# ANALYSIS OF SOLID WASTE MANAGEMENT PROCESS: THE CASE STUDY OF TEMEKE MUNICIPAL COUNCIL IN DAR ES SALAAM

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## CERTIFICATION

The undersigned certifies that, he has read and hereby recommends for acceptance by the Open university of Tanzania a dissertation entitled: ***Analysis of Solid West Management Process: The Case study of Temeke Municipal in Dar es Salaam***: in partial fulfillment of the requirements for the degree of Master of Business Administration of the Open University of Tanzania.

……..……

Dr. Salum Mohamed

**(Supervisor)**

……..……

Date

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## DECLARATION

I, **Chinyaga Octavian Millinga,** do hereby declare that this dissertation is my own original work, unless specifically indicated in the text. It has not been presented and will not be presented to any other University for a similar or any other degree award.

……..……

Signature

……..……

Date

## DEDICATION

This dissertation is dedicated to my husband Henry Mosha for his calmness and patience plus effort which he put on me just to encourage all along the entire time of my studies at Open University of Tanzania, May God Bless him.

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## ABSTRACT

This research was analyzing of Solid Waste Management Process in Temeke Municipal Council in Dar es salaam. A sample of 42 respondents was selected for the study. The study used accidental technique to collect the data from Community members from the streets. The study gathered data from primary and secondary sources where by primary data obtained from Community members from streets of Temeke Distric. The study used quantitative method to analyze the data collected, to carry out the research findings from the questioners were analyzed, tabulated, and then interpreted. The existing municipal solid waste management system in Dar es Salaam particularly in Temeke municipality, are not have good plan for collection and disposal of the solid waste product. There were no proper procedures for locations and vehicle routes. This leads to high consumption of municipal revenues. Data presented by the city council shows that about 30 to 54 percent of the solid waste were collected. It means there were a lot of wastes not collected. In order to improve solid waste management researcher recommends to engage more private contractors in order to manage collection and disposal of solid waste generated daily in Temeke , encouraging informal sector participation and the development of technological innovations for solid waste management. And awareness on solid waste collection and disposal should be supplemented by penalties to those who violet bylaws set by Municipal council.

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## ABBREVIATION

| | |
|---|---|
| ISWM | Intergrated Solid Waste Management. |
| JICA | Japanese International Cooperation Agency |
| UNEP | United Nations Environment Programme |

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Problem

Solid waste management is a critical concern as far as health and environmental issues are concerned. The Sources of solid waste include household activities, production in industries and commercial activities. Tanzania is among of the most country are facing an increasing burden of solid waste management. In general Tanzania does not have capacity and a reasonable working solid waste management which is efficient.

Dar es Salaam is the largest city in Tanzania and it is where most industrial production and trade activities are taking place, with estimated population of more than 4 million in 2012 and population growth rate of 4.3 percent. The total area is about 1,500 km² with population density around 2,700 people per km². ( Mbuya, 2008).

Dar es salaam composed of the four municipal councils: Dar es salaam Municipal Council, Kinondoni Municipal Council, Ilala Municipal Council and Temeke Municipal Council, together the four local government are commonly referred to as Dar es salaam local authority.

Just like other social services, local governments are responsible for solid waste management. Resources needed for solid waste management are also supposed to come under normal budget lines in the process of budgeting for all other social services. Local councils are not able to manage an existing solid waste. Dar es Salaam for example, is growing in terms of business activities, industrial production,population and city

expansion. All these factors have a significant contribution to the increasing generation of solid waste (Ishengoma, 2003).

The Pugu dump site is the an authorized site in Dae es Salaam for the receipt of solid non-hazardous wastes. It was originally intended to be designed and operated as a sanitary landfill meeting International norms. According to the Environmental Impact Assessment prepared for the site in 2004 by ERC, the site should meet the following basic requirements.

i. Formal cell development
ii. Leachate management
iii. Landfill gas management
iv. Daily soil cover, final soil cover and a compaction process
v. Fenced with a gate
vi. Daily records of the volume, type and source of waste
vii. A plan for waste pickers

None of these most basic requirements are being met at present. The site is operated as an open dump with wastes scattered across the 65 hectares. No cover material was available on site or was being applied on a daily or even monthly basis. Compaction was limited. The bulldozer on the site was simply spreading the wastes after it had been picked over by waste pickers.

The city council of Dar es Salaam decided to privatize solid waste management in 1994 in order to improve the situation. This means waste management became a joint activity between city council and private sector. Private sector included private contractors,

community groups and Non-governmental Organizations (Kassim & Mansoor, 2003). Temeke Municipal Council is among City municipals which produce the solid waste. The Solid waste produced by Temeke municipality is amount to seven hundred forty three (743) tons per day (Temeke municipal council, 2013). Two hundred and forty three (243) tons are produced in rural areas, the remaining five hundred (500) tons are produced in the urban areas (Temeke municipal council, 2013). Out of 500 tons only 280 are collected and disposed of by the council and private contractors. The council has 10 Lories and 1 tractor and 8 trailers for solid waste product collection. Out of 10 Lories 8 are old and worn out (Temeke municipal council, 2013)

The refuse collection is done by community based organizations formed in the wards and sub wards, collected solid waste are then sent to the transfer station (secondary collection point) the council then collects solid waste from these transfer stations for disposal at damp site. There are 8 transfer station which includes Mwembeyanga, Temekemwisho, Mpogo station, Mtoni market, Kurasini, Keko collection point, Rangitatu collection point, Sterio Tandika Maguruwe and Yombo market (Temeke municipal council, 2013).

The citizens who are also taxpayers are expecting quality services in return. But it is very unfortunate that the public sector has failed to deliver to the expectation as far as solid waste management is concerned (Nondek, 2002). This study therefore, analyzes the solid waste management process in Temeke municipality and provide information for best possible interventions quantities of waste collection.

## 1.2 Statement of the Research Problem

Solid waste management is one of the big challenges facing most urban cities in the world. Based on research in Ghana (Awortwi, 2003 & Obrih-Opareh, 2003) and Kenya

(Karanja, 2005 & Mwangi, 2003) they pull together the evidence with respect to Solid waste and urban management in Africa. Besides private enterprises, nongovernmental organizations (NGOs) may also play a role in activities like solid waste collection, sanitation and public awareness programs. Despite the initiatives to privatize solid waste management, the problem of uncollected solid waste stays a threat to the population and to the environment in general.

Dar es salaam city is among cities which facing the problem of solid waste management which lead to view our city that are unorganized or uncontrolled. Management of solid waste all over the world is one of the first important priorities to the protection of community health as well as the environment pollution. Solid waste comprises all the waste arising from human and animal activities that are normally solid and are discarded as useless or un wanted disposal (Tchobanoglous, et al. 1993).

The vehicles which collecting the solid waste, instead of collecting the solid waste they just distributing the waste around the city when they are on the way to dispose. This situation is too critical to vehicles of Dar es Salaam city council which lead to distribute the outbreak diseases like cholera, tuberculosis and other related diseases which affect the human resources and environmental of the country. This study will analyse the whole process of waste manageme in the Temeke municipal.

## 1.3 Research Objectives

### 1.3.1 General Objective

The general objective of the study was to analyze solid waste management process in Temeke Municipal Council in the city of Dares Salaam.

### 1.3.2 Specific Objectives

Specific objectives of the study were as follows:

i. To investigate the whole process used by Temeke Municipal Council in solid waste management
ii. To analyse sustainability of the current solid waste management system implemented by Temeke Municipality
iii. To determine the capacity of Temeke Municipal Council in solid waste management
iv. To explore the level of awareness of the society about the importance of solid waste management

## 1.4 Research Questions

The following are the research questions that guided the process of the study:

### 1.4.1 General Research Question

What is the solid waste management process inTemeke municipal?

### 1.4.2 Specific Research Questions

i. What are the process used by Temeke Municipal Council in solid waste management?
ii. How effective are the current solid waste management system implemented by Temeke Municipal Council?
iii. Does Temeke Municipal Council have enough capacity to manage solidwaste?
iv. What is the level of awareness of the society about the importance of solid waste management?

## 1.5 Significance of the Study

Findings from this study will provide information of analysis of problems facing in Temeke municipal at Dar es Salaam City Council on solid waste management process. The study will also help the government to make policies and plan programmes for municipal solid waste management proces; it will also help people to have a better insight and understanding on the optimization of municipal solid waste management process.

Further more, the study will help to develop educational training programs to educate people about the importance of minimizing the cost of the municipal solid waste management process. Moreover, the study will act as the stepping stone to the minimization of municipal budget to solid waste management system and will be useful to the private contractors on planning their operations for solid waste collection. Lastly the study will help municipal planners to quantify the costs for municipal solid waste collections so as to opt for optimal one.

## 1.6 Scope of the Study

Coverage for this study involves solid waste. But in fact there are other types of waste generated in Temeke. For example liquid and gaseous waste is the part of waste produced in the city. This study there fore provides only solid waste management issues. Conclusions and suggestions may not benefit any desired improvement on other types of waste other than solid waste.

## 1.7 Organization of the Study

Following the introduction in Chapter one, the literature review is provided in Chapter two, a brief historical review of the problem of Municipal solid waste management

process and in Chapter three Methodology used to this study and detailed description of the mathematical. It further reviews the methods used to solve those problem. Chapter four presents presentation and discussion of research findindngs, and chapter five summary, conclusions and recommendations.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter presents a review of ideas various authors and discusses theories relevant to this study, conceptual framework and key issues which contribute to the understanding of the subject of this research study.

## 2.2 Conceptual Definitions

This part entails the definition of key concepts used in the study concerning solid waste management process and its strategies of solid waste management, and all empirical literature review in world, Africa and in Tanzania,

### 2.2.1 Solid Waste

Solid waste means any materials which have no value to the original generator in a form of non liquid. Solid waste can be discarded from household, industry, market, construction sites or other institutions (Hoornweg at all,1999). According to the environment management Act (2004), Solid waste is as nonliquid materials arising from domestic, street, commercials, industrials and agricultural activities and include refuse or garbage, construction and demolition activities, garden trimming and mining operation, dead animals and abandoned car scraps.

Solid waste means any garbage, refuse, sludge from a waste water treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials including solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations, and from community

activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit.

### 2.2.2 Solid Waste Management

Solid waste management is the process of collection of solid waste, storage, treatment, transportation up to a point of disposal (Blight and Mbande,1996). The environmental management Act (2004) defines solid waste management as an essential services that is provided to protect the environment and public health, promote hygiene, recover materials, avoid waste , reduce waste quantities, decrease emission and residuals and prevent spread of diseases and environmental pollution.

### 2.2.3 Combustion

According to the Environmental Management Act (2004), combustion is a process of burning waste in a controlled situation. It is done in a well designed facility for this purpose. Sometimes combustion is set to generate electricity. The combustion is carried out for materials that cannot be re used and where no landfills available. To reduce waste volume, local governments or private operators can implement a controlled burning process called combustion or incineration. In addition to reducing volume, combustors, when properly equipped, can convert water into steam to fuel heating systems or generate electricity. Incineration facilities can also remove materials for recycling.

Burning waste at extremely high temperatures also destroys chemical compounds and increase environment pollution, regular testing ensures that residual ash is non-hazardous before being land filled. About ten percent of the total ash formed in the combustion

process is used for beneficial use such as daily cover in landfills and road construction (The environmental management Act, 2004).

### 2.2.4 Composting

Composting which involves the controlled decomposition of plant remains and other organic materials to make an earthy dark, crumbly substance that is excellent for enriching soil and preventing soil erosion is a great way to recycle yard and kitchen wastes and reduce the volume of garbage waste sent to landfills or incinerators for disposal. Natural composting or biological decomposition, began with the first plants on earth and has been going on ever since. As vegetation falls to the ground, it slowly decays, providing minerals and nutrients needed for plants, animals and microorganisms. The production of “mature” (or usable) compost from organic wastes also requires high temperatures to destroy pathogens and seeds that natural decomposition does not destroy construction (The environmental management Act, 2004).

## 2.3 Theoretical Literature Review

In this section will show the types of the solid waste management and strategies of waste management.

### 2.3.1 Types of Solid Wastes

There are several types of solid waste product which includes the followings,

i. Residential solid wastes

ii. Food waste, paper, cardboard, plastic, textiles, leather, garden waste, wood, glass, metal, ash, special waste (e.g. bulky items, consumer electronics, appliances, batteries, oil, tires) and household hazardous waste.

iii. **Industrial/Manufacturing solid wastes**

House keeping waste, packaging, food waste, construction and fabrication waste, hazardous waste, sludge, liquid, ash, special waste and scrap material.

iv. **Commercial solid wastes**

Paper, cardboard, plastic, wood, food waste, glass, metal, special waste and hazardous waste.

v. **Medical solid wastes**

House keeping waste, packaging, food waste, hazardous waste, infectious waste and radiological waste.

vi. **Agricultural solid wastes**

Spoiled food waste, crop waste, hazardous waste (e.g. pesticides) and food processing by-products.

vii. **Construction/Demolition solid wastes**

Wood, steel, concrete, bricks, brush, rocks, dirt and hazardous waste.

viii. **Municipal Services solid wastes**

Street sweeping; landscape and tree trimming; general waste from parks, beaches and other recreational areas; water and waste water treatment plant sludge waste.

ix. **Hazardous solid wastes**

Household hazardous waste such as batteries, tube lights, spent drugs, oils, paints and chemicals and industrial hazardous waste.

### 2.3.2 Strategies of Solid Waste Management

There so many strategies of solid waste in the world but here will be few of these.

### 2.3.2.1 Landfills Strategy

Oduro Kwartengs. (2007) Defines that Landfill is the process of disposal of solid waste which involves burying the waste, this remains a common practice in most African countries. A properly designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials. Common product of landfills is gas (mostly composed of methane and carbon dioxide), which is produced as organic waste breaks down anaerobically. This gas can create odor problems, kill surface vegetation, and is a greenhouse gas.

**Figure 2.1 : Landfills Strategy**
Source: www.metrotaifun.comMariMaticOy: Automatic Waste Collection Systems (2013)

### 2.3.2.2 Recycling Strategy

Oduro-Kwartengs.(2007) Also define Recycling is refers to the collection and reuse of waste materials such as empty beverage containers. The materials from which the items are made can be reprocessed into new products. Material for recycling may be collected separately from general waste using dedicated bins and collection vehicles are sorted directly from mixed waste streams and are known as kerb-side recycling, it requires the owner of the waste to separate it into various different bins prior to its collection.

The most common consumer products recycled include Aluminum such as beverage cans, copper wire, steel and old steel furnishings or equipment, polyethylene bottles, glass bottles and jars, paperboard cartons, newspapers, magazines and light paper, and corrugated fiberboard boxes. The type of material accepted for recycling varies by city and country. Each city and country has different recycling programs in place that can handle the various types of recyclable materials. However, certain variation in acceptance is reflected in the resale value of material once it is reprocessed.Oduro-Kwartengs.(2007)

**Figure 2.2 : Steel crushed and baled for recycling**
**Source:** (Metrotaifun.com Mari MaticOy: Automatic Waste Collection Systems.)

### 2.3.3 Reason for Solid Waste Management being an Issue

Generation of solid waste has been on the increase with raising population and economic change. It is obvious that poorly managed solid waste create a danger to the health of human and high risk to the surrounding environment. Many problem occur, such as water, air pollution and human healthiness. Climatic changes are potential a result of improper handling of waste. A planned comprehensive waste control program can reduce these potential problems (Onibokun & Kamuyi, 1999).

Cointreau (1991) argue that in any form of cities or towns, the Municipal Council or local government in a given area has the responsibility of solid waste management. The author estimates that solid waste management may consume between 20 and 50 per cent of local government annual budget. The task of solid waste management is complex. It requires appropriate organisational capacity and cooperation between various stakeholders both in the private and public sectors. Solid waste management is critical because it has an implication on public health and environment issues in general.

Waste management is also an essential task which has important consequences on the quality and sustainability of the urban environmentand the efficiency and productivity of the urban economy. In most cities of developing countries, waste management has proved to be inadequate. Some streets have no enough access to a waste collection service. Only a fraction of the generated waste is actually collected. In many developing countries for example, the systems for collection, transportation and disposal or recycling of solid waste are not satisfactory from the environmental, economic and financial points of view (Benavides, 1992).

Giroult (2005) explain that an optimum solid waste management requires improvements to technical systems in all levels that are involved in waste management. This includes improving ways of collection, containers or vehicle specifications, dumping sites or innovative recycling. Specific guidelines and methods are needed to support implementation of solid waste management plans. Such improvements will contribute towards building capacity of local government to manage solid waste management operations.

### 2.3.4 Environmental Impact of Solid Waste

Where solid waste is not well managed, there are several impact felt on the environment. The decomposition of waste turns into constituent chemical and cause environmental air pollution. This is the common problem in developing nation. Most of landfills in developing nations do not meet the required standards. It may need huge budget to keep landfills in a required standard. Constituent chemicals are known for their potential to contaminate surrounding air and water.

Another major environmental concern is gas from decomposing garbage. UNEP (1996) for example explain that methane gas comes out as a by product of the anaerobic respiration of bacteria. These bacteria survive within landfills containing high amounts of moisture. These types of gases are contributing to the problem of greenhouse gases (GHGs) which are responsible for global warming.

### 2.3.5 Categories of Solid Waste

Pongracy and Pohjola (1997) contributed to theories of understanding the concept of solid waste management. They provide the following categories of waste:

**Category 1** Materials which were produced for specific purpose are useless after fulfilling the intended purpose. This is true because for example the producer of drinking water uses bottle to store water. When a person purchase and drink the water, the bottle has finished its intended purpose. But on the other hand the bottle may be used for other purpose through it has finished its original purpose. Example of other uses of bottle is storing other forms of liquid like honey or home salt.

**Category 2** Things which has a clear purpose but their performance become low because of change of structure or state. This theory is also presenting a true and Fairview when defining waste material. For example a vehicle may losses its normal function ability as a result of broken part or parts. But the researcher has the opinion that such vehicle should not be treated as a waste material tight away. It is possible to repair or replace the broken component and restore the vehicle function again.

**Category 3** Materials which clear purpose and good performance but users have failed to use. The statement is clearly correct. This is because the owner of a new vehicle may fail to use it because of failure to buy fuel to run the car. In this case to the first owner of the carmightbe a waste. But it is possible to find a new owner who can afford fuel and there for the car become non waste.

From the theory discussed above, the researcher has the observation that it can be so tricky to determine when a certain material becomes waste and when it is not a waste material. UNEP (1996) stipulates some criteria to be considered when evaluating selected technologies as far as solid waste management is concerned. It should be cost-effective. Cost effectiveness is determined through a cost analysis. The cost analysis helps city council to understand cost involved in doing business for services offered. Specifically, cost analysis provides an approach to identify full cost of solid waste management system over a certain period of time. It is associated with identification and inclusion of both direct and indirect costs involved in solid waste management. It should also take into consideration current and future costs and overheads.

The choice considers environmental issues: Solid waste processing and disposal sites passes for environmental problems. These problems are associated with the emissions from the solid waste. Solid waste management systems need to consider pollution control measures to assure a high possible level of safety.It is appropriate in the current social and cultural environment. According to Bartone (1995), most of solid waste management activities do not give priority to research. Lack of research leads to selection of inappropriate methods of solid waste management. Methods and technology selected do not consider local social and cultural environment. Bartone also see that social status of solid waste management workers is low. This brings negative perception on the work of managing waste materials. As a result, these workers disrespect their job and in turn perform below standard and produces low quality work.

Suitability in bringing intended results: Most governments in developing countries have limited funds for solid waste management. Therefore they need to develop measures to reduce and recover the expenditure and increase revenues where possible. They need to turn their solid waste management systems to more self-financing programs. They should develop different alternative cost-cutting, cost-recovering, and revenue-raising schemes (e.g. waste minimization, deposit-refund system for recyclable materials, import or sales tax on certain packaged products, collection of user service charges, etc.) and implement pilot studies on these economic incentive measures. Sustainability on the other hand considers type of technology used and its effectiveness in managing amount of waste produced.

### 2.3.6 Policies Rules and Regulations

Haight (1991) argue that countries need to have policies, rules and regulations to govern solid waste management. The policies, rules and regulations facilitate to achieve the objective of making cities and streets clean. The rules for example, lay down the powers and functions of various stakeholders and the general public in relation to solid waste management. Proper solid waste management policies support resource allocation for the collection, transporation and disposal of solid waste and assures sustainability.

In Tanzania for example, solid waste management is regulated by the Tanzanian solid waste management regulations Act (2009). The regulation stipulates procedures to obtain permit to operate solid waste disposal sites, transport solid waste, dispose solid waste and it regulates licence to own or operate solid waste disposal site. It also define duties of local government authorities and other stakeholders to manage and minimize solid waste atsource.

### 2.3.7 Integrated Solid Waste Management

Agha (2006) defines Integrated solid waste management (ISWM) as a comprehensive waste prevention, recycling, composting, and disposal program. An effective ISWM system considers how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment. The process of ISWM is effective when various actors are working together. But the government through Municipal Councils should take up the leading role to make ISWM effective. A working solid waste management system requires to have proper rules, regulation and policies. Such rules, regulation and policies should be able to control and reduce solid waste

generation,provide for guidelines on disposal and recycling. Finally it will contribute towards an integrated solid waste management.

## 2.4 Empirical Literature Review

This section reviews some contribution from other authors who conducted studies on solid waste management in different parts of the world.

### 2.4.1 Empirical Literature Review Worldwide

Ndimo (1998) report that most of the developed countries have well organized collection systems. Collection bins are provided in curb to collect solid waste. Different colored collection bins are placed in curbs for different types of waste materials.These collection bins are also provided for recyclables such as glass, cans, plastic bottles etc. Communities carry waste and put in these containers. These recyclables are later removed and used for recycling industries, Curbside collection. System is efficient in many developed countries. Wastes are carried out from house and are placed in curb with different colored bins. These wastes are later picked by collection vehicles. These vehicles are single compartmented and multi-compartmented to collect recyclables separately.

Beall (2009) report that the main disposal methods applied by most municipal solid waste systems in Asiaincludes opendumping sites and sanitary landfill. General speaking the conditions of such waste dumping sites are vulnerable causing serious environmental pollution,bad smell for example is affecting areas around the dump sites. The rodents and other insects are spreading waste products around exposing danger for various diseses.

JICA (2004) presents a situation of solid waste managemnt in Nepal. In Nepal, at least each individual person generates about 0.34 kilogram of waste a day. This means the total waste generation in Nepal in 2003 with an urban population of 3.5 million became 1,369 tons/day or approximately 0.5 million tons/year. But the municipal was able to collect about about 600 tons/day.

In Malaysia, solid waste is normally collected from offices, homes and from industries. Then it is transported to some dumpsites. After it has been collected, people takes no interest in where the waste is taken to. Generally few homes or offices have dumping sites of their own. In 1980s, waste collection was privatized. Before thie year, all waste collection was done by the government authorities. After privatization, the governmnet is supervising and set up regulations (Huszain,2004).

In developed countries of Europe, the main priority of waste management took a new turn. Authorities in these countries are laying strategies to prevent too much waste as a priority to manage waste in cities. Conservation of resources is highly promoted in order to minimize waste generation. For this reason, industrial firms looks for space and opportunities outside their firms where they can utilize their waste(Vancini, 2000).

### 2.4.2. Empirical Literature Review in Africa

Developing countries have different solid waste collection systems.The collection system is divided into primary and secondarycollection system. Primary collection systems consists ofCollection of waste from household and put into communitycollection container. And the secondary systems consist of collection of waste from community collection container to the dump site. Primary collection equipmentare easy to operate

and maintain. These primary collection equipments are tricycles which are driven by human power. In order to prevent fall of waste from these equipment, it is enclosed from all four sides.The primary and secondary collection system is carried out by small mechanical vehicles, trucks. These collection vehicles collect solid waste from community collection centers, wastes from street corners (Oduro. Kwarteng, 2007).

Obirih Opareh (2003) reports that in Lagos Nigeria, the Waste Disposal Board divided the city into zones. It awarded contracts to selected contractors to collect the industrial and commercial waste from large generator in these zones. The Lagos State Waste Disposal Board collected user charges from the industrial and commercial establishment serviced paid 60 percent of the monies collected to the private well as for providing across subs dial for residential collection.

Dijk (2006) argue that in developing African Countries, solid waste management is the function given to local government authorities. The local government authorities are given mandate to budget for solid waste management. They are also mandated to formulate bylaws that govern solid waste management in their respective towns and cities. This is in line with Tanzania where the role of waste management is given to local government authorities.

Another scholar Mwangi (2003), said that in Africa solid waste management is challenged by weak regulatory environment. This creates loopholes for people who generate solid waste in cities to avoid actual involvement in managing the waste that they produce. Other challenges includes lack of proper involvement of private sector and other community groups such as non governmental organizations and low level of technology

applied in solid waste management. In Ghana for example in the city of Kumasi, solid waste is collected from house to house by a private waste collector. The collector is giving those service as a private business. Residents pay user fees in an arranged system agreed between the waste collector and the households. This means that the collector is not paid by the municipal council. In streets where there are many households, user fees goes down because of sharing the costs amongst the households (Oduro-Kwarteng, 2007).

### 2.4.3 Empirical Literature Review in Tanzania

While Tanzania has made efforts to further develop its urban centers by allowing private hospitals, there has been a lack of infrastructure generated to accommodate the growing amounts of waste. The rapid industrialization of the country is outgrowing any current infrastructure in place to ensure the health and safety of its citizens.

Kassenga, (1999).Combining a lack of appropriate waste storage, protective equipment, and removal services can lead to the health threats. Currently, the more dangerous medical wastes are simply mixed with municipal solid waste and dumped at the disposal sites discussed above. However, Tanzania is undergoing changes in making a comprehensive, functioning waste disposal system a pre-requisite for the development of new hospitals.

Bigger proportion of Dar essalaam city resident live in unplanned areas. Halla and Majani (1999) report that 60 to 70 percent of the Dar essalaam population lives in unplanned settlement. Study conducted by Majani (2002) reveled that although majority of Dar es salaam population lives in unplanned settlement but solid waste management

infrastructure is not adequate in these areas and this shortage of infrastructure create a huge capacity gap for the city authority in solid waste management.

A study conducted by Coffey (1994) revealed that inadequate infrastructure means that only small proportion of Dar essalaam population is reached by the city solid waste collection services. The sections of the city population which get solid waste management service include people who live or work in the city center or mostly commercial areas and planned settlement. City authority has failed to provide solid waste management services efficiently in other areas of the city. The impact of low capacity to manage solid waste by the city council includes an obvious problem of piles of solid waste in streets. Living in such dirty environment, residents are becoming prone to health problem such as cholera and environment air pollution.

Masamu (2007) argue that among the main factors contributing to the problem of solid waste management is the fact that the city for example, are not equipped with waste bins to dump solid waste. As a result, city residents have taken traditional option where individuals pass through houses to collect solid waste by using push carts.

Another observer Solomon(2011)see that solid waste is a serious problem in the City of Dar es Salaam. The city authorities in each of the districts of Dar es Salaam have the entire role to manage all forms of waste. But the city authorities tends to neglect the role of households in waste management. The households are not considered to be an important actor in dealing with waste although they are involved generating the waste.

According to Nondek (2002) local government authorities in the city of Dar es Salaam have been given the role of waste management. Each district authorities under the local government system is responsible for waste management. But this policy is not fully followed because of some factors that include low capacity to implement policies and an increasing size of the city.

## 2.5 Research Gap Identified

Going through the above readings, the researcher see that the city has tried many ways to deal with waste management problem. The city for example has allowed private sector to remove waste in streets. Individual are also trying to support the efforts to remove solid waste but the problem has not been successfully resolved.

The researcher has the opinion that there is still a chance to deal with solid waste management. This study will focus on some gaps not dealt with by other literatures. The gap that researcher has seen include exploring on other potential option available within the city to incorporate them in the system to support and improve solid waste management and capacity of the city authority. The informal sector for example is potential to supplement the city effort to improve solid waste collection capacity. The researchers also have not shown critically capacity gaps of the solid waste management system. This research will explore more on the existing solid waste management system of the city council and come up with a more informed suggestions for improvement.

## 2.6 Conceptual Framework

Solid waste systems for collection and transport cannot manage to clear out the problem of waste generated in large towns with increasing population. Normally in large cities

where the population is high, solid waste are uncontrolled. Baud and Schenk (1994) suggest that when this happens, authorities need to take critical measures. The measures should include formulation of laws and policies regulation. City authorities should also plan for utilization of available resources and a careful selection of waste collection points and ensure community participation.

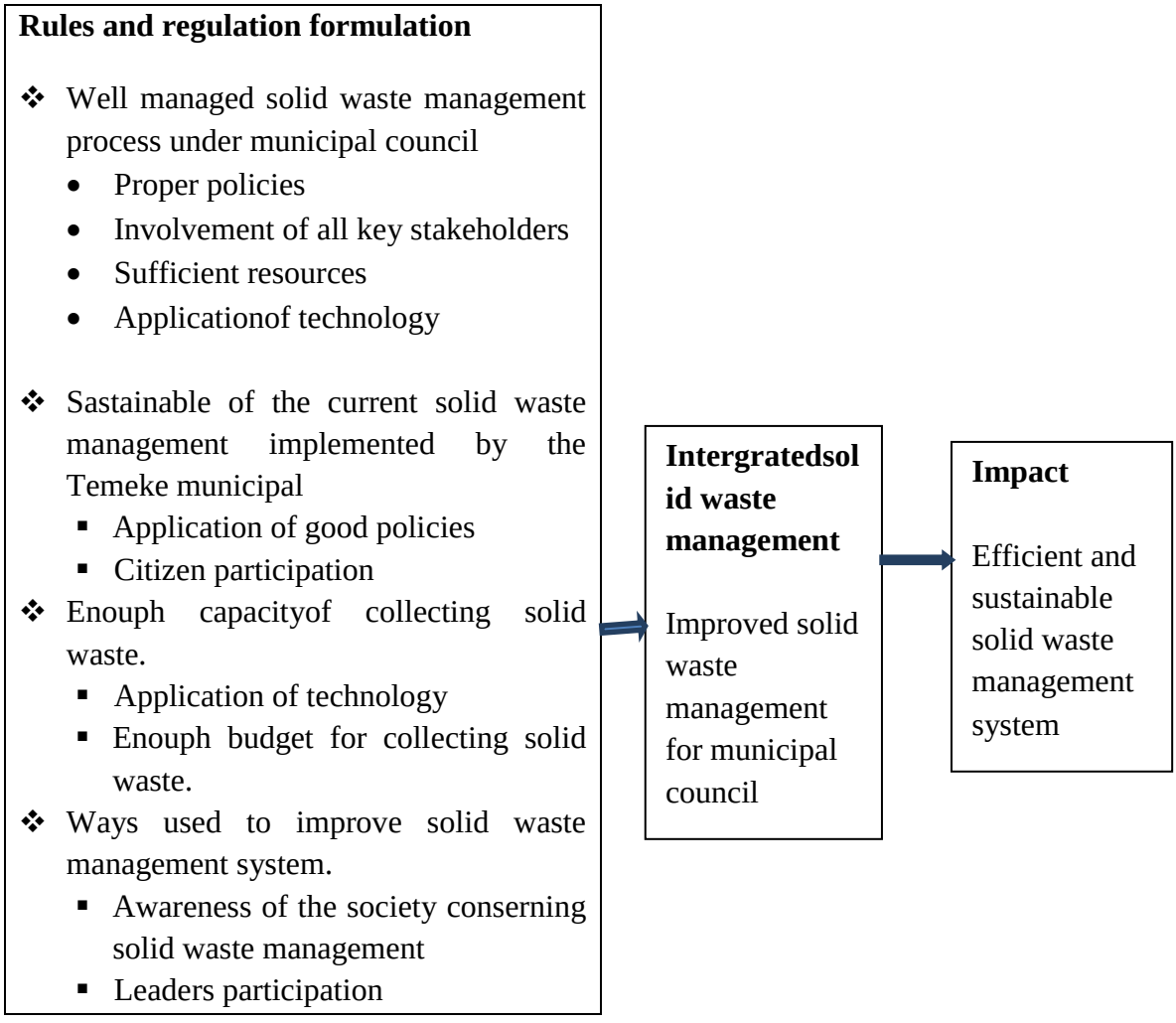


**Figure 2.3 : Baud and Schenk Model (Modified by the researcher)**

## 2.7 Theoretical Framework

Solid waste system for collection and transport cannot manage to clear out the problem of waste generated in large towns with increasing population. Normally in large cities where the population is high, solid waste are uncontrolled. (Baud and schenk (1994) suggest

that when this happens authorities need to take critical measures. The measures should include formulation of laws, regulations,good policies and appropriate technologies. City authorities should also plan for utilization of available resources and a careful selection of waste collection points and ensure community participation. If all be organized the city will reduce harm to human hearth, environmental conservation and effective utilization of resources

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter presents research methodology employed in the study. It covers the overall research design, outlines the research area, study population, sample selection and size, as well as methods adopted in data collection and analysis.

## 3.2 Research Design

Research design is the arrangement of condition for collection and analysis of data in a manner that aim to combine relevance to the research purpose with economy in procedure. In fact the research design is the conceptual structure within which research is conducted. It constituents the blue print of the collection, measurement and analysis of data. Cothary (2004)

The term "research design" refers to how a researcher puts a research study together to answer a question or a set of questions. Research design works as a systematic plan outlining the study, the researchers' methods of compilation, details on how the study will arrive at its conclusions and the limitations of the research.

Research design is not limited to a particular type of research and may incorporate both quantitative and qualitative analysis. When defining research design to an audience, there are a few things you will need to make clear, while avoiding the use of scientific terms that may lose your audience. (http://www.ehow.com/how_7402461_define-research-design.html#ixzz2PxJij9iy)

The case study research design is also useful for testing whether scientific theories and models actually work in the real world. You may come out with a great computer model for describing how the ecosystem of a rock pool works but it is only by trying it out on a real life pool that you can see if it is a realistic simulation.

The researcher decided to use case study design strategy in conducting this study because it will assist to measure the performance and the capacity of the city council as well as the private sectors responsible with waste collection. The Wieviorka (1992) commends the use of case studies in similar situation where by in his book he noted that, “the use of a case design gives an opportunity to relate fact and concept, reality and hypothesis. Both structured and unstructured interview on the subjectwill be used with the aim of understanding facts as people’s view.

### 3.3 Study Area

Data for this study were collected fromTemeke municipal Council in Dar es Salaam region. Dar es Salaam region was chosen because it is the largest city in the country with highest population and produces the largest quantities of solid waste. Temeke district is among three districts of Dar es Salaam region, it was chosen for the study because the researcher lives in the district hence data collection will be convenient.

### 3.4 Study Population

Preece (1994) defines study population as a group of individuals or items that share one or more characteristics from which data can be gathered.Study population is divided into three categories namely senior officer at Temeke municipal, private waste collectors and citizens. Temeke Municipal Council is involved because it is responsible for waste

management and it is the one forming policies and bylaws on waste management within Temeke district. Private waste collectors are invoved because they are directly involved in waste collection and transportation. The ordinary Temeke residents are involved in the study because they live in the study area and they experience waste management challenges in their daily life.

## 3.5 Sample Size and Sampling Technique

The following are the sample size and the sampling technique which were used.

### 3.5.1 Sample Size

Sample size refers to the number of items to be selected from the universe to constitute a sample. The size of the sample should neither extremely large nor too small, it should be optimum (Preece, 1994). In this study a total of 42 people participated in the study. One senior officer from Temeke Municipal council, one official from private waste collection company and 40 ordinary citizens from Temeke residential areas

Sample size determination is the act of choosing the number of respondents to represent a selected population being studied (Emmel, 2013). As indicated on table 3.1 above, the reseacrher for this study involved a total of 42 respondents. Based on the argument by Webster (1985) a reseeacher may select sample size because of the convinience to carry out the study. In this case, the 42 size is chosen because of time and resource limitation.

The table below gives a summary of sample, sample size and sampling technique

**Table 3.1 : Sample Size and Sampling Technique**

| **Type of sample** | **Sample size** | **Reasons of selection** | ***Sampling technique** |
|---|---|---|---|
| Senior officer from Temeke city council responsible for solid waste management | 1 officer | An officer responsible for waste management is selected because of the position roles | Selected by convenience |
| Representative from private waste collection companynamed MP Environment | 1 officer | Temeke district is seved by one company involved in solid waste collection | Selected by convenience |
| Temeke community members | 40 community members | There are many ordinary residents in Temeke district. The researcher time limitation will allow a sample of 40 respondents | The researcher used accidental technique where any person who were willing to take interviewed were be involved |
| **Total** | **42** | | |

Source: Researcher's Own Construct

### 3.5.2 Sampling Technique

White (2002) sampling technique refers to the technique or procedures the researcher would adopt in selecting some sampling units from which inferences about the population is drawn.

One senior officer from Temeke municipal council was selected because the position is the one responsible for solid waste management. In this case it was selected because of its convenience reason. Grimshaw (2010) explain that one representative of a population can be selected because of its convinient position in a situation.

One senior officer from private contractor was involved because there are only one private collector in Temeke district. The senior officer selected because the position is the one responsible for solid waste management in the Temeke municipal. In this case it was selected because of its convenience reason. Grimshaw(2010) explain that one representative of a population can be selected because of its convinient position in a situation.

In the case of ordinary citizens, there are many people in Temeke distric, the resecher used accidental technique to collect the data from community members from the street. In this case, the researcher applied an accidental technique. Accordning to Grimshaw (2010) accidental technique is where the researcher involves any person that come across in a given location such as on a street.

## 3.6 Types of Data to be Collected

### 3.6.1 Primary Data

Data that has been collected from first-hand-experience is known as primary data. Primary data has not been published yet and is more reliable, authentic and objective. Primary data has not been changed or altered by human beings; therefore its validity is greater than secondary data.

### 3.6.2 Secondary Data

Data collected from a source that has already been published in any form is called as secondary data. The review of literature in this research is based on secondary data. Mostly from books, journals and periodicals

Both methods of collecting data were applied for the study.

## 3.7 Data Collection Tools

Questionnaires were used by the researcher to the various sample group established for the study.

### 3.7.1 Questionnaire

A questionnaire is a means of eliciting the feelings, beliefs, experiences, perceptions, or attitudes of some sample of individuals. Questionnaires contained questions that were formulated from specific objectives of the study. The one municipal official and the one officer from private waste management company were given questionnaires to fill in by themselves. This is because they were in their respective offices and some questions had data or reference requirement. This required time and space. The researcher left the questionnaires for some time and collected them back after they have done. But the questionnaires for the 40 ordinary citizens were filled in by the researcher. This is because of the accidental technique used in involving the ordinary citizens which does not offer reasonable contact with the respondent.

## 3.8 Validity and Reliability of the Data

### 3.8.1 Reliability of the Data

Neuman (2003) defines reliability of the data is the extent to which data are consistent over time and an accurate representation of the total population. Cozby, (2001). Reliability is the degree to which an assessment tool produces stable and consistent results. In order to collect reliable data questionnaire were used to collect data. Statement

from questionnaires was used as reference to ensure reliability where necessary table and narrative modelwere used to present the results processed.

### 3.8.2 Validity of the Data

Neuman (2003) defines validity of the data is the ability of data collected in measuring what it is intended to measure. Cronbach(1971). Validity refers to how well a test measures what it is purported to measure. In order to assure reliability and validity of data, the researcher triangulated some information to check accuracy. Before data analysis, the researcher checked all information on questionnaires. Information related to quantities were cross checked with other sources such as existing reports.

## 3.9 Data Analysis

According to Grimshaw (2010) data analysis refers to the computation of certain measure along with searching for patens of relationship that exist among data group.The study used quantitative techniques to analyze the data collected. To carry out the research successfully the findings from the questioners were analyzed, tabulated, and then interpreted. Tables and charts are more useful when it comes to quantitative information. Further explanations are provided to analyze information on these tables and charts. Some of the data were summarized by using description and analyzed by using percentage. A descriptive analysis was done by transforming the raw data into understandable form to facilitate the interpretation of the data.

# CHAPTER FOUR

# PRESENTATION OF RESEARCH FINDINGS

## 4.1 Introduction

This study attempted to analyse solid waste management prosess the case study Temeke municipal council. In chapter four presentantion cover all questionnaire filled by respondents which were officers and community members and the discussion of the findings.

## 4.2 Respondents' Characteristics

### 4.2.1 Community Members Residence:

The community members who participated in the study were asked to indicate the area they lived. They were asked to indicate whether they live in residential or commercial areas. The results were indicated on the table 4.1below:

**Table 4.1 : Community Members Place of Residence**

| **Place** | Frequency (N) | Precentage ( %) |
|---|---|---|
| Resdential | 23 | 57.5% |
| Commercial | 17 | 42.5% |
| Total | 40 | 100% |

Source: research data

Data presented on the Table 4.1 above indicates that a total of 23 community members out of 40 who participated in this study (equal to 57.5 per cent) are living in residential areas. Those who are living in commercial areas were 17 (equal to 42.5 per cent). It indicates that the community members who live in residential area were 23 members which is more than the community members who live in commercial area chich is 17 members as indicated on table 4.1 above.

### 4.2.2 Comunity members Residence streets

The community members who partricipated in the study were asked to indicate where they live by mentioning their respective streets. The results as indicated on the table 4.2 below:

**Table 4.2 : Community Members' Residencial Streets**

| Street | Frequency (N) | Percentage (%) |
|---|---|---|
| Mbagala | 13 | 32.5% |
| Temeke | 15 | 37.5% |
| Tandika | 12 | 30% |
| Total | 40 | 100% |

Source: Research data

Data presented on table 4.2 above shows that 13 community members out of 40 who participated in the study live in Mbagala street. This is (equal to 32.5 per cent). Those who live in Temeke street were 15 (equal to 37.5 per cent). Residents from Tandika who participated in the study were 12 (equal to 30 per cent). It indicates that the community members who live at Temeke were 15 members more than two streets Mbagala and Tandika which shows 13 community members who live Mbagala and 12 members who live Tandika.

### 4.2.3 Community Members Level of Education

Responents who participated in the study were asked to indicate their level of education.

The result wereas shown on thetable 4.3 below.

**Table 4.3 : Community Members Level of Education**

| Level of Education | Frequency (N) | Percentage (%) |
|---|---|---|
| Primary education | 20 | 50% |
| Secondary education | 9 | 22.5% |
| Collage | 7 | 17.5% |
| Non of the above | 4 | 10%% |
| Total | 40 | 100% |

Source: Research dat

The data presented on the table 4.3 above shows that a total of 20 community members who participated in the study (equal to 50 per cent) completed primary education. Those who completed secondary education were 9 (equal to 22.5 per cent) and those who completed college education were 7 (equal to 17.5 per cent) and total of 4 members (equal to 10 per cent) not completed any of primary, secondary or college education. It indicates that 90% of community members who participated in this study were educated and only 10% were not educated. But primary education were 50%, were so many compared with the colleges were 17.5 and secondary education were 22.5%.

### 4.2.4 Community Members Age

Community members who pertcipated this study were asked to indicate their age. They were given three options from which to select a group that represent their age. The result were as presented on the table 4.4 below.

**Table 4.4 : Community Members'Age**

| Ages in years | Frequency (N) | Percentage % |
|---|---|---|
| 18 and 35 | 25 | 62.5% |
| 36 and 45 | 13 | 32.5% |
| 46 and 55 | 2 | 5% |
| More than 55 | 0 | 0% |
| Total | 40 | 100% |

Source: Research data

The data presented on the table 4.4 above shows that 25 community members who participated in this study (equal to 62.5 per cent) were age between 18 and 35 years. Those who age between 36 and 45 years were 13 (equal to 32.5 per cent). A total of 2 community members (equal to 5 per cent) indicated that they are age between 46 and 55 years. There was no community member who participated in the study aged obove 55

years. It indicates that the community members who participated in this study were under 55 years. And community members who have the age between 18 and 35 were 62.5% there most frequency than age between 36 and 45 chich shows 32.5% and age between 46 and 55 were 5%.

### 4.2.5 Officers from Temeke Municipal Council

There was one official from Temeke Minicipal Council who participated in the study. He was a male aged between 46 and 55 years of age. He is working in the Municipal Council as a Dumpsite Officer with nine years of service in the same position and the level of education was collage..

### 4.2.6 Officer from Private Contractor

Currently there is one private contractor working on solid waste management in Temeke Municipal Council. The company is called M.P Environment. The study involved one representative from M.P Environment. The representative was a male person aged between 18 and 35 years. He is a Manager living in Temeke street and the level of education was college

## 4.3 Views from Community members

### 4.3.1 Solid Waste Collection

The community members who participated in this study were asked about solid waste collection in their residential areas. were asked frequency in which they through solid waste at the collection point. The table 4.5 below shows the results.

**Table 4.5 : Community Members' Use of Solid Waste Collection Point**

| Period | Frequency (N) | Percentage (%) |
|---|---|---|
| Regular (more than once per week) | 20 | 50% |
| Avarage ( at least once within one week) | 9 | 22.5% |
| Rerely (at least once in the month) | 11 | 27.5% |
| | 40 | 100% |

Source: Research data

The data presented on the table 4.5 above indicated that 20 out of 40 community members (equal to 50 per cent) who participated in this study indicated that they use solid waste collection point more than once a week. A total of 9 community members who participated in the study (equal to 22.5 per cent) reported that they use solid waste collection points to throw solid waste once a week. Those respondents who reported they rarely use the collection points were 11 (equal to 27.5 per cent) of all respondents. The data indicates that the contractor was good because the members who says more than once a week were 50% , but the system used need more support or follow up because there were 27.5% members who says at least in one month.

### 4.3.2 Duration of Accessing Solid Waste Collection Service

The community members who participated in this study were asked to indicate the length of time they have been accessing solid waste collection service provided by the private contractor. The table 4.6 below shows the results.

**Table 4.6 : Duration of Accessing Solid Waste Collection Service**

| Month | Frequency (N) | Percentage (%) |
|---|---|---|
| Between 0 and 3 Month | 3 | 7.5% |
| Between 3 to 6 Month | 25 | 62.5% |
| Between 6 to 2 years | 11 | 27.5% |
| More than 2 years | 1 | 2.5 |
| Total | 40 | 100% |

Source: Research data

Data presented on the table 4.6 above shows that a total of 3 community members (equal to 7.5 per cent) who participated in the study have been accessing solid waste collection services provided by private contractor within the last three months. Those who reported to have accessed solid waste collection services by the private contractor within 3 to 6 months were 25 (equal to 62.5 per cent). And 11 community members (equal to 27.5 per cent) who participated in the study said that they had access to solid wate collection service by private contractor in 6 months to 2 years while 1 respondent has been accessing the private contractor for more than 2 years. It indicates that the community members who participated in this study and accessing the duration of solid waste collection was between 3 to 6 month were 62.5% and 2.5% were the community members who shows more than 2 years which were too few.

### 4.3.3 Community Members'Opinion about the Quality of the Private Contractor's Service

The community members who participated in this study asked their opinion on how the quality of service provided by the solid waste collection private contractor. The 4.7 table below shows the result.

**Table 4.7 : Community Members'Opinion about Quality of Private Contractors' Service**

| Opinion | Frequency (N) | Percentage (%) |
|---|---|---|
| Excellent (staff well equipped,friendly staff, timely services) | 2 | 5% |
| Average (staff not well equipped,friendly staff, timely service) | 16 | 40% |
| Need improvement (staff not well equipped unfriendly staff, never on time) | 22 | 55% |
| **Total** | 40 | 100% |

Source: Research data

**Note**: Staff well equipped meaning they have proper garbage truck or trolls, put and gloves, ware nose masks, gum- boots and provide garbage bags.

The data presented on the table 4.7 above shows 2 community members out of 40 who participated in the study (equal to 5 per cent) reported that the solid waste collection services provided by the private contractor is excellent. 16 community members who participated in the study (equal to 40 per cent) reported the private contractors' services were average. And 22 community members who oparticipated in the study (equal to 55 per cent) reported that solid waste collection service provided by the private contractor needs improvement. It indicates that the community members who reported the private contractor need improvement were 55% but there were the community members who says the contractor was excellent which were 5% equql to 2 community members.

### 4.3.4 Changes in the Qality of Services Provided by Private Contractor

The community members who participated in this study were asked if they have noteced any positive changes towards improvement of the quality of service provided by the private sector from the time they started to access the services. The table 4.8 below shows the results:

**Table 4.8 : Changes in the Qality of Services Provided by Private Contractor**

| The quqlityof private sector | Frequency ( N) | Percentage (%) |
|---|---|---|
| Noticed the changes in the quality of solid waste collection by private contractor | 17 | 42.5% |
| Not noticed any changes in the quality of solid waste collection by private contractor | 23 | 57.5% |
| **Total** | 40 | 100% |

Source: Research data

The data presented on the table 4.8 above shows that 17out of 40 community members who participated in this study (equal to 42.5 per cent) have noticed some changes in the quality of service provided by the private contractor since they have started to access the services. Those who said they have not seen any change in the quality of solid waste collection services by private contractor since they started to access the services were 23out of 40 (equal to 57.5 per cent). It indicates that although 23 of community members reported to not noticed the changes in private contractors there were 17 community members who reported notesed the changes in the quality of solid waste collection by private contractor. So private contractor need to be impoved in some areas.

### 4.3.5 Community Members Awareness Importance of Waste Collection and Disposal

The community members who participated in this study were asked if they were aware of the importance of solid waste collection and disposal. The table 4.9 below shows the results:

**Table 4.9 : Community Members Awareness on Solid Waste Collection and Disposal**

| Awareness | Frequency (N) | Percentage (%) |
|---|---|---|
| Aware of the importance of solid waste collection and disposal | 26 | 65% |
| Not aware of the importance of solid waste collection and disposal | 14 | 35% |
| Total | 40 | 100% |

Source: Research data

Data presented on the table 4.9 above shows that a total of 26 out of 40 community members who participated in the study indicated that they are aware of the importance of the solid waste collection and disposal. This is (equal to 65 per cent). 14 community members out of 40 who participated in this study (equal to 35 per cent) reported that they

not aware of the importance of solid waste collection and disposal. lt indicates that majority of community members were aware of the importance of solid waste collection and disposal which were 65%, but there were the 35% community members who reported they were not aware of the importance of solid waste collection and disposal.

### 4.3.6 Community Members' View on Privatecontractor's Service Standard

Community members who participated in this study were asked to give their views on the level of standard of solid waste collection and disposal services by the private contractor. The table 4.10 below shows the results.

**Table 4.10 : Community Members' View on Private contractor's Service Standard**

| Standard of the contractor's Services | Frequency ( N) | Percentage (%) |
|---|---|---|
| Private contractor meets good standard | 1 | 2.5% |
| Private contractors does not meet the standards | 39 | 97.5% |
| Total | 40 | 100% |

Source: Research data

The data presented on table 4.10 above shows that only 1 community member out of 40 who participated in this study (equal to 2.5 per cent) reported that the private contractor meets the required standards in solid waste collection and disposal. The 39 community members who participated in this study (equal to 97.5 per cent) reported that the private contractor does not meet the required standard in solid waste collection and disposal.

It indicates that respondents who said does not meet the required standard were 97.5% which shows the private contractor they delays rules and regulation of collection of solid waste that is why they not meet the standard.2.5% of community members equal to 1 member reported private contractor meets the standard.

### 4.3.7 Private Contractor's Areas for Improvement

The community members who participated in this study were asked to indicated areas in which the private contractor should improve. The table 4.11 below shows the results.

**Table 4 11 : Private Contractor's Areas for Improvement**

| Contribution of the community members | Frequency (N) | Percentage (%) |
|---|---|---|
| Proper solid waste collection trucks | 7 | 17.5% |
| Equipment improvement | 10 | 25% |
| Regular schedule for solid waste collection | 21 | 52.5% |
| No suggestion | 2 | 5% |
| Total | 40 | 100% |

Source: Research data

Data presented on table 4.11 above show that 7 out of 40 community members who participated in this study (equal to 17.5 per cent) suggest that the private contractor should have proper solid waste collection trucks. 10 community members who participated in the study (equal to 25 per cent) suggested that the private contacrtor should have a regular schedule for collection of solid waste. A total of 21 members of the community who participated in the study (equal to 52.5 per cent) suggested that the private contractor should have a regular schedule for solid waste collection and 2 community members who participated in the study (equal to 5 per cent) had no opinion.

It indicates the majority of community members who participated in this study shows private contractor who collected the solid waste were collected at regular entervals which shows 52.5% . But there were 5% of the community members who reported no suggestion, 17.5% community members reported the private contractor need to improve in proper solid waste collection trucks and 25% of community members reported the

private contractor need to improve equipment used in collection of solid waste and disposal.

### 4.3.8 General Views about the Quality of Solid Waste Collection and Disposal

Community members who participated in this study were asked to give their general views about the quality of solid waste collection and disposal service provided by the private contractor. Table 4.12 below shows the results.

**Table 4.12 : General Views about the Quality of Solid Waste Collection and Disposal**

| Community members' views | Frequency (N) | Percentage (%) |
|---|---|---|
| Good services | 3 | 7.5% |
| Poor services | 15 | 37.5 |
| Modarate quality of services | 22 | 55% |
| Total | 40 | 100% |

Source: Research data

Data presented on table 4.12 above shows that 3 out of 40 community members who participated in this study (equal to 7.5 per cent) reported that solid waste collection and disposal service provided by the private contractor is generally good. 22 community members out of 40 who participated in this study (equal to 55.5 per cent) indicating they see that solid waste collection and disposal service provided by the private contractor is generally poor. And 15 community members out of 40 who participated in this study indicated moderate (equal to 37.5% ). It indicates that the solid waste collection and disposal service provided by the private contractor were generally moderate table 4.12 shows 55.5% of community members reported moderate quality of service. But there were 3 members who participated in this study which is equal to 7,5% reported good service and 15 members reported private contractor provide poor services.

## 4.4 Private Contractors' Views

This section presents the views of the private contactor who is responsible for solid waste collection and disposal in Temeke Municipal Council. The private contractor was presented by one official in thi study.

### 4.4.1 Solid Waste Collection and Disposal Equipment and Tools

Private contractor's representative who participated in the study was asked about working equipment provided to employees who collets and dispose the solid waste. The representative of this study he pointed out that the employees are given necessary equipment for their job. He mentioned some working tools provided by the private contractor were: hand gloves, nose masks and gumboots used to protect the employees during solid waste collection. He reported that solid waste are collected through large metal drums or plastic containers placed on streets. These containers are designed and intended for collection of solid waste around the city. The containers are put along road sides in the streets. They are placed free-standing and some are supported by stands fixed on the ground. When they are full, the containers are lifted up to the solid waste collection vehicles mainly trucks and transported to dumping sites which are located outside Temeke district. It indicates that the Temeke Distric have the system of putting the large metal drums on streets for their resident who live near by to use for putting the waste.

### 4.4.2 Frequency of Solid Waste Collection and Disposal

Representative from the solid waste collection and disposal from private contractors' company who participated in this study was asked about the frequency of solid waste collection and disposal in Temeke Municipal.

The data reported that the private company collected and disposed solid waste once a week in each small collection points, and collected daily in main collection points because there were larger amount of solid waste. But he added that waste were generated daily in all areas within Temeke Municipal. Some people do not use the dumping equipment such as drums appropriately. They through the waste outside the drums. This makes collection more difficult and time consuming. It indicates that the frequency of collecting the solid waste not eficency because there were huge solid waste in Temeke Distric, so they need more trucks to collect the waste propely in orde to satisfy their residential.

### 4.4.3 Contractor's Capacity to Collect and Dispose Solid Waste

The officer who participated in this study from the private contractor was asked if the Company have the capacities to perform the solid waste collection. The officer participated in this study reported that, the company has necessary equipment in cluding trucks, gumboots and nose mask to manage the amount of solid waste generated in Temeke Municipal. He added some streets difficult to complete all the solid waste because time spent on the road from collection points to dumping sites. Traffic jum and diststsnce from the source. It indicates that the place for disposing solid waste or dumping site were very far from the collection point so need special road for the waste collection truck.

### 4.4.4 Support from Municipal Council to Private Contractor

Representative from the private contractor who participated in this study was asked if the private contractor receives support from Temek Municipal Council. The officer participated in this study reported that the municipal council provides support in terms of

creating awareness to the community. The awereness enables community members to understand the importance of proper solid waste collection and disposal. He also added that this type of support  part of agreement with the municipal. It indicates that the Temeke Municipal Cuncil were fulfilled their duties and responsibility to their agent and to the community

### 4.4.5 Efficiency of Temeke Municipal Council in Solid Waste Management

The officer from private contractor who participated in this study was asked about his views on the efficiency of Temeke Municipal Council in management of solid waste. The officer who participated in this study reported that, Temeke Municipal Council's system of solid waste management is efficient. The Temeke council is also supportive and provides needed information and guidelines on time. It indicates the Temeke Municipal have good relationship with  private contractor because the officer reported Temeke Municipal Council system of solid waste management were efficient.

### 4.4.6 Acceptanceof Solid Waste Collection Work

The officer from private contractor who participated in the study was asked express his views on the level of community acceptance of solid waste collection services.  The officer reported that the community members accepts the solid waste collection services but they are not satisfied with the services. This is because the solid waste collection are not collected adequately in most of the time. It indicates that the trucks used to collect waste and the equipments used were not good and not enough to satisfy the resident of the Temeke Municipal Council

### 4.4.7 Monitoring of Solid Waste Collection and Disposal by Municipal

The officer of private contractor who participated in this study was asked about Temeke Municipal Council monitoring of solid waste collection and disposal. Representative from the private contractor reported that Temeke Municipal Council has a monitoring plan for solid waste collection and disposal activities, officers from the Municipal visits on weekly basis. It indicating that the Temeke Municipal gave good support to the private contractor by doing the mornitoring in weekely basis.

### 4.4.8 Capacity Building for Private Contractor's Employees

The officer of private contractor who participated in this study was asked about whether the company builds capacity of its employees. The officer from the private contractor who participated in the study reported that there were no capcity building training provided to employees. It indicates that there were no capacity building training to private contractor workers for solid waste collection which is not good to any company.

## 4.5 Views from Temeke Municipal Council

The purpose of this part is to present the findings from Temeke Mincipal Council about solid waste management and disposal. The study involved one official from Temeke Municipal Council responsible for solid waste collection and disposal.

### 4.5.1 The Number of Private Contractors in Temeke Municipal

The officer from Temeke Municipal who participated in this study was asked how many contractor do they have in their Municipal. The officer from Temeke Municipal Council who participated in this study indicated that there are only one private contractor engaged in solid waste collection and disposal. It indicates that one contractor given the task to collect and dispose solid waste in the whole district of Temeke.

### 4.5.2 Private Contractor's Capacity

The officer from Temeke Muncipal Council who participated in this study was asked about the capacity of the private contractor in solid waste collection and disposal. The officer from Temeke Municipal who participated in this study reported that the private contractor who provides solid waste collection and disposal service has the necessary equipment used in solid waste collection and disposal.

The contractor has trucks, loading equipment and employees to carry out solid waste collection and disposal activities. But the private contractor they have no private space for landfills. The contractor uses public landfills. The trucks used are normal trucks but they are not designed specifically for transporting solid waste. In most cases, solid waste fell off as the trucks moves. Further more, some streets are not saved by solid waste collection due to expanding residential areas. These streets are saved by unofficial individuals who go house to house to collect solid waste at a small fee paid directly by households. Indicates that the Temeke distric were unplanned settlement which cause the collection of solid waste to be very difficult.

### 4.5.3 Municipal's Monitoring System

The officer from the Temeke Municipal who perticipated in this study was asked if they have appropriate monitoring system. The officer from temeke Municipal repoted that they have monitoring system to private contractor to ensure that private contractors are carrying out their work to the satisfactory level. The officer participated in this study from Municipal reported that the Municipal Council monitoring of solid waste collection and disposal initially were on weekly basis. But the Municipal Council now days were done in daily basis. It indicates the mornitoring done by Temeke Municipal were in daily basis.

### 4.5.4 Regulatory Framework Governing Private Contractors

The offier from Temeke Municipal who participated in this study was asked if they have any appropriate regulatory (by laws and procedures) for solid waste management. Officer from Temeke Municipal Council who participated in the study reported, the Muncipal has appropriate regulatory framework for private contractors who were engaged in solid waste collection and disposal. He also added that general solid waste collection and disposal also governed by by-lawys developed according the needs and are supposed to be followed by any person or organization who collects and dispose solid waste. It Indicates that Temeke Municipal Council have appropriate regulatory framework for private contractor, and also have bylaws developed according the needs of the residential.

### 4.5.5 Law Enforcement

An officer from Temeke Muncipal Council who participated in the study was asked if enforcement of the law efficient on solid waste collection and disposal. The officer repoted that all laws and regulations are enforced in order to maintain good level of quality on solid waste management and leave the city clean. Indicates that the Temeke Municipal fulfilling their duties and responsibility, the officer reported the enforcement of the law were efficient.

### 4.5.6 Capacity Building for Private Contractors

The officer from Temeke Municipal who participated in this study was asked if there were any training program to build capacity of the private contractor, such as arranging campaign to create awareness among the public and training of the staff. The officer from Temeke Municipal Council reported that the Municipal has capacity building plan for private contractor of solid waste and disposal. The capacity building plan includes

various on site training on solid waste management and awareness creation to the members of the public about solid waste collection and disposal. It indicates that Temeke Municipal Council have the plan of training program to build the private contractor capacity such as arranging campaigns to create awareness of among the public and training of staff.

### 4.6. Discussion of the Findings

The discussion of findings based on the specific objectives of the study. As a point of reference, specific objectives of the study were as follows:

i. To study the whole process used by Temeke Municipal Council in solid waste management
ii. To analyse sustainability of the current solid waste management system implemented by Temeke Municipality
iii. To examine the capacity of Temeke Municipal Council in solid waste management
iv. To explore the level of awareness of the society about the importance of solid waste management.

#### 4.6.1 Process Used in Solid Waste Management

Based on the information from an official from Temeke Municipal Council and an official from the private contractor who participated in the study it shows that solid waste is collected through large metal drums or plastic containers placed on streets. These containers are designed and intended for collection of solid waste around Temeke Municipal. They are used to dump solid waste from households or from offices or from industries. This process is in line with Beall (2009) who reported that the main disposal

methods applied by most municipal solid waste systems in Asia includes collection from containers placd in streets and transported to open dumping sites and sanitary landfill.

The municipal councils is responsible for solid waste collection and disposal. But it engages the private sector to support in collection and disposal. The municipal remain with the role of setting up policies, bylaws and guidelines. It also responsible for the supervisory role in solid waste management in general.

The private sector once hired takes the role of solid waste collection and disposal. They collect the solid waste from containers and transport them to dumping sites. Trucks are used in transporting the solid waste. Equipments that are used on solid waste collection include gloves, boots, brooms and wheel barrows. Private waste collectors agreed that some containers are very heavy and it requires a lot of human labor or machinery to lift them up to the truck to empty.

One of the challenges reported by city and private collectors is the strange behavior of city residents who do not use available containers to throw waste materials. They just throw waste materials next to the containers provided instead of putting them inside the containers. Where waste is dumped next to containers or dust bins, it takes more time and labor to collect and put the waste back to dust bins before the bins are lifted and empties on containers.

Another challenge is the high production of solid waste by the citizens. The city and private collectors said that the citizens produce a lot of solid waste daily. Most goods used by the citizens are those less durable. When goods are not durable, it forces people to buy new goods more frequently for consumption. Most of ordinary Dar es Salaam

residents cannot afford durable goods. Less durable goods are always cheap but they result in producing solid waste.

Data provided by the city council officials revealed that solid waste generated in Temeke district is about 1,300 tons in a day. But the present solid waste management system is capable to collect 400 to 700 tons a day. This amount of collected solid waste is equivalent to about 30 to 54 percent only. This means over 40 per cent of solid waste remain uncollected daily and are not properly disposed off.

JICA (2004) presents a situation of solid waste managemnt in Nepal. In Nepal, at least each individual person generates about 0.34 kilogram of waste a day. This means the total waste generation in Nepal in 2003 with an urban population of 3.5 million became 1,369 tons/day or approximately 0.5 million tons/year. But the municipal was able to collect about about 600 tons/day.

On the other hand, the citizens said that the system of using dust bins is not managed well. This is because collection schedules are not well planned. In most places schedules for emptying and transporting waste collected on bins is not observed. As a result the bins are always full and piles of solid waste is found overflowing and scattered. Crawling insects and flies are common in streets where shows of solid waste is not removed. Residents also reported bad smell in streets and fear of spread of outbreak diseases like cholela.

Another problem that was reported by the citizens is low quality of collection containers. These containers are not standardized and at some point they are small and are filled up too quickly. In residential areas, nor municipal councils or private waste collectors

provide containers or garbage bags for solid waste storage. It is up to the citizens themselves at individual households to designate particular sort of containers for this purpose. More often you will find plastic bags full of solid waste left on streets waiting for collection.

In discussing the problem of solid waste collection containers, Mungai (1998) suggests that it is important for households to have corrosion-resistant containers. The containers must have lids. The lids need to be closed when containers are full and facilitates handling of containers. When containers are lifted up, solid waste will not fall off. This will save time and protects the health of laborers.

Private solid waste collectors said that they have an average of 40 to 50 employees. Ninety five per cent of these employees are casual laborers. They are involved in collection of solid waste in streets, lifting solid waste containers or dust bins and empty them on trucks. They move with trucks and off load solid waste and dump at dump sites.

Private solid waste collectors admitted that they do not have proper trucks designed for solid waste collection. Temeke residents who were interviewed said that the trucks used to transport solid waste are open. They are not covered to prevent solid waste from spilling off trucks. When trucks containing solid waste pass on a street, it leaves behind piles of solid waste falling from behind. When it rains, rain water mix with solid water and run through down the truck and make roads dirty.

Ndimo (1998) report that most of the developed countries have well organized collection systems. Collection bins are provided in curb to collect solid waste. Different colored collection bins are placed in curbs for different types of waste materials.These collection

bins are also provided for recyclables such as glass, cans, plastic bottles etc. Communities carry waste and put in these containers. These recyclables are later removed and used for recycling industries, Curbside collection. System is efficient in many developed countries. Wastes are carried out from house and are placed in curb with different colored bins. These wastes are later picked by collection vehicles. These vehicles are single compartmented and multi-compartmented to collect recyclables separately.

### 4.6.2 Sustainability of Solid Waste Management System

Temeke Municipal council provides daily supportive supervision. This is part of monitoring of solid waste collection and disposal activities. Monitoring assures that the standards and applicable bylaws are observed. It was also seen that Temeke Municipal Council has capacity building plans to support the private contractor to maintain quality standards.

Temeke district residents and business owners are the primary groups that generate solid waste. The municipal council conducts public awareness that helps members of the public to be aware and understand issues related to solid waste management. This fact is also supported by Ishengoma (2003) who say that members of the public are the main producers of solid waste. They need to be educated on proper handling of solid waste and be willing to contribute user fees for solid waste collection.

The main challenge to sustain solid waste collection remain to be unplanned settlements. Temeke municipal official said that at least more than 65 per cent of the district population lives in squatter areas which are not planned. It is difficult for the solid waste

trucks to reach these settlements. Roads are very narrow and most of the streets have no roads.

### 4.6.3 Capacity of Temeke Municipal Council in Solid Waste Management

Evidence from the study shows that Temeke Municipal Council has engaged one private contractor to collect and dispose solid waste in Temeke district.There are many streets in Temeke district but the an official from the Municipal Council said that one private contractor is capable of collecting and dispose solid waste.

The Municipal contributes towards solid waste management through bylaws, policies and guidelines. daily supportive supervision by Municipal staff contributes towards proper handling of solid waste in the district. But on the other hand, it was also seen that at least 40 per cent of solid waste generated daily is not properly disposed off because of reasons some of which are beyond control. The reasons include traffic jam and lack of passable roads in some streets in Temeke district.

Giroult (2005) also explain that an optimum solid waste management requires improvements to technical systems in all levels that are involved in waste management. This includes improving ways of collection, containers or vehicle specifications, dumping sites or innovative recycling. Specific guidelines and methods are needed to support implementation of solid waste management plans. Such improvements will contribute towards building capacity of local government to manage solid waste management operations.

### 4.6.4 Community Awareness on the Importance of Solid Waste Management

The study showed that there are efforts by Temeke Municipal Council to create community awareness on the importance of proper solid waste management in general. This was said by both the private company engaged in solid waste collection and disposal and the Temeke Municipal. The community members who participated in the study confirmed that they are aware of the importance of proper management of solid waste management which includes collection and disposal.

When the community members are aware of the importance of solid waste collection and disposal it means that it is a good step towards improvement of solid waste and disposal system. Referring to a scholar Mwangi (2003), the community members will be able to participate in keeping the environment clean and educated or influence others to support solid waste collection and disposal. On the other hand, the private contractor engaged in solid waste collection and disposal reported that although the community is aware of the importance of propoer solid waste collection and disposal, some of them throw solid waste outside the dust bins making the waste scattered around the collection points.

# CHAPTER FIVE

# SUMMARY,CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

This section presents summary conclusions of the study based on the objectives of the study. The section also presents the study recommendations drawn from the study findings.

## 5.2 Summary of the Main Findings

The aim of the study was to analyze solid waste management process in Temeke Municipal Council in the city of Dar es salaam. Specifically the whole process used by Temeke Municipal Council in solid waste management and Temeke Municipal Council used as a case study . Data were collected by the way of questionnaire circulated to the 42 respondents with response of 100% .

The study found that based on the information from officer of Temmeke Municipal Council and an officer from private contractor who participated in this study the citizens produce a lot of solid waste so most goods used by the citizens are those less durable ,so it leads to buy new goods more frequency for consuption.

The data shows the solid waste generated in Temeke District is about 1,300 tons in a day. And the solid wast management capable to collect only 4oo to 700 tons a day which is equivalent to 30 to 54 percent. On the other hand the study shows that the collectors of the solid waste they don’t have proper trucks designed for solid waste collection. Temeke

residents who were enterviewed said that the trucks used to transport solid waste are not coverd well which leads to spread the waste in the street.

## 5.3 Implications of the Findings

The study implication towards private contractors'managers who collect and dispose of the solid waste. Temeke distric has a lot of streets and have more population compared to the other districs in Dar es salaam, so they have to improve their equipment and add more employees in order to make municipal clean.

The findings also has implication to Temeke Municipal Council that they must know that the Temeke distric has unplanned senntlement and their people live in squatter areas the roads are narrow and most of street are not have road so they need to add more the street collector who collect and be paid by the household.

Municipals must support Solid Waste Management through moritoring and make bylaws, policies and guidelines in order to sartisfy their community who live and doing the business at Temeke distric.

## 5.4 Conclusions

The Temeke Municipal Councils as a government arm is responsible for solid waste collection and disposal. But it engages the private sector to support in collection and disposal as part of Public Private Partnership in providing social services to the community. The municipal remain with the role of setting up policies, bylaws, guidelines, providing education and awareness to the community in relation to solid

waste collection and disposal. It also responsible for allocating dumping sites and the supervisory and monitoring role in solid waste management in general.

There are selected collection points where members of the community throw solid waste from households or from commericial areas. A contractor from the private sector plays the role of actual solid waste collection and disposal. They collect the solid waste from public collection points and transport them to dumping sites. Trucks are used in transporting the solid waste. Equipments that are used in solid waste collection include gloves, boots, brooms and wheel barrows. Private waste collectors agreed that some containers are very heavy and it requires a lot of human labor or machinery to lift them up to the truck to empty.

Based on the findings from the study, it is concluded that Temeke Municipal Council is not capable to collect and dispose all solid waste generated on daily basis in Temeke district. That's why they hired private contractor, the Municipal is able to collect and dispose 60 per cent of solid waste generated daily. The remaining 40 per cent is not collected and is not disposed. Findings from the study revealed that the community is aware on the importance of solid waste management which include collection and disposal. The awereness is created by Temeke Municipal Council through public meetings and through education and communication materials.

## 5.5 Recommendations

In relation to the findings outlined in this research and the interpretation of the infromation obtained, the following recommendations are proposed:

i. Temeke Municipal Council should consider to engage more than one private Contractor in order to manage collection and disposal of solid waste generated daily in Temeke district
ii. Awereness on solid waste collection and disposal should be supplemented by penalties to those who violet the bylaws set by Municipal Council
iii. Temeke Municipal Council should engage a private contractor who has higher level of capacity including having appropriate vehicles for solid waste collection and disposal.

## 5.6 Limitations of the Study

The limitation of the study were: some of the respondents were not give good cooperation during the collection of primary data, the cost of stationary used in the research are too high. The other limitation are private company are not need their workers to get futher education because they fear to pay huge salary. For such limitation I will going to advise the community members to coopatate with all official researcher because they need to help them after completing their researches, and for the private company need to be advised because others they do not know the if to employ the professional is more profitable than un professional.

## 5.7 Sugested Areas for Futher Study

From the findings of this study I recommended that futher studies should be undertaked in the following area.

i. As the problem of awereness on solid waste collection and disposal observed should be supplemented by penalties to those who violet the bylaws set by

Municipal Council, there is a need to conduct study to determine if these bylaws seted by Municipal are well knowned and observed.

ii. As the Temeke Municipal Council observed to have a problem of a private contractor who has higher level of capacity including having appropriate vehicles for solid waste collection and disposal, there is a need to conduct study to determine how many contractors needed in Temeke Distric in oder to improve the solid waste collection and disposal.

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# APPENDICES

**Questionnaire 1: community**

The purpose of this part of the questionnaire is to give you a chance to tell how you feel about your solid waste / garbage collection service as provided the private contractor. As you satisfied or not satisfied with the service provided. Read each statement carefully: decide how satisfied you feel about the aspect of your service described by the statement, keeping the statement in mind.

1 Please indicate the types of community:

Residential ……

Commercial……

2 Please indicate the street:

Mbagala……

Temeke.....

Tandika……..

3 Please indicate your level of Education

Primary school

Secondary school

Collage

Non of the above

4 Please indicate Age between years

18 and 35

35 and 45

45 and 55

5 Please indicate the period of time you use the service of the solid waste collection.

Regular (more than once per week) ……..

Average (at least once within one week …….

Rarely (at least once in the month) ……..

6 Please indicate length of time that you have been using the service provided by private contractor.

Between 0 and 3 Month……..

More than 3 Month but less than 6 Month…….

More than 6 Month but less than 2 years ……..

Over 2 years ……..

7 In your opinion , how is the quality of service by the private contractor? Please tick the level of satisfaction as per below explaination:

Excellent (staff well equipped ,friendly staff, timely services) ……..……

Average (staff not well equipped ,friendly staff , timely service): ……..……..

Need improvement (staff not well equipped , unfriendly staff, never on time) …….……..

Note: Staff well equipped meaning they have proper garbage truck or trolls, put hand gloves, ware nose masks, gum- boots and provide garbage bags.

8 If you have been using the service for more than 2 years , have you noticed any changes in the quality of service by the private sector? Please explain either answer:

……

……

9 Are you aware of the importance of solid waste collection and disposal?

Yes ……

No ……

10 Ifyou answered “question No 6, please indicate how you come to know about the collection and disposal of solid waste?

11 Does the private contractor meet the service delivery standard?

Yes, they are meet the standards ……..

No they are not meeting the standard ……...

12 In your views, what are the three areas of improvement by the Private contractor?

……

……

……

13 What is your general view about the quality of service provided in your area?.....

……...……

……...……

**Questionnaire 2: Senior Officials at the private contractors Offices.**

The purpose of this part of questionnaire is to give you a chance to tell how you feel about your current solid waste collection duty

1 Please indicate your position below

Position……..

2 Please indicate the street:

Mbagala……

Temeke.....

Tandika……..

3 Please indicate your years of service with the contractor.

Years of service ……..

4 Please indicate your Gender

Male

Female

5 Please indicate your level of Education

Primary school

Secondary school

Collage

Non of the above

6 Please indicate Age between years

18 and 35

35 and 45

45 and 55

7 Do you provide the waste collectors with necessary tools and equipment's (hand gloves, nose masks gumboots) required for the solid waste collection and disposal?

Yes ……

No ……

8 If the answer Yes, kindly indicate the various equipment here below

…….

……..

…….

…….

9 How often do you collect the solid wastes from the house holds/business in a week?

Frequently……

Once…….

Twice…….

Other …….

10 Do you have the capacities to perform the solid waste collection like vehicles, equipment, landfills for the efficient collection and disposal of waste?

Yes…….

No…….

11 If the answer is "Yes' in the above question Kindly elaborate what capacities you posses……

……

12 Does Dar es salaam city council support your organization in terms of creating awareness to the community you serve on the importance of waste

collection?.....

.....

.....

13 In your view, is solid waste management system by the council efficient?

Yes ……..

No ……

14 Is the solid waste collection task accepted and embraced by the community you serve?

Yes ……..

No …….

15 Are there regular monitoring from the city council? Please indicate the frequeny:

Yes……..

No ……..

Frequency:……

Monthly…….

Quarterly…….

Yearly……

Never……..

Other please indicate ……

16 Do workers receive capacity building training on solid waste collection?

Yes…….

No…….

17 On average what percentage of the workers within the organization has attended various capacity building training within the last 2 years?

Indicate percentage ……

**Questionnaire 3: Temeke Municipal council**

The purpose of this part of the questionnaire is to give you chance to tell how you feel about your current solid waste management process, what challenges you are facing in your council that hinder your organization to meet set goals and objectives on solid waste management.

1 Please indicate your position here below

Position

2 Please indicate your years of service with the city council

Years of service

3 Please indicate your Gender

Male ……

Female ……

4 How many private contractors are there for the solid waste collection in the city?

Kinondoni ……

Ilala……..

Temeke……

5 Do the private contractors have the resources / infrastructures like landfills, equipment and proper trucks for the efficient collection and disposal of solid waste?

Yes ……..

No…….

6 Do you have an appropriate monitoring system to ensure that the private contractors are carrying out their work to the satisfactory level

Yes …….

No……..

7 What is the frequency of measuring your private contractor's performance with your monitoring system?

Monthly ……

Quarterly……

Yearly……..

Never……

Others (please indicate)……..

8 Do you have any appropriate regulatory framework (by laws and procedures ) for solid waste management.

Yes ……..

No…….

9 Is the enforcement of the law efficient?

Yes …….

No……..

10 Do you have any training programs to build the private contractors capacity such as arranging campaigns to create awareness among the public and training of staff?

Yes …….

No…….

If you answered yes to the above question. Kindly elaborate

……

……

……

……