FACTORS INFLUENCING SOLID WASTE MANAGEMENT IN URBAN CENTRES: (A CASE STUDY OF EMBAKASI NORTH SUB COUNTY)

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A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF MANAGEMENT AND LEADERSHIP IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF BACHELOR OF ARTS IN DEVELOPMENT STUDIES OF THE MANAGEMENT UNIVERSITY OF AFRICA

OCTOBER, 2017
DECLARATION

This research project is my original work and has not been presented for a degree in any other University.

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This research project has been submitted for examination with my approval as University Supervisor

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DEDICATION

This research project is reserved and dedicated to my lovely baby girl, Faith, my loving mother and family members who have supported me morally and in kind throughout my years of study
ACKNOWLEDGEMENT

Am very grateful to my heavenly Father for the gift of life, the knowledge, wisdom, understanding and affording me the time for this study from the beginning to the end. His protection and love has enabled me carry out my studies successfully.

I appreciate my mother for her financial and non-financial support in the course of this research work. I am very grateful and I recognize the great assistance and guidance from my research supervisor Dr. Diana for dedicating her time and commitments to enable me develop a splendid piece of research work. I also thank the management of Nairobi City County environmental department for their esteemed cooperation. My heartfelt gratitude goes to the area Chief and the Dandora police station for security assurance throughout the period of my research project. I would lastly like to acknowledge Management University of Africa and to be precise the school of Leadership and Management for granting me with a conducive learning environment necessary for effective career achievement.
ABSTRACT

This study explores the factors influencing solid waste management in urban Centers. The case of Embakasi North Sub-County, in Nairobi City County. The study aims to determine the influence of public training and capacity building on solid waste management practices in Embakasi North sub-County. To identify the influence of public and private sectors in solid waste management in Embakasi North sub-County, to assess the influence of institutional structures on solid waste management costs in Embakasi North sub-County, and to identify the influence of the enforcement of county by-laws on solid waste management and environmental preservation in Embakasi North sub-County. Purposive sampling and stratified random sampling techniques was used in the case. The target populations for data collection were the sub-County environmental management staff. This data was then analyzed descriptively and presented in tables and figures. The study findings were that the county should engage the services of private sectors for consistency in waste collection, should engage the public through trainings on waste management, should ensure that all county by-laws related to solid waste management are followed to the latter. The study further recommends that the county should improve on waste collection and disposal and that the county by-laws should be modernized in line with the waste management regulations, 2006.
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ABBREVIATIONS/ACRONYMS

UNEP: United Nations Environmental Program

JICA: Japan International Cooperation Agency

KENSUP: Kenya Slum Upgrading Programme

SOEs: State-Owned Enterprises

RO: Reflective Observation

MSW: Municipal Solid Waste

PPP: Public Private Partnerships

NEMA: National Environmental Management Authority
OPERATIONAL DEFINITION OF TERMS

**Institutional Structures:** Mechanisms that govern social order or behaviors of a set of employees within a firm/company or an organization.

**Public Private Participation:** It refers to the active participation of all stakeholders in a project right from the need analysis till successful realization of the project benefits.

**Public Training:** Provision of skills, technical knowhow, expertise to employees in an organization through learning or to enable them to institute their operations and mandated roles effectively and efficiently.

**Solid Waste:** It is any garbage, refuse, sludge or hazardous materials supplied or produced in liquid, solid or semi liquid state and is detrimental to the environment.
CHAPTER ONE
INTRODUCTION

1.0 Introduction

Waste management should provide an all-inclusive measure to addressing all the activities involved and required to managing waste. These activities include collection, transportation and disposal and other regulatory frameworks which relates to waste management during collection and disposal and even recycling if need be. This chapter explains the main problems to waste management, the global and local context to the same and the target populations used for the study.

1.1 Background of the Study

Solid wastes are abandoned and accumulated materials like trash, junk and or refuse of human activities and that are unwanted. Globalization is said to affect people’s consumption, use of solid materials that result into huge solid wastes. Solid wastes increase with the developmental rate of a country; though African countries are said to be the least developed as compared with others worldwide. One of the major problems in urban centers is collection, transportation and disposal of waste. According to UNEP, the county’s population produces over 3.2 tons of waste, with Embakasi North Sub-County producing over 850 tones and the rest is unaccounted for, most of which is dumped at Dandora, Kariobangi, Mathare and Korogocho within Embakasi North sub county.

The Japanese government had tried to use the scientific methods of waste management through the Japan International Corporation Agency in 2012, which was
to be extended to Dandora dumping site. This did not bore any fruits though it was the first phase.

The accumulation of wastes in the informal settlement results from lack of an alternative dumping site. Garbage collectors’ cartels who are unregistered, and who collects estates garbage have no alternative site to take the refuse. Huge trucks, handcarts cue at the entrance of the only dumpsite in Nairobi’s Eastland’s Dandora trying to offload what has been collected from the informal residents. This solid waste not only emanates from the surrounding estates, but this is a common garbage site for the entire city.

According to Mazzanti and Zoboli (2008), the generation of waste is linked to population growth, economic prosperity and urbanization. Waste generation is positively correlated to economic growth and development. This implies that as nations grow economically, the more they generate waste. Both developed and developing countries are in pursuit of economic growth. This is because; it is through economic growth that socio-economic welfare of citizenry can be enhanced. Consequently, the generation of waste is unavoidable to all economies. However, waste can have adverse effects on both social and economic welfare if not adequately managed (Wilson et al 2006). Waste management thus plays a critical role in social and economic welfare.

Other challenges of waste management include:

(a) lack of proper governing structures to manage waste
(b) the lack of proper mechanisms for partnerships in public and private sectors
(c) lack of adequate resources to manage solid waste
(d) the lack of proper legislation
1.1.1 Profile of Embakasi North Sub-County

Embakasi North sub county is one among 17 other sub counties in Nairobi City County. The City County is one of the 47 counties, the smallest but with the largest population. It’s the capital city and the largest city of Kenya with a population of 3.375 million according to the 2009 population census. Nairobi ‘s population growth has increased rapidly due to rural urban migration in search of greener pastures and other economic reasons. This leads to huge generation of wastes as the population within the city continues to grow.

Embakasi North sub-county is located in the Eastern side of the city with approximately a population of 181,388. The sub-county is further subdivided into 5 wards, Kariobangi North with a population of 39,342, Dandora phases one with 28239, phase 2 with 28238, phases 3 and 4 with 42784 and 42785 respectively.

There is only one owned and operated official dumpsite in Nairobi which is Dandora located in a densely populated area which is controlled by scavengers who age 27 years and above who collect plastics and sell them to the middle traders who later sell to the industries. This forces the private agencies to bribe the scavengers to access the dumpsite Gatheru (2008). Proper solid waste disposal has become one of the most pressing issues in the urban areas and it is with this regard that this study will evaluate the mandate charged to KENSUP, county council, recognize their achievements, identify the bottlenecks and propose strategies towards sustainable solid waste management. Therefore, this will be of great concern to the researcher to conduct a research in this county of interest.
1.2 Statement of the Problem

According to the Global Waste Management Outlook (GWMO), 2010, the total estimated solid waste is around 2 billion tones which comprises of county wastes in which the county governments are responsible for handling. Half of the wastes is generated from high income developed countries like Europe, Canada, Asia etc. The challenges that both developed and developing nations are facing in disposal of waste as a waste management practice (Gakungu, et al. 2012). This suggests that solid waste management is a problem which needs to be addressed due to the fact that the population within urban areas in Kenya is increasing tremendously.

The results of growing populations in Africa, rural-urban migrations have also resulted to the huge generation of these wastes as the African economies grow. Due to globalization and a shift on production, poisonous industrial wastes continue to be generated in the developed and developing countries.

With the devolved government in Kenya, part of the responsibility and functions of the county authorities lies in waste management, from collection to disposal mechanisms.

According to UNEP, 2010, Nairobi City County produces about 1900 to 2400 metric tons with the population of over 3.2 million which is increasing tremendously. The main challenges in the county includes and not limited to inadequate financing, lack of awareness among the county dwellers and lack of enough regulatory policies in handling and managing wastes.

The County is not able to manage their wastes in the appropriate manner due to financial constraints, lack of cooperation between the county governments and the community disposing these wastes anyhow and the upcoming of garbage collector cartels who also pose a threat to the people.
The tremendous growth of Nairobi County like any other developing city has seen in itself growth of slums. It is imperative to note that solid waste is collected and dumped in open sites for instance in the Dandora dump site located within Embakasi East Sub-county exposing the slum dwellers to health risks. Burning of plastics in the open is eminent which produces toxic fumes such as furans, dioxins which are very harmful to human health causing upper respiratory problems, are sources of major greenhouse gases contributing to global climatic change. Scavengers are estimated to collect 20 tons of the approximately 800-1000 tons generated daily in Nairobi. Poor enforcement of legislative policies impedes effective management of solid waste, a budgetary deficiency to finance, effective awareness and sensitization campaigns, collection and treatment of solid waste at the source impedes implementation of solid waste management projects. Other bottlenecks are corruption and embezzlement of funds allocated for solid waste management projects by the responsible management within the County.

The impacts of poor solid waste management cannot be overstated, solid waste accumulating in heaps creates potential breeding grounds for disease causing micro-organisms exposing the slum dwellers to diseases, clogging of drains, industrial effluents deposited in rivers affects aquatic life, human waste which drains into the rivers especially during rainy seasons causing waterborne diseases to the slum dwellers for instance; cholera, typhoid and severe diarrhea

1.3 Objective of the Study

Main Objective

The overall aim of this study is to investigate the factors influencing solid waste management in urban Centres.
1.3.1 Specific objectives

i. To examine the influence of public and private partnerships on waste management in Embakasi North Sub-county

ii. To determine the influence of public training and capacity building on waste management practices in Embakasi North Sub-county

iii. To assess the influence of institutional structures on waste management costs in Embakasi Embakasi North Sub-county

iv. To identify the influence of the enforcement of county by-laws on waste management and environmental preservation in Embakasi North Sub-county

1.4 Research Questions

i) What is the influence of public and private partnerships on waste management practices in Embakasi North Sub-county?

ii) What is the influence of public training on waste management practices in Embakasi North Sub-county?

iii) What is the influence of institutional structures on waste management costs in Embakasi North Sub-county?

iv) What is the influence of the enforcement of county by-laws on waste management and environmental preservation in Embakasi North Sub-county?

1.5 Significance of the Study

The study will be of importance to the environmental directorate of the Nairobi City County and the National Environment Management Authority as it highlights the challenges the County experiences in its quest to management waste and especially
the Embakasi North sub-county where the major dumping site is located. This study seeks to fill this gap and could furthermore be used as a foundation for future research and as a source of secondary literature. This study also recommends measures to be implemented in overcoming these challenges which will make the environmental department of the city county effective and gain more trust from the county residents. This study will also benefit the residents of the Embakasi North Sub-county and especially residents of the Dandora phases one, two and three.

1.6 Scope of Study

This study focused on waste management in Embakasi North sub-County targeting the Embakasi North Sub County Environment management staff in the month of October.

1.7 Chapter Summary

According to UNEP, 2010, Nairobi City County produces about 1900 to 2400 metric tons with the population of over 3.2 million which is increasing tremendously. The main challenges in the county includes and not limited to inadequate financing, lack of awareness among the county dwellers and lack of enough regulatory policies in handling and managing wastes.

This study seeks to fill this gap and could furthermore be used as a foundation for future research and will be significance to the Nairobi City County environmental department and the National Environment Management Authority as they try to fix the quest in managing county wastes. The study focuses on waste management in Embakasi North sub-County targeting residents of Dandora phases one, two, three and the Nairobi County Environment management staff as the target population.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

The literature review provides the reader an explanation of theoretic rationale of the problem being studied as well as what research has been done and how the findings relate to the problem at hand. The main purpose of the literature review is to avoid unnecessary or intentional duplication or materials already covered. The literature will be reviewed from working papers, journals, reports, periodicals and internets, the past studies; theoretical review, critical analysis and research gaps will be discussed.

2.1 Theoretical Literature Review

2.2.1 Behavioral Finance Theory

Jung (2003) asserts that behavioral finance theory is focused on relevance to service providers of investment management. Service providers learning from behavioral finance ought to learn to make out their own mistakes and those of others, comprehend those mistakes, and take mitigation strategies where necessary and applicable.

In the County government in question, if service providers lack effective behavioral mannerisms in their service provisions then solid waste management lacks effective managerial control hence poor services in the City County government in question.
2.2.2 Institutional Theory

Public policy is indomitable by government institutions, enforcement bodies which provide services and provide policy legitimacy (Bantel, 2001). The policy enforcer applies guidelines to all people of society and monopolizes the strength of the applying policy; for instance, the legislature, executive and judicial branches of government are examples of institutions that enact, amend and enforce policies both that govern assets and provision of services. Anderson (2002) considers policy as an institutional yield. Government institutions have long been an epicenter focus on service provision. The author further asserts that the policy is commandingly determined, put into effective use and enforced by the governing institutions.

Walker (2004) asserts that the affiliation between policies and government institution is shut because a public policy cannot become a communal policy until it is opted, put into effect and enforced by government institutions. Boyne (2004) asserts that public institutions give public policy legitimacy, legal duty that authorizes loyalty of the people through universality that is only government policies enlarge to all people in the society and has the legitimate liberty to imprison violators of public policy. The ideology of maximum social gains implies no policy should be embraced if its costs surpass its payback and among policy alternatives, policy makers should choose the policy that yields the greatest benefits over costs. So a policy is cogent when it serves the intended purpose. Therefore, in this regard the government as the constitutional mandate to enforce the polluter pays principle (PPP) to the violators of this guideline in solid waste management.
2.2.3 Kolb’s Experiential Learning Theory

The attention and focus is on the learning process for the individual so as to produce effective service providers. Further, Edmondson (2006) asserts that this study is coined on the ideology of a cyclical learning theory. The first stage is the concrete learning involving field experience e, while the second one involves observation. The third one involves mindful thinking while the last one focuses on ideas and experiments.

Garbage collectors and service providers who lack the experience or fail to actively implement their learning, technical knowhow and expertise in solid waste service provision will definitely provide compromised services if not substandard.

2.2.4 Solid Waste Management

Solid waste in Kenyan slum has become a matter of concern to many. Solid waste broadly comprises of hazardous and nonhazardous domestic, commercial, industrial, construction and demolition waste, street sweepings among other solid waste (Bryson, 2000).

A report prepared by Osborn (2001) outlined major categories of solid waste generations as residential wastes which includes household wastes which is not limited to food waste, fruit and potato peels, rubbish and ashes, industrial waste which has two components as hazardous, flammable, corrosive and irritant wastes which poses health and environmental dangers.

The county council has been charged with the mandate to ensure effective solid waste collection, treatment and disposal, however it has become increasingly difficult to manage solid waste leading to; Improper incineration and open burning of plastics
which produces toxic gases such as furans, dioxins which pose threat to upper respiratory diseases to the slum dwellers and pollution of urban air, water and sewer blockages.

According to Muniafu (2010), managing waste is a sore responsibility of the County Government due to the rapid population. He further argues that private companies have engaged in solid waste collection but has often concentrated on the affluent areas who are capable of paying for the services. However, it is costly to dispose solid waste irresponsibly as it leads to generation of heaps of garbage detrimental to both human and the environment.

Solid garbage in Kenyan slums has become a matter of concern to many as it comprises of hazardous and nonhazardous domestic, commercial, industrial, construction and demolition waste, street sweepings among other solid waste (Walker, 2003).

A report prepared by Gould-Williams (2002) outlined major categories of solid waste generations as residential wastes which includes household wastes which is not limited to food waste, fruit and potato peels, rubbish and ashes, industrial waste which has two components as hazardous, flammable, corrosive and irritant wastes which poses danger to people’s health and the environment.

The county council has been charged with the mandate to ensure effective solid waste collection, treatment and disposal, however it has become increasingly difficult to manage solid waste leading to; Improper incineration and open burning of plastics which produces toxic gases such as furans, dioxins which pose threat to upper respiratory diseases to the slum dwellers and pollution of urban air while stagnant
water as a result of the blockages acts as potential breeding grounds for mosquitoes and other disease causing microorganisms.

Mooney (2005) argues that private companies have engaged in solid waste collection but has often concentrated on the affluent areas who are capable of paying for the services. However, it is costly to dispose solid waste irresponsibly as it leads to generation of heaps of garbage detrimental to human health and the environment.

2.2 Empirical Literature Review

2.2.1 Public Training

Inadequate staff leads to poor quality waste management. To ensure effective and quality project implementation, it is critical to set aside adequate human resources at the planning stage to institute proper public training. The required staff for project implementation should be considered within the overall costs of delivering the agreed results and not as additional costs. For project execution to be effective there is need for human, material, and financial resources. Solid waste management in most projects is not working because of poor or insufficient training especially in the poor and developing countries. Sufficient allocation of staff is vital for developing effective execution of the project in a community set-up (Lippiti, 2007).

For the effective implementation of a solid waste project, there is need for skilled personnel who can fulfill the solid waste management services. These tasks mainly include designing the general outline of implementation system, setting up and operating supportive computerized system, facilitating learning in reflective events and managing communication of the monitoring and evaluation findings. There is poor use of participatory and qualitative implementation methods due to limited
capacity and little recognition of the need for such methods. Effective public training facilitates enhancement of accurate documentation and record keeping with regard to solid waste management thereby addressing the management problem at hand. Project staffs with insufficient relevant skills and experiences make little effort to fill the gap created by the underlying problems in a community set-up (Kotler, 2006).

Kenneth (2006) points out that the key principles to keep in mind when setting project implementation priorities are paying close attention to human resources.

There is dire need of effectively skilled project implementation staff who are able to draw on technical assistance, when and where needed. Mostly understaffing causes poor projects implementations especially in big programs where much work is required.

Public training is important if project implementation structures are to be supported. Where the staff ability to handle project implementation is questionable, then there should be room for outsourcing quality skilled staff to execute the same mandates. This means that there is need to get qualified and skilled staff from the start who poses different skills from statistical, data managers and project implementers

Public training is one of the critical components required in a solid waste project implementation system. In the context of project implementation, there are several terms that are used for human training such as monitoring and evaluation training, education and human resource development for monitoring and evaluation.

Where qualified staff with different capabilities at all levels of the project execution are involved, quality completion of tasks is assured. Staffing is a special concern for project execution work because it demands special training and a combination of
research and project management. Also, the effectiveness of monitoring and evaluation work often relies on assistance from staff and volunteers who work closely with the monitoring and evaluation experts. Public training is of paramount importance to an effective solid waste management, the staff needs to be trained on the basics of waste management. Not only is it necessary to have dedicated and adequate numbers of project implementation staff, it is essential for this staff to have the appropriate skills for the work. Effective assigning of roles, responsibilities in project implementation should be guided by the ability, capacity of the individual employee to timely deliver all the project objectives. Therefore, there should be clear allocation of duties to ensure that there is qualified staff set aside to conduct and control the implementation of the project is fit for hence achievement of quality project results. This will make them to be committed leading them to work towards achieving the set priorities and project goals (Saleemi, 2010).

In order to implement and evaluate solid waste management, is important to understand theories of change since they reveal how project designers and implementer’s envisioned activities contributing to the expected results(Taylor,2002)

### 2.2.2 Public and Private Partnerships

JICA (2010) proposed that collection and transportation of solid waste and the entire management can only improve with the involvement of private sectors because of their way of working, the transparency in financial management and all what it takes to managing wastes.

Many nations fail to provide basics in terms of services where waste management is concerned. Although its seemed a responsibility of the county governments to collect and manage wastes, they also are faced with a myriad of challenges ranging from
financial and mismanagement and lack of adequate planning. This is where partnerships come in hand to promote the expansion of quality and quantity services which are beyond the private and pure public arrangements.

According to UNESCAP, public and private partnership alone are not solutions to offer holistic service delivery to certain problems, but it’s a feasible way of project implementation mechanism for a desired solution option (UNESCAP, 2011).

According to the World Bank survey, private and public partnerships are long or medium term arrangements between the public and private sectors, where public sectors transfers parts of their responsibilities to the private ones (World Bank, 2011). It's normally noted that a private owned institution will perform better than a public one. The services offered by the privately owned institutions perform better than those publicly owned and especially where the privately owned institution are on a performance contract. The public private partnerships mean that a public office has either contracted a private sector to perform a public office duty or has transferred the mandate to perform on behalf of the public sector. There is improved performance as the private sector performs duties on behalf of the public sector as they use their improved and innovative ways of operating, private sectors are way much cost effective and productive, most privately owned sectors work along with qualified personnel’s who are able to manage wastes, through their qualified and highly dedicated staff leading to a well improved and protected environment. Most privately owned sectors are able to access capital to improve infrastructure and thus their capability in managing solid wastes.
As solid waste remains the mandate of the county council, the issue of public cleanliness is everybody’s business. Where a number of factors has to be considered in waste management, the issue of private sector’s participation cannot be left aside due to its efficiency, accountability and holistic management issues.

Public private partnerships should be used as tools for active and continuous services delivery to the public. This is because of the over increased amount of solid wastes which is generated on daily basis and which needs to be managed. It’s at this point that the private sectors are much involved as they have what it takes to manage wastes even with increased populations.

Contractual arrangements can be done in engaging privately owned sectors. These contracts can range from leases, service contracts and management contracts, operations and maintenance. These various levels of partnerships are done in order to improve the efficiency and effectiveness of service delivery to the public. Collaborations with these sectors can be long term or short term depending with the nature of the work at hand. Several other actors are involved in managing wastes. They range from public, private, commercial, citizens and informal sectors and even other donor agencies. Citizens participation is in the support they offer to the private sectors through their monitory constitutions and allowing them collect their wastes.

2.2.3 Institutional structures

Hackman (2005) indicates that individuals with effective institutional skills are considered to be good leaders and therefore, through their leadership, organizations are steered to prosperity. However, not all institutional leaders are good managers. In the quest to establish effect of management skills on success of community based projects, which also included and not limited to solid waste management as it all
involves the public, leadership should start form the management of funds allocated for the purposes of wastes collection to disposal.

Institutional managers have to influence all that they interact with so that projects success can be achieved; therefore, there is dire need to not only possess good management skills, but leadership as well. The issue of integrity, application of leadership skills will also ensure that the persons you are leading are able to accomplish all the tasks assigned to them successfully.

Hambrick (2005) claims that institutional management of projects must be aligned in a manner that all the stakeholders are involved. Priorities should be given to the direct beneficiaries who are mostly the community, if projects have to be sustainable. Where institutions require efficiency, then the resources mandated to run such community or public projects must be manned and used appropriately so that the integrity of the institutions can attract more other resources.

There is dire need to distribute the responsibilities of each institution and available structures in managing solid wastes. The society expects that the set public institutions will have goals and priorities regarding the protection of the environment and all services will be done equally by all. Governance approaches to waste management and planning entails the development and the implementation of actions plans and policies or by laws with the participation of the community and other key actors and institutions from all sectors (Yousif and Scott, 2007)

Institutions mandated to allocate budgets for counties must ensure that the financial aspect of waste management in looked well into. The should be concerns for solid
waste programs especially in low income areas where majority of the populations reside and which must be allocated the highest amounts in the budgets.

2.2.4 Enforcement of County By-Laws

Kenya has made steps in enforcing county by laws but there still is a lot to be done in harmonizing and coordinating the county by laws and waste management laws (Kazungu, 2010).

Challenges of solid waste management is caused by lack of enforcement of the relevant laws in place (Al-Khatib et al., 2010).

This issue contributes to mismanagement of waste in most developing countries, and this can also be clearly seen in our country Kenya. The local authorities who are mandated to enforce the laws related to the solid waste lack enough capacity to implement eve the already existing bylaws (Henry et al., 2006).

The City Council enacted the Nairobi solid waste management by-laws in 2007 which was to necessitate and desire good maintain ace of solid wastes for better health, safety and wellbeing of the Nairobi city dwellers. The By-Laws 8(1) was to arrange for collection, treatment and disposal of all domestic wastes and streets and other litter that is generated by city dwellers. Dumping anyhow is also prohibited under that sale laws but there is a provision regarding the dumping sites. There are also regulations 4(1) of the environmental management and coordination of wastes which prohibits illegal disposal of wastes especially in public recreational areas which also includes along the roads. Despite all these frameworks the public continues to illegally dump wastes in all places making the county surroundings filthy and messy.
Lacking clear lines of responsibilities among actors in waste management leads to the many problems citizens experience in managing wastes. Sometimes there are no communications among private and public stakeholders and other resources users. This makes the public not to be aware of the many operations that involves them in line with waste management which they can follow and comply with.

2.3 Summary and Research Gaps

Lippiti (2007) asserts that inadequate staff leads to poor quality waste management. To ensure effective and quality project implementation, it is critical to set aside adequate human resources at the planning stage to institute proper public training. The required staff for project implementation should be considered within the overall costs of delivering the agreed results and not as additional costs. However, the author did not document how public training affect solid waste management in urban centers creating a research gap that this study is focused to fill.

Palmer (2009) claims that public management focuses on the management of public services which are mostly carried out by the private sector and which in exchange brings about managerial changes. Partnerships are mostly considered very important especially in achieving sustainable waste management, from the collection to financial burdens (World Bank, 2000)

Cannella (2009) points out that the similarity between managers and projects doesn’t only concern skills but also other characteristics in managing institutions and projects. The author did not extenuate how institutional structures influence solid waste management in urban centers creating a gap that this study is focused to fill.
Governance on the other hand has structures and machineries to ensure that policies are shared amongst stakeholders who direly need them. These policies involve a combination of government roles and those of the public and other stakeholders (Saleemi, 2010). However, the author failed to link how enforcement of county by-laws influence solid waste management in urban centres creating a research gap that this study is focused to fill.

2.4 Conceptual Framework

Figure 2.1

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Training</td>
<td>Solid Waste Management in Urban Centers</td>
</tr>
<tr>
<td>Public and Private Partnerships</td>
<td></td>
</tr>
<tr>
<td>Institutional Structures</td>
<td></td>
</tr>
<tr>
<td>Enforcement of County By-Laws</td>
<td></td>
</tr>
</tbody>
</table>

2.5 Operational Definitions of Variables

2.5.1 Public Training

Public training is an imperative pillar in the success of solid waste projects; implying that even implementation of such solid waste projects is coined under a strong
foundation of effective training from the need assessment which should be done keenly due to the development of the home grown solutions to the most pressing need in the targeted community members hence success of solid waste management. On the other hand, when employees are ill-trained, semi-skilled lacks competent skills and knowledge on how to implement and institutionalize effective solid waste management further making the issue cumbersome. From the Abraham Maslow need hierarchy theory, the theory depicts that human beings must first satisfy the basic needs/physiological needs which include water, food, and clean environment; its until human beings satisfy basic needs that they have the urge to go for higher needs.

2.5.2 Public and Private Partnerships

A public and private partnership is an important aspect in waste management as it gives chances to different stakeholder’s to make holistic decisions on ways to put together waste management decisions and bring on board different approaches to managing the waste. However, should the responsible institutions such as the City County government officials implement the policies on solid waste management devoid of active participation, then the stakeholders disrespect, dishonor the management effort subjecting these efforts to failure.

2.5.3 Institutional Structures

Institutional theory is a theory on the deeper and more flexible aspects of social structure. The stipulation considers organization structures, including beliefs; rules, norms, and attitudes, become established as authoritative guidelines for social behavior. Institutional theory inter that the institutional environment may musccularly influence the development of formal structures in an organization and how it performs its functions. Innovative institutional structures that improve operational efficiency in
early-adopting institutions are legitimized in the environment and promote effective performance in their undertakings.

2.5.4 Enforcement of County by Laws

Organization policies are rules and guidelines set by the ones in power and authority. They are formulated to bring about efficiency, consistency and order in the way operations are conducted. County governments are expected to follow and enforce various rules, guidelines and regulations in solid waste management in affiliation where such policies entail environmental management and environmental Act, while delivering solid management services to the public. In fact, there has been establishment of many rules and regulation made by the central government, such policy Acts need to be adhered to. Some of the policies have at times made it hard to people and organizations to use their creativity to perform their roles. Effective compliance to the stipulated solid waste policies enhances effective management and the converse holds true.

2.6 Chapter Summary

The chapter covers the theoretical literature, the review of other literature, conceptual framework and the operational definitions of variables and a summary of the research gaps.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction

This discussed the designs and methodologies used in the research. Certain procedures were adopted during the collection and analyses of data. The chapter also detailed research instruments which were used, the sampling design and data collection procedures. This chapter also described the research design, target population, sampling methods and the steps taken for data collection and analysis.

3.1 Research Design

Research design is the tactic that a researcher chooses to bring together different components of the study to ensure effective address of a certain research gap. A descriptive research design was used in this study as it enabled the researcher to seek new ideas from the respondents and develop an insight of the research phenomenon under study. The descriptive research ensured to collect data without tampering of the context of the research and was not intrusive therefore dealt with occurrences naturally, and the researcher had no control over this fact. (Mugenda and Mugenda, 2003)

Questionnaires as a method of collecting data was used in the study and was issued out to the selected population.

3.2 Target Population

A population is the totality of features which has one or more characteristics in common. According to Mugenda and Mugenda, (2003), a target population means a
set of complete individuals, cases, units, items, animals (antelopes, cats, dogs) or objects with some common characteristics used by a researcher in generalizing a study result. The study focused mainly on the employees of Nairobi’s Embakasi East sub county in the following categories, senior management, middle level management and support staff which have a target population of 150 employees.

<table>
<thead>
<tr>
<th>Category</th>
<th>Target population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management staff</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Middle Level Management staff</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Support staff</td>
<td>144</td>
<td>96</td>
</tr>
<tr>
<td>Totals</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

3.3 Sample and Sampling Technique

Sampling is the selection of a few units out of the whole population to be used as representative of the general population. Stratified random sampling was used as it was easier to stratify the populations into strata based on similarity in characteristics. Stratified sampling technique is best in the study because it minimizes research biasness in the study. The general procedure for taking stratified sample entails stratifying population, defining a number of separate partitions using the sample size and then combining the results to obtain the required stratified samples. Samples will then be drawn from each stratum formed where respondents will be selected. The researcher will use a sample size of 75 respondents representing 50% of the target population.
### Table 3.2 Sample Size

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Target Population</th>
<th>Sample Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management staff</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Middle level Management staff</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Support staff</td>
<td>144</td>
<td>72</td>
<td>96</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>75</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### 3.4 Instruments

This study used primary data which was collected by use of questionnaires. Questionnaires were used because they are economical, ensures anonymity, are very practical and quick to answer. The questionnaires comprised of closed and open ended questions to avoid rigidity in the study (Kothari, 2004). The method also was meant to ensure that analyses of data was easier, fast and can be quantified. The secondary data was also collected from published materials such as periodicals and journals.

### 3.5 Pilot Study

This study was meant to identify elements of study population and unit of analysis. During the study, draft questions will be pre-tested to avoid ambiguity and achieve high degree of precision. On the other hand, questionnaires will not yield the required data will be discarded.

#### 3.5.1 Validity

Validity is the correctness and relevance of various suggestions or ideas (Kothari, 2004). To ensure validity of study, the research questionnaire was scrutinized by the researcher before the final distribution was done and through the help of the research supervisor, those questionnaires that were unclear and ambiguous
were discarded so as to remain a simple and clear questionnaire that would measure the expected results.

3.5.2 Reliability
Reliability can be identified as the repeatability and uniformity of a measurement. A pre-test study on ten respondents was conducted to identify elements of study population and unit of analysis in a bid to remove ambiguity and achieve high degree precision. The pre-tested ten individuals were not included in the final study.

3.6 Data Collection Procedure
This is the systematic gathering of data from various sources for a particular purpose while data collection instrument refers to the device used to collect data (Mugenda and Mugenda, 2011). Primary data was collected using structured questionnaires, Questionnaire was divided into two sections representing the various variables in the study then controlled.

3.7 Data Analysis and Presentation
This involved qualitative and quantitative analysis. Data analysis involves gathering, modeling, transformation with an aim of getting only the beneficial materials in preparation for an interpretable designs Mugenda (2003). Questionnaires as tools of data collection was verified to ensure that they are fully completed and accurate. The analysis was statistically done and presented by use of tables, charts and figures.

3.8 Ethical Considerations
3.8.1 Informed Consent
An informed consent was given to the research respondents in a bid to solicit their voluntary contribution. Respondents were also assured of absolute anonymity and confidentiality of the information that they provided. The researcher provided
adequate and vivid explanation on the purpose of the study, explain why and how the study was conducted and give a detailed explanation as to why the target respondents were suitable for the study.

3.8.2 Voluntary Participation

Before and during the conduct of the study respondents were allowed to exercise free will in deciding whether to participate in a research activity. Additionally, the researcher was not at any particular point in time before and during the entire study to coerce the research subjects to participate in the study but free will was absolutely guarantee.

3.8.3 Confidentiality

Confidentiality is a very sensitive matter at the workplace and therefore the researcher produced a research letter from the Management University of Africa to authenticate that the research study was to be conducted purely for academic purposes only.

3.8.4 Privacy

To cater for privacy of the study, the author demonstrated to the research subjects that after data analysis all the data collected and recorded data from the field was to be dismantled to prevent its access to other non-authorized persons outside the study work.

3.8.5 Anonymity

Respondents were also assured of absolute anonymity and confidentiality of the information that was provided as the study was not requiring them to disclose their identity whatsoever.
3.9 Chapter Summary

The chapter involved the design used, target population, the sample size, sampling design used, tools of data collection, the pilot study conducted, the reliability and validity of study. It also outlines how data was collected and analyzed and finally it depicts how research ethics was catered for in the study respectively.
CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSIONS

4.0 Introduction

This chapter covers research findings, presentations and discussions, limitations of the study and the summary.

4.1 Presentation of research findings

4.1.1 Response rate

Table 4.1 Response Rate

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>62</td>
<td>83</td>
</tr>
<tr>
<td>Non response</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.1 Response Rate

Out of the 75 questionnaires given to different population categories at the county, 83% responded while 17% did not respond. The non-respondents were not able to
complete their questionnaires but the time of collecting the questionnaires. Others failed to respond completely to the questions.

4.1.2 Gender analysis

Table 4.2 gender analysis of respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>39</td>
<td>83</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.2

From table 4.2 and figure 4.2, the male respondents were at 83% which makes the total number of 39, while the female respondents were at 17% (23 respondents). Based on the assessments and own observation, the researcher noted that majority working in senior positions were male and also those willing to respond. In most instances, the researcher noted that the female respondents were hesitant in giving information, despite assurance of the confidentiality.
4.1.3 Age of respondents

Table 4.3

<table>
<thead>
<tr>
<th>Age of respondents</th>
<th>Frequency</th>
<th>Male</th>
<th>Female</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-35</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>36-50</td>
<td>31</td>
<td>20</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td>&gt;50</td>
<td>22</td>
<td>16</td>
<td>6</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.3
From the table, 4.3 and figure 4.3, 62 respondents were reached. Out of the total number nine (9) of ages between 18-38 were reached, among who three (3) were male and six (6) were female. 31 respondents of between 36-50 were reached out of who 20 were male and 11 females, 22 respondents of over 50 years were reached, 16 males and 6 females.

4.1.4 Education levels

Table 4.4

<table>
<thead>
<tr>
<th>Education level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Diploma</td>
<td>34</td>
<td>55</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Post graduate</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Figure 4.4
Majority of the respondents had attained a diploma level, at 55% seconded by undergraduate with 24%, certificate levels with 18% and post graduate at 3%.

From the study, its noted that a majority are at diploma levels with various fields

4.1.4 Job experience

Table 4.5

<table>
<thead>
<tr>
<th>Experience</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 year</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1-2 years</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Above 4 years</td>
<td>51</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.5
Majority of the respondents have worked for over 4 years with 82%, between one and two years, respondents recorded 15% while those with less than one year in experience were at 3%.

This shows that the respondents are aware of the behavior of their work places and the researcher noted that they have a clear guideline on how they should perform.

4.1.5 Influence of public training on solid waste management

Table 4.6

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>59</td>
<td>95</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.6
Rating public trainings

Table 4.7

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great effect</td>
<td>41</td>
<td>66</td>
</tr>
<tr>
<td>Moderate effect</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td>Low effect</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>No effect</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.7

95% of the respondents noted that public training on solid waste management is key. Majority didn’t understand how to manage waste, how to separate and how to dispose. Only 5% of the respondents who felt that with the trainings or without, there are no effects. 66% of the respondents felt that public trainings on solid waste management is of great importance and that lack of the same affect the manner in which solid wastes is managed within Embakasi North Sub-County within Nairobi City County.
4.1.6 Influence of public and private partnership solid waste management

Table 4.8

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>55</td>
<td>89</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.8
Table 4.9 responses

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great effect</td>
<td>38</td>
<td>61</td>
</tr>
<tr>
<td>Moderate effect</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Low effect</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>No effect</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Figure 4.9

89% of the respondents felt that public and private partnerships are key to managing solid wastes. At 61% respondents felt that the partnerships are of great effect, 23, 11, and 5% felt that the effects are moderate, low and has no effect respectively.

This shows that most of the respondents would want to seek other sectors working on the solid wastes and assisting the counties environment management manage these solid wastes.
4.1.7 Influence of institutional structures on solid waste management

Table 4.10

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>38</td>
<td>61</td>
</tr>
<tr>
<td>No</td>
<td>24</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.10
Table 4.11

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great effect</td>
<td>31</td>
<td>50</td>
</tr>
<tr>
<td>Moderate effect</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Low effect</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>No effect</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.11

There are many institutions in place that can manage solid wastes. 50% felt that these institutions greatly affect the management of solid wastes for lack of velar guidelines on how to operate and even as they understand how, there are no clear guidelines on who to do what and where. 61% felt that these institutions affect solid waste management. At 31%, the respondents felt that they moderately affect solid waste, 14% and 5% felt that these institutions have low effect and no effect at all respectively.
4.1.8 Influence of county by-laws on solid waste management

Table 4.12

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>41</td>
<td>66</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.12
Table 4.13 influence of County by laws on solid waste management

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great effect</td>
<td>34</td>
<td>55</td>
</tr>
<tr>
<td>Moderate effect</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Low effect</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>No effect</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.13

66% of the respondent felt that the county by laws have influence in solid waste management. At 55%, the respondent that the influence has great effect in how the solid wastes are managed at the county level. Other respondent just though that these by laws are of moderate effects at 32%, 8 and 5% for low and no effect respectively. At 34% the respondents felt that these by laws have no effect, either because they don’t know the laws or they are not aware what the laws entails as far as solid waste management is concerned.
4.2 Limitations of the study

Most County environmental department officials were reluctant in giving information, especially before they were informed of the confidentiality of the details. Majority of the female workers were hesitant to speak and would suggest that the researcher seeks authorization with the senior management beforehand. This costed the researcher much more time than the intended time for conducting the study as the senior management staff were mostly engaged in meetings.

The researcher at first had fears on whether the study would be completed without much interference with the current political situation, especially in the city County and its environs. These fears were mitigated by the support offered at the county environmental department, and the good will to participate for the betterment of the county.

4.3 Chapter Summary

General information

Out of the 75 questionnaires given to different population categories at the county environmental department, 83% responded while 17% did not respond. The number of response was at 62 for response and 13 for non-response. The non-respondents were not able to complete their questionnaires but the time of collecting the questionnaires. Others failed to respond completely to the questions.

The male respondents dominated the respondents with 83% which makes the total number of 39, while the female respondents were at 17% (23 respondents) Based on the assessments and own observation, the researcher noted that majority working in senior positions were male and also those willing to respond. In most instances, the
researcher noted that the female respondents were hesitant in giving information, despite assurance of the confidentiality.

Out of the 62 respondents reached, nine (9) were of ages between 18-38 among who three (3) were male and six (6) were female. 31 respondents of between 36-50 were reached out of who 20 were male and 11 females, 22 respondents of over 50 years were reached, 16 males and 6 females.

Majority of the respondents had attained a diploma level, at 55% seconded by undergraduate with 24%, certificate levels with 18% and post graduate at 3%. From the study, its noted that a majority are at diploma levels with various fields

Most respondents have worked for over 4 years with 82%, between one and two years, respondents recorded 15% while those with less than one year in experience were at 3%

This shows that the respondents are aware of the behavior of their work places and the researcher noted that they have a clear guideline on how they should perform.

**Public training**

95% of the respondents noted that public training on solid waste management is key. Most didn’t understand how to manage waste, how to separate and how to dispose. Only 5% of the respondents who felt that with the trainings or without, there are no effects. 66% of the respondents felt that public trainings on solid waste management is of great importance and that lack of the same affect the manner in which solid wastes is managed within Embakasi North Sub-County within Nairobi City County.
Public and private partnership

89% of the respondents felt that public and private partnerships are key to managing solid wastes. At 61% respondents felt that the partnerships are of great effect, 23,11, and 5% felt that the effects are moderate, low and has no effect respectively. This shows that most of the respondents would want to seek other sectors working on the solid wastes and assisting the counties environment management manage these solid wastes. Some of the reasons given as to why the respondent would like to seek other alternatively within the private sector included accountability, transparency in handling of the finances involved in the management of the solid wastes and the employees in the private sectors are accountable to everything they do in their work, unlike in the public sector.

Institutional structures

There are many institutions in place that can manage solid wastes. 50% felt that these institutions greatly affect the management of solid wastes for lack of velar guidelines on how to operate and even as they understand how, there are no clear guidelines on who to do what and where. 61% felt that these institutions affect solid waste management. At 31%, the respondents felt that they moderately affect solid waste, 14% and 5% felt that these institutions have low effect and no effect at all respectively. Most respondents would like to see both the national government and the county government combine efforts in managing wastes. The National Environmental Management Authority should up their game in ensuring that solid wastes are not dumped anyhow. With the current ban of plastic bags, the county officials felt that NEMA is trying to manage some of these solid wastes but there is still much more to be done.
County by-laws

66% of the respondent felt that the county by laws have influence in solid waste management. At 55%, the respondent that the influence has great effect in how the solid wastes are managed at the county level. Other respondent just though that these by laws are of moderate effects at 32 %, 8 and 5 % for low and no effect respectively.

At 34% the respondents felt that these by laws have no effect, either because they don’t know the laws or they are not aware what the laws entails as far as solid waste management is concerned. The respondents would like to see full accountability of the environmental department in ensuring that the county by laws are exercised to the fullest.
CHAPTER FIVE
SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

5.0 Introduction

The chapter puts into consideration the findings of the study, giving conclusions which attempted to answer specific questions that were investigated. Recommendation for possible actions, policy implementation strategies, work plan for the existing structures is given.

5.1 Summary of findings

5.1.1 What is the influence of public training on waste management practices in Embakasi North Sub-county?

Most respondents indicated that public trainings are of much importance when it comes to the management of solid waste. This was indicated by 95% of the respondents. Some of the reasons given for the high numbers is that majority of the respondents felt that if the public are educated on the best ways to managing wastes, then this would have a great impact on how mostly the domestic wastes are handled from collection to disposal. The public need to be informed on how best they need to separate wastes from degradable to non-degradable, and if possible to be informed on how they can make decompose products like manure from the domestic wastes. For the County environmental department felt that despite them being employees of the environmental department, there is much more that they need to understand so that they can inform the larger populations. The department also felt that the public need to be more informed on the consequences of illegal disposal of solid wastes, ranging from harboring breeding places for mosquitoes due to blocked sewer lines and bad
smells. This calls for further policy development on public engagements in waste management and how best the public can learn to manage solid waste.

5.1.2 What is the influence of public and private partnerships on waste management practices in Embakasi North Sub-county?

89% of the respondents felt that there is need to engage private sectors in managing wastes. Some of the issues raised includes and not limited to; their availability, privately owned sectors are well organized and they don’t lack finances to manage their collected wastes. The 61% who felt that the engagement of the privately owned sectors have great influence in solid wastes felt that if they are engaged, there is a high possibility of generating income out of the solid dumped wastes. Some gave examples of the Japanese company who had expressed their interest in generating energy out of the wastes, some companies who collect wastes like papers and producing more usable tissue papers, nylon papers for basket weaving. Respondents felt that if only privately owned sectors can combine efforts with the County government, there the management of these solid wastes would be much easier.

5.1.3 What is the influence of institutional structures on waste management costs in in Embakasi North Sub-county?

There are many institutions in place that can manage solid wastes. 50% felt that these institutions greatly affect the management of solid wastes for lack of vistor guidelines on how to operate and even as they understand how, there are no clear guidelines on who to do what and where. 61% felt that these institutions affect solid waste management. At 31%, the respondents felt that they moderately affect solid waste, 14% and 5% felt that these institutions have low effect and no effect at all.
respectively. Most respondents would like to see both the national government and the county government combine efforts in managing wastes. The National Environmental Management Authority should up their game in ensuring that solid wastes are not dumped anyhow. With the current ban of plastic bags, the county officials felt that NEMA is trying to manage some of these solid wastes but there is still much more to be done.

5.1.4 What is the influence of the enforcement of county by-laws on waste management and environmental preservation in in Embakasi North Sub-county?

66% of the respondent felt that the county by laws have influence in solid waste management. At 55%, the respondent that the influence has great effect in how the solid wastes are managed at the county level. Other respondent just though that these by laws are of moderate effects at 32 %, 8 and 5 % for low and no effect respectively. At 34% the respondents felt that these by laws have no effect, either because they don’t know the laws or they are not aware what the laws entails as far as solid waste management is concerned. The respondents would like to see full accountability of the environmental department in ensuring that the county by laws are exercised to the fullest. The researcher noted that majority of the county environmental department do not know whether these laws exists. If the laws were to be exercised to the fullest, and harsh penalties imposed on to those who break the law, then a majority would ensure that solid wastes is managed well.
5.2 Recommendations

Public trainings

The study recommends that the county environmental department together with the National Environmental Management Authority plan to hold at least one public forum within the Embakasi North Sub-County especially where the dumpsite is situated in order to enlighten the public on the best way to manage waste.

The County government should ensure that environmental management is allocated enough budgets to cater for the public trainings. This can be well achieved through one on one open forums, media broadcasts and setting aside one-day quarterly in a year to mark the environmental cleanliness day. The Sub-County environmental management should also work together with ward managers to ensure that each ward is neat with no traces of wastes, should ensure that there are enough litter bins in every estate and that the county vehicles collect these litter weekly. Once the public has been made aware, the implementation of this activity will yield fruits.

Public and Private partnerships

The County government collects revenues from all operations within the county. They are mandated to purchase all tools required for the environmental management, but due to the current devolution, the county management seems to be overwhelmed by the volumes of work.

This study recommends that the County environmental management works closely with other private partners as this relationship will yield more fruits in terms of waste management. The private sector should be contracted to collect and manage litter in the sub- Counties. This will also safe respiratory illnesses experienced by the
residents of the Embakasi North Sub-County. This should be done in the next two months in order to allow binders to apply. The NEMA should monitor the implementation of these collection projects to ensure that the private stakeholders are working.

The Private partnerships should be included in the county by-laws and each member of the ward representative should ensure that the wards are neat and that the laws are exercised to the fullest.

**Institutional structures**

These recognized offices should work together with the residents for sustainability of the projects. Where institutions work alone without public participation, there is likelihood of failure to succeed. The County environmental management should ensure that whatever measures they put in place, there is an element of support from the members of the public. This has also been enshrined in the supreme law that whatever actions that the authorities need to take and that which either directly or indirectly involve the public, then public participation is key.

**County By-Laws**

The county by-laws should be amended to give room for financial and physical capacity for waste management. The penalties for defying the rule of law should be harsh and serious.

The county environmental management should keep monitoring the effectiveness of these by laws to the management of solid wastes, which should later recommend for further reviews and amendments to suit the general public.
The bylaws should be modernized in order to be consistence with the waste management regulations, 2006.

5.3 Conclusion

Majority of the respondents being male, and have attained basics in education up to a diploma level means that they have clear understanding on solid waste management. The county environmental department lacks enough tools to manage wastes, ignorance and corruption dominating the offices. Most people know what to do but are ignorant to act.

There is therefore need to engage private sector to assist in the management of such wastes who should be legally contracted by the county authority.

The environmental management should ensure that the public are involved and engaged in matters that concern then so that they be part of the process in managing solid wastes.

Collection and managing solid wastes is everybody’s business. A clean environment is a constitutional right.
REFERENCES


APPENDIX II: QUESTIONNAIRE

The researcher is a student at the Management University of Africa, pursuing a degree in Bachelor of Arts in Development Studies. The researcher is hereby conducting an academic research on factors influencing solid waste management in urban centers will close reference to Nairobi City County. I kindly request your assistance in responding honestly to all items in this research questionnaire. All responses provided will be treated confidential and will be used for the intended research purpose ONLY

SECTION A: GENERAL INFORMATION

1. What is Your Gender?

   Male { }  
   Female { }  

2. What is Your Age?

   i) 18-35 years { }  
   ii) 36-50 years { }  
   iii) 50 and above { }  

3. What is your Education Level?

   i) Certificate { }  
   ii) College { }  
   iii) Under Graduate { }  
   iv) Post graduate { }
4. Job Experience

i)   Below 1 year   {   }
ii)  1-2 years      {   }
iii) 4 years and above {   }

SECTION B: PUBLIC TRAINING

5. Does public training influence solid waste management in urban centers?
   i)   Yes   {   }
   ii)  No   {   }

6. What is the influence of public training on solid waste management practices in Embakasi North Sub-County of Nairobi County?
   i)   Great Effect   {   }
   ii)  Moderate Effect {   }
   iii) Low Effect     {   }
   iv)  No Effect      {   }

SECTION 3: PUBLIC AND PRIVATE PARTNERSHIPS

7. Does public and private partnership influence solid waste management in urban centers?
   i)   Yes   {   }
   ii)  No   {   }

8. What is the influence of public and private partnerships on solid waste management practices in Embakasi North Sub county?
   i)   Great Effect   {   }
   ii)  Moderate Effect {   }
   iii) Low Effect     {   }
iv) No Effect {   }  

**SECTION 4: INSTITUTIONAL STRUCTURES**

9. Do institutional structures influence solid waste management in urban centers?
   
   i) Yes {   }  
   
   ii) No {   }  

10. What is the influence of institutional structures on solid waste management costs in Embakasi North Sub county?
   
   i) Great Effect {   }  
   
   ii) Moderate Effect {   }  
   
   iii) Low Effect {   }  
   
   iv) No Effect {   }  

**SECTION 5: ENFORCEMENT OF COUNTY BY-LAWS**

11. Does enforcement of county by-laws influence solid waste management in urban centers?
   
   i) Yes {   }  
   
   ii) No {   }  

12. What is the influence of the enforcement of county by-laws on solid waste management and environmental preservation in Embakasi North Sub county?
   
   i) Great Effect {   }  
   
   ii) Moderate Effect {   }  
   
   iii) Low Effect {   }  
   
   iv) No Effect {   }  

**Thank you for your cooperation**