25 of 32 respondents (78.1) admitted that Jinja Town council has not taken serious step to address the element of public awareness on solid waste management yet sensitization play a key role towards better solid waste management.

4.2.3 Solid waste management respondents were requested to give their opinions with regards to how solid waste managed in Jinja Town. Their responses were summarized in table 5 respondents opinions on solid waste management in Jinja Town

Alternatives	Response	Frequency	Percentage
Solid waste in Jinja is adequately managed	Strongly disagree	69	21.2
	Disagree	211	64.7
	Undecided	24	7.4
	Agree	14	4.3
	Strongly agree	8	2.5
Jinja Town council collects rubbish daily	Strongly disagree	31	9.5
	Disagree	224	68.7
	Undecided	35	10.7
	Agree	25	7.7
	Strongly agree	11	3.4
Jinja Town council provides efficient and reliable collection services	Strongly disagree	37	11.3
	Disagree	237	72.7
	Undecided	33	10.1
	Agree	15	4.6
	Strongly agree	4	1.2
All the refuse generated by house hold business premis3s in Jinja is collected.	Strongly disagree	149	45.7
	Disagree	135	41.4
	Undecided	18	5.5
	Agree	16	4.9
	Strongly agree	8	2.5
Jinja Town council has enough refuse collection tracks	Strongly disagree	46	14.4
	Disagree	192	58.9
	Undecided	74	22.7
	Agree	8	2.5
	Strongly agree	6	1.8
The available trucks are in very good operational state.	Strongly disagree	54	16.6
	Disagree	179	54.9
	Undecided	87	26.7

	Agree	5	1.5
	Strongly agree	1	.3
All residents in Jinja have refuse compositing sites	Strongly disagree	67	20.6
	Disagree	134	41.1
	Undecided	105	32.2
	Agree	15	4.6
	Strongly agree	5	1.5
Jinja Town council has a land fill for deposing refuse.	Strongly disagree	35	10.7
	Disagree	36	11.0
	Undecided	156	47.9
	Agree	87	26.73.7
	Strongly agree	12	
The landfill is a property managed and maintained	Strongly disagree	23	7.1
	Disagree	57	17.5
	Undecided	228	70.2
	Agree	11	3.4
	Strongly agree	6	1.8
Residents in Jinja always burn their garbage	Strongly disagree	49	15.0
	Disagree	179	54.9
	Undecided	29	8.9
	Agree	58	17.8
	Strongly agree	11	3.4
Refuse burning in Jinja Town is done on large scale.	Strongly disagree	45	13.8
	Disagree	225	69.0
	Undecided	45	13.8
	Agree	9	2.8
	Strongly agree	2	.6

The findings in table 5 above shows that solid waste in Jinja is inadequately managed as shown by majority respondents whose views were negative on the first item (thus strongly disagree or disagree) with their respective percentage being higher (thus 21.2%-64.7% respectively) the higher increase in population in the city ideally warrant the collection of garbage on daily basis, however this was not so in the case of Jinja Town as a significant number of 78.8% (thus 68.7 + 9.5%) maintain in addition the findings show that large number of individuals 274 (83. 5%) asserted that waste collection services were not insufficient but also un reliable which resulted in accumulation of garbage in the city.

The study also found out that refuse generated were not always collected 87.1% (45.7 +41.4%) due to limited number of trucks which are also in poor state.

The findings also indicated that 47.9 percentage of individuals sampled were not aware or undecided whether the council has a land fill for disposing refuse they were also un described on whether the land fill is properly managed and maintained 70.2% by the city authorities.

The findings also established that the population rarely burns its garbage; majority of the respondents (63.8 percent) who responded to this item disagreed with the statement

4.3.0 Verification of hypothesis

Before moving to the substantive of hypothesis verification it is important to explain how composite indices were computed. Composite indices were computed by summary up al valid responses intended to obtain, respondents, opinions per each of three variables thus urban population growth, behaviour and solid waste management. The justification for summing up these responses up these responses was that the researcher's method analysis (thus linear regression) necessitated data which is continuous. It is important to turn into categorical data alternatives form. Accordingly extreme positive responses like

strongly agree) were assigned the value of 5 and the extreme negative response (thus strongly disagree) were assigned the value 1 composite indices were computed for the independent variable for statements of the questionnaires dealing with each of the four independent variable and dependent variables consequently the analysis entailed the verification of the null hypothesis at 95 percent level of confidence. Using the statistical package for social sciences. In this section, the effect of independent variables on independent on dependent variables is presented in verifying the hypothesis, the researcher used the linear regression analysis to find out whether solid waste management was significantly dependent on each of the three predictor variables.

The finding demonstrated linear relationships between each of the predictor variable and the dependent variable . in this section findings for the 2 hypothesis are presented one after the other.

4.3.1 Urban population growth and solid waste management.

The null hypothesis stated "urban population growth has no significant effect on solid waste management "the result of the analysis are shown in table 6

Table 6: effect of urban population growth on solid waste management (a,b)

Model	Un standardized co efficiency	standardized co efficient	
B	Standard error	Beta t	Sign
Constant	108.968 2.124	51.30%	.000
Urban population	-1.872 -160	-.546 -11.726	.000
Dependent variables	Solid waste management	R square =298	298

In table 6, the co-efficient of urban population growth is given by the value of -1.872. the coefficient being negative implies that population growth has an inverse relationship with solid waste management and it makes it difficult to efficiently manage solid waste in the city.

The p. value for the t. statistics was significant ($E=0.001, P=0.05$) , implying that solid waste management is significantly affected by increase in urban population. The R. Squared value of .298 shows that about 29.8 percent of the council's failure to effectively manage solid waste in Jinja Town is accountable for by the increase in the population in relation to the variable facilities to collect, transport and dispose the accumulated garbage in Jinja Town as indicated in plate 1 (i.e. shows photograph of heaps of indisposed off garbage as shown below.

The above phenomenon was as a result of lack of segregation of solid waste while it is known fact that the waste generated in urban centres contain different forms of wastes' with different characteristics some of which are dangerous. However the study showed that in Jinja Town waste segregation is a management strategy yet it is realized with disposed off without sorting, opportunities for possible reuse of some of the valuable reuse of some of the valuable and re-useable waste items are squandered hence [posing or challenge to solid waste management in Jinja Town i.e. show another plate2 photo of waste heap here drawn in some divisions of indiscriminate waste disposal on a waste collection site.

4.3.2 Urban population behaviour and solid waste management.

The null hypothesis stated" urban population behaviour does not significantly affect waste management. The finding are presented in table 7

Table 7: Effect of urban population behaviour on solid waste management.

B (constant) 91.529 -414	Standard error 3.449 .209	Beta -109	T 26.158	sign 0.001
Dependent variable solid waste management			R. square=0.12	

The results in table 7 above show negative behaviour and solid waste management in particular. The careless dumping of waste, lack of sensitization /awareness coupled with low education levels of some urban residents 50 percent of the respondents and consumption habits of people whereby most food stuffs eaten have high potential of generating a lot of waste during their preparation have resultant off negative effect on solid waste management in Jinja Town –J

From table 7 above the coefficient of urban population behaviour given by -.414 implies that holding other factors constant, poor urban population behaviour as mentioned above leads to a 0.414 significant (PL 0.05) decline in solid waste management. Such behavioural tendencies make waste management such as behavioural tendencies make waste management difficult if they persist.

Looking at the value of R squared given by 0.012, the results suggest that about 1.2 percent of the failure to adequately manage solid waste in Jinja Town is accountable for by urban population behaviour. The problem of indiscriminate solid waste disposal has been aggravated due to whether legislation by laws coupled with poor law enforcement mechanism.

CHAPTER FIVE

SUMMARY DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0. Introduction

In this chapter the finding presented in chapter four are discussed based on either hypothesis and referred to the related literature cited. the summary, conclusion, recommendations contributions and areas for further research are also presented.

5.1 Summary

The purpose of the study was to assess the influence of urban population growth and behaviour towards solid waste management in the urban local authorities with specific influence to Jinja Town council.

The researcher used questionnaire to collect data from heads of households and business operator's interview to elicit information from elected leaders, technical officers and garbage collectors, documentary review and observation and photography were also used.

The data was analyzed quantity and qualitative. It was presented in three parts namely the socio economic characteristics of respondents, the frequent counts of respondent's opinion per each of the items relating to a particular objective and the study findings according to hypothesis.

The study showed that the major influence of solid waste management in Jinja Town include urban population behaviour.

5.2 Discussions

5.2.1 Relationship between urban population growth and solid waste management in Jinja Town

In the first objective the study hypothesized that urban population growth significantly affects solid waste management in Jinja Town and the results obtained in table 6 confirm the assumption.

The results of analysis using linear regression analysis techniques revealed that urban population growth have a significant (P<0.000) negative effect on solid waste management of solid waste in the city. There exists an inverse relationship between urban population growth and effective solid waste management of solid waste in the city. In other words when urban population grows it becomes difficult for city council authorities to adequately collect, transport, dispose, recycle, or treat waste materials.

The finding of this study are perfectly with align with those of the previous scholars like Badial (1998) who asserted that a rapid increase in the urban population density makes management of waste especially solid waste or monumental problem of municipal authorities .

Anomanyo (2004) warns that population dynamics have considerable influence on the waste generated and it is proper handling in the municipality an increase in population due to rural urban migration or natural growth implies service provision in the regard waste management will become a problem.

Anomanyo (2004) points out that per capita waste generation increased nearly three-fold of the last decades, reaching, and a level five to six times higher than in developing countries.

He further warns that if no measures are taken to control the sky rocketing population this imply movement in volume of waste generation consequently if the current trend population continue the world may see a five –fold increase in waste generation of the year 2005.

5.2.2. Relationship between population behaviour and solid waste management in Jinja Town

In this objective the study hypothesized behaviour significantly affects solid waste management in Jinja Town is largely due to careless dumping of solid waste in Jinja Town. And the findings in table 7 confirm this assumption. The coefficient of urban population behaviour given 0.414 shows the failure to effectively manage solid waste in Jinja Town is largely due to careless dumping of solid waste by city dwellers.

The increase in the relationship between solid waste management and urban population was significant ($0.49 < 0.5$) which suggests that other factors constant poor urban population behaviour significantly explain the failure of authorities in the city to collect transport and dispose waste.

In long run the variations of only 1.2 % ($R^2 = 0.12$) as shown this imply accumulation of solid waste, rotation and disposed garbage will make the city and its neighbourhood fitting, foul smelling and unhealthy.

Common infectious diseases like malaria, intestinal worms and upper respiratory infections are among the common health problems reported by municipal health care providers (Aguwamba1998).

5.3 Conclusion

Solid waste management is an essential component of environmental infrastructure in human settlement and therefore emphasis should be placed on its efficiency. The study in Jinja Town has revealed inefficiencies in management of garbage heaps. The deduction is that solid wastes have not been properly managed on account of sectors discussed in the previous chapters. Any attempt to improve the situation should therefore be focused on the factors addressing the factors underlying waste management as means of improving the solid waste crisis in Jinja Town, based on the study's findings the following conclusions were made.

1. It has established that urban population growth significantly affects solid waste management. This was a result of solid segregation since the waste is indiscriminately disposed off.
2. The finding revealed that urban population behaviour significantly affects solid waste management in Jinja Town council, the local officials, community and Jinja Town council need to address the problem.
3. There is a need to advise proper and appropriate strategies to mitigate the problems accordingly.

Solid Waste Segregation and Separation

A large proportion of waste generated in Jinja Town is biodegradable and can be re-used; hence an effort should be channelled towards putting these wastes to more productive use. It is therefore recommended that segregation of waste be embarked upon in order to hold value on the waste.

Waste segregation should take place at the point of its generation such as residential and commercial premises levels. The sorting can be made; degradable waste be embarked upon in order to hold value of the waste.

Waste segregation should take place at the point of generation such as residential and commercial premises levels. The sorting can be made degradable waste . bio degradable materials can be used to make composite soil fertility or as animals feed especially on peeling staff.

Enforcement

Whereas it is true laws related to waste management to exist, more need to be done in strengthening the enforcement personnel need to be availed with necessary knowledge and skills to enforce the law.

Legislation

In order for a plan to work it must be backed by legislative measures which will help to enforce decisions that have been made .

By laws against altering of garbage should be enacted and enforced as situation demands for instance people who litter the city with garbage should be apprehended and fined if not imprisoned.

Jinja Town council should advocate for bye-laws for privatization of solid waste management such that private firm come to ease the pressure of garbage collection and disposal on city council authorities who have failed to manage solid waste generated around the city.

Provision of alternative solid waste management facilities. Jinja Town council should purchase more solid waste handling equipments to ease the collection and disposal of generated garbage.

Training

In order to improve technical and managerial capacity for solid waste management in Jinja Town, there is need to develop capacity to prepare plan for action waste management monitoring.

5.4 Contribution of the study.

The study has pointed out that population of Jinja Town is heterogeneous since the residents are from fixed socio-cultural backgrounds . This implies that their specific behaviour needs to be addressed hence behavioural change is pre-requisite for effective solid waste management in urban local authorities.

The study revealed that poor physical planning of the city needs to be structured to ensure effective solid waste management.

Effective legislation mechanisms should be structured and enforced to control careless dumping around Jinja Town.

5.5. Area of further research

The researcher acknowledges the study is not exhaustive and it does not claim to have covered all aspects of solid waste management, this means that what has been done is a "tip of the ice" to emphasize the fact that there is still a lot to be done; further researchers should focus on the following.

1. Medical waste disposal and city safety in urban planning.
2. The role of physical planning on management of cabbage.

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Appendix 1

QUESTIONNAIRE FOR RESIDENTIAL/COMMERCIAL PREMISES

Dear Respondent,

This questionnaire is intended to facilitate a study on “urban population growth, funding and urban population behaviour influence towards solid waste management in Jinja Town.” You have been selected as key respondent. The information provided will be treated with utmost confidentiality and shall only be used for study purpose.

Thanking you in advance.

Ssegujja Kasim

SECTION A:

Socio-economic characteristics of respondents.

Please tick or fill in the space provided or tick in the box on the appropriate alternative answers provided.

1. Street/Cell Name:
2. Age group (a) Below 18 years ☐ (b) 18 – 35 years ☐
(c) 36 – 65 ☐ (d) above 65 years ☐
3. Sex/Gender (a) Male ☐ (b) Female ☐
4. Religious affiliation (a) Protestant ☐ (b) Catholic ☐
(c) Moslem ☐ (c) Seventh Day Adventist ☐
(e) Others ☐

5. Highest qualification of education attained.

(a) O' level ☐ (b) A' level ☐ (c) Diploma ☐

(d) Bachelors ☐ (e) Masters ☐ (f) others specify.....

6. Nature of business occupation.....

7. Experience

(a) Below 1 year ☐ (b) below 5 years ☐ Above 10 years ☐

Instructions: In each of the sections B, C, D, E tick or circle the number that best indicators your opinion on the question by using scale.

1 = Strongly Disagree, 2 = Disagree, 3 = No comment, 4 =Agree , 5=Strongly agree

SECTION B: URBAN POPULATION GROWTH INFLUENCES SOLID WASTE MANAGEMENT

		Responses				
8.	There is high population growth in Jinja Town	5	4	3	2	1
9.	High population growth of Jinja Town is due to rural-urban migration and natural birth	5	4	3	2	1
10.	Increase in population lends to increase in solid waste generation in Jinja-Town	5	4	3	2	1
11.	High population growth in Jinja Town is associated with natural population growth.	5	4	3	2	1
12	The population of Jinja Town increases due to due to her central location between various districts of Uganda.	5	4	3	2	1
13	High population growth is responsible for increased solid waste generation in Jinja Town	5	4	3	2	1
14	Population growth has a direct effect on solid waste generation rate	5	4	3	2	1

Urban Behaviour		Responses				
15.	Careless open dumping of waste is common in Jinja Town	5	4	3	2	1
16.	Most food stuffs sold in Jinja Town have a high potential of waste generation	5	4	3	2	1
17.	Lack of sensitisation is responsible for waste accumulation in Jinja Town	5	4	3	2	1
18.	The sensitisation is carried out regularly	5	4	3	2	1
19.	Careless open dumping is associated with irresponsible behavioural tendencies of urban population	5	4	3	2	1
20.	The increase in solid waste generation in Jinja Town is associated with traditional feeding habits	5	4	3	2	1
21.	Jinja Town council carries out sensitization to avoid indiscriminate solid waste disposal	5	4	3	2	1
SECTION C: SOLID WASTE MANAGEMENT SOLID WASTE COLLECTION						
22.	Jinja Town Council collects garbage daily	5	4	3	2	1
23.	Refuse generated by all households/business premises is collected	5	4	3	2	1
24.	Jinja Town Council has enough refuse collection trucks	5	4	3	2	1
25.	There are vehicle pass ways to access households and business premises	5	4	3	2	1
26.	Jinja Town Council promotes recycling of wastes	5	4	3	2	1
27.	Jinja Town Council has high potential for recycling of waste	5	4	3	2	1
28.	Solid waste in Jinja Town is adequately managed	5	4	3	2	1
29.	Jinja Town council provides efficient and reliable waste services	5	4	3	2	1
30.	The available refuse trucks are good operational state	5	4	3	2	1

31	Jinja Town council has waste recycling facilities which are functional(on use)	5	4	3	2	1
	Solid Waste Composting					
32	All residents of Jinja Town have refuse composting sites	5	4	3	2	1
33	Households not accessed by Jinja Town Council refuse facilities practice composting	5	4	3	2	1
	Solid Waste Incineration					
34	Jinja Town Council does incineration of waste	5	4	3	2	1
35	Jinja Town Council has incineration plants managed by skilled operators	5	4	3	2	1
36	Jinja Town council has potentials for incineration of wastes.	5	4	3	2	1
37	The incineration plants are working effectively	5	4	3	2	1
	Land Fill					
38	Jinja Town Council has landfill for disposing refuse	5	4	3	2	1
39	Land fill is properly managed and maintained	5	4	3	2	1
40	Jinja Town land fill is hazardous to surrounding communities	5	4	3	2	1
41	There is public opposition on the location of land fill.	5	4	3	2	1
	Solid Waste Burning	Responses				
42	Residents in Jinja Town always burn their garbage	5	4	3	2	1
43	Refuse burning is dangerous to environment and property	5	4	3	2	1
44	Refuse burning in Jinja Town is done on large scale	5	4	3	2	1
45	People in Jinja prefer burning their refuse	5	4	3	2	1

46	People in Jinja Town burn their garbage to avoid payment of waste tax.	5	4	3	2	1
47	Refuse burning is mostly done during dry season	5	4	3	2	1
SECTION D: COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT						
48	Communities in Jinja actively participate in solid waste management	5	4	3	2	1
49	Lack of community participation affects waste management in Jinja Town	5	4	3	2	1
50	Local authorities in Jinja Town always mobilise their residents on solid waste management issues.	5	4	3	2	1
51	Am satisfied by the level of community participation in solid waste management in Jinja Town.	5	4	3	2	1
SECTION E: LEGAL FRAMEWORK (CURRENT LEGISLATORS) FOR SOLID WASTE MANAGEMENT						
53	Jinja Town Council has bye laws on solid waste management	5	4	3	2	1
54	People in Jinja Town are aware of legislations on solid waste management	5	4	3	2	1
55	Am aware about legislations on solid waste management in urban areas.	5	4	3	2	1
56	These bye-laws are regularly enforced to ensure proper waste management	5	4	3	2	1
57	These bye-laws are effective in addressing solid waste management problems in urban areas	5	4	3	2	1
58	These bye-laws are relevant to the current situation in Jinja Town.	5	4	3	2	1

59 In your own opinion what solutions do you suggest to address the problems of solid waste (garbage) management in Jinja Town?

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Appendix II

INTERVIEWS GUIDE FOR FOCUS GROUP DISCUSSIONS FOR TECHNICAL OFFICERS, GARBAGE COLLECTORS AND ELECTED LEADERS

1. What has been the trend of population of Jinja Town during the last five years?
2. How has this population affected solid waste management in Jinja Town?
3. What types of food stuffs are consumed in Jinja Town and how do they affect solid waste management?
4. Does Jinja Town Council undertake sensitisation of masses on solid waste management, how effective is it?
5. How effective is collection, transportation and disposal of waste?
6. What are the methods of waste disposal in Jinja Town?
7. Do communities of Jinja Town participate in waste management?
8. Does KCC have any bye laws on solid waste management, how effective are they in addressing solid waste problem in the City?
9. What solutions do you suggest to address the problem of solid waste in Jinja Town?

Thanks for your cooperation

Appendix III

OBSERVATION CHECK LIST

1. Garbage collection sites.
2. Nature of roads.
3. Refuse collection equipments
 - (i) Refuse trucks.
 - (ii) Skips/bins.

Thanks for your cooperation