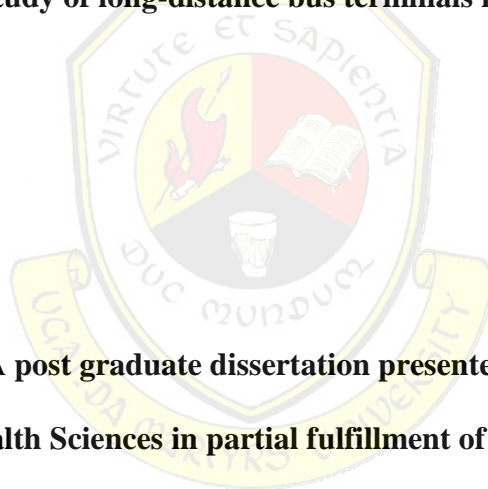


**FACTORS INFLUENCING SOLID WASTE LITTERING BY THE TRANSPORT SECTOR:  
A CASE STUDY OF LONG-DISTANCE BUS TERMINALS IN KAMPALA CITY**

**Factors Influencing Solid Waste Littering by the Transport Sector:**

**A Case Study of long-distance bus terminals in Kampala City**



**A post graduate dissertation presented to the  
Faculty of Health Sciences in partial fulfillment of the requirements for  
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## **DEDICATION**

I dedicate this dissertation to the Almighty God who has made me sail through regardless of many hurdles that I met.

To my wife Charity and Children, Susan, Sheba, Lilly and Josephine; I dedicate this research report to you. I know in one way or the other, I have failed to full fill my obligations as the father or Husband due to this academic struggle. However, we are all winners in this context.

Finally, to my parents Mr Charles Bazerezi and Mrs Joselyn Babwerata who used your hard earned income to make me a national resource person through education.

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## **ABBREVIATIONS /ACRYNOMS**

**AFASS-** Affordability, Feasibility, Achievable, Social acceptability and Sustainable

**CBOs-**Community Based Organizations

**CCTV-**Closed-circuit television cameras

**DStv-**Digital Satellite television

**EMA-**Environmental Management Authority

**EPA-**Environmental Protection Authority

**GDP-**Growth Domestic Product

**KAB-**Keep America Beautiful

**KCCA-**Kampala City Council Authority

**LC's-**Local councils

**NCHRP-**National cooperation of high way research program

**NGO's-**Non Governmental Organization

**OECD-**European Co-operation and Development

**PPP-** Polluter pays principle

**PRECEDE-** Predisposing Reinforcing Enabling Constructs in Educational / Environmental Diagnosis Evaluation.

**PROCEED -** Policy Regulatory Organizational Constructs Educational Environmental Development.

**S/N-**Serial Numbering

**TLB-**Transport Licensing Board

**UNEP-**United Nations Environment Program

**UTC-**Uganda Transport Company

**UTODA-**Uganda Taxi Operators and Drivers Association

## CONCEPTUAL AND OPERATIONAL DEFINITIONS OF TERMS

Events- What the actors or participant will be observed on or interviewed during research.

Exploratory case study - An empirical inquiry into the extent to which the concepts concerning learning organizations are conducted in their natural setting (Yin, 2009).

Fast foods-Take away foods eaten while on transit (in a bus).

Health promotion models - Logical flow of activities in order to cause desired health outcome.

Litter management - All measures put in place to ensure that litter is collected from buses and bus parks, stored, sorted, transported to final destination for treatment and or disposal.

Litter transfer points or stations -Collection center for temporal storage of litter materials before final treatment or disposal.

Littering- An act of dropping of solid materials onto the floor of buses, park yards and along the roads, as opposed to disposing them properly in designated areas.

Mobility - Movement of people from place to place by public transport

Participant- The person that is interviewed or observed during research

Plastic convenience culture- Is where people prefer products that are packed or in bottles as they can consume them while on transit

Plastic- Materials composed of various elements such as carbon, hydrogen, oxygen, nitrogen, chlorine, and sulfur. Plastics typically have high molecular weight, meaning each molecule can have thousands of atoms bound together (CPCB, 2009).

Settings-Any geographic place or situation where the research will be conducted from

Thick description-A rich, thorough description of the research setting, and the transactions and processes observed during the enquiry (Polit et al, 2001).

## ABSTRACT

**Introduction:** Public bus transport plays key roles in facilitating the development of economy as it aids trade and social wellbeing through movement of goods and people. Therefore, it is a pre-requisite of efficient economic and social activity that the reliable transport has to be available. However, the plastic convenience culture, population increase, mobility and rapid urbanization has worsened the already complicated problem of solid waste littering in the transport sector especially in developing countries. The amounts of waste generated have reached alarming levels that are both difficult and costly to manage due to littering tendencies (Yu-Min et al, 2008).

**Objectives of the study:** The overall objective of the study was to investigate the influencing factors for solid waste littering in the transport industry and in particular buses that terminate in Kampala City. The specific objectives were: To determine the influence of knowledge and awareness on littering in public buses; the influence of social economic factors to littering in the transport sector; roles of different stakeholders in abating littering in public buses; and key elements of a successful anti-littering program.

**Methodology:** A cross-sectional qualitative study design was used, with exploratory case study approach. Purposive sampling was used for identification of the participants. Data was collected through Focus Group Discussions, Key informants and Observation. The audio recorded data was later transcribed. Thematic analysis was used to categorize and analyze data with the help of Excel package.

**Results:** The findings show participants had knowledge related to littering. However, it could not be put into use due to absence of litter bins and negative attitude. The channels of sharing information on littering such as TVs in buses were not utilized. High affinity for money has affected littering.

**Conclusion:** There is need for hierarchy of communication to all stake holders and KCCA/Government need to coordinate litter management in the transport sector

**Recommendations:** Bus owners need to provide litter bins and use TVs in buses to sensitize passengers. KCCA need to ensure that manufacturers erect bill boards on anti littering and all people whose works generate litter contribute in creating awareness on litter management.

Exchange study tours for bus owners and bus terminals could be coordinated by KCCA. Solid waste recyclers need to publicly announce amount of money to be paid for given quantity of wastes.

Government could help waste recyclers by giving them waste collection centers along highways and towns. Government could enact and enforce anti littering related laws in the transport sector.

## **CHAPTER ONE**

### **INTRODUCTION AND BACKGROUND**

#### **1.1 Introduction**

Environmental pollution has become an issue of serious international concern since the start of the industrial revolution (Gray, 2008). Environmental pollution has caused a lot of distress not only to humans but also animals, aquatic species and environment; where some species are endangered and even faced extinction. Of the different kinds of environment pollution that such as air pollution, land pollution, water pollution, thermal pollution, sound pollution and light pollution (Gray, 2008); Heaps of uncollected Litter are the most visible sign of environmental pollution and also reflect managerial weaknesses (Environmental Management Authority -EMA, 2011). Littering refers to acts or practices of throwing solid objects onto the wrong place and is not removed, as opposed to disposing them properly (Tanyanyiwa, 2015). While litter refer to any solid waste that is indiscriminately disposed on surface other than waste receptacles or pits. The Legislative Council of the State of Michigan (USA) (2013) clarified litter as any rubbish, refuse, waste material, garbage, offal, paper, glass, cans, bottles, trash, debris or other foreign substances that is considered abandoned. In this research, influencing factors refers to the power that affect a person's course of action especially to the behaviour or one's thinking towards litter management (Marais & Armitage, 2004 and [www.vocabulary.com](http://www.vocabulary.com)) especially on littering.

#### **1.2 Back ground to the study**

The change in economic trends, population increase, mobility and rapid urbanization has worsened the already complicated problem of solid waste littering especially in developing countries. The amounts of waste generated have reached alarming levels that are both difficult and costly to



manage (Mara & Hidefumi, 2004). This is attributed to high and increasing volumes of solid waste littering and the changing characteristics from predominantly organic to non decomposable materials a fact leading to the low collection rates (Yu-Min, et al, 2008). In order to cope with these challenges, the critical role in protecting the environment and public health, efficient and effective litter management is urgently needed by Municipal and other urban authorities.

The local authorities identified specific places as source of wastes and thus putting measures for control of littering. These places are residential areas, industries, institutions and even streets and market places (Water Aid, 2011). However, when it reaches to public transport like buses, solid waste littering tend to be unattended to in developing countries. Littering is either consciously or unconsciously carried out by passengers and bus staff. In a study conducted in Zimbabwe, littering was identified as one of the most problematic environmental issues in Zimbabwe. It was astounding that 94% of Zimbabweans identify litter as a major environmental problem and yet they continue to litter (Tanyanyiwa, 2015).

Public bus transport plays key roles in facilitating the development of agriculture, commerce and trade, social wellbeing of a person through movement from one place to the other to access different goods and services. It is a pre-requisite of efficient economic and social activity that reliable transport be available not only between towns, villages and remote settlements throughout the country, but also within the larger cities themselves, especially the capitals like Kampala and the immediate surrounding areas (Ministry of Works and Transport, 2008). However, the increased mobility of people through use of public means of transport like buses has escalated the levels of littering along the streets (Marais & Armitage, 2004).

In a study carried out in the USA State of Michigan, most of the litter at bus termini and along highways emanates from commuters who throw litter through the window (Michigan, 2013). This is because the transporter has no provision for litter receptacles, Yet legislation clearly spells out that they are required to put bins in their transport conveyances. Likewise, the law stipulates that it is illegal to throw litter on undesignated points; and if there are no bins available in the commuter omnibuses, passengers should hold the litter until they disembark and drop it in bins.

However, in Uganda's case, little or no attempts have been made to manage littering in public transport yet there is overwhelming evidence on the dangers it poses to the environment and people's health (Tukahirwa, 2010; Isaam, 2010). Littering has detrimental effects on health of people by causing diseases and injuries; animals' deaths by being knocked along roads as they feed on litter or get intestinal obstruction and either acquires human diseases. Littering can v also lead to environmental degradation, flooding as result of blockage of drainage channels and economic loss as a result of hampered tourism potentials (Environmental Protection Authority (EPA, 2013). The Mumbai floods in India in which about a thousand people died were blamed in several quarters to drains being clogged from plastic bags (Jarod, 2012). Similarly, litter thrown out of windows can cause accidents to on coming or following vehicles (Jackson et al, 2013). Municipality authorities usually try to respond to litter management in the cities through street sweeping, litter collection and penalties for littering. However, their efforts do not yield much due to inadequate organization, huge financial resources required, complexity in access to littered roads, streets and lanes (Lilliana et al, 2012).

There are many benefits that are accrued from better litter management. It contributes to increase on the Growth Domestic Product (GDP) through savings as many diseases and property destruction resulting from floods will be prevented. Also tourism potentials will improve thus

increasing business opportunity gains from re-use and recycled products (UNEP, 2013). In 2000, recycling activities in the European Union created 229,286 jobs, which by 2008 had increased to 512,337 – an annual growth rate of 10.57%. Yet, Government has not formalized recycling as an economic venture and there are no policies to that effect (Chitotombe, 2014).

The importance of undertaking this study helped to explore the influencing factors for littering in buses in relation to management of services, policy and legislation, public and political commitment, technical capacity, knowledge and awareness and develop necessary interventions (Liyala, 2011 ; Tukahirwa, 2011). This is in support of the World Health Organization (WHO, 2005) sixth global conference on health promotion that was held in Bangkok (2005), which recognized the need to strengthen the building of healthy public policy. The urgent need for a study in littering especially in public transport is cognizant of the renewed global sustainable development goals (SDGs) especially goal 3 that emphasizes good health, goal 6 on clean water and sanitation, goal 9 on innovation and infrastructure, goal 15 on life on land, goal 13 on climate change and its action and goal 14 on life below water (Manipadma, 2014). Littering greatly affects life both on land and water thus requiring this study if the SDGs are to be realized in Uganda.

With the transboundary nature of the public transport that cuts across districts and countries' borders; and also that navigates through swamps or forests that are not under any authority to handle litter; yet passengers do littering with impunity. The study was not only timely but rather to provide diverse insights in dealing with the challenges in a predominantly private owned sector as far as litter management is concerned.

### **1.3 Back ground to the study area**

Uganda's transport system is more or less controlled by a body called 'Ministry of Works and Transport' whose vision is to promote an adequate, safe and well maintained public works and transport infrastructure so as to effectively contribute to the socioeconomic development of the entire country (Ministry of Works and Transport, 2008). However, issues on solid waste management in public transport are not spelt out in the master plan or policy. Uganda has four main types of transport: Road transport, air transport, railway transport and water transport. The road transport is majorly dominated by public transportation (Trans-Africa, 2008) that conduct their businesses within and outside countries like South Sudan, Kenya, Nairobi, Tanzania, Burundi and Democratic Republic of Congo where lessons on solid waste litter management could contain rich findings. In Kampala, the privately owned Uganda Transport Company (UTC) held the exclusive franchise for bus services until its nationalization in 1972. Due to the political chaos that happened before 1986, the UTC and Peoples Bus Company before they were liquidated in 1993 under privatization and liberalization of the economy concentrated to long distance services. The Uganda Taxi Operators and Drivers Association (UTODA) later emerged to bring order to the market through self-regulation and control of the terminals in Towns and the short distances (Ministry of Works and Transport, 2008).

In Uganda, the licensing authority, the Transport Licensing Board (TLB), makes no attempt to limit the number of bus or taxi operators, to impose transport fares to be charged as Uganda is a liberalized economy. The transport operators are permitted to determine their own fares. However, there is some evidence that the operators' association (UTODA) has significant influence on the fares charged (Trans-Africa, 2008). Yet, these transport boards do not impose standards on waste

management for the operators. This has led to the accumulation of litter mainly in towns and at the Bus stopovers along highways.

Globally, the plastic convenience culture has led people to eat and drink from approximately 34 billion newly manufactured bottles and containers weighing about 7 billion kilograms of plastics daily (Tanyanyiwa, 2015). These waste materials are scattered all over the country by passengers in public transport especially buses along the roads, stopovers and parks. The problem arises from the fact that the vehicles do not give enough time to passengers to finish eating at bus stops. They move quickly and so the passengers are forced to eat while travelling. In developed countries, the buses stop long enough or provide litter bins on Buses and Trains which is not the case in Ugandan context (Forbes, 2009). With the world Bus stock of 3.6 million by 2010 and each having sitting capacity of 69, the world will be overwhelmed by the problem of littering unless urgent action is taken (Ealey & Gross, 2008). It is estimated that Uganda's road network is 78,100 Kilometers (KMs) with 3,050 KMs paved, that accommodates 3,756 million vehicles of which 11.4% for mini buses (428,184) and 4.8% (180,288) are buses (Ogwang, 2011).

Whereas, the Polluter pays principle gives an obligation to the polluter to take responsibility of cleaning the environment and pay the costs it has caused (UNEP, 2013), this is not applied in public transport companies in Uganda. Currently, the burden of litter management in this profit making industry is being borne by municipal authorities and others left to choke the drainage system (Marais & Armitage, 2004). As the saying goes, "cleanliness is next to godliness", this is far from being achieved in public buses and parks due to indiscriminate littering (Water Aid, 2011; Tukahirwa, 2010; Isaam, 2009).

Much as Kampala City Council Authority (KCCA) tries to maintain streets clean through regular sweeping, this is not sustainable due to the cost of operation involved (KCCA, 2012). Comparing what Waterford City spent on street cleaning and litter management, a staggering cost of \$ 2,000,000 and €350 Million in 2011 (Humphrey, 2010) shows that it is very expensive to maintain City and streets clean by picking litter dropped by passengers instead of putting measures in place to stop littering. Psychologists believe littering is behavioural that can be changed if concerted efforts are put in place to address it (Marais & Armitage, 2004). Even, street sweeping is always within City center of Kampala leaving other motorable roads that join suburbs unattended to thus making litter to pile and others disposed to the water stream which is associated with outbreaks of Cholera, Typhoid and dysentery (Water Aid, 2011). This gap underpins the need for the study which will produce evidence based information necessary for local authorities, policy formulators and implementers to come up with workable solutions to abate solid waste littering in the transport sector (Oluyinka, 2011).

#### **1.4 Statement of the Problem**

Public Bus transport plays key roles in facilitating the development of the economy as it aids trade and social wellbeing through movement of goods and people. Therefore, it is a pre-requisite of efficient economic and social activities that the reliable transport has to be available. However, the plastic convenience culture, population increase, increase in mobility and rapid urbanization has worsened the already complicated problem of solid waste littering in the transport sector especially in developing countries. The amounts of waste generated have reached alarming levels that are both difficult and costly to manage due to unabated tendencies of littering. The poor litter management in the predominantly private led transport sector has contributed to the pollution on land especially Towns and Bus stopovers, water bodies and breeding sites for disease vectors.

Manufacturers of the transport vessels have advanced in technology whereby electrical charging systems, safety measures by use of seat belts and on side of entertainment and news updates, Television Sets (TVs) and Radios have been installed. However, attempts to address littering by the transport sector have not gained momentum. Yet the Buses that operate routes in other neighbouring countries such as Rwanda, observe good practice in litter management while in their country but it cannot be practiced in Uganda. Why is littering in the Uganda's transport sector not given a priority? Much as Uganda is regarded as "Pearl of Africa," with her highways, Bus stopovers and urban centers choked with litter from transport sector; such status could not benefit. Something needed to be done on litter management so as to maintain Uganda as a tourism and business hub. This study was necessary to explore the littering problem by the transport sector in-depth and come up with appropriate recommendations.

## **1.5 Research Question**

What factors influence solid waste littering in Buses on Ugandan roads and Bus parks?.

### **1.5.1 Specific research questions**

1. What factors influence littering behaviour in public transport buses in Kampala?
2. What are the roles of different stakeholders in controlling littering in public buses?

## **1.6 Aim of the study**

The aim of the research was to conduct an in depth investigation by exploring the aspects related to influencing factors for littering in buses.

## **1.7 Objectives**

1. To determine the factors that influence littering in the transport sector.
2. To explore the roles of different stakeholders in controlling littering in public buses.
3. To understand the key elements of a successful anti-littering program in the transport sector.

## **1.8 Justification of the study**

There is overwhelming evidence that improved litter management offers particular benefits to resource constrained countries through promotion of tourism, savings from reduced burden of disease and earnings from trading recycled materials. The informal sector of recycling, which plays a vital role in many developing economies, could be recognized, protected, professionalized and integrated into the waste management system. This sector already makes a significant contribution, which could be built upon to develop a low cost, efficient and remarkably effective grass roots recovery, reuse and recycling system of littered materials (UNEP, 2013).

Corporate bodies may contribute in recycling of solid waste and advancement of existing litter management practices in buses as a contribution by undertaking this study (Arvind et al, 2011). There is often a large gap between the knowledge of existing conditions and administrative perception. Existing conditions are generally depicted based on older data. However; complexity of litter management unfolds by increasing urbanization, changing lifestyle of people, changing waste composition (Minghua et al, 2009) that requires updated data. In many cases, litter



management challenges are recognized, but the gap between demand and supply of funds, manpower and proper strategies become a limitation factor (Arvind et al, 2011). Therefore, this study would be resourceful in designing and implementing interventions to abate littering in the buses through an integrated approach that combines empowerment, cognitive, social, legislative, enforcement and technical solutions (Oluyinka, 2011).

### **1.9 Significance of the study**

High way littering is posing a challenge in volume of waste generated, the cost of its collection, transportation and disposal, the blockage of water channels and culverts thus leading to floods, foul smells and spreading of diseases like Cholera. It also affects environmental degradation especially due to plastics and polythene papers that affects soil fertility and unsightly conditions (Manipadma, 2014). They also have negative effects to tourism as visitors tend not to buy food and products that are nearby such filthy environment.

Until now very little success has been reported with regard to solid waste littering in buses. The reasons for littering in buses need to be explored. This would reduce on occurrences of floods as result of blocked drainage channels, improve tourism, reduce sanitary related diseases like cholera and dysentery, increased Growth Domestic Product (GDP) as result of savings made from reduced diseases and property loss due to flooding, increased passengers of buses thus reducing traffic jams, improved environmental hygiene through re-use and recycling of plastics and papers (Water Aid, 2011). The beneficiaries of this study were students and academic researchers, policy makers and implementers through sharing insights on litter management in public transports as a whole, the passengers who would travel in hygienic and clean transport vessels and general public who will have a clean and healthy environment that promotes health (Coupland et al, 2011).

### **1.10 Scope of the study**

The study was carried out on buses and their terminal stages in Kampala. Bus staff, passengers, transport boards and associations, Traffic police, vendors of fast foods and drinks, agents or persons involved in waste recycling, KCCA staff supervising waste management and Bus park authorities were interviewed in relation to solid waste management in public Buses. Questions related to influencing factors, stakeholder's analysis, knowledge and awareness and key elements of anti littering programs in Buses were used. However, the study did not determine quantities of litters generated in the transport sector or buses. Also, the study did not establish the effects of litter but only depended on the participants' views. The study was limited to buses that worked during the time of the study and passengers that were present at the time of interview. With the help of the guide, researcher made observations on presence of litter bins in Buses and Bus parks. He also checked for any information related to anti littering both on bill boards and reminders in buses. He also observed how solid waste in Buses and Bus terminals was handled. Researcher also made in-depth interviews with different key stake holders from their work places. To avoid interruptions of services, appointments were made at times that was presumed not to be busy. Focus Group Discussions with passengers were held in passengers waiting shade or area. Their views were recorded on field note books and tape recorder after obtaining consent from them.

## **CHAPTER TWO**

## **LITERATURE REVIEW**

### **2.0 Introduction:**

This is a case study of an exploratory nature and the overall objective presented in this literature review was to explore the current practices and research on factors influencing solid waste littering by passengers while in buses along highways, in Bus terminals, stopovers and the roles of stake holders in litter management. This literature reviewed highlights the types, quantities and content of consulted sources and also the way in which they were acquired. The review covered theoretical or empirical sources related to the main concepts found in this study.

### **2.1 Purpose of the literature review**

Every research report should be placed in the context of the general body of scientific knowledge (Babbie & Mouton, 2001). The general purpose of a literature review was to gain an understanding of the current state of knowledge about the research topic (Tshibumbu, 2006). Literature is reviewed to gain more understanding on the influencing factors for solid waste littering in buses. The review also helped the researcher specifically to refine the research problem and problem background information; Identified literature gaps thus supporting the choice of this topic; identified the relevant concepts to be included in this research such as key elements for any successful anti littering program in the transport sector, the influence of knowledge and awareness to littering, influence of social economic factors and assessing roles of key stake holders in abating littering. Literature reviewed also helped the researcher to dwell on health promotion model of PRECEDE-PROCEED. Literature reviewed helped to refine the study methodology and process (Mat & Peter, 2010). The researcher had to use descriptive exploratory case study to get deeper understanding on influencing factors for solid waste littering in the transport sector. The researcher also triangulated data sources by getting views from a cross section of people that were presumed

to have the required data. Different data collection tools such as Focus Group Discussion Guide, Key informants interview guide and Observation guide were used. All these, enabled the researcher to obtain the enriched findings as they are stipulated clearly in chapter four.

## **2.2 Scope of literature review**

Sources of data included internet whereby peer reviewed articles by use of Google scholar, Sage publications, Hinari and Open gates were accessed. Researcher has also reviewed written materials like Acts, policies, guidelines, Text books and reports. The literature review is carried out based on objectives of the study that are grouped under themes.

## **2.3 Inclusion and Exclusion criteria of literature reviewed**

Literature review is based on resource materials that were published by year 2007 because research needs materials that are relevant and not out dated. Source materials that are beyond 2007 are the ones that shows the principles or original concepts like models, theories and those that the researcher deemed worth quoting so as to enrich the study. Only materials written in English were reviewed and clearly acknowledged by citation and referencing.

## **2.4 Theoretical resources**

In order to have in depth understanding of the study, theoretical models were adopted. The PRECEDE- PROCEED model helped in giving deeper understanding on how various factors could or have influenced the problem in question (solid waste littering in buses). Theoretical models were used in order to reflect on phases or steps that are necessary in designing, implementation and evaluation of health promotion programs (Green & Kreuter, 1999).The PRECEED-PROCED model was not used independently but rather offered a framework within which individual level theories like Health belief model (Green & Murphy,2014) and Social

cognitive theory (Bandura, 1986), community level theories like that of Pretties community participation ladder (Kinyashi, 2006) and theory of diffusion of innovation (Robinson, 2009), interpersonal communication, interactive technologies, media campaigns and grass roots organizations could be utilized (Claudine, 2012) to enrich the study. Sources of theories that were used for this study included internet and textbooks (Tshibumbu, 2006).

## **2.5 Knowledge and awareness on solid waste littering practices in buses**

High way littering poses a challenge in volume of waste generated, the cost of its collection, transportation and disposal, the blockage of water channels and culverts thus leading to floods, foul smells and spreading of diseases like Cholera thus affecting tourism as well. It also affects environmental degradation leading to soil infertility (Water Aid, 2011). Knowledge and awareness is principle in averting challenges posed by indiscriminate littering. As stated by theory of innovation, adoption of programs by recipients is influenced by knowledge and awareness (Robinson, 2009). Lack of access to information may be contributing to littering in buses and bus parks. The National Environment Act 1995 of the Republic of Uganda asserts that; every person has a right to live in a healthy environment and duty to maintain it through proper disposal of waste. It also emphasizes the duty of every citizen to inform and be informed by the authority on harmful activities carried out on the environment. However, access to this vital information has remained scanty due to few copies of the Act that are in the public domain and they are not even translated into various local languages, thus limiting the citizens to take up the role of maintaining a clean environment (Mubangizi, 2015).

A study carried out in Harare found that 94% of Zimbabweans identify litter as a major environmental problem and yet they still litter (Tanyanyiwa, 2015). Majority of respondents (60%)

believed that someone else like a municipal worker will clean up after them. Others, believed that littering is convenient due to shortage of bins and some see littering as not a problem to a place that is already accumulated with solid litter (Tanyanyiwa, 2015).

## **2.6 The socioeconomic factors affecting solid waste littering in buses**

Socio-economic factors refer to social and economic experiences and realities that help to mould one's personality, attitudes and life style (Chase, 2016). The socioeconomic factors include levels of education, income and occupation, religion, ethnicity and culture, and place of residence. All these, in one way or the other, contribute to littering in the transport sector.

### **2.6.1 The economic trends**

Following the downward trajectory of the economy that left many unemployed, informal trading of fast foods, drinks and other petty items on high ways to avoid congestion in the city and police raids has resurfaced as a livelihood option. To avoid confrontation with law enforcement agencies, vendors in the city have resorted to nocturnal vending in some instances by disguising their operations during the day (Dube & Chirisa, 2012). Although vending tends to promote livelihoods particularly for small scale farm holders in rural communities who sell along rural highway stopovers (Chazovachi i& Chuma, 2013) the predicament still lies on littering. A study carried out by Makwara & Magudu (2013) showed that people have a strong preference especially to fast foods for their convenience that can be consumed while travelling. Consequently, litter is not only increasing in quantity but also changing in composition from less organic to more of non organic materials like plastics and glasses, a fact leading to too much accumulation of uncollected litter (Kinobe, 2015). However, the reality of poor institutional capacity, financial constraints and lack of political will, make litter management the most significant challenge faced by developing and transition-economy countries in the 21st century (Tanyanyiwa, 2015; UNEP, 2013). In the same

way, solid waste littering in buses faces the same challenges as it is trans-boundary in nature; calling for regional collaboration (Jackson et al, 2013).

### **2.6.2 Social causes**

Litter is considered a serious social and behavioural problem (Marais & Armitage, 2004). A survey carried out in Florida USA showed that a person on average generates 190 Kilo grams of litter per Annum from daily lives' activities (Jackson et al, 2013). With the reasons for littering varying from one person to the other, the survey revealed that most people are hardly inclined to stop littering, although a large majority of them (94%) sees litter as a serious problem according to National cooperation high way research program (NCHRP), (2009). Active littering is concerned with deliberate antisocial behaviour in dumping waste(s) in places where littering is simply not allowed. Passive littering occurs more often and is more resistant to control and enforcement than active littering because it is less likely to be observed. As there is no (negative) feedback by other people, littering offenders are not made aware about this type of unwanted behaviour (Sibley & Liu, 2003). Therefore, peoples' negligence is one of the important factors that account for littering.

Dwyer et al. (1993) assessed preventive (advice) and remedial (fines) strategies for behavior modification for littering and other environmentally related behaviors. With respect to preventive strategies, commitment, modeling, and goal-setting resulted in consistent and significant changes in behavior. Furthermore, these strategies produced residual effects lasting 9 to 12 weeks following intervention removal. With respect to remedial (fines) strategies, they produced beneficial effects in the short term. However, for the fine strategy, the practice of proper litter disposal immediately stopped after the intervention was removed (NCHRP, 2009). This means that to abate littering, it requires both intrinsic and extrinsic motivators.

In order to develop targeted and effective litter prevention programs, researchers have attempted to determine who litters and why they litter. Research conducted on Keep America Beautiful (KAB), (2009) identified specific demographic variables related to littering. Among the findings was that, males litter twice as much as their female counterparts, and that adults under the age of 35 were also likely to litter twice as much as people aged 35–49 and three times more likely to litter than people over the age of 50 (Beck, 2007). Studies show that people are more likely to litter in areas with high densities of litter, for the reason that littering is apparently considered socially acceptable in those places. Thus, a vicious cycle is formed, which enhances the stubbornness of litter the problem in certain areas (Forbes, 2009). It is in this context that sociologists hypothesize that when ‘small’ antisocial behaviours like littering do not have sufficient attention, and are not corrected in timely fashion, more intense antisocial behavioural activities will follow (Kelling & Coles, 1996 in Thomas et al, 2013).

Also, socially, waste has a disproportionate impact on the poor and marginalized in cities, towns and villages. Waste pickers and others earning a meager income on the fringes of the waste management industry, especially women, are frequently among those who have most difficulty making a viable place for themselves in local economies thus making the occupation less attractive for fear of social rejection (UNEP, 2013).

Much as most food packages and drinks have an instruction written to keep your country tidy or place litter in a bin as well as please recycle, people still continue to litter due to social cultures that are inculcated in them thus making it very difficult for people to do away with their old habits of littering (Chitotombe, 2014). It is suggested that psychologists should be involved in designing litter prevention strategies. An integrated approach to litter prevention that combines



empowerment, cognitive, social, and technical solutions is recommended as the most effective tool of tackling the litter problem (Oluyinka, 2011; Mbeng et al, 2009).

### **2.6.3 Political will**

Some of the identified common root causes for poor solid waste management services are as the result of inadequate policy and legislation, lack of political will, lack of public commitment, lack of technical capacity and poor financing. Lack of political will has been identified as a major factor that hinders littering management (Tukahirwa, 2011). Little investment has been made in littering research, resources and human capacity development. Community based organization (CBOs) training on awareness and capacity building on litter management is not coordinated and also discontinuous causing duplication of efforts. They therefore have insignificant impacts on target communities (Liyala, 2011). Even though urban councils contract private operators to collect litter along roads, the urban councils themselves are still the main waste collectors and the combined efforts of the urban councils with the private sector have not yielded the levels of success expected. This is evident by the common scenes of uncollected wastes on roadsides and in drainage channels, streams and wetlands in urban and peri-urban areas (Liyala, 2011).

The prevailing attitude of the public towards litter collection and disposal or treatment is poor (Liyala, 2011; Oberlin, 2011). The urban communities generally do not participate in litter management responsibly and this is not helped by the inability of the urban councils to enforce existing waste management laws (Liyala, 2011). Political interference caused by personal interests has in some cases obstructed opportunities to implement ordinances or bye-laws. Political interference weakens environmental management institutions and creates a community that is difficult to work with (Okot-Okumu & Nyenje, 2011).

The low standard of living, high illiteracy levels and low GDP per capita are influencing factors that cause low levels of willingness to participate in public management matters (Jackson et al, 2013). Such systems can be promoted through community participation and education involving CBOs and the informal sector. There is need for political support for such initiatives of litter management strategies to succeed (Okot-Okum, 2009).

## **2.7 Identifying roles of stakeholders.**

In Kampala city and in other major towns in Uganda, the standards of litter management have always been gauged and evaluated on the role and performance of service providers such as local authorities and other alternative players. The policies and legal framework governing litter management have also been emphasized to these providers completely ignoring the demand side of the problem. Hence, the efforts made not fully appreciated by service receivers who includes households, institutions, industries, commercial premises and general public (Water Aid, 2011). This has been characterized by constant demonstrations by market vendors and negative utterances to urban authorities and Government in general for their failure to clean streets and urban centers where the heaps of unsightly and smelly solid wastes lies un collected (Tukahirwa & Oosterveer, 2010). The involvement of the service receivers especially, passengers and food vendors who are the primary producers and generators of significant proportion of litter in making of sound policy decisions and designing of effective e joint solutions solid waste problem (Habitat International, 2012), is in line with the United Nations Conference on Environment and Development, popularly known as the Earth Summit, which marked the birth of Agenda 21, a comprehensive blueprint for action to be taken globally towards realizing the goal of sustainable development (Stakeholder Forum for a sustainable future, 2012). This is an approach based on participation of various groups

and stakeholders as the brainchild behind clean up campaigns involving local communities worldwide.

However, in Zimbabwe since the inception of clean up campaigns in the 1990s, it was hoped that these would act as platforms for encouraging and involving educational campaigns regarding waste reduction programs. Despite efforts by both state and non-state actors on anti-littering campaign including litter bins, these efforts have proved inadequate (Marais & Armitage, 2004).

### **2.7.1 Partnership**

The issue of solid waste littering has reached alarming levels thus attracting global attention such as the Rio+20 Earth summit in Brazil that proposed SDGs, which replaced the MDGs as the major threat to life on land and below water through pollution. This has led to promulgation of a number of goals like 3, 6, 9, 13 and 15 (Mamipadma, 2014). Much as urbanization, industrialization, increasing population, increase on mobility and economic development have improved the standards of living that has seen life expectancy increasing, on the other hand, it has complicated and worsened the nature and volumes of solid waste littered (Jackson et al, 2013). Yet, the collection coverage of these littered wastes is just 40% in urban authorities of middle income countries (UNEP, 2013) thus calling for urgent action against littering.

Litter management requires governance that takes into account the complexities and inter-relationships both within and outside the country. In order to implement the strategies, partnerships for litter management were formed between actors in the public, population and private sectors (Water Aid, 2011). Under such partnerships, the public sector is involved through the district coordination committees and its municipalities as lead partners. The private sector participates as a partner community based organizations (CBOs), non-Governmental organizations (NGO's) and

other community groupings. The activities included joint venture of litter collection, transportation, street sweeping and disposal of wastes. The private sector solely participates in recovery; recycling and re-use of litter especially plastics and metals (Coastal City Challenges, 2009). However, litter management and more so littering in buses that even goes across borders; requires a cooperative and political will process that involves a wide range of different interests including government at regional, national and local levels (Kardish, 2014).

## **2.8 Key elements of a successful anti-littering program in the transport sector**

Urban authorities are faced with the uphill task of litter management as it is increasingly drawing attention of citizens due to too much garbage and plastics lying uncollected in the streets, causing inconvenience and environmental pollution, and being a risk for public health (Manipadma, 2014). Although, government authorities have applied the necessary means at their disposal, the piles of wastes only seem to grow at exponential level. With the evidenced shrinking of municipal budgets coupled with the restriction on the scope of municipal government jurisdiction, the problem is likely to go on uncontrollably unless alternative approaches can be devised (Water Aid, 2011).

### **2.8.1 Legislation**

With the awakening of realizing the negative effects resulting from littering of roads by road users, many countries like USA promulgated anti littering laws (Jackson et al, 20113). This prohibits passengers from throwing wastes through the windows of vehicles. The fines from offenders will be used to clean cities and Towns as well as a deterrent to others (London Local Authorities Act, 2013; Dick, 2003).

All the East African Community countries have policy, legal and institutional framework for waste management where urban councils are charged with the tasks to manage urban litter (Tukahirwa,

2011). The duties and responsibilities are spelt out in a number of pieces of national legislations mainly in the area of public health, environmental management, urban planning and local governance (Okot-Okumu & Nyenje, 2011). The urban councils are responsible for the implementation of these instruments including ordinances and bye-laws. The existing laws on waste management are not being effectively enforced (Okot-Okumu & Nyenje, 2011), which may be attributed to inherent weaknesses of the laws themselves. Therefore, informal sector and the community operate with little or no regulation at all.

Uganda promulgated a number of laws and Acts to curtail environmental pollution, which includes Public Health Act, (Cap.281), KCC Solid Waste Management Ordinance (SWMO), 2000, Solid Waste Management Strategy (SWMS), December, 2002, as revised in (2006), Local Governments Act (1997) revised in 2004, The Constitution of Uganda 1995 (amended 2005) and The National Environment (Waste Management) Regulations, S.I. No 52/1999. However, none of the above laws or Acts compels bus management, passengers or local authorities on abating solid waste littering. On roads, the Public Health Act emphasizes on obstruction of roads like a fallen tree, broken down vehicles, and dead animals that affects traffic flow leaving road littering. The laws do not provide punitive measures or enforcement against offenders of solid waste littering in buses, bus stopovers and along roads (Water Aid, 2011). Owing to the state of affairs, the City and Municipal authorities handle solid litter management issues according to bylaws they set for themselves (Coastal City Challenges, 2009).

In Zimbabwe, it is the mandate of the Environmental Management Agency to ensure that every citizen has a right to a clean and safe environment. Environmental law in Zimbabwe actually criminalizes littering under Section 83 of Environmental Management Act (Ch 20:27). It is an offence to discard, dump or leave any litter on any land, street or road except in a container

provided for such purposes or at a place which has specifically been designated for such purposes. Public transporters are required to have sufficient waste bins within their vehicles for use by passengers as stipulated in section 23 subsection (2 ) and (3) of Statutory Instrument 6 of 2007 (Chitotombe, 2014). However, a study that sought to investigate the causes of littering along road servitudes on highways, found littering continued to take place due to consumption style of fast foods. Their reluctance in providing bins is a warrant for wanton littering by the public from moving vehicles (Chitotombe, 2014).

### **2.8.2 Anti-littering campaigns**

Littering is a worldwide phenomenon and not only peculiar to Uganda and other developing countries. A study conducted in Zimbabwe found that as a result of littering, nuisance was not only within urban areas, but even along road servitudes on major highways (Chitotombe, 2014). The government through the Environmental Management Agency (EMA) and other civil society stakeholders developed strategies to stop this undesirable behavior through anti-litter campaigns though the problem seemed to be beyond control of law enforcers (Lilliana et al, 2012). The then Vice President Comrade Joyce Mujuru officially launched the National Clean-up Campaign on 3 September 2009 (EMA, 2011) that was achieved through social diffusion, by the use of community leaders such as Councilors, Members of Parliament (MPs) and other individuals who attract people's attention and renown musician such as Oliver Mtukudzi who have the skill of making powerful acquaintances. However, this approach was ridiculed by civic groups who considered it as a nomenclature due to its inhumane approach (Dube & Chirisa, 2012). This has made people continue to litter (Makwara & Magudu, 2013).

EMA of Zimbabwe under its publicity section has been engaging communities through road-shows, environment clubs in schools and debates under auspice "catch them young", use of print

and electronic media while imparting environmental education (Chitotombe, 2014). However, media coverage on environmental issues is very minimal owing to lack of skilled reporters (Makwara & Magudu, 2013). Moreover, most people do not watch the local television and frenzy Digital Satellite television (DStv) to which they subscribe to. Mapira (2013) argues that challenges confronting media in provision of Environmental Education (EE) in Zimbabwe include resistance from communities, political climate and language barriers.

Keep America Beautiful (2009) argues that, like many social problems, litter is caused by human behavior. Whether intentional or accidental, litter begins with the individual. This study advanced many reasons to littering as: Some individuals simply decide to litter, littering is most likely to take place in littered environments hence litter begets litter; and some people just believe that, it is others responsibility to come and clean littered up places (Chitotombe, 2014). It is important to identify different stakeholders that can help in designing messages that promote anti-littering social behavior through all appropriate channels of communication (Humphrey, 2010).

Even the National Environment Act 1995 of Uganda states that, every person has a right to a healthy environment and duty to maintain it through proper disposal of waste as well as the duty to inform the authority or the local environment committee of all activities and phenomena that may affect the environment significantly. However, the Act has never been translated in other languages other than English that limits its accessibility (Mubangizi, 2015). Also, English copies are not widely distributed among the population in addition to poor reading culture of Ugandans. Due to the enormous environmental problems caused by the plastic paper bags litter, immediate public awareness be made to the consumers on the hazards that are occasioned by the plastics through solid waste littering(Theuri et al, 2014). It is also hypothesized that the presence of the reminder message would reduce the litter rate and that signs with a cooperative message would be

more effective in reducing litter than signs bearing a threatening message. The threatening message like “Littering Is Unlawful and Subject to a \$10 Fine”; the cooperative sign showed a man placing trash into a receptacle, with the caption “*Pitch In*” (Spacek, 2008). Both messages produced lower litter rates. However, research found that, the threatening messages were complied with more than those seeking cooperation (NCHRP, 2009) though the cooperative messages had long residual effects. Therefore, combination of strategies is better in attempt to abate littering.

### **2.8.3 Penalties for solid waste littering**

Taxes on use of economic goods promote consumer awareness of the environmental “bad effects” they are producing as they feel the pinch of paying extra money for the product. It needs an explanation to why the prices have increased (Jarod, 2012). Low cost information interventions can be very effective as they update the beliefs of agents regarding the “social costs” of plastic bags as it prevents plastic and paper generation and littering.

Most countries all over the world have established anti - littering policy programs. While some countries, like the Netherlands, implement broad well equipped programs, others stick to an emphasis on corporate responsibility and citizen initiatives (KAB), 2009). One key problem perspective assumes that creation of litter should be prevented at all times, and when littering occurs the person responsible should remove litter immediately, or face a penalty (Thomas et al, 2013). Express penalties to offenders of poor litter management, was instituted at Waterford city, 2012 to prevent solid waste littering (Jackson et al, 2013).

Law enforcement agencies such as EMA have been working together with the police in order public conveyances blitzes have been conducted to enforce the placement of bins within these vehicles (Beck, 2007). However, this has been very difficult because of the resurgence of many



illegal route flouters in the transport industry (Chitotombe, 2014). More to that, experiences in meetings with representatives from municipalities led to insights that the intended mode for law enforcement was not feasible. Municipalities shared the opinion that law enforcement on littering would cost them more than they would benefit from it (Thomas et al, 2013). Although the administrative fine was formally implemented, it was not implemented in an effective manner. It only benefits those involved in collecting it through corruption.

There has been an attempt to install stand by Cameras and closed-circuit television cameras (CCTV) to identify offenders of littering in buses (Waterford City, 2012) and to apprehend and fine illegal dumpers in Scotland has resulted in convictions and is being expanded to enforce littering from vehicles (Black 2006). Under the Irish rules, the registered owner of a littering vehicle is charged with the offense, and the monitoring body is required to erect signs warning the public on littering (London Local Authorities Act, 2007). However, this approach is insufficient and may have produced misleading results, because several non-fixed objects are not considered litter that is often struck by motor vehicles. These objects can include, for example, traffic control devices used for road construction, trees and tree limbs that have fallen on the roadway during storms and high winds, animals, and accident debris (Spacek, 2008)

#### **2.8.4 Polluter pays principle (PPP)**

The precautionary principle is one of the fundamental guiding works on the environment and sustainable development. In 1972, Organization for European Co-operation and Development (OECD) promulgated the Polluter pays principle as an environmental policy that requires the costs of pollution to be borne by those who cause it (Tejvan, 2013). The litter issue in the Netherlands led to the development litter management to be considered as a case in which a PPP policy (program) was accordingly designed and implemented (Thomas et al, 2013). However, the ability

to determine the extent of environmental damage, the cost of damage, the burden of proof and the scope of liability as a basis of litigation proved futile. It therefore appeared that the courts are uncertain as to the legal implications of the principle and particularly when to put aside the traditional requirements for the discharging the burden proof either beyond doubt, or on a preponderance of evidence (Kakuru & Ssekyaana, 2009). A person, who may litter without knowing of financial implication, will meet the cost of managing such litter through exorbitant taxes (Thomas et al, 2013).

### **2.8.5 Deposit fee for containers**

Example of litter avoidance to reduce the amount of plastic bags and bottles dumped indiscriminately, a deposit service fee was introduced in order to reduce, prevent and control the amount of plastic bottles and Kavera dumped (Lucia, 2013). Practically, the business owners/producers would be encouraged to integrate a deposit fee like on the container of juice, water and other merchandise packed in returnable bottles. This can greatly reduce the amount of litter generated most especially from business enterprises including buses and bus parks. Waste avoidance is an example of a “polluter pays principle” where a fee is introduced to all generated litter to enforce collection (Water Aid, 2011). Government and administration should pay attention to environmentally sustainable, skilled nodal agency and supportive functionaries (World Bank, 2000), awareness, polluters pay principle, practice of waste minimization, prevention of malfunctioning and investigating the gap areas. Corporate bodies may contribute in recycling, waste to energy plan and advancement of existing litter management (Arvind et al, 2011).

### **2.8.6 Complaints register**

A litter complaints register is established to investigate the activity/incident with the view to obtaining evidence which might secure a fine or prosecution, should there be any illegality

involved (NCHRP, 2009). This collaborative approach greatly assisted in minimizing the impact of littering and illegal waste activities on the city and in protecting our environment (Okot-Okumu & Nyenje, 2011). In the wake of health promotion in built environment where the use of public transport like buses fall, Coupland (2011) recognizes the use of crime preventers in prevention of littering of solid waste. There is a need to have a phone number, such as a toll-free number for timely and easy reporting to act as a deterrent against littering. However, corruption and source of funding of such community led activities will compromise with the desired result of prohibiting littering along roads (Lilliana et al, 2012).

### **2.8.7 Use of litter bins**

Research indicates that in some settings disposal-facility availability contributes to more use of the facility and less litter (NCHRP, 2009). The study carried out that involved placing litter receptacles along highways and city streets (Spacek, 2008), reduced litter on average of 28.6% and was effective for at least 6 miles along the highway. However, when signs were placed to remind on use of litter receptacles, the average reduction was only 25.2% compared with a 32% reduction when signs were not present. Nonetheless, litter receptacles do not by themselves prevent litter, as about 50% of littering occurs within 26 feet of a receptacle (NCHRP, 2009).

In America, public conveyances without litter bins are subject to US\$20 fine and imprisonment or both (Thomas et al, 2013). It is ironical that environmental law further incriminates people who throw litter from moving vehicle (Chitotombe, 2014). However, US\$20 is too lenient to make a positive difference. Although EMA constantly engages the police to ensure effective enforcement of littering laws, law enforcement still has some loopholes (Lilliana et al, 2012). In addition, the police are often labeled as corrupt and toothless bulldogs making enforcement

elusive (Jackson et al, 2013). However, the only solution is to give people the custodianship of the environment to effect citizen arrest littering offenders.

### **2.8.8 Litter transfer stations**

The transfer points have enabled the transporters collect litter from central places as it eases the work of public or private waste transporters (NCHRP, 2009). Such litter transfer points include skips, bunkers, standby trailers where solid wastes are segregated before loaded to the waiting trucks. The waste generators that include households, commercial premises, market traders, industries, large institutions like educational, hospitals and shopping malls (Okot-Okum, 2012). The same strategy could be used in managing littering in public transport where litter transfer stations could be put or constructed at known stopovers in the urban centers and fuel stations. However, much as litter transfer points are advocated to improve on litter management; they are often abused by users by disposing litter onto ground instead of designated receptacles (Oberlin, 2011). It was also argued that when these litter transfer points are placed in inaccessible positions, indiscriminate disposal will flourish hence causing disastrous effects like foul smells, diseases and blockage of water channels (Okot-Okumu & Nyenje, 2011).

### **2.8.9 Street Cleaning**

It is the duty of every local authority to ensure the environment is kept clean by taking necessary measures for those that litter face the law (Tanyanyiwa, 2015). In 2011, Waterford City Council spent approximately 2,000,000 dollars on street cleaning and litter management in the city and suburbs (Waterford City Council, 2012). Municipalities have failed to manage litter due to huge expenditure needed to provide the service (Sharholly et al, 2007), the absence of financial support, limited resources and the unwillingness of the users to pay for the service (Sujauddin et al, 2008). It is generally regarded that waste management is the sole duty and responsibility of local

authorities, and that the public is not expected to contribute (Vidanaarachchiet al, 2006). Bearing in mind that the solid waste sector has limited funds, this arrangement is not sustainable as it requires a lot of money so as to be effective (Tanyanyiwa, 2015).

This contrasts with an environment in Japan where litter is valued and cleaning is viewed as productive and honorable and little money is spent on litter removal due to the large number of volunteers (Luan & Sovacool, 2011.).

Sharholy et al. (2008) indicated that the involvement of the private sector is a factor that could improve the efficiency of the system. The operational efficiency of litter management depends upon the active participation of both the municipal agency and the citizens, therefore, socio cultural aspects mentioned by some scholars include people participating in decision making community awareness and societal apathy for contributing solutions (Moghadam et al, 2009).

#### **2.8.10 Developing a national strategy**

There is a need to develop a national litter management strategy that is composed of a systematic assembly of policy choices made at a given point in time, within the national and international contexts (Kardish, 2014). This should be built upon the fundamental elements, situation and gap analysis while giving particular emphasis to priority issues like solid waste littering in buses. It is critical that the completed national strategy could receive high level endorsement and political commitment, and be subjected to an appropriate public consultation and information process (UNEP, 2013). Since strategy development entails a planned and consistent process to be applied nationally, the policy process should be more transparent, ensuring that all relevant stakeholders and interests have both access to information and the possibility of contributing to decision-making (Oberlin & Sza'nto', 2011).

### **2.8.11 Recycling**

Recycling and re-use is fostering the emergence of a skilled and effective business sector, in poor urban communities currently deriving wealth from the provision of environmental services. Litter is therefore becoming the catalyst for their income generation and employment opportunities (Living earth, 2015). The benefits related to health include the direct health impacts due to reduced contact of the vulnerable populations with garbage in streets, reckless dumping and improved management of designated dumpsites. In addition, reduced treatment for illness such as diarrhea and cholera avert health costs and enhance productivity of the population (Shekdar, 2009). The global waste market, from collection to recycling, is estimated at US\$410 billion a year, not including the sizable informal segment in developing countries (UNEP, 2013). Sorting of wastes is important as the waste materials can be used to make other fine products like carpets, caps, hats, bags, necklaces, baskets, door rugs, mats and seedling cups that are sold to the community as crafts (Okot-Okum, 2009). However, sorting at the source leads to scattering of litter that is less important thus contaminating the environment (Arvind et al, 2011).

Recycling reduce the costs of the disposal facilities and also reducing the environmental impact of disposal sites of the inorganic as they are largely to blame for the polluting the environment (Water Aid, 2010). Much as recycling is viewed as economic venture and improves sanity to environment, there is no policy to promote recycling or resource conservation, and the municipalities do not have the expertise to launch recycling activities (Theuri et al, 2014). It has also been observed that some of industries even re-use the plastic waste/scrap which is totally unhygienic (litter contaminated with soil) and thus posing a health hazard to persons who use items made from such plastics or used for packaging of foodstuff and medicines (CPCB, 2009).

In 2000 recycling activities in the European Union created 229,286 jobs, which by 2008 had increased to 512,337 which translate to an annual growth rate of 10.57%. The proportion of people employed in waste-related recovery activities in Europe increased from 422 persons per million inhabitants in 2000, to 611 in 2007, an increase of 45% (UNEP, 2013). However, high labour and transport costs and the limited market for recycled goods make recycling economically unattractive for the private sector and it is performed almost exclusively by the public sector. In practice, for recycling to succeed, it should be a mix of formal and informal entrepreneurship (Okot-Okum, 2012).

With the attempt to solve solid waste littering, Water Aid, (2011) suggested that, there should be support to the community with working capital to collect and purchase the waste in bulk and provide market information and linkages where to collect such materials and finished products can be sold for money from recyclers. The phone application in connecting waste recyclers and waste generators provides easy location tracking with the collectors' existing Android phones, and maps the traces in real-time through a simple web interface. In many cities in Sub-Saharan Africa, informal collectors, waste pickers, and middlemen provide the bulk of waste management and recycling services. These workers also retain useful tactical knowledge about urban form and activities in the areas they serve. However, such knowledge is often poorly understood and rarely documented from a geographic perspective (David et al, 2015).

The process of planning to implementation should be all inclusive to ensure consensus building for success. The role of the private sector, NGOs, CBOs and the informal sector should be strengthened to minimize litter in the environment while at the same time providing social and economic benefits to communities especially the urban poor. This requires long-term planning by the urban councils that involve all the stakeholders (Okot-Okum, 2009). Ottawa Charter of 2005

suggests that strategic and actions of health promotion interventions should be multi-sectoral and at multi-level in order effectively solve community based problems (WHO, 2005). However, more interventions in Uganda are vertical because they are donor funded. This caused divisions among staff and hence hampered health service delivery (Atun et al, 2008; Jackson et al, 2013).

### **2.8.12 Conclusions**

The literature reviewed overwhelmingly recognizes the burden of solid waste littering economically, on health, and environment. The literature reviewed generally dwelt much on general wastes in other public places and even legislation on street or road littering is well mentioned by developed countries thus the recommendations made may not suit developing countries like Uganda. Littering in the transport sector is a very under researched field which calls for urgent in-depth study so as to come up with formidable solutions.

## **CHAPTER THREE RESEARCH METHODOLOGY**

### **3.0 Introduction**

This chapter re-states the rationale of research by describing the processes and methods used to conduct the study. The chapter covers the processes from study identification to data collection and specifically focuses on: study design, setting of the study, study population, procedures used in selecting the participants for the interviews, sampling design, data collection and analysis. The strategies to ensure trustworthiness of the data and the ethical considerations that were adhered to during this research are also discussed. The chapter also presents study limitations, the work plan and how the findings of the study will be disseminated (Burns & Grove, 1995).



### **3.1 Area of study**

Kampala city is the business hub of Uganda with many academic institutions of higher learning and with other many social amenities thus making it a destination of many bus companies, Taxis, Lorries, Trailers, Personal vehicles and Bodabodas (Guide 2 Uganda, 2014). Kampala was selected as the study area because it is a district where a large number of bus companies have their route terminal.

### **3.2 Research Design**

There are various approaches to qualitative inquiries that include narrative, phenomenology, ethnography, grounded theory and case study (Creswell, 2007). Ultimately, the case study design was selected, taking into account a number of factors like providing the rich contextual data collected from participants during interview and observation in the given setting of the study. That is why one section of public transport (Buses) that could be got in Kampala with their passengers and key stake holders were considered to represent general public transport in this study. This exploratory case study is an empirical inquiry into the extent to which the concepts concerning learning organizations are conducted in their natural setting (Yin, 2009). In this case, passengers and other participants were interviewed either in Buses or within Bus terminals to avoid inconveniences and while also observations were being made. Exploratory research is conducted for a problem that has not been clearly defined (Shields & Rangarjan, 2013). In this case, solid waste littering in public transport is an under researched area especially in Uganda's context. The findings of the case study can be generalized to similar or closely related setting. It is hoped that, at the end of the study information related to solid waste littering in all forms of public transport like water, marine, railway, air and road transport will benefit.

### **3.3 Study setting**

Bus terminals were used as a study setting because they have buses that operate routes in almost all districts of Uganda and neighboring countries where lessons on litter management could be learnt.

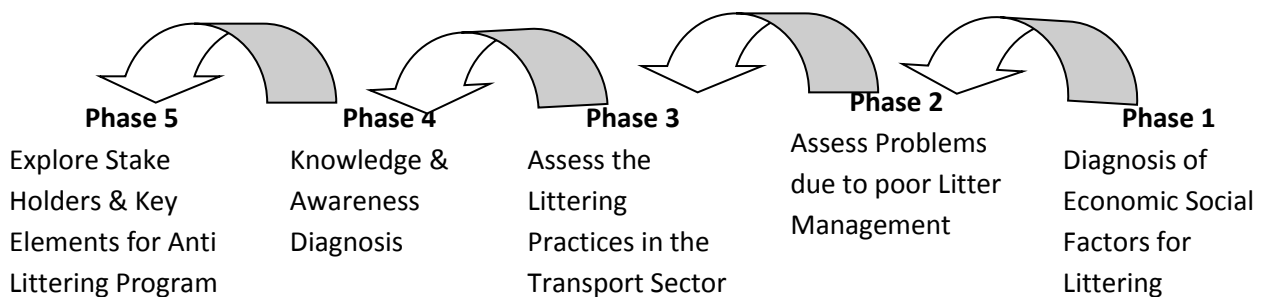
### **3.4 Health promotion Models**

The study employed the settings approach and Precede-Proceed Model. Settings refer to geographical or phenomenological situations that have unique characteristics and different determinants of health requiring specific interventions (Jackson et al, 2013). Precede-Proceed refers to the frame work of chronological activities that has to be followed an intervention to yield expected results (Green & Murphy, 2014). However, other theories like social cognitive theory (Bandura, 1986), community level theories of Pretty's participation ladder (Kinyashi, 2006) and theory of diffusion of innovation (Robinson, 2009), interpersonal communication, interactive technologies, media campaigns and grass roots organizations were utilized to enrich the study (Matlo, 2012).

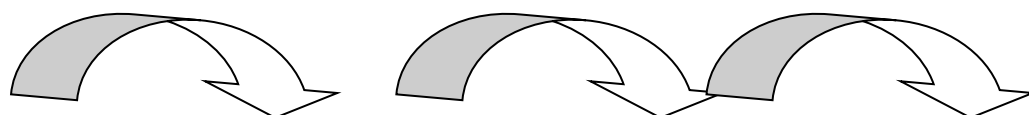
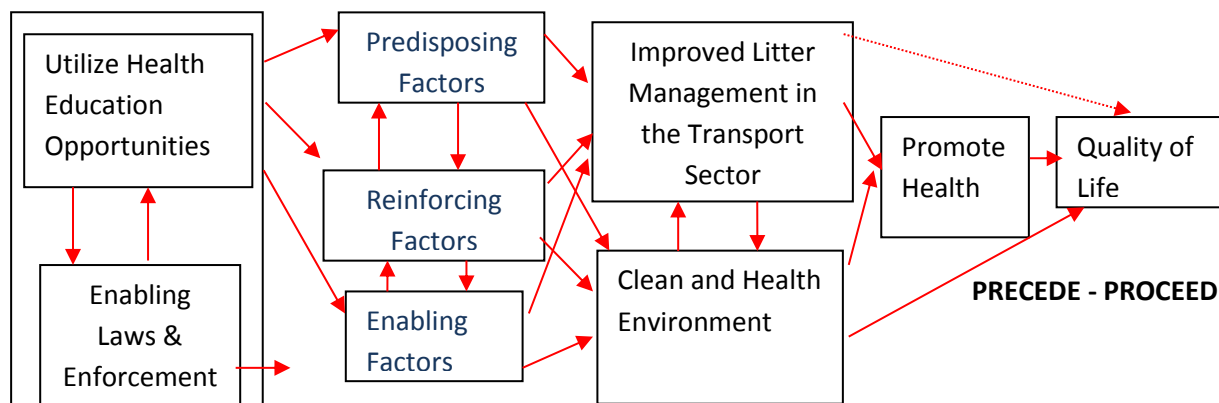
The PRECEDE-PROCEED model was used to guide the identification, planning, implementation, and evaluation of various health improvement initiatives (Phillips et al, 2012). Dealing with the problem of littering is a complex and dynamic process that requires considerations of social, economic, and organizational factors. An understanding of the specificities of the target population, and other stake holders and determinants of change is of paramount importance developing an intervention to address a health related or a community problem, it makes no sense to pick up an issue at random and use whatever resources or means available to address it without putting other things into consideration. Similarly, one have to consult with the different stake holders to understand and analyze the information related with solid waste littering in buses and

parcs through observation and in-depth interviews so as to come up with an effective and efficient interventions (Jackson et al, 2013).

Since the health promoting behavioural activities that individuals engage in are almost always voluntary, using PRECEDE-PROCEED would guarantee a participatory process where all stake holders like bus staff, boards of buses and bus park management, passengers, vendors of fast foods and KCCA staff will be involved at the time of diagnosis of the problem, planning, selection of interventions, implementation and evaluation of the interventions (Green & Kreuter, 2005).



**HEALTH PROMOTION**



## **Theoretical Model on designing Anti littering Practices in the Transport Sector: Adopted from Green & Kreuter (2005)**

### **3.4.1 Assessment:**

The researcher sought to subjectively define the problems, describe & priorities depending to their public health importance and available resources to address them. The theoretical model was used to assess the influencing factors for the solid waste littering in buses. The choice of an intervention against each problem was prioritized basing on Affordability, Feasibility, Achievable, Social acceptability and Sustainable (AFASS) (Adegbehinge et al, 2012). The area of focus while carrying out initial assessments included Assessment of Social-Economic Factors; Establish problems that occur due to poor litter management, Assess influence of Knowledge and Awareness to littering; and Explore on Stake Holders and Key Elements for anti littering program. The details of these factors was catered for in data collection tools and also expounded on Chapter Four (Analysis, Interpretation and Presentation of the results).

### **3.4.2 Implementation**

Implementation referred to the act of converting program objectives into actions through policy changes, regulation and organization (Green & Kreuter, 1999). However, for implementation to be a success, some factors were looked into. These included Predisposing, Enabling and Reinforcing factors. "Predisposing factors" were defined in this model as factors that exert their

effects prior to a behavior occurring, by increasing or decreasing a person or population's motivation to undertake that particular behavior (Green & Kreuter, 1999). Examples of predisposing factors were knowledge, attitudes, values, beliefs and perceived benefits influenced littering in the transport sector.

Within the PRECEDE-PROCEED Model, enabling factors were defined as those that make it possible (or easier) for individuals or populations to change their behavior or their environment. They included resources like litter bins; conditions of living like cleanliness of buses and environment; and skills such as good communication which facilitates a behavior's occurrence (Mercer, 2002). Other enabling factors especially those that were meant to achieve environmental change included organizations of delivery of services, policies, laws, and regulations, facilities, accessibility, availability, affordability, skills, having resources that impact, money and time.

Reinforcing factors referred to mechanisms put in place to strengthen by adding extra support or materials that follow a behavior in order to get a desired practice such as thanking after placing wastes in litter bins, the media, peer influence, family influence, provide continued reward, incentive and recognition (Matlo, 2012) thus abating littering in buses, bus parks, bus stopovers and along roads.

### **3.4.3 Evaluation:**

Evaluation referred to measurements of implementation against the set objectives in relation to the time frame so as to have value for money. In this case, we expected improved solid waste litter management practices in all Buses (Matlo, 2012). We even expected the good litter practices to trickle down to other transport vessels like Taxis, trucks, Air lines and Railways. However, in case some of the results that could still show little or no improvement on litter management in buses, strategies could be revised as the arrowed showed on negative outcomes.

Process Evaluation referred to measurements of implementation to control, assure, or improve quality of program. Impact evaluation referred to immediate observable effects of the program (Matlo, 2012). An example is proper use of waste bins in buses and bus parks. The theoretical frame work would not be a static entity; it would continually be reviewed to represent the evolving insights of the researcher (Dubois & Gadde, 2002).

#### **3.4.4 The strengths of PRECEDE PROCEDE Model**

The theoretical frame work is the lens through which the exploratory research design is developed to address the research questions and it will influence the decisions concerning the sources of data and how the data would be collected and analyzed (Blaikie, 1993). For example, the questions used in the in-depth interviews based on the concepts depicted in the theoretical framework.

Precede-Proceed model provides a frame work on exactly what to do. Although it sets out a strict process, it leaves plenty of leeway for adapting the intervention's design and methods to the current situation and needs of the community (Green & Kreuter, 2005).

The model also incorporates a template for the process of conceiving, planning, implementation and evaluation process, an intervention itself, and the final outcome. This allows an intervention to be monitored and adjusted to respond to community needs and changes in any given situation, thus leading to the project goals (Blank, 1993).

Precede-Proceed model is structured as participatory, to incorporate the ideas and help the community. That means that its use provides more and accurate information about solid waste littering and with better understanding of the history and context in bus parks and Ugandan roads. The model also banks on community involvement as a means of building community ownership

of the intervention, leading to more of community support and hence standing at a greater chance of success of the project (Green & Kreuter, 2005).

#### **3.4.5 Weakness of PRECEED -PROCEDE Model**

The originators of the model give strict steps to follow which might not apply to any given situation. So, in case of improper planning, the quality of outcome might be affected due to the rigidity of the model. Another criticism is that; there is too much emphasis on implementing programs and too little on designing interventions to strategically meet needs (Matlo, 2012).

#### **3.4.6 Conclusion**

PROCEED –PROCEED model is applicable to in-depth studies as it gave frame work that the researcher based on while designing the study to explore the factors influencing solid waste littering in buses and parks. The model would be based on the premise that just as a medical diagnosis precedes a treatment, so should a situational analysis precede an intervention plan to have the desired outcome (Matlo, 2012).

#### **3.5 Study Population**

The participants were bus conductors, drivers, waste recyclers, passengers, washing bay manager, Traffic police officer, Vendors of drinks and fast foods, KCCA staff supervising waste management and bus park authorities were interviewed in relation to solid waste littering in public buses. The idea to recruit the participants for the case study was based on the need to maximize the opportunity to collect diverse views on the concept of solid waste littering in buses, bus parks and along roads (Burns & Groove, 1997). Participants of this study were identified solely on the basis that they meet the recruitment criteria, were from a variety of settings and likely to contribute to the research (Behumbiize, 2009).

## **3.6 Sampling procedure**

### **3.6.1 Sample size**

Selection of the most appropriate sample size is important for ensuring the credibility of a qualitative study (Graneheim & Lundman, 2004). The participants in this study were selected purposively, thus the sample size would be determined after reaching the point of saturation. This is where the researcher feels that no new responses are expected when a number of respondents have been interviewed (Creswell, 2013). If the saturation of data is incomplete, it may cause problems in data analysis and prevent items being linked together (Cavanagh, 1997).

### **3.6.2 Sampling Technique**

Patton (1990) offers different strategies to help the researcher think about obtaining rich information from study population. Such strategies include random sampling, purposeful sampling, snowball sampling and convenience sampling. The researcher evaluated each of the strategies, in an attempt to select the most appropriate strategy for the case study, while remaining cognizant with issues relating to cost, time, acceptability, achievable and convenience. By eliminating some of the strategies recommended by Patton (1990) for selecting participants, the researcher used purposive sampling as a suitable method for this research (Elo et al, 2014). Purposive sampling is suitable for qualitative studies where the researcher is interested in informants who have the best knowledge concerning the research topic (Kynge et al, 2011). However, a disadvantage of purposive sampling is that it can be difficult for the reader to judge the trustworthiness of sampling if full details are not provided (Cresswell, 2013). The method was vital in generating information and also tracing ideas of arguments in the social and programmatic context in reaching lasting solutions to littering (Imms & Ereant, 2009). This method was used



because it provided researchers with the justification to make generalization from the sample that was studied (Lund, 2012).

### **3.6.3 Inclusion and exclusion criteria**

The criterion for inclusion in the study was based on the bus terminals with buses that travel to or from beyond the boundaries of central region of Uganda. This was aimed at sharing their wider experiences of litter management. The study took place in 6 bus terminals.

### **3.7 Data collection techniques**

An exploratory case study was used as a research design by employing different data collection techniques such as Observation, Focus group discussion and in- depth interviews (Use of key informant) (Elo et al, 2014). Exploratory case study explores the meaning of the data in the study through a systematic analysis of the sources of data collected for this research. The theoretical frameworks were highly relevant to the data collection and analysis in many aspects of this case study (Dubois & Gadde, 2002).

### **3.8 Data collection tools**

To gather data about participants and the site under a study in a qualitative research design; four aspects were considered as highlighted by Miles and Hurberman (1994). These were; the setting, the actors, the events and the processes. Data collection tools like, Observation guide; Focus group discussion guide and Key informants interviewer guide were used. These tools were considered to be appropriate ways to gather contextually rich information pertinent to the research problem (Elo et al, 2014).

### **3.8.1 Interviews**

Interviews were one of the most important sources of case study information (Yin, 1994). Creswell (2013) assert; ‘for qualitative enquiry, the interview is rightly conceived as an occasion to reach at the bottom of things’. Or as Patton (1990) asserts; “the interview enables the interviewer to find out what is on someone else’s mind”. In this research, the interview took the form of open ended and focused questions based on research questions. The interviewer guide was used as a tool during data gathering from research participants. In an open-ended interview, the researcher would ask for the informant's opinion on events or facts related to solid waste littering in buses. The tape recorders were used during the interviews though it depended on the consent of the participant (Creswell, 2007). Therefore, the in-depth interviews were structured to maximize the opportunity for eliciting the most relevant and meaningful information (Yin, 2009). Each interview lasted an average time of 40 to 60 minutes.

#### **3.8.1.1 Focus Group discussions**

Five Focus group discussions (FGD) were conducted; three with males alone and two with females alone with 6-9 members each. The members of each FGD were passengers that could be met in a bus or in passengers waiting shade. The discussion was guided by use of interviewer guide and while probing to have in-depth understanding on influencing factors for solid waste littering. Each focus group session would begin with welcome remarks followed by a brief introduction of the research project and setting of the ground rules. Among these rules, confidentiality and assurance was important given the fact that the session was to be tape recorded after seeking consent. There were no wrong or right answers and all individual opinions were to be respected (Creswell, 2009). A summary of the main views and checks for completeness was made at the end of each discussion or session.

### **3.8.2 Direct observation**

Due to the exploratory nature of this study, observation was considered as a suitable data collection method to complement the interviews. The qualitative Observations included taking notes on behaviours and activities of persons involved in the study at the research site (Tapia, 2010). The field notes were recorded in unstructured and semi structured by having prior questions that the researcher wants to know about.

The scope of the observation was defined by the theoretical framework as well as themes that were highlighted in the literature review. Multiple observations were made to guard against the problem of bias (Wonyima, 2015), by obtaining information from six bus terminals and 20 buses.

### **3.9 Piloting the Instruments to be used in this Study**

The pre-testing of the instruments used in this study was undertaken to assess the convenience, access, completeness, time efficiency and geographic proximity to the informants. This aimed at refining the questions to be used in data collection, with respect to both the content of the data and the procedures to be followed (Yin, 2009). Pre-testing of data aimed at knowing how best to maintain the participants on track and obtain the desired data from them. The researcher administered questionnaires that were in English as well translated in languages such as Luganda and Runyakitara to the research assistants and later to three passengers. Corrections were made depending to responses obtained on each question. Some questions were re-written and others changed the order they were appearing on questionnaire or guide.

### **3.10 Trustworthiness of the study**

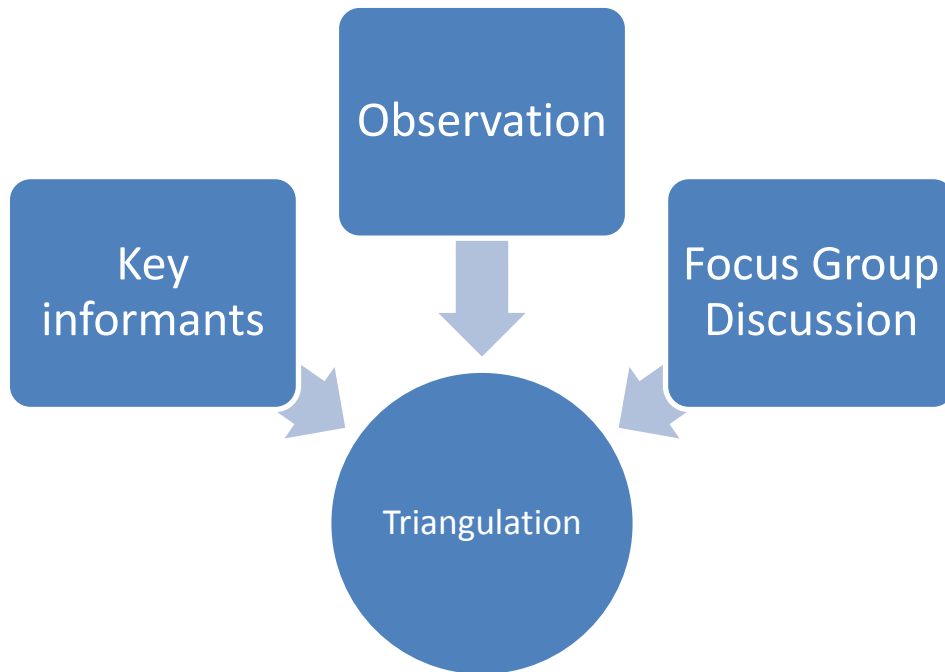
The case study method shares the strengths and weaknesses of other forms of qualitative research (Elo, 2014). This section addressed the issues that related specifically to the rigor of the case study

method, as an appropriate research designed for this study. Trustworthiness is the truth value of a piece of research (Holloway & Wheeler, 2010) when it reflects the reality and ideas of participants (Krefting, 1991). The aim of trustworthiness in a qualitative inquiry is to support the argument that the inquiry's findings are "worth paying attention to" (Lincoln & Guba, 1985). Trustworthiness was achieved through four elements: credibility, confirmability, dependability and transferability as described by Graneheim and Lundman (2004).

### **3.10.1 Credibility**

Credibility refers to confidence in the data and is similar to internal validity in quantitative research. Credibility exists when the research findings reflect the experience of people under study (Polit et al, 2010) and whether the researcher's perceptions are accurate (Padgett, 2008). The researcher used three data collection tools such as observation guide, interviewer guide and Focus Group Discussion Guide (FGD) that were pre-tested to eliminate any form of bias and unclear questions. The questions were translated to major languages spoken in Kampala so as to increase credibility (Yin 2009). This helped to capture diverse views of many people on littering in the transport sector. Other colleagues such as course mates were used to check for accuracy and the entire flow of research was being guided by supervisor through continuous consultations.

Below is an illustration of the data collection methods used in this study.



**Figure 1: Triangulation of data collection tools: Source; Author (2016)**

Triangulation of data sources, helped in making research reliable as varying views were gathered (Kyngäs et al, 2011).

### **3.10.2 Confirmability**

Confirmability refers to neutrality or objectivity of data (Polit et al, 2010). This means that the research findings are the result of the research not the researchers' assumptions or perception. Confirmability is seen as the degree to which the findings are determined by the respondents and conditions of the enquiry and not by the biases, motivations, interests or perspectives of the enquirer (Elo, 2014). The researcher achieved confirmability by obtaining an introductory letter from the Faculty of Health sciences of Uganda Martyrs University after the research proposal had been approved. The researcher made a concept note, a request letter to seek permission to conduct research and together with introductory letter. They were taken to City Hall of KCCA. After making analysis and consultations; they wrote to the researcher indicating that the request has been

honoured and gave copies to Central Division Town Clerks and Head of Medical Services to provide the necessary support.

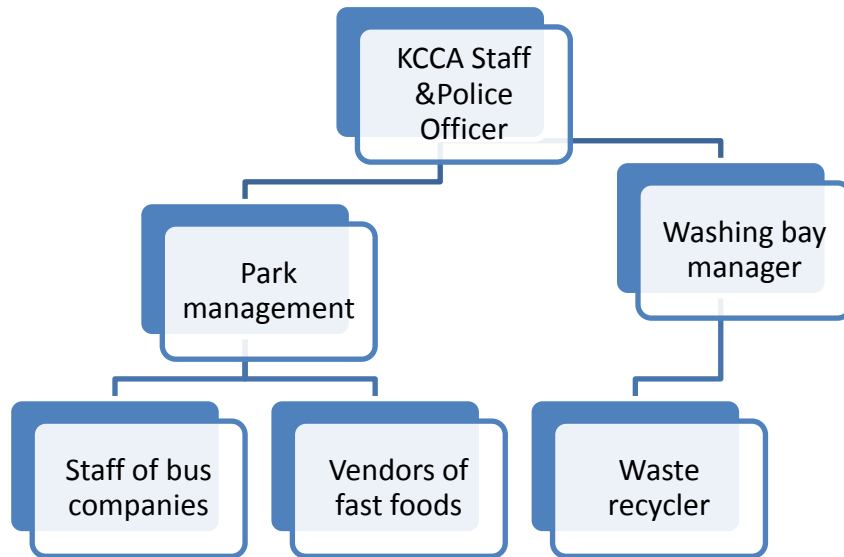
Thereafter, the researcher could go to the office of bus terminal authorities to seek for consent and also to interview them. During interviews and observations; consent were sought to be recorded or share the views. Also, the language of preference in which one could easily express their views could be asked. The place that could be convenient for interviews would be jointly agreed on. Researcher could also take precaution not to disrupt service delivery by making appointments or halt the interview until the client could be served first. Respect through greeting participants in their titles and name was performed as well as keeping eye contact. Researcher could also dress appropriately depending on the participants were scheduled to be met. This could make participants to feel free while sharing their views. To ensure that the quality data were collected, researcher paraphrased statements to confirm what participants had said. They either agreed with statements or made corrections accordingly.

### **3.10.3 Dependability**

Dependability is the degree of data stability over time and conditions (Polit et al, 2010). This can be linked to reliability in quantitative studies in which reliability is said to be present if the testing can be repeated, giving the same result each time and remaining stable over time(Elo et al, 2014). In the context of qualitative research, it is accepted that reality changes over time. Therefore, it is not possible to reproduce qualitative studies, because contexts do not remain static and the findings of qualitative research are highly dependent on context.

However, it is the key to ensure objectivity within the data collection so that the findings when presented are dependable (Sandelowski, 2001). Dependability in this study was achieved by collecting data from various sources and data audit by the supervisor (Lincoln and Guba, 1985).

A wide range of participants that includes passengers, vendors, waste recyclers, washing bay staff, traffic officers, bus management staff and KCCA staff who work directly or indirectly in solid waste management have been considered to be part of study. Below is an Illustration of participants that were involved in the study.



**Figure 2: Triangulation of sources of data: Source; Author (2016)**

The generated information from various categories of participants was useful in making conclusions and recommendations.

### **3.10.4 Transferability**

Transferability is the extent to which the findings can be replicated in other settings or groups. In this study this will be achieved by providing thick description about the setting, participants as well as detail data collection and process of analysis (Halloway & Wheeler, 2010). Therefore, it is important to state the principles and criteria used to select participants and detail the participants' main characteristics so that the transferability of the results to other contexts can be assessed (Polit & Beck, 2012). The researcher took a rich and vigorous presentation of findings and use of

quotations was used to achieve this (Mays & Pope, 1995). It was also achieved by obtaining views from many and different respondents.

### **3.11 Data management and analysis**

The aim of this section was to explain the data analysis approach as well as the code book designed to achieve this objective. The approach taken for the data analysis allowed enough flexibility to address the research questions in an exploratory manner so as to obtain evidence that can support conclusions (Tapia, 2010).

#### **3.11.1 Data management**

The data collected were kept confidential by use of codes and thematic analysis that began immediately during the answering of the first question as the interview and observation was being done. The data were transcribed by playing the audio recordings that had been stored in the smart phone and writing them down (Elo et al, 2014). On completion of the transcription process the researcher would recheck for accuracy of the data as per the narration of the participants (Behumbiize, 2009).

#### **3.11.2 Data Analysis**

Data analysis was guided by the objectives and the themes. Data was analyzed using data abductive method. In this method data was analyzed using coding by content that was aided by excel computer package that categorized data into themes and sub themes (Cresswell, 2013).

Direct quotation of verbatim in the local language was made to emphasize points from the transcriptions of the audio recordings (Van-Manen, 2006). As it is recommended that the analysis could be performed by more than one person to increase the comprehensiveness and provide sound interpretation of the data (Burla et al, 2008; Schreier, 2012). Together with



research assistants, we analyzed with the help of tables and figures. However, there are no published recommendations on how the trustworthiness should be checked if the inductive content analysis is conducted by two or more researcher (Elo et al., 2014). Instead, Kyngäs et al. (2011) has suggested that data could often be analyzed by one researcher, especially when using inductive content analysis.

### **3.11.3 Quality control methods**

The data collected from the in-depth interviews, observations by guides that were pre-designed according to research questions and themes. The data were collected by use of field note books and audio recorders. The data was later transcribed in excel computer program for easy analysis and retrieval as it is recommended by Strauss and Corbin (1990) who claimed that coding data is an essential part of transforming raw data into theoretical constructions of social processes. While in the field, the researcher could lead in interviewing while, one research assistant could be taking notes and, the other recording observations and tapping the proceedings of the interview. The researcher would check for completeness before they could leave and then ask participant if they had any question related to the study.

### **3.12 Interpreting the Data**

The interpretation of the data is probably the most critical feature of qualitative research (Murray, 2004). The data in this study was invariably shaped by the analytical interpretations of the researcher (Strauss & Corbin 1990). This was arrived at after a systematic analysis of results that were grouped in themes and sub themes in comparison with verbatim quotations. Researcher related them with body expressions of participants while airing their views. This was complemented with findings from observations and researcher's experience on the available policies. In short, the researcher used cross pollination of ideas to come up with the interpretation

of findings in a given theme. This process enabled the researcher to sharpen analytical skills so as to substantiate any emerging ideas from the data adequately (Cavanagh, 1997). More to that, the researcher would offer the participants every opportunity to review their views through paraphrasing and probing which could help to make any changes or alterations which ever they chose. This strategy has been described as ‘uncovering’ (Packer & Addison 1989) and also, it contributed in determining validity of the study (Creswell, 2013).

### **3.13 Ethical considerations**

#### **3.13.1 Consent**

After the research proposal was concluded, it was submitted to the supervisor who later gave me an introductory letter to take the authorities where the study was carried out from. The researcher was told to make a concept note about the study and request for the permission from KCCA authorities. The researcher was given permission in writing and conditioned to voluntarily obtain data from participants and also avail a copy of report to KCCA. The divisional authorities were again written to with intention of providing necessary support to researcher. A letter of introduction was given to all participants, which clearly outlined the research topic and that participation would be entirely voluntary and had liberty to withdrawal from the study if they wished so. Both verbal and written consent was sought before the participant could be engaged in the study (Marczyk et al, 2005).

#### **3.13.2 Confidentiality**

Only the researcher and research assistants could access the tape recorded in-depth interviews, transcriptions, notes taken at meetings and documents collected for this research. To ensure confidentiality of the information obtained, codes were provided to all participants that participated

in the study (Schreier, 2012). Participants could be described by their titles, settings and serial numbers that were given during interview sessions but not revealing their names.

### **3.14 Potential for Bias**

Cognitive dissonance theory suggests that, most people operate with a double standard when weighing evidence (Polit & Beck, 2012; Lincoln & Guba, 1985). Information gathered from the participants in the study reflected their perceptions, rather than comprising of incontestable truths, which may have influenced their existing mindset, thus making it difficult to challenge. For this reason, a deductive or systematic combining approach (Dubois and Gadde, 2002) of the case study research was adopted. Dubois and Gadde (2002) describe the abductive approach as a systematic combination process where theoretical framework, empirical fieldwork and case analysis are handled simultaneously. Bias was also minimized through triangulation whereby various data collection tools and different categories of participants were used in the study.

### **3.15 Plans for dissemination of findings**

Copies of this study were submitted to the Faculty of Health Sciences of Uganda Martyrs University. The findings of this study would be published by the researcher so that Government and development partners may use the findings to help in solving the problem of solid waste littering in public transport as a whole. Another copy of the report was also given to the management of KCCA where the study took place for their appropriate action on the findings.

### **3.16 Conclusion**

The objective of this chapter was to explain the methodology and research design that was implemented during the exploratory study. In-depth interviews and observations were used in data collection. The data collected was categorized using codes under different themes and subthemes

in order to give clarity and organize data. The themes were modified as new codes emerges from the data collection methods (Elo et al, 2014). Tables and figures were used in qualitative research to aid in summarizing data and later analysis.

## **CHAPTER FOUR**

### **PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS**

#### **4.0 Introduction**

As the saying goes, “Cleanliness is next to Godliness”, this is far from being achieved in public buses and parks due to indiscriminate littering. Why, then, is this practice; and what factors contribute to solid waste littering in the transport sector? The soaring challenges posed by littering practices to urban authorities in terms of high costs meant for litter collection and street sweeping as well as great concerns to people and environment have reached alarming levels. This necessitated to carry out an in depth study by exploring the aspects related to influencing factors for littering in the transport sector. In depth interviews by use of key informants and focus group discussions (FGD) were used to collect data. These were complemented by carrying out observations on anti-littering practices both in buses and outside within the bus terminals.

Importantly, the findings were analyzed and presented according to the specific objectives. Themes and sub themes were developed to guide the categorization of responses. Figures and tables were used to summarize data. Others are described using verbatim quotations. At the same time, participants were described by their titles, settings and the sequence in which the interviews were conducted so as to keep confidentiality. Participants in the study were passengers, drivers, bus conductors, food vendors, and management of bus terminals, KCCA staff and a police officer. Details of the codes for participants and respective bus terminals are found in the table 1.

**Table 1: Details of participants at different settings**

Number	List of Bus terminals	List of Bus companies	Particulars of the respondent	Codes
1.	Kisenyi	Gate Ways	Conductor	KCO Respo1.1
2.	Kisenyi	Global Coaches	Driver	KDR Respo1.2
3.	Kisenyi	Swift Safaris	Food vendor	KFV Respo1.3
4.	Kisenyi	Not Applicable	Park manager	KPM Respo1.4
5.	Qualicel	Link Buses	Conductor	QCO Respo2.1
6.	Qualicel	Y.Y Coaches	Driver	QDR Respo2.2
7.	Qualicel	Felistar (U) Ltd	Food vendor	QFV Respo2.3
8.	Qualicel	Not Applicable	Park manager	QPM Respo2.4
9.	Gaaga	Gaaga Coaches	Gaaga park manager	GPM Respo3.4
10.	Gaaga	Gaaga Coaches	Gaaga conductor	GCO Respo3.1
11.	Namayiba	Modern Express	Manager	NBPM Respo6.4
12.	Jaguar	Jaguar Coaches	Manager	JPM Respo4.4
13.	Trinity	Trinity Coaches	Manager	TPM Respo5.4
14.	Not applicable	Not applicable	Waste recycler Nsambya	WRC NSB Respo5a
15.	Not applicable	Not applicable	Waste recycler Nakivuubo	WRC NVB Respo5b

16.	Not applicable	Not applicable	KCCA staff	KCCASF Respo6
17.	Not applicable	Not applicable	Traffic Police Officer	POL Respo7
18.	Namayiba	Not applicable	Washing bay manager	WBM Respo8
19.	Qualicel	Bismarkan Buses	FGD female Qualicel	FGDFQ Respo2.1.1...9
20.	Qualicel	Y.Y Coaches	FGD male Qualicel	FGDMQ Respo2.1.1...9
21.	Kisenyi	Passengers'shade	FGD male Kisenyi	FGDMK Respo1.1.1...9
22.	Gaaga	Gaaga Coaches	FGD female Gagga	FGDFG Respo3.2.1...9
23.	Trinity	Trinity coaches	FGD Male Trinity	FGDMT Respo5.1.1...9

There were 18 key informants interviewed and 5 focus group discussion. Each group had up to 9 (1....9) passengers who were met in a loading bus or seated in the passengers waiting area. The participants represented the wider members of the community that were believed to have impact on littering transport sector. There were also fourteen Bus companies and six Bus terminals that participated in the study.

#### **4.1 Influence of Knowledge and awareness on solid waste littering practices**

Themes that came up included littering practices and problems that result from littering. The sub themes of effects of littering on environment, people, KCCA / Government and bus companies emerged. The details of themes and sub them were discussed separately.

##### **4.1.1 How do passengers litter in the Buses?**

The sub themes that came up from FGDs of passengers on how littering is practiced in Buses included throw litter through windows, place litter under passengers seats, inferior materials used as carpets in vehicles and litter due to luggage carried along with passengers. The participants said passengers after consumption of products, they throw litter through windows. Such waste

products could include husks, empty bottles, plastic bags and wrappings. This is mainly by passengers sitting near windows who see it as the easiest waste disposal method.

[.....] *Along the way, people just throw rubbish anyhow via the windows especially before crossing the Rwandan border. There is littering along the roads with recyclable materials such as buvera (polythene bags) and bottles whether on tarmac or murrum roads that are thrown by the passengers (FGDMT Respo5.1.1).*

Therefore, the culture of throwing materials after use is likely to increase litter to the environment especially where buses stop such as at bus stopovers and terminals.

In addition to that, some other passengers place litter under seats intentionally or unintentionally. While eating or drinking, some items fall on floor and they are never picked as they were feared contaminated due to dirty environment that cause diseases. In contrast, other passengers drop trash to the floor of the bus thus leading to the accumulation of litter.

Also, littering in buses happens due to the luggage that is transported along with the passengers. The luggage such as bananas, cassava, chicken and charcoal leaves particles or their contents on the floor or boot of the bus.

[.....] *Luggage carried along with the passengers like chicken and other food stuffs leave litter in the buses. Carrying birds with passengers is disturbing as their droppings do smell and soiled one's shoes (FGDMK Respo1.1.7).*

Due to the fact that food is expensive in urban areas, buses coming from up country tend to carry all sorts of food stuff and charcoal for fuel to use in urban areas. This could be explained by many mushrooming bus stopovers that have turned to be like market places stocked with a variety of food stuff waiting for customers from buses.

Other participants argued that, during rain periods, some drivers or conductors look for card board boxes to be used as carpets. This is meant to reduce on dirtying within the buses or vehicles. Later, theses materials are thrown out to the environment thus increasing the accumulation of litter. The

use of non re-usable materials as carpets in vehicles has also contributed to littering in the transport sector. This could be attributed to the high cost for re-usable carpets thus forcing drivers to use inferior materials.

It was noted that after eating or drinking, passengers throw rubbish through the windows or under their seats. This could suggest that, managing the behavior of littering may greatly help in realizing clean environment in the transport sector.

#### **4.1.2 Problems that result from solid waste littering**

Some participants said environment is the most affected as a result of poor management of litter. This was partly because; those wastes that are dropped under passengers' seats or poured in waste receptacles they might end up the environment. The other category that could likely to be affected most was the people. People could acquire diseases, injuries and discomfort as the result of poor management of litter. While the less affected institutions according to the participants were KCCA/Government and Bus companies.

##### **4.1.2.1 Effects of poor management of litter on the environment**

The participants said, the environment was the most affected due to change in litter composition from organic to non organic waste materials that could degrade the environment. “[.....] *Wastes like buveeras cannot be degraded easily. So they cause environmental degradation thus reducing soil fertility for agriculture*” (FGDFQ Respo2.2.3). Other participants said, “[...] *un attended to litter blocks water channels which is a cause of frequent floods in Kampala*” (WRC NVB Respo5b). Participants also argued that solid waste littered along high ways could lead to the death



of animals that eat them especially plastic papers. Litter could as well be carried away by storm to water bodies which can cause poisoning of fish.

The Packing culture of using polythene papers and other plastic materials could have triggered the littering practices as some are not re-usable. White polythene bags are given freely while black bags are charged 100/= and green PIL bags are sold for 200/=. The low cost and or tendency of the business community not to ask for money for these packing materials used to carry luggage has led to their accumulation in the public domain.

#### **4.1.2.2 Effects of poor management of litter on people**

In consideration of the effects of poor management of litter on people, themes that came up included nuisances, danger and low business. The participants said, the problems mentioned included foul smells; breeding ground of diseases vectors such mosquitoes and flies thus transmitting malaria and diarrheal diseases respectively. One participant noted that; “[...] *accumulated litter creates an unhygienic environment and in case someone vomits in a kaveera and throws it there, if I’m not the one, I don’t feel okay. I also feel like vomiting*” (FGDFQ Respo2.2.1).

Other respondents said; “[...] *oyinza kuba nga olyawo nolwala*” Literary meaning “*It may lead to diseases. There may be disease outbreak*” (FGDMQ Respo2.1.2). In any case, this is what has been experienced in Kampala where typhoid had ravaged the city dwellers some time back.

Important to realize, responses on poor litter management to people could be attributed to media houses which in the past have been full of news of outbreak of diseases such as typhoid in Kampala that even registered some deaths. Signs of grief could be seen on the faces of some participants as they discussed this issue.

There was a fear of diseases and death that could be banked on while designing health promotion strategies of anti littering practices.

#### **4.1.2.3 Effects of poor litter management on the bus companies**

It was prudent to understand from participants how the bus companies suffer directly or indirectly from the effects of poor management of litter. Themes such as high cost of cleaning, low business and havoc came up. Some participants argued that, the individual bus or entire bus company may lose passengers as a result of being dirty. To emphasize their points; they gave example of bus companies that ceased their operations because people were not satisfied with their services. Even passengers tend to shun some bus terminals that are believed to be filthy. Other respondents said poor litter management would increase the cost of cleaning buses. They added on that, it requires much water and soap to clean than those that are fairly clean.

Likewise, other respondents echoed that such litter could cause accidents as they may contain sharps such as nails and glasses that might pierce bus tyres. “[...] *the vehicle may pass over litter containing nails that may pierce the bus tyres thus causing accidents*” (KDR Respo1.2). This could happen especially due to litter of construction materials in bus terminals or stopovers.

Also it was noted from the study that, throwing of litter recklessly can cause confusion to drivers. If it hits at the screen of the coming vehicle, the driver might be confused thus leading to accidents between two involved vehicles. Also conflicts have been ensured due to reckless littering as one narrated;

*[.....] One time we were travelling in a Nothern Uganda bus, a passenger threw empty bottle and it hit a glass of Sudanese vehicle, unfortunately there were some Sudanese officials and they drove very fast ahead of the bus and they blocked us it was a nasty situation (FGDMK Respo1.1.3).*

The challenges that could be faced by the bus companies due to poor litter management such as passengers shunning their services, increased cost of washing, accidents and possibility of conflicts to break up, could be a blessing in disguise. This is because; bus companies have an upper hand in control of littering in the transport sector. Therefore, after realizing that the problem is also affecting them, they may give the necessary support to end littering in the transport sector.

#### **4.1.2.4 Effects of poor litter management on KCCA/Government**

The participants shared their views on the effects of poor litter management on KCCA/Government that, the institution would meet the high cost of cleaning the City by contracting many people to do sweeping and collecting garbage to its final disposal points, as one noted.

*[.....] The cost of cleaning of parks and streets will be high due to too much accumulation of solid waste. It would require many people and trucks to be involved in sweeping and transportation of garbage respectively (KPM Respo1.4).*

Another participant commented, “[.....] Yeah, the City is choked with garbage as litter is everywhere which also blocks water channels thus leading to flooding of the City as we have been witnessing” (KCCASF Respo6). Whereas flooding is a constant happening in Kampala City whenever there is heavy down pour, the problem has not been fully addressed. This could be due to the fact that KCCA is not seen as a directly affected institution but rather the business community. It could be implied that KCCA continues to collect taxes despite of the fact that some individuals could be making losses. It is viewed that, those persons making losses should relocate to other places while new ones come in as KCCA collects revenue, but the problem of flooding continues.

One could draw a conclusion that, participants had adequate knowledge on littering practices and problems of poorly managed litter to people, environment, bus companies and KCCA. However, their failure to put into practice the knowledge they had to solve the problem of littering in the transport sector could be due to institutional weaknesses at all levels that are necessary to trigger intrinsic and extrinsic actions to stop littering.

**Table 2: Summary of problems that result from poor management of litter**

<b>Theme</b>	<b>Environment</b>	<b>People</b>	<b>Bus Companies</b>	<b>KCCA</b>
Nuisance	It creates unhygienic environment	It induces vomiting	Unhygienic buses chase away passengers	City choked with garbage
	It causes bad smell when it over stays			
Havoc	Degrades environment	Decomposed materials bring flies that transmits diseases	Accidents due to glasses or nail piercing tyres.	Flooding of the City
	It affects soil fertility	It leads to outbreaks like Cholera	Thrown rubbish confuses drivers of other vehicles	
	Global warming	Bottles can cause accidents and diseases like tetanus		

	Blocking of water channels thus causing flooding			
	Contaminates water sources			
Danger	Death of animals and fish that feeds on wastes	Death of people due to diseases or accidents		
		Conflicts		
High cost			The cost of cleaning of buses	High cost of cleaning streets and parks
Low business		Loss of clients due to filthy environment	Passengers shun Buses due to dirt/filth	Low business in the City

From the table above, all categories shared the burden of poor management of litter. It was observed that, there were cross cutting themes in all different categories.

**4.2 Influence of socio-economic factors on littering**

This looked at the conditions that make people litter. The findings came with factors such as economic factors, social back ground, and nature of available laws and awareness of these laws.

**4.2.1 Economic factors**

The factors referred to the survival mechanisms of people in the transport sector through whose activities or involvement littering increases. Participants said, vending of foods, drinks and other items within buses and bus parks increases littering because in absence of litter bins or failure to use them, these used up materials and wrappings are dropped under passenger’s seats or thrown out through the bus windows.

*[.....] People mind about today's survival not tomorrow thus leading to littering. People are about solving immediate problems which in this case could be hunger or thirst but not knowing their litter disposed anyhow will create more complex problems to people and environment (POL Respo7).*

A police officer demonstrated a case of lack of irresponsibility for litter management by asking us to count how many plastic bags were in his office? After counting five he commented, “[...] *all this will end up to the environment because they are not re-usable and also the culture of not going re-usable from home or office hopping to get new one all the time we buy items increases waste*”. The problem of littering in the transport sector could also be worsened by the plastic convenience culture whereby passengers feel comfortable to take a snack or drink while on transit unlike a situation where they could stop for refreshments at one eating place. The majority of takeaways at fuel stations pack food and tea in disposable containers that are thrown away after use.

When I asked about the work of vendors in relation to littering, some participants did not hesitate to share their views by saying,

*[.....]Kandi abo nibobataha n'abacaafu muno, asobora kukwata ebintu nabisesa ahansi ye'Baasi. Means, [those are the ones that litter a lot; they can even pour rubbish under the bus] (QDR Respo2.2).*

Another participant said:

*[.....] I have always seen vendors selling things in the bus but I have not seen anybody directing us on where to throw the litter. They ask, do you need water or soda. After giving a soda, you pay and they just leave (FGDMQ Respo2.1).*

Some bus company staff attributed littering in the bus terminal to the monthly levy charged by bus terminal management for cleaning the parks. They said, they want to see value for their money which they think is their right. Most bus companies are tenants in the bus parks where they park. Since they pay, they also expect cleaning services from the land lord. Participants gave their views with vigor as they shook their fists in air and some talked at top of their voice to stress their points on the subject.

*[.....] We do not mind about dumping litter in the park because we pay 90,000/= per month to clean the park. Let those taking our money come and clean (KCO Respo1.1).*

Another participant said:

*[.....] We give money to KCCA; you go and ask them why they do not want to clean bus terminals the way they sweep Entebbe road? They are only stealing our money, he reiterated. Do not expect us to be the ones to carry rubbish to the litter collection centers. We need value for our money (GPM Respo3.4).*

Once people pay, they feel they have done their part and others should the cleaning of the litter.

In this case, the monthly fee charged of each bus company ranging from 90,000/= to 240,000/= for sanitation management within the park has made some bus staff to be outrageous. They felt that, park management and KCCA should clean bus terminals and transport all solid wastes.

Similarly, high affinity for money by some Bus terminal has led to failure to put in place waste receptacles meant for litter collection. They preferred to give the space for litter bins to buses that give them money. Even during the interview, this very participant looked not bothered as she could read some stuff from her phone while at the same time sharing with us her views.

*[.....] Tosobola kuwa drum yakasasiro space, oleke bus ekuwa sente". [“You cannot give space to litter drums and you leave buses that give you money]. As park management, we mind about someone urinating in a wrong place but not about litter dropping. We cannot harass passengers because they have littered the park. We have sweepers who clean the park (QPM Respo2.4).*

The aim would be to maximize profits from bus companies unlike the bus terminals that were managed by one Bus company. Likewise, from another school of thought, the shared bus terminals could be having fear that when one puts stringent rules on bus companies say on litter management, some could shift to other terminals or be forced to have their own parks thus losing revenue.

In all economic factors given above, economic pressures that necessitate people to save some money by cutting expenditure through buying cheap, non-reusable products is likely to have led

to accumulation of litter. Other people steal waste receptacles with intention to obtain money out of them. Also, economic pressures have led to many people to travel a lot and consume many products from mushrooming petty businesses.

All the issues could be due to the fact that bus companies do not have regular meetings to discuss sanitation issues. Thus they are dissatisfied with the way sanitation money was charged and used. The interests of different key partners or stakeholders have to be put into consideration when designing and implementing an intervention. This increases ownership and sustainability of the program.

#### **4.2.2 Social back ground**

The study noted that social back ground is a contributing factor to littering. The participants suggested that some people litter because that is how they have grown up in their families. Others suggested that the people who litter commonly come from villages where it is looked as a norm, as noted by one; “[.....] *Oli yamanyira nti wosanga wosula engeri gye kyibeera mukyalo*”. Means “*People are of different origin and they just handle litter according to their own way in villages*” (QFV Respo2.3). People’s background such as families and communities where people belong could trigger littering in the transport sector especially if they were not shaped with education or exposure to do good practices of managing litter. Similarly, low educational levels in Uganda, could compromise the ability to conceptualize problems caused by littering.

This calls for the need to integrate litter management practices into the school curriculum so as to break the vicious cycle of littering. Also, the health inspections of homes, institutions and workplaces which emphasize the need to have sanitary facilities that include refuse pits or other waste receptacles could be revitalized so as to have a changed society that is mind full of littering.



### 4.2.3 Awareness on anti-littering practices

In this theme, some participants attributed littering to ignorance of the law or failure to comprehend dangers posed by litter to the environment, people, KCCA and bus companies.

*[....] Some people are ignorant about the law and that is why they litter. There is limited sensitization of the community as far as littering is concerned both in educated to uneducated categories of people (WRC NSB Respo5a).*

Other participants said that people were not aware of the need to have a clean environment. One participant asserted that people look not bothered when they are in filthy environment as he pointed to the litter surrounding bucket that was adjacent to him.

*[.....] Litter is being thrown everywhere especially in the passenger waiting area because of lack of knowledge as you can see there is a dust bin here but there is rubbish thrown everywhere (FGDMK Respo1.1.1).*

From all other methods I used in the study, it was noted that there few attempts made to sensitize the public in litter management. I did not find any reminder in buses on any anti littering practices. The only notices I saw were on prohibition of smoking. There were no posters or bill boards in any bus terminals depicting any information on anti-littering practices. Even, much as most bus companies had Television Sets (TVs), none of them were playing music or a skit related to littering. Equally, none of the buses had a compact disc (CD) related to litter management. Yet, this could have been an opportunity for passengers to share information about litter management in the transport sector or in the general population. Kampala giant digital screens, especially at street junctions, that display business messages especially that of telecommunications, while anti littering messages were not seen. Much as one respondent had said as KCCA, they usually have a radio program and meetings with VHTs over littering; this still needed more to be done.

Innovations on information sharing in relation to litter management in the transport sector has not been embraced despite various opportunities such as TV screens in buses, phone messages and bill boards among others have been devoted to entertainment and business advertising.

#### **4.2.4 Management styles**

The service providers such as bus companies, contracted solid waste transporters and KCCA have the obligation of providing waste receptacles like litter bins, drums, skip; and collection of litter and disposal to the right place. The study noted that some waste receptacles were in place according to the responses that were obtained from key informants, FGD and through observation. However, some litter bins were far apart especially along streets of Kampala and one of the bus terminals never had drums for solid waste storage. It was evident through observation that waste was piled up in an open space in the neighborhood of eating places. While some bus terminals whose operators come from Rwanda, had better litter management practices such as waste receptacles with lids praised their country for putting in place strict measures on littering which they have also replicated in Uganda.

*[.....] Nikyigambwa ngu Rwanda n'abayonjo, tibarenda oburofu, naitwe nikwo turi tutyo. [People say Rwandans are hygienic; they do not want filth, and even us we are like that] (TPM Respo5.4)!*

In contrast, one respondent said, “[.....] *It is none of their business as park management in ensuring that buses have litter bins. The bus park management has no authority on putting of dust bins in the buses; it's an initiative of the bus owners*” (QPM Respo2.4). Another participant asserted that some bus terminals could not provide drums because the park is small. They added, the limited space could only be preserved for buses that give them money. “[.....] *the bus park has minimal space for placing in the containers. Even if we put them, the buses will be stepping on them* (QPM Respo2.4).

On the other hand, another participant was quick to note the shortfalls of KCCA in managing littering in the transport sector and other anti-littering strategies in place.

*[.....] However, I will also blame ourselves; we have not provided enough litter bins along the street. The gap between one litter bins to the other is wide. It makes accessibility of litter bins hard. We still have a challenge in controlling litter in the transport sector (KCCASF Respo6)*

Also some bus companies admitted that, they have not minded much about litter management in buses. We have been majorly looking at the mechanical conditions of the vehicle and other appliances such as seat belts, but not litter management.

*[.....] In the bus, we have not minded much about managing litter. But if council can be strict on us that every bus where a passenger throws rubbish is fined, then would we have to ensure we buy buckets where to deposit rubbish (KDR Respo1.2).*

On the good note, some participants were able to acknowledge the contributions made by bus companies in managing litter by taking up their responsibilities.

*[.....] There are some bus operators who are upright thinking; after reaching a destination, they collect the litter in the bus, as they are going to the washing bay, they call these young boys who know their value to take them (WRC NVB Respo5b).*

From all the above, there is a need for all key stake holders involved in the transport sector to have insights through training or study tours on litter management and its implications.

#### **4.2.5 Collection of solid waste**

The frequency of collection of solid waste is a determinant factor to cleanliness of the bus terminals and the whole City in general. Regular collection was considered daily collections while irregular were collection of solid waste at most once in a week. The participant commented, “[.....] *In the Bus Park, we contracted Nabugabo Updeal. When the Bus arrives, boys clean it and heap the litter*

*in one place which is then collected by Nabugabo” (NBPM Respo6.4). Some other participants raised concerns of non-collected litter. They said it had affected their businesses as they pointed to the heap of uncollected garbage with flies and unsightly.*

*[.....] KCCA collects the garbage from the waste collection site in the park every Monday. Uncollected litter is blown by wind and scattered all over in bus parks (KPM Respo1.4).*

Another participant said:

*[.....] KCCA does not collect the litter in time despite the payment made to them. We pay 240,000/= for litter per month, but waste collection is irregular (GPM Respo3.4).*

The frequency of litter collection depends on the capacity of agencies contracted to do the work. Two companies such as Nabugabo Updeal and Home Klin are too small to carry out waste collection in the whole city. Very few companies were involved in transporting solid wastes which could be due to the fact that they might be protected from competition.

#### **4.2.6 Applicable Laws**

The enacted laws that are enforced could signal to the general public that it is an offence to act contrary against any required practice. Some participants said laws were there but weak and could not prevent littering practices in the transport sector.

*[.....] Weak laws cannot govern litter management. Uganda’s laws are strong as soon as they are enacted but after sometime they become like irrelevant as the kaveera law (POL Respo7).*

Another participant said:

*[.....] There is no law enforcement against people who litter in buses, bus terminals or along the roads. People throw waste through the window even at police check points. Nobody is bothered about littering (QDR Respo2.2).*

One participant asserted that, there were neither laws nor planned system to govern littering in the transport sector. That was why littering looked like a norm. “[.....] *There is no proper revised system for the transport sector to protect the environment” (POL Respo7).* In contrast, laws related

to sanitation were in place including the 1995 constitution which requires every Ugandan citizen to live in a healthy and clean environment. Even other institutional frame works such as the NEMA Act and KCCA sanitation ordinances provide guidance on littering. However, it was equally important to note that, laws and regulations specifically for litter management in the transport sector were scanty.

Every institution could formulate byelaws that can govern them in case of a weakness of national laws in a given field. Institutional weaknesses could have contributed to the failure to enact specific laws or to enforce closely related to littering.

**Figure 3: Summary of socio-economic factors linked to littering**

<b>Number</b>	<b>Theme</b>	<b>Factors</b>
1.	Personal survival	Vendors of foods, drinks and other items in buses and bus parks.
		Economic activities at the bus stopovers and along roads
		Stealing of waste receptacles
		None re-usable products or low cost of packaging materials
		Convenience Plastic culture
2.	Money to do everything	Pinching of the money paid by bus companies for cleaning the parks
		Dirty Luggage carried along by passengers like charcoal
		Garbage from the eating places in the bus parks
3.	Trust in their own systems	We mind about one urinating in the park but not the passenger who drops litter in open space
		We keep our bus terminals clean as it is done in Rwanda where we come from.

4.	Preference of revenue over sanitation	Cannot provide drums for rubbish and leave buses that give us money
5.	Home background	They throw rubbish anyhow as it is done in the villages
6.	Institutional weaknesses	Weak laws related to littering
		Ignorance of the law
		Poor enforcement of the law
		Lack of sensitization on litter management
		Irregular collection of garbage by contracted companies from Bus terminals

From the table above, it was noted that, there were various socio-economic factors contributing to littering in the transport sector.

**4.3 Stake holders in anti-littering practices in the transport sector**

This theme showed different people and institutions that could help in tackling the problems of littering in buses, bus terminals and along roads. These included the Ministry of Works and Transport, passengers, Bus companies, Bus terminals, KCCA, Law makers, security, waste recyclers and companies contracted to transport garbage. The participants concurred that; KCCA/Urban authorities have a big stake in anti-littering practices followed by bus companies (staff). Ministry of Transport, waste recyclers and law makers were seen to be the least in contributing to anti-littering practices. When asked why they think the named categories of people were fundamental in anti littering practices, they said those were the ones with capacity, resources and responsibilities necessary to tackle the problem.

*[.....] KCCA be balina obuyinza kubanga omukulu abera mukulu. [KCCA are the concerned people to ensure environment in the City is clean because they are on top of management] (KFV Respo1.3).*

The given responses were in accordance with stake holder's responsibility in relation to abating littering in the transport sector. The ability and capacity to handle the problem have been used as their basis in proposing stakeholders.

KCCA is the custodian of laws and oversees the bus companies that could wish to operate within the City and bus terminals. That could be the reason it was indicated stake holder number one. While bus companies and terminals management, were indicated to be second and third respectively due to their close attachment to the source of littering. People who litter in the transport sector are passengers, vendors, bus staff and other people in the bus terminal who are under the docket of management of bus companies or terminals. If KCCA, Bus companies and terminals fulfilled their obligations, littering in the transport sector would be dealt with.

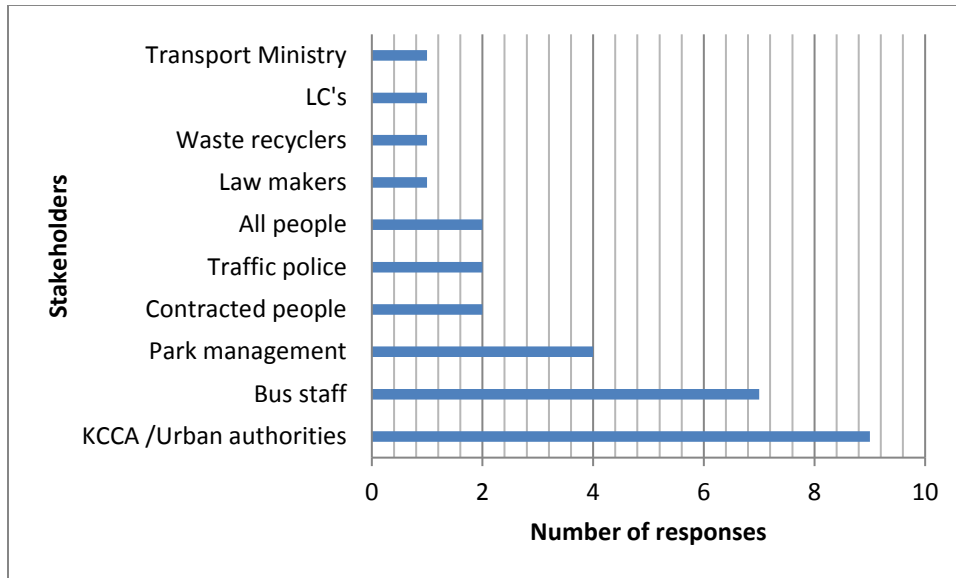
#### **4.4 Cooperation of different stake holders**

The theme of cooperation came up as respondents gave their views on how to work better in ensuring littering to scale down pollution by the transport sector. Their responses included conducting stake holders meetings so as to be at the same level of understanding.

*[.....] The executive director of KCCA should call boda riders and drivers for a meeting and seminars and discuss issues related to litter management in parks and along roads (WRC NSB Respo5a).*

Meanwhile, participants contended that there was a need to have relevant laws if the stake holders were to cooperate and adhere to the code of conduct. KCCA/ Gov't needs to take lead in ensuring the cooperation of all stakeholders is achieved so that, they can take littering as a problem which requires combined effort.

#### **Summary of perceived stakeholders in litter management**



**Figure 3: The stakeholders in anti-littering practices.**

Various stakeholders that are believed to have a hand in litter management in the transport sector are highlighted in the above figure.

#### **4.5 Roles of different stakeholders in litter management**

This factor came up in relation to the contributions of different stake holders in stopping littering in the transport sector. The key stakeholders included KCCA/ Government, park management, Bus companies, vendors and passengers.

##### **4.5.1 Roles of Bus companies in litter management**

Bus companies have the responsibility of ensuring that passengers could be transported safely and comfortably so as to increase market demand for their services. One of the ways to increase passengers' comfort is through proper management of litter by bus companies while on transit and in parks. Respondents were assessed on their knowledge and awareness on the roles of bus companies in managing litter.

**Table 4: Showing methods of litter management by Bus companies**



S/N	Assessed variables	The number of responses
1.	Bus companies pays monthly fee for solid waste management for bus terminal	14/14
2.	Sweeps litter out at the washing bays	9/14
3.	Use of litter bins	5/14
4.	Bus companies train staff on litter management while in bus and at the terminal	4/14
5.	Inform passengers to use litter bins	3/14
6.	Empties litter bins in wrong places like in the bush or along the roads	3/14
7.	Empties litter bins at the waste collection center or waste receptacles	2/14
8.	Passengers prevented to board buses with Boveras (polythene paper)	2/14
9.	Conductor moves around collecting wastes from passengers using litter bags	1/14

Some participants said, few bus companies have litter bins where passengers drop their wastes. “[.....] *We are okay; we have 3 dustbin containers inside the bus, if someone finishes eating; he/she throws trash in those bins*” (QDR Respo2.2).

The observed litter bins were in form of buckets, baskets and litter bags. Whereas few bus companies (5/14) that had litter bins, they could as well inform the passengers (3/14) to drop the wastes in provided litter bins. This could be due to the fact that, some bus companies would orient their staff on littering management so as to guide passengers adequately.

*[.....] We train our staff on litter management while in the bus and at the terminal. The training is before they are given jobs which take not less than 2months. They then transfer the knowledge about the dangers of littering to the passengers before the bus takes off* (GPM Respo3.4).

Another respondent said:

*[.....] The conductor tells the passengers before setting off, “[aba baasi mwena akantu aka nakokuta mukasiro]”. [All passengers, the displayed bucket is for depositing rubbish]* (TPM Respo5.4).

Even, in those buses where conductors inform the passengers on dropping litter to trash bins, they could do it before the bus set off. Other passengers that might board the bus on the way will

somehow miss such communication on litter management. However, in all buses I visited during observation, I did not witness bus staff reminding passengers on disposing rubbish into litter bins. This could be in agreement to what some respondents said that bus staff just provided litter bins in bus corridors or near the door without informing passengers about their presence and use. By placing litter bins in buses without giving any information about them was on premise that passengers will be able to see and know their uses.

*[.....] Our buses are two by two seaters so that every after 2 seats, we put a bucket where every passenger sees it. We do not again have to direct passengers what to do as they are old people to see (NBPM Respo6.4).*

The bus staff thought that, placing litter bins could stop the practice of throwing or dropping litter under seats; this somehow did not work as expected. Through use of focused group discussion and observation methods, it was noted that a number of passengers littered while they could be in less than a meter away from litter bins. This was witnessed in one of the passengers waiting area of the bus terminals and some buses where litter was seen on ground near rubbish bins.

It was observed by one participant that, bus companies that keep time or with displayed time schedules tend to be keen in maintaining their buses clean by devising different anti littering practices. Much as I did not go ahead to verify, there seemed to be a close link with littering practices to levels of education of bus companies and park management staff. I noticed it from where bus staff and bus terminal staff were able to express their views in English, had better littering methods, whereas those staff that expressed their views in their local languages had a lot of issues with littering. Even their arguments were self-centered such as; *“we cannot provide spaces to drums and leave buses that give us money, by doing so we are not working”*.

Likewise, Bus companies that had operations in other countries especially Rwanda, had improved mechanisms in managing litter than their counterparts. They also made emphasis for passengers

to observe maximum anti littering practices after crossing Ugandan border to other countries where littering is prohibited.

One could conclude that exposure whether through former education or experience could be a key in abating littering practices in Uganda's transport sector. Employing educated people in various positions of transport sector and study tours could help in curbing down the problem of littering.

#### **4.5.2 Emptying of filled up Litter bins**

In an attempt to understand how litter is disposed off from the Buses, various responses were given. Some participants said, “[.....] *When the Buses arrive at their destinations (bus terminals) or fuel stations, the litter collected in the bus is thrown where other litter is collected from*” (FGDMQ Respo2.1). In contrast, some Bus companies would pour the litter contents in open space in the parks. It was also noted that, some other bus companies empty full liter bins along the roadsides like Mabira forest or bush.

*[.....] Along the way, rubbish bins are emptied from unexpected places by the bus staff in the bush or swamps thus affecting the environment and we experience all the consequences (POL Respo7).*

Some other bus companies with or without litter bins, their staff pour solid waste in the washing bays. Through observations it was noted that, after the buses reach at bus terminals, waste pickers enter to collect plastics that were within litter bins and those dropped under seats. Thereafter, those buses that make return journeys are swept while the remaining rubbish is ejected. Buses that have a single journey are taken to the washing bay, where they are swept and washed from.

Litter management might not to be part of the professional code of conduct for drivers. In addition to that, the bus staff invited to refresher sessions like their counterparts in other occupational fields

such as farmers and manufacturers thus leading to knowledge gap on do's and don'ts in the transport sector. Bus companies dispose of litter according to their convenience.

#### 4.5.3 The role of Bus terminal authorities in anti-littering practices

The role of bus companies in anti-littering practices were summarized in the table 5 below.

**Table 5: Observations on litter management practices employed by Park authorities**

S/N	Methods	Number of Bus terminals (6)
1.	Night or day sweeping	6/6
2.	Provision of litter bins	5/6
3.	Have drums for waste disposal	5/6
4.	Day time solid waste pickers	3/6
5.	Have drums with lids	3/6
6.	Have a warning poster not to drop rubbish in open space	1/6

From the table above, it can be noted that, all bus terminals have recruited staff to do night sweeping and the litter could put in one place or drums provided. They attributed to night sweeping to the minimal traffic in parks that could allow uninterrupted cleaning as one said, “[.....] we have recruited around five people who clean the park when the place is a bit silent” (KPM Respo1.4). It was important to note that some bus terminals when drums are full of litter, they could cover them to avoid spill over and also to prevent passengers from continuing looking at them as they are believed to be unsightly.

*[.....] We have 24 hour cleaners who remove all the litter that may be dropped by the passengers. When the drums get full; we cover them to avoid passengers from seeing the wastes as they could induce vomiting (TPM Respo5.4).*

However, some bus terminals had drums with no lids and even some were seen empty but surrounded with litter on the ground. Yet, some other bus terminals, no drum could be seen as the park management asserted that, the small space available was reserved for buses but not drums for litter collection.

There was a notable bus terminal that had put a warning notice to bus companies not to pour litter in the open space except at waste collection centers provided.

*[.....] We have ordered the bus owners not to pour any waste down in the park. We had a meeting with managers of bus companies while discussing rules and regulations governing this Bus terminal. We agreed to put them at the entrance on a sign post (KPM Respo1.4).*

Another participant said:

*[.....] Posters about litter management should be put up; incase a person came from a place far away from Kampala and littered along the road and he is arrested, he cannot claim that he did not know that it is prohibited to litter on that road so as to take away the case from him or her (WBM Respo8).*

Having the litter reminder at the gate could somehow have helped to guide some bus conductors and passengers that littering in the park is not condoned. Through observation method, the warning notice indicated was among the long list of the regulation that the park management had come up with. It was actually regulation number seven (7) out of fourteen (14) that they had listed. It was also noted that these regulations were both in English and Luganda which are believed to be commonly spoken languages in Kampala city. However, with a bus terminal having three gates, one notice that was placed at only the entry gate could not suffice. Even the notice was crowded and also written in small letters that required a person to be in a close range so as to read it.

All bus terminals do not have clear instructions detailing on what they could do to eliminate the problem of littering in parks. Even having association of bus terminals could have helped in knowledge and experience sharing.

#### **4.5.4 The role of KCCA/Government in litter management**

KCCA/ Government have a mandate of maintaining capital City orderly and clean. This has to be achieved by employing different methods to ensure Kampala is not choked with solid waste. Among the methods used by KCCA one participant said, “[.....] *Some people are employed to sweep roads and for those roads that cannot be swept, litter picking is done*” (WRC NSB Respo5a). However, the KCCA has a mandate of sweeping streets and taxi parks such as New and Old Taxi Parks where they have even provided waste skips that are emptied regularly only. Therefore, the sweeping and cleaning of other private parks were in the hands of contracted companies like Nabugabo and Homeklin. It is equally important to note that KCCA still had the duty of supervising the works performed by such companies on regular basis.

Furthermore, some participants shared that KCCA has powers to formulate and enforce laws related to storage, collection and disposal of litter despite the fact they are not strict enough to solve littering problems in the transport sector. One said, “[.....] *bring some strict rules just like it is in Rwanda. In Rwanda when you throw rubbish anyhow, you are imprisoned for not less than six months*” (GPM Respo3.4). To have biting and enforceable laws, there is need for collaboration with other institutions, Ministry of Trade, Works and Transport.

From the above results, it was noted that KCCA/Government as the duty bearer could ensure all passenger service vehicles (PSV) had sanitary related facilities such as litter bins and passenger reminders before they could be given license to operate or to be renewed.

*[.....] There should be basic requirements for waste disposal facilities that should always be asked for PSV just like traffic may stop you and ask for a permit*

*or license. This would make mandatory acquisition of sanitary facilities within buses (POLRespo7).*

Some participants argued that much as KCCA/Government has allowed people involved in recycling to do their work uninterrupted, they could be helped by establishing places for waste collection centers both in bus terminals and along high ways for proper emptying of litter bins. This will reduce the pouring of wastes in wrong places.

*[.....] There should be receiving centers for wastes whereby whoever brings wastes, they are measured and paid by the recyclers or their agents. You will be seeing every waste in terms of money thus reducing litter in circulation (POL Respo7).*

Other respondents said that KCCA/Government have staff that help in supervision of solid waste management in bus terminals and the whole City in general. They requested to have trained people coming from all regions of the country to be responsible in monitoring and guiding people on proper disposal of litter.

*[.....] There should be people in charge of litter management in town. KCCA should recruit staff from different regions who know various languages for proper sensitization and easy communication (GPM Respo3.4).*

They required regional representation in order to of fight littering in the transport sector since Kampala is metropolitan with different cultures that need to be addressed.

It can be concluded that absence of delegation of functions to lower operational areas such as park management and bus companies and hierarchy of command from top and lower level management of litter in the transport sector was somehow noted as weak or non existing.

**Table 6: Summary of different methods employed by KCCA to manage littering**

<b>Number</b>	<b>Themes</b>	<b>Methods</b>
1.	Waste collection	KCCA has trucks that collects wastes KCCA entered joint ventures with other companies like Nabugabo Updeal and Home Klin

		to collect waste from private parks and other places
2.	Street cleaning	KCCA has contracted people to do street sweeping
		Allowed companies involved in recycling
		KCCA has some reminders in some places urging people to keep Kampala clean
		KCCA has put in place litter bins along streets
3.	Provision of technical services	KCCA desilts water channels that are choked with litter
		KCCA conducts and approves all solid waste related researches/studies
		KCCA has enacted byelaws, policies and guidelines to manage littering
		KCCA has staff in the field who handle issues of sanitation and hygiene

The table above shows the different methods used by KCCA to manage solid waste littering.

**4.5.5 Role of passengers in Litter management**

The study noted that some passengers take the initiative to drop rubbish in the provided litter bins if they happen to be there in buses. Other participants said, “[.....] *Some people hold/handle litter until the conductor brings a bucket where to put it or when they get out of the bus to look for waste receptacles*” (WRC NSB Respo5a). On the other hand, some participants argued that passengers do help in correcting the behavior of their colleagues that litter. They remind them to use litter bins or help them to pass trash to litter bins in those buses that have them. However, they noted that there those passengers that are errant where their colleagues could use a toll free line that might be established by KCCA environmental health department or national sanitation committee or desk that would be mandated to oversee anti littering practices in the transport sector. In other words, these respondents were suggesting having whistle blowers as an anti-littering strategy. Another participant supplemented, “[.....] *A toll free line could be put in place that any responsible person should call on incase a bus is seen littering along the way*” (Conductor Respo3.1).



However, the whistle blower strategy needs when there is a developed network to crack down the littering practices in the transport sector. It would be an uphill task for a whistleblower in Karamoja to call for help from the anti littering desk in Kampala. Anti-littering desks could work well if they are in every district.

There is overwhelming evidence that, passengers could be very resourceful in curbing down the practice of littering by using the whistle blower strategy and having a toll free line known though this requires a critical mass of sensitization to avoid witch hunting.

#### **4.5.6 The role of vendors in anti-littering practices**

This came up as the result of the contributions made by vendors of fast foods and drinks in minimizing of littering in the transport sector. Respondents said, “[.....] *Vendors in buses and parks should direct passengers where to deposit trash since they are the source of litter*” (KCO Respo1.1). Other respondents complemented that vendors can even help in picking trash and take them to litter bins. By doing so, they would be reducing scattering of litter and even showing a good example in anti-littering practices in the transport sector. However, it was noted from the study that vendors in bus terminals were of low education status as they could not express themselves in English other than their local languages. This implies that, vendors could not start anti littering practices voluntarily due to limitation of their education levels to conceptualize hazards posed by accumulated litter to the environment.

Having the operational guidelines in the works of vendors in relation to litter management, detailing terms and conditions before they are granted permission to transact their business in KCCA would be of great help. This could be complemented by vendors forming associations for easy communication and coordination.

#### **4.5.7 The role of Security Personnel in litter management**

In this sub theme, participants suggested that the security personnel could help in enforcing anti-littering practices such as charging and collecting express penalties or call back the offenders to come and clean where they have littered. This could be a deterrent to others so as to desist from littering.

*[.....] The Police should follow up vehicles whose passengers throw litter through the windows and the bus with its occupants be arrested. Or else, a person who litters could be called back to pick and put trash to the dust bin or collection center. If fined, the charged money could be shared with security and whistle blowers that could have participated in identification and arresting of culprits” (KDR Respo1.2).*

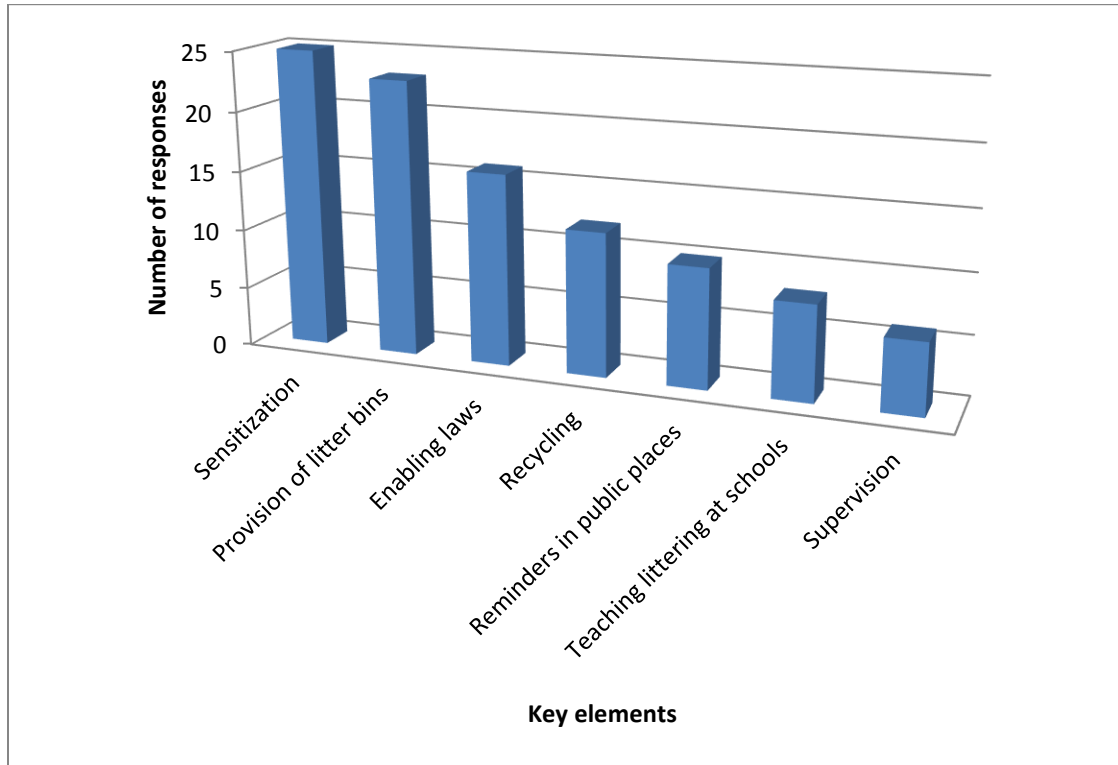
This strategy of arresting and fining culprits of littering requires massive support. In this case, much more ground work could be done through conducting sensitizations and awareness at various forums so as to garner public support. Enforcement of anti-littering requires political will to as politicizing every intervention could jeopardize the good intentions of eliminating littering in the transport sector. In the same way, corruption, nepotism and favoritism could hinder the well-intended strategy of fining the offenders of littering in the transport sector.

It can be concluded that the level of education and exposure had great influence on stakeholders’ ability to understand and appreciate their roles as far as fighting littering is concerned. People who had ever traveled outside Uganda and those participants that were able to express themselves in English had put in place measures to manage litter and even had constructive contributions to the study. Through interactions with the research participants, it was seen that the majority of people whose livelihood depended on transport sector were of low education.

#### **4.6 Key elements in anti-littering practices in the transport sector**

The responses were given on what could be the most important things in ensuring littering in the transport sector is minimized there and then. The responses were categorized into themes that

included sensitization, provision of litter bins, enactment and enforcement of laws, reminders in public places, teaching littering in schools, waste recycling and supervision.



**Figure 4: Key elements of anti-littering programs**

The figure above shows various key elements for a successful anti-littering program in the transport sector.

#### **4.6.1 Sensitization**

This theme “sensitization” in anti-littering practices was said to be the leading key element as often people litter because they are not aware of the dangers that could come out of it. Participants suggested sensitization could be carried out by holding stake holders meetings, discussing litter management packages using radios, TVs and using newspapers.

*[.....] The public should be taught litter management. Because a litter bin could be empty while in a few meters away from him, but he or she litters anywhere (KCCASF Respo6).*

Participants argued that mass sensitization will help the public to understand that, it requires everyone's responsibility to have a healthy and clean environment as it is enshrined in the 1995 Ugandan constitution.

*[.....] President (Kagame) told us; we don't have natural resources but the only resource we have is the people themselves that have to be protected (TPM Respo5.4).*

Another participant said:

*[.....] Itwe abari omu Town, kw'okukuza omwana, aba namanya buri kurya, n'okurisa fork, n'owazarwa erizoba, kwaraze kurya, nawe naba nayenda fork. n'abantu kubarabashomese bakakyikwata, ningyira kasasiro neza kukyendera. [For us who live in town, if you up bring your child well, he or she knows every eating they have to use a fork. Therefore, if people are sensitized on how and why to drop the litter in bins, I think litter will reduce.] (KDR Respo1.2).*

In order for sensitization to be effective, it could be carried out in all spoken languages of Uganda. This could be realized if the hired and recruited staff would be able to communicate in the language the different communities understands so as to have higher compliance.

#### **4.6.2 Provision of waste receptacles**

The participants said provision of waste receptacles could ensure littering is managed in buses, bus terminals and along the roads. More to that, these waste receptacles would be provided by KCCA, management of bus terminals and bus companies. At the same time, bus staff such as conductors and turn boys could endeavor to empty the filled litter bins at designated waste collection centers but not in any other place as this could contaminate the environment.

*[.....]Even in Costas in Rwanda, the conductor carries the full bins to empty them from waste collection centers; where he will clean and return it to the bus and no one laughs at him because it is his job (TPM Respo5.4).*

However, for these litter bins to achieve the intended purpose, they should be adequate in number, put in strategic positions, have reminders in place, be regularly emptied and cleaned so as not to be a nuisance themselves.

#### **4.6.3 Enacting and enforcing anti littering laws**

It was noted from participants that, enacting and enforcing laws are a key in anti-littering programs. Other countries which have implemented them, such as Rwanda, are now enjoying fruits as their country is free from litter. Participants recommended,

*[.....] Pass strict laws of anti-littering which should cover the whole country, not only the city. In Rwanda even a kid of yesterday cannot throw rubbish anyhow because they know it is bad (GPM Respo3.4).*

Generally speaking, the enacted laws would require input from various stakeholders so as to be comprehensive and garner the required support. To meet their intended purpose, they could also be translated in various languages so as to be widely circulated and increase readership.

#### **4.6.4 Teaching litter management at schools**

In this respect, participants rooted the act of littering in moral decay in our society, that could be corrected if anti littering programs can be integrated in the school curriculum. They further said that having posters at schools that are commonly known as “talking compound” could help pupils to understand the need to protect and stay in a clean and healthy environment.

*[.....]Litter management should be taught in schools; if you are taught that this is wrong as a child, you don't do it as an adult. Littering should be part of the talking compound at every institution to deter people from littering (KCCA SF Respo6).*

The children are change agents whereby equipping them with knowledge and skills of anti-littering practices is one of the sure ways of having a litter free environment. Respondents further added

that, most homes and communities are represented by a pupil at schools. Therefore, using schools as a strategy of anti-littering would reach a wider community.

Teaching ethics at all institutions of learning is essential in grooming citizens to be responsible and sensitive to the environment which could be replicated in litter management so as to prevent the challenges that comes with them.

#### **4.6.5 Supervision of anti-littering program**

The participants contended that, for any program to succeed there needs to be regular and purposeful supervision. The supervision could ensure bus terminals, contracted companies in solid waste management and bus companies are up to the standards of litter management practices. They continued to say, “[.....] *Health Assistants and other staff could monitor and supervise the litter management in bus terminals and the City in general*” (FGDMK Respo1.1).

There is a need for adequate resources in terms of man power, means of transport, fuel, air time for coordination and field allowances. To achieve the above, political will that could be influential in allocating adequate financial and other resources to environmental health department is required.

#### **4.6.6 Provision of reminders on anti-littering practices**

Reminding is part of life as one would be involved in activities that could lead him or her to forget a given practice. Similarly, it was notable from participants that, having reminders in public places such as buses, bus terminals and high ways would help to inform masses on the habit of littering. In this aspect, bill boards, public television sets, notices in buses, on streets and other public institutions with anti-littering messages if well designed, it could help in abating the vice. One

said, “[.....] *they could put up warning posters about improper disposal of litter. There should be posters availed to those people who can be able to read*” (FGDFG Respo3.2.1).

However, with the poor reading culture of Ugandans, written reminders cannot work alone unless electronic reminders that are automated say at certain intervals or before the bus sets off could go far in reducing littering in the transport sector. This is because, verbal reminding by bus conductors to passengers on use of litter bins have also been irregular as it was noted from some participants

#### **4.6.7 National and Regional anti littering strategy**

This theme came up as the participants suggested that, fighting littering in the transport sector requires collaboration of all local and urban authorities as well as support from neighboring countries. They reasoned that, some passengers litter while in Uganda; but as soon as they cross into other country such as Rwanda; such behavior stops.

*[.....] Along the roads some people throw the litter via the windows especially before crossing the Rwandan border. After crossing the border; the conductor informs us not to throw anything through the window (FGDMT Respo5.1).*

In support for regional collaboration against littering, one contented that, “[.....] *if other surrounding towns do not manage litter well, it will flow back to areas which managed their litter well through water channels or storms*”(KCCA SF Respo6).

Good enough, there are forums such as East African Community at regional level and associations of local and urban authorities at national level among others, which could be utilized to tackle the problem of littering in the transport sector. Fighting the problem of littering in the transport sector requires national and regional support as buses that come to Kampala some come from beyond district and national borders where passengers could have different attitude to littering.

#### **4.6.8 Recycling of solid waste**

Recycling came up as a contribution suggested by participants towards controlling of littering in our environment and their effects. It was equally noted that, recycling removes a big chunk of litter from environment. Litter could be re-used as containers for liquid soap, local porridge, irrigating crops and others to be recycled in plastic industry to make cups, basins, jewels and other bottles.

*[.....] Singa kampuni ezibitwala teziliwo, twandibade tetulina gye tubiteka kubanga ne'Kiteezi gye'babitwala, babagobayo emisana n'egulo. Kati kampuni singa tezibitwala, ne Kampala yandibade mufunyo. [If recycling companies were not there, we could not be having where to take solid waste since Kiteezi land fill management is also chasing transporters of garbage day and night. Even Kampala; would be choked with litter] (WRC NVB Respo5b).*

Importantly, recycling helps them to acquire food for their children and for their own survival. However, spectators see those people involved as being in inferior business. They scavenge looking for wastes at times in filthy places which could be a hindrance to the general public to appreciate their contribution to the economy. Recycling in its current form cannot solve the problem of littering as recyclers only pick litter of their preference and leave others unattended to.

However, failure for Industries and agents involved in waste recycling to be reorganized by Government through NEMA or KCCA as their heroic contributions to our environment by helping in removing many tones of wastes has led to the heaps of litter despite of high demand for them.

##### **4.6.8.1 Strengthening cooperation between transport and recycling companies**

After realizing that there could be the gap between transport companies and recycling industry, various strategies were sought which could be used to foster the cooperation. In order to realize the desired state of recycling, participants proposed to have a hierarchy of communication whereby KCCA informs Ministry of Transport to make circular to all Bus companies and terminals detailing



how litter should be managed in the transport sector, such as having litter bins and disposing all litter in waste collection centers.

*[.....] There should be a hierarchy of communication in litter management in the transport sector. Let the KCCA inform the minister of transport that will later inform all bus companies on how to manage the litter (GPM Respo3.4).*

Another respondent said:

*[.....] They (recycling companies) should cooperate with park management to give them space for putting in drums where they will collect their bottles from (QFV Respo2.3).*

More to that, other participants recognized the need to have waste transfer points along the major roads that can enable bus conductors to empty their litter bins and where recyclers could collect them from.

*[.....] There should be specific points for disposal of such wastes; one who needs could find them like at washing bays (QPM Respo2.4).*

Another participant said:

*[.....] The bus managers should work hand in hand with the recyclers to deliver the litter to the garbage sites that the bus companies or Government could have set up (WRC NSB Respo5a).*

Participants also suggested the need to have regular stakeholders' meetings to harmonize working relations between transport and recycling companies. “[.....] *There should be management meetings over littering in buses among key stakeholders so as to have consensus on what should be done to improve the cleanliness in the transport sector*” (KFV Respo1.3). It was also noted from participants that, if waste recyclers or their agents informs public on different types of wastes they require and the amount of money to be given per certain amount of wastes brought to them for selling, this could reduce the rate of littering. Bus companies and passengers themselves would collect and deposit the used up materials for exchange of money.

Surprisingly, through interaction and observation, people involved in recycling seemed to be of low education and incomes. This came into light when participants involved in that trade could hardly express themselves in English. Some operated in isolated places with no sanitary facilities, protective gear and others at the bank of the water channels without any barrier yet they had children.

It can be concluded that people involved in recycling especially waste pickers and agents are of low status. They do not have the capacity to bargain with other institutions to have better working environment and take recycling to another level. KCCA needs to broker the negotiations with waste recyclers and the transport companies if the problem of littering is to be controlled.

#### **4.6.8.2 Waste Segregation**

Waste segregation could be an important element in anti-littering practices and recycling industry. The participants agitated for waste segregation such that all wastes whether biodegradable or none biodegradable could be collected and recycled. They reasoned that, biodegradable materials could be used in making manure while non-biodegradable is re-used or get new products out of them thus making demand for every litter.

*[.....] The recyclers should bring their containers in which their litter of preference is segregated and placed .There should be segregation of wastes; the decomposing alone and none decomposing alone (WBM Respo8).*

Another participant said:

*[.....] In Germany, they put different containers inorganic materials such as bottles, plastic bags, glasses and organic materials of different wastes such as husks which are later weighed and money is given to the collector (POL Respo7).*

Waste segregation could be good as it improves acceptability of litter by different interested parties. However, it requires cooperation, massive sensitization and political will at all levels since Uganda is politically charged. KCCA could take a lead in coordination of all key partners.

**Table 7: Strategies for cooperation between transport and recycling companies**

<b>Number</b>	<b>Themes</b>	<b>Strategies</b>
1.	Effective communication	Hierarchy of communication
		Dialogue meetings
2.	Increased access to wastes	Attaching payment to all wastes
		Having recycling agents in all bus companies
		Recycling companies bring litter containers at bus terminals
3.	Enabling laws	Having laws related to recycling

The table above shows various strategies that can be used to promote cooperation between waste recyclers and transport companies.

#### **4.7 Summary of the findings**

This study generated a lot of information in relation to the influencing factors to littering in the transport sector. The key issues that emerged according to study objectives were that:

**Objective 1:** Passengers, management staff of bus companies and bus terminals showed knowledge on how to manage litter and the problems that could come out of littering. However, they said absence of law enforcement has made them not to comply. Peoples' social background, sanitation money charged to bus companies, affinity for money by bus terminals and operating petty business for survival were linked to littering in the transport sector.

**Objective 2:** KCCA, staff of bus companies and terminals were key stake holders in prevention of littering in the transport sector. Enforcement and awareness creation could be carried out by the named stake holders, to reduce littering.

**Objective 3:** The key elements for anti-littering program were sensitization, provision of litter bins, integrating littering messages in school curriculum, enacting relevant laws and embracing recycling of wastes.

## **CHAPTER FIVE**

### **DISCUSSION OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.0 Introduction**

The interplay of changes in composition of solid wastes from organic to mostly plastics and the increasing population has exacerbated the problem of littering in the general population and more so in the transport sector due to plastic convenience culture (Minghua et al, 2009; Mara & Hidefumi, 2004). This has supported the need to conduct an in depth investigation by exploring the aspects related to influencing factors for littering in buses.

The key issues raised in this chapter are discussed in comparison with studies done by other scholars in the literature reviewed and theoretical model. The study came up with the section of discussion, conclusion, summary of the key findings and recommendations made to the designated authorities for their appropriate actions.

#### **5.1 Discussion of results**

In this sub section, key findings are categorized under each objective and themes that were developed and fitted in PRECEDE-PROCEED Model of Green & Kreuter (2005). The model gave important things that are entailed in anti-littering program in the transport sector. Whereas other studies looked at littering in the general population (Tanyanyiwa, 2015), or obtained their views from security agencies and professional bodies (Chitotombe, 2014), this study focused on littering in the transport sector. It also received responses from the people that are believed to be directly linked to littering such as passengers, staff of Bus companies, management of Bus terminals, vendors, enforcement officers and supervisor of solid waste in KCCA.

### **5.1.1 Objective one: Influencing factors of solid waste littering in buses**

Effects of poor management of litter were known by participants and they included diseases, floods, breeding of diseases vectors, accidents, soil infertility and unsightly conditions came up. This showed the adequate knowledge by the participants on the subject matter. The findings concur with the study carried out by Jarod (2012), on plastic grocery bags and willingness to accept reusable bags which noted that, plastics and polythene papers had created a lot of havoc to the environment. The present study also noted high cost of cleaning the City due to too much litter which is in line with Lilliana et al (2012), findings noted that huge financial resources are required to maintain cities clean through sweeping and collection of garbage.

The participants had adequate knowledge on littering practices and the problems that can result from poorly managed litter to people, environment, bus companies and KCCA. These findings emerged both in the study and literature reviewed as they are common in our daily life and happening world over. The case example is flooding that has ravaged most cities such as Mumbai in India that killed thousands of people (Jarod, 2012) and diarrheal diseases such as cholera that usually follows.

The un expected findings were that bus companies could suffer an additional cost to clean their buses if presumed to be very dirty as it would require more water, detergent and time; conflict could ensue between individuals or companies as result of indiscriminate disposal of solid waste if such wastes are thrown from a moving vehicle and land on the wind screen of the coming vehicle, it can shatter it and also confuse the driver who might be angered thus a quarrel. Even, neighbors can pick a quarrel from the rubbish thrown in their area of jurisdiction such as work place or homesteads.

The failure of stakeholders to put into practice the knowledge they had to solve the problem of littering in the transport sector could be due to internal and external factors that could influence their decisions. The findings are supported by Tanyanyiwa (2015), whose study found that 94% of Zimbabweans were able to identify litter as a major environmental problem and yet they continued to litter. Majority of respondents thought somebody else especially from Municipal Council would come to clean after them.

Littering in buses is a human behaviour. The management of the behavior of littering may greatly help in realizing clean environment in the transport sector. This observation concurs with the PRECEDE-PROCEED Model which emphasizes the need to identify and manipulate predisposing, enabling and reinforcing factors through internal and external motivators so as to influence one's behavior and in this case littering in the transport sector (Green & Kreuter, 2005). Predisposing factors contains elements such as knowledge, beliefs, values and attitudes, while enabling factors include has organization of services, policies, laws, and regulations, availability and accessibility to facilities such as litter bins. Reinforcing factors include elements such as the media, peer influence, family influence, reminders, provision of continued reward, incentive and recognition (Claudine, 2012). Therefore, if KCCA/Government does not take a lead in ensuring that all stake holders take up their responsibilities and duties in managing litter, the challenges of solid waste could reach exponential levels.

Since our practice and habits could be influenced by our families and communities to which we belong, there is a need to have deliberate effort to revive health inspection of homes and public institutions such as schools to counteract the habit of littering through putting in place and reminding on use of litter bins or composite pits (Forbes, 2009). This strategy is well laid in the

PRECEDE-PROCEED model that bank on community involvement as a means of building sense of ownership of the intervention, leading to more community support and hence standing a greater chance of success of the project (Green & Kreuter, 2005).

Economic factors affecting littering included reasons such as vending in buses, plastic convenience culture, sanitation money charged from bus companies, stealing of waste receptacles, luggage carried along with passengers, mushrooming businesses along highways, shops and eating places in bus terminals that could all contribute to littering. Some of the suggested factors are in line with findings of other scholars such Dube and Chirisa (2012), who asserted that, vendors were looked as the major contributor to littering because what they sold to passengers after consumption could be thrown out or under the passengers' seats. While Makwara & Magudu (2013), contended that people have a strong preference especially to fast foods that are packed in plastics for their convenience that can be consumed while in transit, thus leading to littering in the transport sector in case there are no litter bins or they are not informed about the need to use litter bins.

However, the study came up with new emerging factors such as stealing of waste receptacles, sanitation money charged from bus companies and the desire by authorities of bus terminals not to spare spaces for drums instead of buses that give them money, could not be connected with the literature I reviewed. This could give a clue to persistence of littering despite the fact that some interventions have been made by KCCA/ Government to address the problem. While bus companies feel they are cheated on sanitation money charged from them, it means they will not comply hence littering. Also, if the management of bus terminals prioritizes space in the park for buses, but not waste receptacles, it encourages littering. Important to note is that buses and bus



terminals are key places where littering happens in the transport sector. Therefore, failure to appreciate the importance of managing litter by these very authorities could worsen the conditions. Even the few waste receptacles if they are stolen then this puts anti littering interventions at jeopardy.

There is a need to have in place mechanisms of coordination where everybody could be brought on board. This could yield consensus and transparency on matters of littering in the transport sector and formidable solutions are jointly formulated. These suggestions are well catered for under the PRECEDE- PROCEED model as highlighted by the model proponent Green and Kreuter (2005). They agitated for developing targeted health service interventions could require an understanding of the specificities of the target population, and other stake holders and determinants of change. This is in line with the observation that I had earlier made on this very theme that, the interests of different key partners have to be put in considerations when designing and implementing an intervention as it increases ownership and later sustainability of the program.

### **5.1.2 Objective 2: Roles of different stakeholders in abating littering in public buses.**

On the key stake holders, if KCCA / Government, bus companies and bus terminals are willing to full fill their obligations, this could greatly help in curbing the problem of littering in the transport sector. This supports Tukahirwa (2011), who asserted that the willingness of key stake holders to perform their core functions has a positive impact in managing solid waste. This is due to the fact that, even if passengers are willing to use waste receptacles, the absence of such containers could lead to littering. Habitat International (2012) supports the involvement of the service recipients especially passengers and food vendors, who are the primary producers and generators of significant proportion of litter, in making of sound policy decisions and designing of effective joint solutions solid waste to the problem. The PRECEDE- PROCEED Model of Green and Kreuter

(2005), asserts that when developing an intervention to address a health related or a community problem, it makes no sense to pick up an issue at random and use whatever resources or means available to address it without putting into consideration the service utilisers (Phillips et al, 2012).

When passengers are not involved in designing of anti-littering practices by obtaining their views through a study, it might lead to low utilization of facilities given. This is similar to the findings where the receptacles were in place but litter could be found on ground (NCHRP, 2009). This suggests that, there is need for to have a dialogue for key stake holders in sanitation coordinated by KCCA as they have the duty and responsibility of maintaining the City clean.

The level of education, exposure and incomes had great influence on stakeholder's ability to understand and appreciate their roles as far as managing littering is concerned, this supports finding by (Kardish, 2014). People who had traveled outside Uganda and those participants that could express themselves in English put in place measures to manage litter and even shared constructive contributions to the study. Similarly, majority of people whose livelihood depended on transport sector could be of low education. These findings correspond to the study carried out by Jackson et al (2013), who observed that, low standard of living, high illiteracy levels and low GDP per capita are influencing factors that cause low levels of willingness to participate in public management matters. Such challenges could be solved by embracing community participation and education involving CBOs and the informal sector (Okot-Okum, 2009).

Employing educated people in various positions in the transport sector could help in curbing down the problem of littering as they could easily devise means of maintaining their places clean un like their counter part with low education. However, Uganda is a free economy where individuals and investors decide on whichever business to start and the people to employ. Also, proprietors of the

business such as bus companies and bus terminal management aims at maximizing of profits than on service delivery which could lead them to recruit less educated people who could not demand for higher salaries and better working conditions. Also waste recyclers have contributed much in removing tones of litter from the Environment. However, they only pick litter according to their preferences leaving much uncollected. Even other wastes are not picked because they are very dirty.

As financial challenges are hindrances to some of well-intended interventions, KCCA could organize study tours to the somehow well rated bus terminals and Bus companies in managing litter within Kampala. It was noted that the bus companies that operate to other countries especially Rwanda had improved in managing their litter. Other stakeholders can have exchange visit and deliberate on issues of littering on transport sector. This could help in achieving vision 2040 of becoming a middle income economy and also the Global Sustainable Development Goals especially those that demand staying in a cleaner environment (Mamipadma, 2014).

### **5.1.3 Objective Three: To determine key elements of a successful anti-littering program in the transport sector.**

For the all elements to be implemented and to achieve the intended purpose, KCCA or government should have the will to implement them. This requires a broad-based approach while implementing the strategies so as to garner public support or popularity. This is in line with the PRECEDE-PROCEED Model that offers comprehensive and rigorous structure which covers all the areas that are critical in designing interventions to tackle any given problem like solid waste littering in buses (Green & Kreuter, 2005). The struggle of fighting the vice of littering is not an economic venture where you expect the private individuals or persons to take the lead. That is why many billboards in Kampala and Television sets in buses contain messages of entertainment and advertising business but not information of social responsibility such as promoting better littering practices.

The private enterprises would put money where they can reap more but not on public service. Then it is prudent that government regulates this sector by enacting laws and enforcing laws them and above all, coordination mechanisms with different stake holders so as jointly devise means of managing litter in the transport sector (Water Aid, 2011).

It is equally important to note that, some of other key factors that help in fighting littering such as having waste receptacles, awareness creation on through media houses, reminders on littering and supervision are in place (Lilliana et al, 2012). However, their impacts have not been felt due to low limited popularity. Much as the manufacturers have tried to full fill their obligations of reminding public by writing on their products to deposit trash in litter bins so as to protect the environment, such words and pictorial are too small to be read (Chitotombe, 2014). It could have been better if such companies could erect bill boards containing such messages of anti-littering practices in all public places designed in common languages.

In comparison with polluter pays principle, agencies involved in the transport sector if demanded by KCCA to utilize their resources in creating awareness like use of Television sets in their buses, writing anti littering messages on buses, food vendors having caps, aprons and T-shirts that discourages littering, and having bill boards that are large enough as well as using electronic devices on reminding passengers and public on better littering practices (Water Aid, 2011). However, most interventions are usually failed by corruption tendencies of some individuals (Jackson et al, 2013).

## **5.2 Conclusions**

The transport sector being largely managed by private sector, government has not regulated some of their operations. The people whose livelihoods depend on the transport sector such as the drivers, conductors, food and drink vendors, car washers and waste recyclers majority were less

educated. This could limit their ability to conceptualize and bargain for the need to operate in a clean and healthy environment. This situation has made the proprietors to maximize profits where they either may not buy waste receptacles or may recruit less educated staff. The involvement of KCCA or Government by coordinating littering activities in the transport sector is of paramount importance.

It is equally important that all agencies and individuals whose activities generate wastes in the transport sector; had an opportunity in one way or the other to limit littering but was never utilized. Bus companies have TV sets in most buses, Manufacturers of drinks and fast foods have erected bill boards with other messages, buses have the capacity to convey messages if written on them, vendors have aprons where the messages can be typed on and bus terminals have also bill boards. Enacting and enforcement of litter management related laws in the transport sector could be of great use. Express penalties that are jointly agreed on by different stake holders and supported with whistle blower strategy can do wonders in preventing littering.

Overall, the implication of littering in the transport sector has greatly created job opportunities to the less educated people and as the raw materials in the recycling industry. However, KCCA/ Government needs to broker with other agencies to develop the recycling industry.

## **5.3 Recommendations**

### **5.3.1 Recommendations to the bus companies**

1. The bus companies could ensure that in all their buses, they have litter bins.
2. Bus conductors or turn boys could ensure all the litter bins are emptied at waste collection centers.

3. The Bus companies could always inform passengers in different languages at the start of the journey, at stopovers and before the end of the journey on how to dispose their trash in litter bins by use of their TVs, conductors and displayed posters.
4. The Bus companies could integrate litter management issues in their associations
5. Since, for example, in all flights passing through Kigali, all air passengers are informed to leave their plastic bags on board, It is also possible to tell the bus passengers to leave their rubbish or waste in the buses because the bus management can handle the litter better than individual passengers.
6. Bus companies could employ educated people with minimum level of Senior four who are able to understand the need to work in a clean and healthy environment.

### **5.3.2 Recommendations to the management of Bus terminals**

1. They could ensure that every Bus terminal has adequate litter bins.
2. They could have bill boards containing anti littering messages that are big enough to be used by passengers.
3. They could have regular meetings with the stake holders within the park and discuss about litter management such as the value of sanitation money charged from the Bus companies.

### **5.3.3 Recommendations to the Waste recyclers**

1. Recycling companies or agents need to announce publicly an amount to be given for any amount of wastes that could be brought to the waste collection centers since they buy such wastes.
2. They need to form associations so as to be effective in collection of wastes country wide and collaborate with Government and bus companies.

#### **5.3.4 Recommendations to KCCA/Government**

1. KCCA could enact and enforce litter related laws in the transport sector with input from various stakeholders and also translated in various languages spoken in Uganda.
2. KCCA could take a lead in ensuring all people whose livelihood depends on the transport sector adhere to anti littering practices.
3. KCCA could take a lead in coordination of recycling activities by having waste transfer stations along roads and recognizing the work of waste recyclers publicly.
4. Anti-littering practices could be incorporated in school curriculum and use of talking compounds.
5. The Government could strengthen the inspections by Health Inspectorate and Local Council systems on anti-littering practices in the transport sector and in general public.
6. There is a need to have regional and national collaboration in fighting littering in the transport sector. The available plat forms such as East African Community and association of Local and Urban Councils could be utilized.
7. KCCA /Government could use whistle blower strategy in identifying and arresting culprits of littering. These could be fined or called back to pick litter.
8. Government could establish anti littering structures with response desk office at different levels of administration with toll free line. The hierarchy of command from top to lower level management of litter in the transport sector. These structures could be at national, district, bus terminals and bus companies.
9. KCCA / Government could utilize innovative channels of communication and more so automated ones in sending anti littering messages such as phone messages, electronic bill boards, use of TVs in Buses and installing automated reminders in the Buses.

10. Government / KCCA could initiate study tours both within and outside the country of key stake holders of litter management in the transport sector so as to obtain exposure and experience.
11. KCCA/Government could ensure that all the passenger service vehicles (PSV) have sanitary related facilities such as litter bins and passengers reminders before they are given license to operate or renewed.

#### **5.4 Limitations of the study**

The researcher did not assess the levels of Education for the key stake holders involved in the transport sector which could be important in determine its influence in littering. The researcher only used inability of participants to express their views in English as the clue on whether they are educated or not.

Also, the researcher did not search for data related with hiring of man power or companies in connection with the littering practice in the transport sector.

Researcher did not go into details to study the operations of waste recycling, challenges they face and their recommendations. The researcher only looked at the cooperation of recycling industry with the transport companies in managing litter.

#### **5.5 Lessons learnt**

Lessons learnt emerged from the study that; for anti-littering practices to be effective in the transport sector, there could be relevant laws and bye-laws that have to be enforced. It was realized that, the more deep you probe about something the more insights to the participant thus able to make resolutions on their own will “[.....] If it is like that, we are going to buy three buckets for passengers where to put their rubbish” (QCO Respo2.1).



There is need to have national strategy of managing littering in the transport sector as it has no boundaries. It was equally noted that, hierarchy of communication has to be followed so as to have chain of command. The line ministries should give circular to bus companies detailing the litter management criteria in the transport sector.

Similarly, the need to attach price tag for all the litter generated could solve the problem of littering as a whole. I have also learnt that, money factor could affect interventions if stakeholders do not have common interest of solving a given problem. Transport sector has majority of people who are less educated which could have an impact on safety of passengers and environment by managing litter as well as inability to avoid road traffic accidents.

Finally, much as transport industry has a lot of opportunities such as TVs and stickers among others to create awareness about the problems that affect the sector like littering, their utilization is at the minimum.

## **5.6 Suggested areas for further research.**

1. There is need to carry out a study on influence of Education levels of people that earns a living in the transport sector on different options of littering management.
2. There is need for a study on operations of recycling industry in achieving SDGs that are sanitary related and more so in the transport sector.
3. There is a need to understand the contributions of companies that are contracted to transport garbage in KCCA in anti littering practices. Or how the operations of contracted companies

in garbage transport could be extended to litter management in the public transport companies especially along the roads and highways.

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## APPENDICES

### APPENDIX I: INTRODUCTORY LETTER



making a difference

24<sup>th</sup> May, 2016

Dear Sir/Madam

**RE: Introducing Mr. ENOCK KYAKUNZIRE**

This is to introduce Mr. Enock Kyakunzire as a bona fida student of the Faculty of Health Sciences, Uganda Martyrs University. Enock is currently undertaking the award of Master of Public Health – Health Promotion. He is at present undertaking research on:

*Factors Influencing Solid Waste Littering in the Transport Sector: A case Study of Buses that Terminate in Kampala City.*

Any assistance that you can give to Enock will be most appreciated by the faculty and university.

For any further clarification, please do not hesitate to contact me.

Yours faithfully

A handwritten signature in blue ink that reads "Vivienne Laing".

Vivienne Laing  
Programme Co-ordinator MPHHP/Lecturer  
[vlaing@umu.ac.ug](mailto:vlaing@umu.ac.ug)/[vivlaingculross@gmail.com](mailto:vivlaingculross@gmail.com)  
0704078205

## APPENDIX II: RESEARCH APPROVAL LETTER



### DIRECTORATE PUBLIC HEALTH AND ENVIRONMENT

**REF: DPHE/KCCA/201/17**

13<sup>th</sup> July, 2016.

Mr. Kyakunzire Enoch,  
Uganda Martyrs University,  
P. O. Box 5498,  
Kampala.

**RE: PERMISSION TO CONDUCT RESEARCH IN KAMPALA ON  
THE TOPIC “FACTORS INFLUENCING SOLID WASTE  
LITTERING IN TRANSPORT SECTOR: A CASE STUDY OF  
BUSES THAT TERMINATE IN KAMPALA CITY”**

Reference is made to your letter dated 4<sup>th</sup> July, 2016 requesting for permission to conduct research on the above research topic.

This is to inform you that permission has been granted to you to collect data from Kampala Central Division from 13<sup>th</sup> July to 30<sup>th</sup> August, 2016.

The above permission is granted to you on the following conditions:-

1. Participation in your research is voluntary and the informed consent process should be observed at all times.
2. Provision of a report to the office of the Director, Public Health and Environment

P. O. Box 7010 Kampala- Uganda  
Plot 1-3 Apollo Kaggwa Road  
Tel: 0414 231 446 / 0204 660 000  
Web: [www.kcca.go.ug](http://www.kcca.go.ug), Email: [info@kcca.go.ug](mailto:info@kcca.go.ug)  
f: [facebook.com/kccaug](https://www.facebook.com/kccaug), t: @KCCAUG



By copy of this letter the Town Clerk and Division Medical Officer Central Division requested to render you all the necessary support.



Dr. Julius Simon Otim

**FOR: DEPUTY DIRECTOR MEDICAL SERVICES**

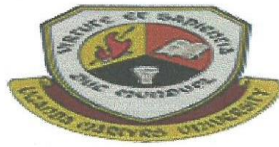
c.c. Director Public Health and Environment

c.c. In-Charge:-

- Town Clerk, Central Division
- Division Medical Officer, Central



## APPENDIX III: REQUEST LETTER



Uganda  
MARTYRS  
University

4<sup>TH</sup> JULY, 2016

THE DIRECTOR PUBLIC HEALTH AND ENVIRONMENT

KAMPALA CITY COUNCIL AUTHORITY

Dear Sir/Madam

**RE: REQUEST FOR AUTHORISATION TO CONDUCT RESEARCH**

In reference to the above subject matter, I forward my request to be allowed to conduct research in KCCA from 5<sup>th</sup> July to August 30<sup>th</sup> 2016. The study is to assess *“Influencing factors on solid waste littering in transport sector: Case study of buses that terminate in Kampala City.”*

The study units will be passengers, bus staff, transport boards, traffic police, KCCA staff overseeing solid waste management, persons or agents involved in waste recycling, sellers of fast foods and drinks in buses and management of bus parks.

The study is entirely for academic purposes and confidentiality will be ensured for all participants and respondents will only be included in this study after their consent has been sought.

Your help will be highly appreciated

Yours faithfully,

A handwritten signature in black ink, appearing to read 'E. Enock'.

**KYAKUNZIRE ENOCK**

Tel. 0772348670/0754595519

Email: ekyakunzire@yahoo.com



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## **APPENDIX IV: INFORMED CONSENT**

I am **Kyakunzire Enock** a student at Uganda Martyrs University undertaking a course of Master of Public Health –Health Promotion. I hereby humbly invite you to participate in the study on **“Factors influencing solid waste littering in the transport sector: Case study of Buses that terminate in Kampala City”**.

The information you shall give will be treated with utmost confidentiality and shall be used only for the purpose of this study. Your identity shall not be disclosed to any other person.

Participation in this study is voluntary and you are free to withdraw from it if the situation demands so. You have liberty to ask any question in relation to this study.

The findings will be used to generate information which can be used by policy makers in designing policies geared to litter management in the transport sector as a whole.

**APPENDIX V: RESPONDENT’S DECLARATION**

I have read the above information and the purpose of the study as adequately explained to me. I am also informed that participation is voluntary and that I am free to withdraw from the study if I wish so without affecting me and my relationship with the researcher in any way whatsoever. I had the opportunity to ask questions and answers were given accordingly and appropriately to my satisfaction.

Having read, heard and understood my participation requirements, I therefore voluntarily accept to participate in the study.

Signature .....

**Respondent**

Signature .....

**Researcher**

## **APENDIX VI: INTERVIEWER GUIDE**

1. How is litter like used bottles, plastics and others materials managed in the Buses, Bus parks, Bus stopovers and along roads?
2. Why do you think litter in buses, bus parks and stopovers is managed in that manner?
3. How is economic survival and social back ground linked to littering in buses, bus parks and stopovers?
4. What could be the dangers of poor management of such litter from passengers of buses?
5. (a) Which people should have the responsibility of ensuring our buses, bus parks, bus stopovers and along the roads are free from litter?  
(b) Why do you think the named categories are critical in preventing solid waste littering?  
(c) How should the named people or institution cooperate in preventing littering in buses, stopovers and bus parks?
6. Recycling of plastics and other waste products is a strategy of reducing solid waste littering and also offers economic gains. How should people involved in recycling cooperate with transport companies to prevent the littering in bus parks and along the road?
7. How else should littering in buses and bus parks be prevented?
8. Based on your experience, which anti-litter practices are most successful at reducing roadside and Bus Park littering?
9. In your opinion, what are the key elements of a successful roadside anti-littering program?

**Thank you for your time**

## **APPENDIX VII: FOCUS GROUP DISCUSSION GUIDE**

I am **Kyakunzire Enock** a student at Uganda Martyrs University undertaking a course of Master of Public Health –Health Promotion. I hereby humbly invite you to participate in the study on **“Factors influencing solid waste littering in the transport sector: Case study of Buses that terminate in Kampala City”**. The findings will be used to generate information which can be used by policy makers in designing policies geared to litter management in the transport sector as a whole.

The information you shall give will be treated with utmost confidentiality and shall be used only for the purpose of this study. Your identity shall not be disclosed to any other person.

Participation in this study is voluntary and you are free to withdraw from it if situation demands.

You have liberty to ask any question in relation to this study.

**Question 1:** In your experience, tell us how solid waste is littered in public transport especially in:-

- a) Buses,
- b) Bus parks,
- c) Bus stopovers and along roads?

**Question 2:** How is littering in buses, bus parks, bus stopovers and along roads a problem?

**Question 3:** What should be done to end the problem of littering in public transport?

Thank you for your responses and participation

**APPENDIX VIII: OBSERVATION GUIDE.**

**AT BUS PARKS: Name/ No.....**

1. Presence of litter transfer stations (Skip or waste bank) nearby (a) Yes..... (b) NO.....
2. Presence of litter bins (a) Yes..... (b) No.....
3. Presence of reminders on litter disposal (a) Yes..... (b) No.....
4. Presence of translated reminders on litter disposal (a) Yes..... (b) No.....
5. Presence of enforcement officers on litter management in Bus parks (a) Yes..... (b) No.....

**WITHIN BUS: NAME/NO.....**

1. Presence of litter bins (a) Yes..... (b) No.....
2. Presence of reminders on litter disposal (a) Yes..... (b) No.....
3. Presence of translated reminders on litter disposal (a) Yes..... (b) No.....
4. Does the bus staff educate people on how to handle wastes? (a) Yes..... (b) No.....
5. How litter is disposed by bus occupants?
  - (a) Thrown out side.....
  - (b) Dropped on floor of bus .....
  - (c) Put in litter bins.....
  - (d) Kept by passenger in his or her bag.....
  - (e) Dropped in outside litter bins.....

**APPENDIX IX: WORK PLAN**

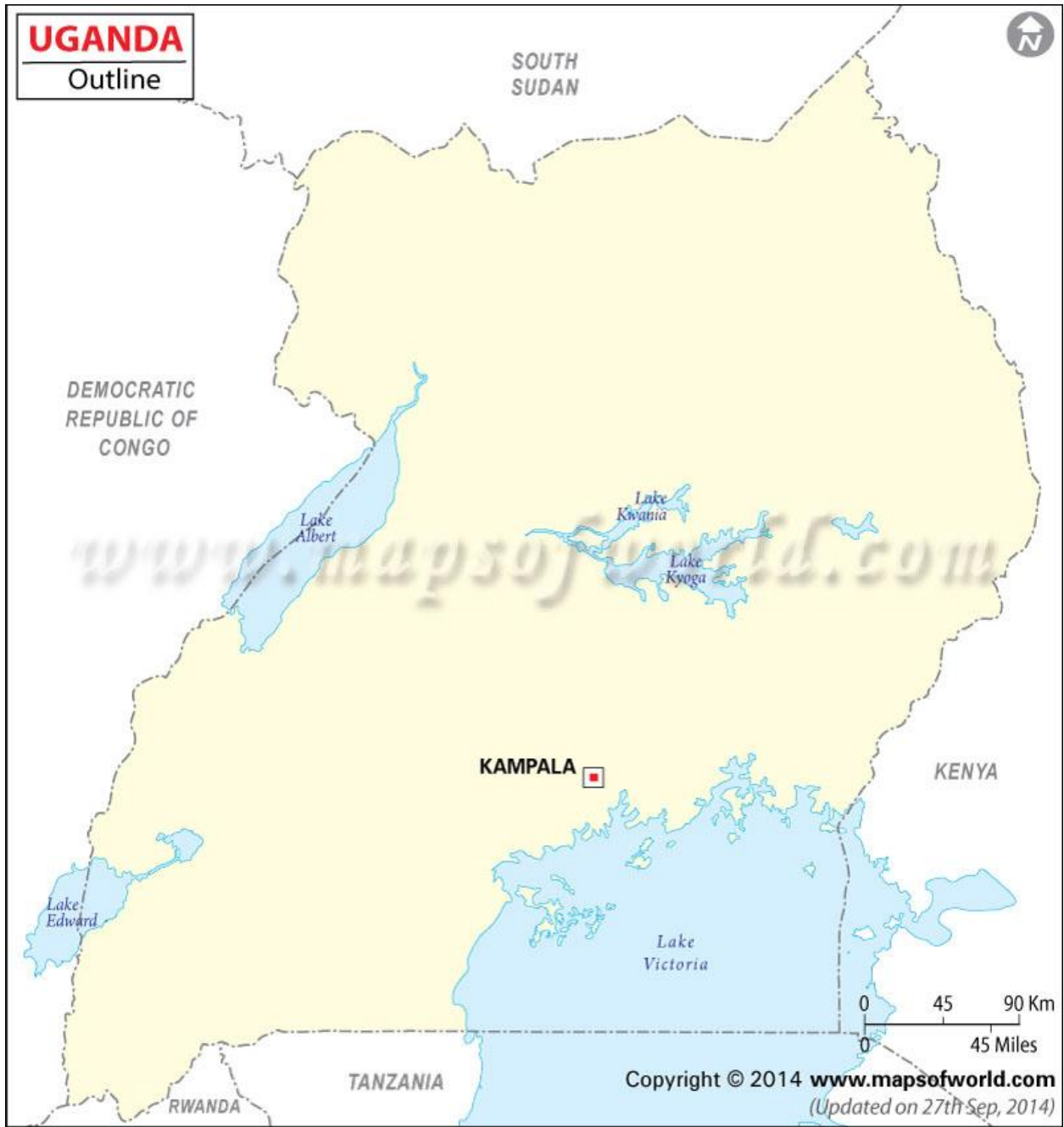
S/N	ACTIVITY	TIME FRAMES IN MONTHS (2015/2016)					
		Aug-Dec	Jan-May	Jun-July	Aug	Sept	October
1	Formulation and approval of the topic						
2	Proposal development and approval						
3	Pretesting of data collection tool and review of tool						
4	Data collection sessions						
5	Data analysis						
6	Report writing						
7	Submission of draft						
8	Submission of final report for marking						
9	Preparation for Grad.						

## APPEDENX X: BUDGET

S/N	Activity	Item	Frequency	Unit cost - UGX	Total cost - UGX
1	Formulation and approval of the topic	Airtime for modem	1	50,000/=	50,000/=
2	Proposal development and approval	Airtime for modem	5	50,000/=	250,000/=
		Printing & Photocopying	3 drafts	50,000/=	150,000/=
3	Pretesting of data collection tool and review of tool	Printing & Photocopying	20	1,000/=	20,000/=
		Transport & Lunch	2	100,000/=	200,000/=
4	Data collection sessions	Buy recorder	1	300,000/=	300,000/=
		Printing & Photocopying	20	1,000/=	20,000/=
		Transport and Lunch	5	100,000/=	500,000/=
		Welfare at Campus	10	20,000/=	200,000/=
		Other expenses	Lump sum		300,000/=
5	Data analysis	Lump sum			300,000/=
6	Report writing	Lump sum			300,000/=
7	Submission of draft	Printing & binding	2 copies	100,000/=	200,000/=
8	Submission of final report for marking	Printing & binding	4 copies	100,000/=	400,000/=
9	Preparation for Grad.	Clearing, Transport and Refreshments	Lumpsum		2,000,000/=
<b>10</b>	<b>Total</b>				<b>5,190,000/=</b>

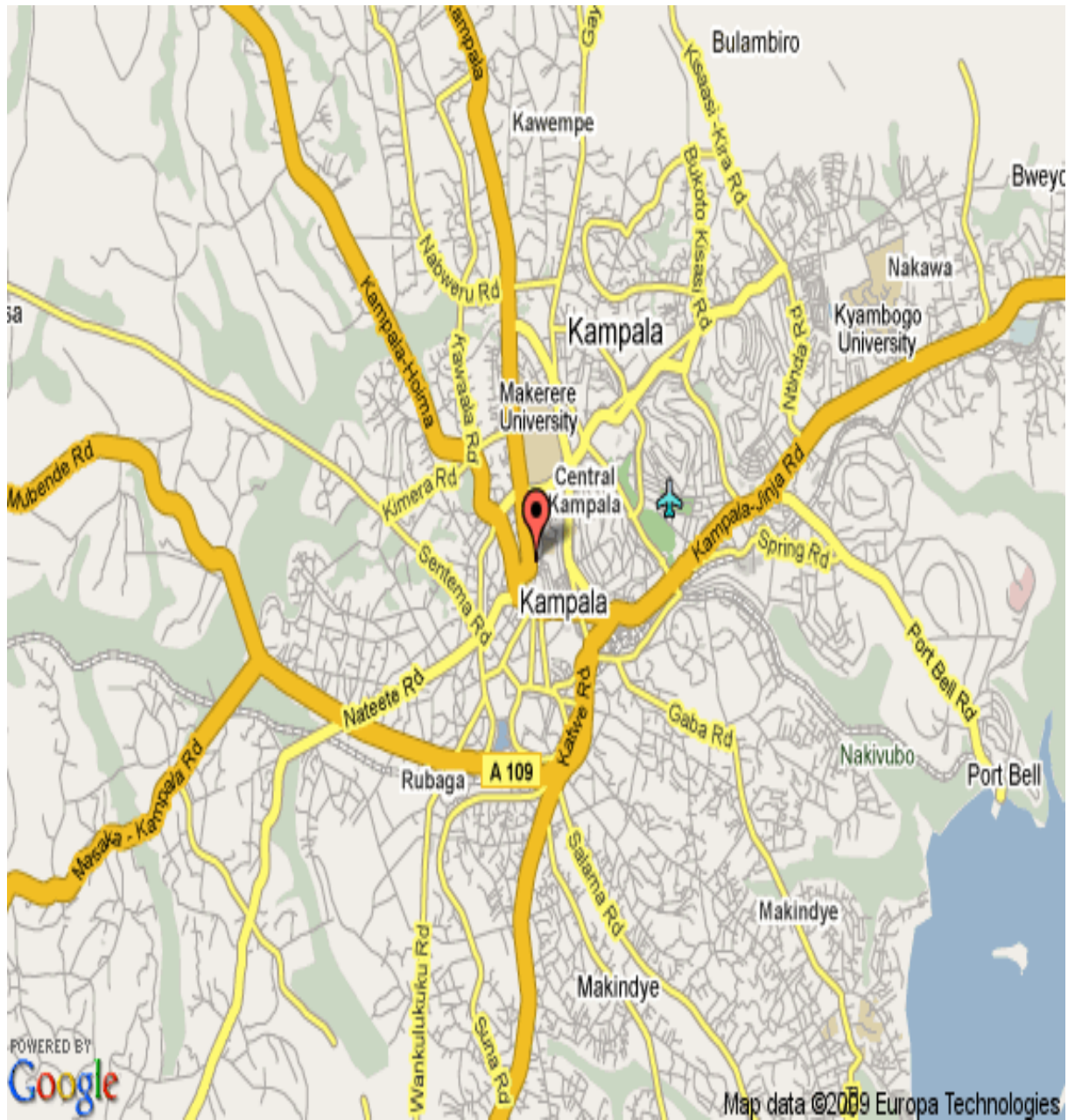


**APPENDIX XI: MAP OF UGANDA SHOWING LOCATION OF KAMPALA**



Source: Google Maps

## APPENDIX XII: MAP SHOWING KAMPALA CITY ROADS



Source: Google Maps