THE EFFECTIVENESS OF COMMUNITY APPROACH IN SOLID WASTE MANAGEMENT AT HOUSEHOLD AND STREET LEVEL IN TANZANIA
A CASE OF MBEYA CITY COUNCIL

By

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A Dissertation Submitted to the Institute of Development Studies in Partial Fulfillment of the Requirements for the Award of the Master of Science Degree in Environmental Management (MSc. EM) of Mzumbe University.

2013

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled **The Effectiveness of Community Approach in Solid Waste Management at Household and Street level. A Case of Mbeya City Council** in partial fulfillment of the requirements for award of the Degree of Master of Science in Environmental Management (MSc. EM) of Mzumbe University.

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DIRECTOR, INSTITUTE OF DEVELOPMENT STUDIES

DECLARATION

I, **Josephine Ferdinand Nguge**, declare that this dissertation is my own original work and that it has not been presented to any other university in a similar or any other degree award.

Signature ……..

Date……

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DEDICATION

This work is dedicated to my dearest husband David, my son Johnson, sister Flora and my mother Lucy who were with me through prayers throughout the study period.

ABBREVIATIONS

ADB	African Development Bank
CBO	Community Based Organization
CEE	Centre for Environment
DSM	Dar Es Salaam
EGSSAA	Environmental Guidelines for Small-Scale Activities in Africa
IWM	Integrated Waste Management
M&E	Monitoring and Evaluation
MCIP	Mbeya City Investment Profile
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
NBS	National Bureau of Statistics
NEP	National Environmental Policy
NGOs	Non-governmental Organizations
Rs	Rupees
SW	Solid Waste
SWM	Solid Waste Managemet
TNAO	Tanzania National Audit Office
TNUP	Tanzania National Urban Profile

Tsh	Tanzanian shilling
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Social and Cultural Organization
US $	United States Dollar
WB	World Bank

ABSTRACT

This study was conducted in Mbeya City Council to examine the effectiveness of the community approach in solid waste management at household and street levels. It aimed to identify the roles played by the community in the management of solid waste, the impact of the community involvement in the management of solid waste, factors affecting community participation in the management of solid waste and stakeholders' views in improvement of the solid waste management.

The study adopted a case study design, targeting the household and street levels in Mbeya City Council. A sample size of 65 respondents was drawn using purposive and systematic random sampling techniques. Questionnaires, interviews and observation were used to collect primary data while documentary review method was used to collect secondary data. Data collected were analyzed by using the Statistical Package for Social Sciences (SPSS) and Excel software and presented in tables, figures, and text.

The findings revealed that the community approach in solid waste management at household and street level in Mbeya City Council is partially effective in consideration of Ghana, Mwakibete and Igawilo wards where 80 percent of the respondents are participating in collecting solid waste in waste bins at household level and then send them to the communal container (collection points) ready to be collected to the dump site, it is less effective at street level where only 20 percent of the respondents were paying for solid waste collection fee thus accumulation of solid waste at collection points. This has contributed to poor service provision on solid waste management by the city council.

The study recommended that, education should continue to be given to the community so that they will understand the benefit to be obtained when solid wastes are well managed; urban local authorities should make faster decisions in involving community based organizations (CBOs) and private investors to help them in the solid waste provision services. Also enforce the existing bylaws so that everyone who generated waste has to manage them by having containers at their locality for collecting the solid waste and pay waste collection fee at street level thus reduced load to the city and ensure effective management at household and street level.

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CHAPTER ONE

INTRODUCTION OF THE STUDY

1.1 Overview

This chapter serves as the general introduction, highlighting the issues of solid waste management in Tanzania. It is divided into eight sections including an overview, background of the problem, statement of the problem, research questions, research objectives, significance of the study, the scope of the study and limitation of the study.

1.2 Background of the Study

It is considered that, nearly half of the world's population (47 percent) lives in urban areas, a figure which is expected to grow by 2 per cent per year by 2000–2015 (UNPD, 2001). The concentration of people, their consumption patterns, travel behavior, and their urban economic activities have a large impact on the environment in terms of resource consumption and waste discharges. These have lead into environmental problems such as air pollution, soil pollution and water pollution in many parts of developing countries and create a great challenge for them. This is especially witnessed in the section of solid waste management in different countries of the region.

According to the World Bank (2007), high income developed countries with an approximation of 1.0 billion people produce an urban solid waste of approximately 1.4 million tons per day while middle income developing countries with approximately 3.3 billion people and low income developed countries with estimated 2.4 billion people produce 2.4 million tons per day and 1.4 million tons per day of urban solid waste respectively.

While the quantity of waste produced in cities continues to increase daily, the effectiveness of the means of handling waste in terms of collection and disposal in developing countries remains low. The evidence of this has been given by the World

Bank (2007) which asserts that, middle income developing country collection of urban waste is 60 percent while its safe disposal is 30 percent and in low income developing countries the collection is 40 percent and safe disposal is 5 percent. Taking Egypt as an example, we are informed that approximately 10 to 15 million tons of solid wastes are generated annually, Cairo alone contributes more than 3 million tons. Waste collection and transportation efficiency ranges between 15 percent and 65 percent. Approximately one third of solid waste is not collected.

In Nairobi Solid waste generation ranged from 800 to 1000 tons. The daily disposal capacity of the Nairobi City Council (the municipality), which is in charge of waste collection, is about 400 tons. Waste collected by the municipality on a regular basis amounts to one third and periodic collection deals with the remaining two thirds of the waste. Approximately 70 percent to 80 percent of solid waste remains uncollected (ADB, 2002).

Traditionally, solid waste management in Tanzania has been dealt with public health regulation which includes a joint command and control approach. In particular, human existence is dependent on the use of material resources which finally produces wastes. These wastes then are grouped into two parts normally soft and solid wastes. Increase in population and expansion of towns has increases production of solid wastes. Since the year 2000, Tanzania has experienced rapid expansion of cities which have been accompanied with an increase in economic activities and populations. The major towns are DSM, Arusha, Mwanza and Mbeya, these town cities have adverse activities such as social activities like education, health, trade and business activities such as hotels and manufacturing activities. All of these have jointly produced more solid wastes (Liyala, 2011).

As in other cities of East Africa, solid waste management in Tanzania has been highly centralized, using special department which collects wastes using special trucks from the collection points to the dump sites. Yet due to increase in the amount of solid wastes produced, more efforts have been done to decentralize and more

involvement of both private and community in the issues of solid waste management. These wastes have diverse sources such as households, commercial areas, industrial activities, hospitals etc. It is noted that the rural area where the poor lives are experiencing higher rates of poor solid waste management due inadequate knowledge and negligence by town health officials who involved in collections of solid wastes.

In Tanzania, it has been estimated that only 20-30 percent of the urban solid waste generated is collected and deposited off (Chinamo, 2003). The evidence is shown by Mungure (2008), who pointed out that the average waste collection percentages in Dar Es Salaam and Arusha are observed to be below 50 percent. The uncollected solid waste are said to accumulate in various places such as in the house compound or open spaces, on streets thrown in ditches. This show that there is lots of waste that remain scattered in the cities without being collected, the evidence for this is the increasing dumping sites and abandoned waste deposit along city streets and open places in residential areas. The piling up of uncollected solid wastes (as shown in figure 1.1) later becomes a breeding ground for disease carrying organisms leading to the outbreak of diseases like cholera and typhoid, also the emission of greenhouse gases and other air pollutants which affect the environment such as, soil can be contaminated with toxic compounds, waste can pollute surface water and ground water through produced leachate.

Figure 1.1: Overflowing of Solid Waste from the storage container. The picture was taken in Mwanjelwa, Mbeya along Tunduma road

Source: Field Survey, (2013)

The capacity of the government especially local governments to manage wastes proved a failure and that is why the community approach was introduced. This is the approach or a process which mobilizes the people in the community in self help and organizing effort towards problem solving and establishing opportunities for development (Espaldon and Baltazar, 2004 as cited in Atienza 2008). Education is given to community members concerning solid waste management so that they will understand why they should be involved in the process and the benefit of involving themselves in solid waste management.

Tanzania Local Government Act (Urban Authorities) No. 8 of 1982 required the Local Government Authorities to conduct solid waste management services in their local authorities and allowed them to charge the community the solid waste fees.

This act has given the councils the mandate to outsource these services of collection and solid waste fees (TNAO, 2009).

With all efforts, solid wastes are found scattered and most of it remaining uncollected for a long period hence posing environmental and health risks to the public. In 2000 Mbeya City Council introduced the community approach so as to help them in the management of solid wastes (Mbeya City Council, 2013). Solid waste management at household and street levels as per my study means handling of solid waste at source by separating them, store it in bins or bags and then collect them to the required place for final collection to the dump sites by the city authorities.

1.3 Statement of the Problem

Mbeya city is one of the rapid expanding city in Tanzania which is also experiencing huge production of solid waste The city adopted community approach in 2000, since then the community has been involved in the management of solid waste by understanding their responsibility of disposing waste in bins that are later send at agreed point at which they can be collected easily as well as participate through cost sharing as per ones generating waste which assists the city council/municipal in covering the cost for waste collection at collection points.. But there is no study that has been conducted to evaluate the effectiveness of the approach in solid waste management at household and street levels in Mbeya City Council. This study aimed at filling the gap by evaluating the effectiveness of the community approach in solid waste management at household and street levels in Mbeya City Council.

1.4 Objective of the Study

1.4.1 Overall Objective

The overall objective of this study was to examine the effectiveness of community approach in solid waste management at household and street levels in Mbeya City Council.

1.4.2 Specific Objectives

The study was guided by the following specific objectives:

i. To identify the role played by the community in the management of solid waste at household and street levels in Mbeya City Council.
ii. To reveal the impact of community involvement in the management of solid waste at household and street levels in Mbeya City Council.
iii. To identify the factors that affect community participation in the management of solid waste at household and street levels in Mbeya City Council.
iv. To gather stakeholders views on improvement of solid waste management at household and street levels in Mbeya City Council.

1.5 Research Questions

i. What roles played by the community in the management of solid waste at household and street levels in Mbeya City Council?
ii. What are the impacts of the community involvement in the management of solid waste at household and street levels in Mbeya City Council?
iii. What are the factors affecting community participation in the management of solid waste at household and street levels in Mbeya City Council?
iv. What are the stakeholders' views on improvement of solid waste management at household and street levels in Mbeya City Council?

1.6 Significance of the Study

The findings of this study are beneficial to Mbeya City Council, since they provide useful information for development of the alternative solutions for the community to participate fully in solid waste management. Moreover, the study will serve as a reference to future researchers doing research which relates to this problem. Lastly, the study as well will help the researcher to fulfill the requirement for the degree of Master of Science in Environmental Management at Mzumbe University.

1.7 Scope of the Study

The scope of this study was limited to Mbeya municipality and more specific to Ng'osi street (Mwakibete ward), Mbata street (Ghana ward) and Chemchem street (Igawilo ward). The study focused on how effective the community approach is in the management of solid waste at household and street levels. Specifically, this study wanted to know what roles played by the community, the impact of community involvement, factors affecting community participation and what are the views of stakeholders on improvement of solid waste management in the household and street levels in the Mbeya City Council.

1.8 Limitation of the Study

Though the study accomplished, there were some limitations. Some of the respondents did not want to provide the information needed by the researcher worrying that they will be reported to government officials. This necessitated the researcher to use extra efforts in sensitizing them and omitting naming of respondents in a questionnaire. The researcher had financial incapacity, in order to meet the requirements needed she tried to reduce other costs by using a motorcycle for transportation instead of a taxi.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides the theoretical, and an empirical literature review related to the problem area. It also presents the conceptual framework of the study, whereby, the researcher assembled set of research concepts cum variables together with their logical relationships in the form of a diagram (Ndunguru, 2007). In the theoretical part, basic terminology such as community, community approach, solid waste, and solid waste management explained. Theories related to the study including waste categorization, waste hierarchy, solid waste management, community environmental education and actor oriented approach were briefly described. The part also went far to find the literature which talks about the economics of solid waste as well as the importance of using integrated solid waste management framework.

The empirical part provides reviewed literature on the role of environmental education in community participation, the impact of community involvement in solid waste management in other countries and the impact of community involvement in solid waste management in Tanzania.

2.2 Theoretical Literature Review

This part consists of four sections, which includes conceptualization of terms, theories guiding the study, solid waste management, and concept of institution and capacity building.

2.2.1 Conceptualization of Terms

For the purpose of this study, the researcher decided to explain the meaning of four basic terms in order to enhance the understanding of the concepts used in this study. The terms are; community, community approach, solid waste and solid waste management**.**

2.2.1.1 Community

Different author has defined the term community in different perspectives as follows, Hoffman and Muller (2001) defined the term **'community'** as the whole population of a city; a section of the city; or an ethnic or social group within the city. The term community has also referred to a group of people or households living in a settlement or part of it, who share common problems and responsibilities in addressing matters concerning their own lives and development (UNDP, 1997 cited in Kaluwani, 2009).

This study used the term community in the limited part of the city council which is at the household and street levels only.

2.2.1.2 Community Approach

Community approach refers to an approach or process which mobilizes people in the community in self help and organizing effort towards problem solving and establishing opportunities for development (Espaldon and Baltazar, 2004 cited in Atienza, 2008). It involves community participation which concerned with the engagement of individuals and communities in decisions about things that affects their lives. This means that communities are playing an active part and have a significant degree of power and influence (Burns et al, 2004).

2.2.1.3 Solid Waste

Clairvair (2006) refers solid waste as a refusing (resources that are to be discarded that are perceived as useless). It includes refuse from households, non-hazardous solid waste from industries, commercial and institutional establishments (including hospitals), market wastes, yard waste and street sweeping (Schubuler, 1996).

Therefore, in this study solid waste will be defined based on the kind of solid waste of household and street.

2.2.1.4 Solid Waste Management

Solis Waste Management can be defined as a systematic administration of activities that provided for the source separation, storage, collection, transportation, transfer, processing, treatment, and disposal of solid wastes (Claivair, 2006).

For the purpose of my study solid waste management has based on the storage, and collection of solid waste at household and street levels.

2.2.2 Theories Guiding the Study

In this section five theories related to this study were reviewed. These theories are; waste hierarchy, solid waste management, environmental education, and actor oriented approach.

2.2.2.1 Waste Hierarchy Theory

The concept of the waste hierarchy is the basis for waste minimization strategies and refers to the 3Rs which are reducing, reuse and recycle. According to (Baud et al, 2004 cited in Gugssa, 2012) a more environmentally friendly and sustainable solid waste management strategies emphasizes on activities in relation to reduction, reuse and recycling.

Reduction is aimed at reducing the amount of waste produced by adopting or optimizing the production process of manufacturers and industries. As a result, natural resources will be saved. Reuse does not involve reprocessing or transforming from one type of material into another. Rather reuse occurs when one material served its original purpose and reused for another purpose rather than being thrown away. Recycling, is all about transforming, or reprocessing of materials that served the original function into new products. Otherwise, those products that served the original function will be considered as waste. Recycling also involves organic materials for the production of compost (Zhu et al, 2007)

Figure 2.1: Hierarchy of Solid Waste Management

Source: ADB, (2002)

The solid waste management hierarchy (see figure 2.1), categorizes solid waste management strategies depending upon their ability to minimize wastes as reduce, reuse and recycling. The concept promotes the collaboration between waste generators, collectors, processors, and manufacturers, and reduces the amount of waste that is disposed. As a result, the amount of environmental deterioration will be reduced, emissions from landfills will be minimized, and natural resources and energy will be saved (Zhu et al, 2007).

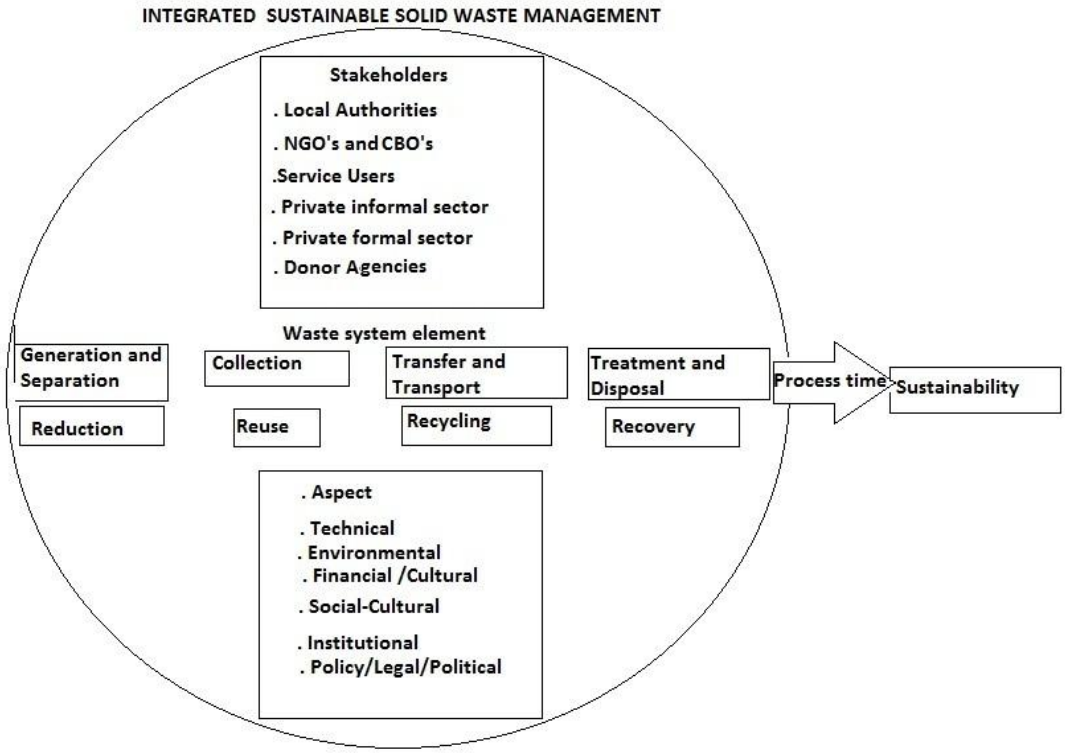
The government and the private sector are responsible for the minimization of wastes by reducing the amount of inputs resources used in production and consumption and recycling to make these inputs more efficient. Both the reuse and recycling of solid wastes can be carried out in the primary and secondary level. The primary level includes all the activities within the household, firms and an institution on the other hand the secondary level includes the materials that have entered the waste stream. At this point the extent of the source separation is an important aspects that determines the level where the recycling and reuse activities are carried out (Baud et al, 2004 cited in Gugssa, 2012).

2.2.2.2 Solid Waste Management (SWM) Theory

SWM has been identified as a priority area to be addressed as part of the sustainable development plan. Comprehensive SWM systems are being developed with an overall goal of pollution prevention and control and maximization of the waste as a resource (Claivair, 2006). Now SWM is considered as a major public health and environmental concern in urban areas of many developing countries. The situation in Africa is particularly in the capital cities is severe. The public sector in many countries is unable to deliver services effectively, regulation of the private sector is limited, and illegal dumping of domestic and industrial waste is common practice. In general SWM is given a very low priority in these countries. As a result, very limited funds are provided to the SWM sector by the governments and the levels of services required for protections of public health and the environment are not attained. The problem is most acute at the local government level where the local taxation system is adequately developed and therefore, the financial basis for public services including solid waste management is weak (UNEP, 2005). Due to this SWM requires an integrated approach, and a number of African countries have been implementing integrated solid waste management (ISWM), which refer to the complementary use of a variety of practices to safety and effectively handling. It may include source reduction, recycling, composting, combustion, and land filling.

In order to understand solid waste management systems, I adopted the Integrated Solid Waste Management Framework (ISWM) developed by Muller and Hoffman, (2001). The model (see figure 2.2) shows that the effectiveness and sustainability of the urban solid waste management system depend on their adaptation to the prevailing content on the particular city in which the system operates. The four most important aspects of this model are political, socio-cultural, economic and environmental.

Figure 2.2 Integrated Solid Waste Management Framework



Source: Muller and Hoffman, (2001).

Political Aspects

The existing relationship between the urban local body and the state government, the form and extent of citizen's participation in the policy making, the role of party politics in local administration (example, policies regarding the degree of decentralization, private participation and community participation), all affect the character of management and the type of municipal solid waste management.

Socio – cultural Aspect

The functioning of urban SWM is also influenced by people's attitudes and the pattern of waste handling. This is especially true for low income residential communities. The effectiveness of waste management depends on people's identification with the responsibility of waste generation and different phases of

waste management, from collection to disposal. Community involvement is particularly important in waste disposal, whether on a small or large scale.

Economic Aspect

The level of economic development is an important determinant of the volume of waste generated. The effective demand for waste management services, the willingness, and the ability to pay for a particular level of service is also influenced by economic context of a particular city.

Environmental Aspect

The design of the urban SWM system must be adapted to the geophysical characteristics of the area, the interaction between the waste handling procedures and public health condition and also the health risk or the environmental condition likely to affect through collection, transportation, storage, treatment, and disposal.

Sasikumar and Krishna (2009) give out six reasons have been identified as to why communities are opting for an integrated system for SWM. They are as follows;

1. Multiple needs: Many new goals and varied needs demand that a single management method cannot successfully handle them example there is likely to be a mismatch between the time target for waste reduction and waste available and the quantum and characteristics of waste generated which require adoption of different technique of disposal and actual available facilities.
2. Efficiency and flexibility: An integrated SWM system allows a community to identify the most efficient method for handling each portion of the waste stream and also to shift from one method to another as conditions change.
3. Cost effectiveness: An integrated approach consider long term costs and thus helps the community to choose the urban SWM system that will cost the least over the long term example a community may choose to recycle a material even if its disposal is less costly.
4. Environmental integrity: Developing an integrated system increases the community opportunity recognizes the environmental benefits and risks associated with each management option.

5. Wiser scope: Developing a SWM system is not confined to technical aspects of designing facilities and programs. This approach may also deal with management issues such as how to pool financial and natural resources and how to pay for and administer the urban SWM system.
6. Local control: Developing an integrated system envisages responsibility of the community for monitoring and evaluating the system. This allows the community to take or make well thought out decisions rather pressure, thus maintaining control over the system.

2.2.2.3 Environmental Education Theory

Community based education is widely accepted as a room in social construction to form better community institutions and active participation in local initiatives. Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues" (Mull, 2005).

"It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow. Progress increasingly depends upon the products of educated minds: upon research, invention, innovation, and adaptation. Of course, educated minds and instincts are needed not only in laboratories and research institutes, but in every walk of life. Indeed, access to education is the sine qua non for effective participation in the life of the modern world at all levels. Education, to be certain, is not the whole answer to every problem. But education, in its broadest sense, must be a vital part of all efforts to imagine and create new relations among people and to foster greater respect for the needs of the environment" (UNESCO, 2001 cited in Kohlscheen, 2003).

Education can take many forms and the widespread idea that people get knowledge only at schools is a mistake. Learning is a continuous process that occurs during a person's lifetime. Simple things and action can sometimes teach valuable lessons. Various techniques can be used as a means of education: lectures, plays, flyers, news, songs, etc. But the education method itself will be ineffective if the target group is not taken into consideration. An example of a good education method used

ineffectively would be the distribution of pamphlets with written information to a group of illiterate people. Environmental education needs to be given to the community so that to let them understand the importance of managing their environment as well as the impact of improper management of the environment. Public awareness and understanding of the importance of waste management and its benefits are consequences of education and awareness raising campaigns. These campaigns are also responsible for more involvement and participation of the public.

2.2.2.4 Actor Oriented Approach

An actor oriented approach was developed in late 1906's by Normal Long and his colleagues at Wageningen Agricultural University (Gugssa, 2012). The approach is meant to analyze a situation where a number of actors interact and fought over resources use mostly in the development process.

Actor within social context should be understood as a result of a social construction rather than a simple mere representation of the individual. The different patterns of social organizations within every society are the results of the continuous interactions, negotiation, and social struggles among the different actors within the system. However, it is also important to take note of the different actors that might be absent from the face to face encounter but still influence the situation by affecting the actions and outcomes (Long, 2001).

Therefore, to understand social change there is the need to understand the role played by the internal and external factors and to recognize the significance of the role played by human action and consciousness. Social actors provide different responses to similar structural circumstances resulting in different patterns. Social actors should not be considered as disembodied social categories such as based on class and passive participants, processing information and standardized their dealings with other local actors and institutions (Long and Long, 1992 cited in Gugssa, 2012). Human agency is the central concept within the actor oriented approach. The notion of agency attributes to the individual actor capacity to process social experience and to devise ways of coping with life, even under the most extreme forms of coercion. Within the limits of information, uncertainty and the other constraints, social actors

are knowledgeable and capable. They attempt to solve problems, learn how to intervene in the flow of social events around them, and monitor continuously their own actions, observing how others react to their behavior and taking note of the various contingent circumstances (Long, 2001).

According to (Long and Long 1992 cited in Gugssa, 2012) agency is not simply a mere decision making capability rather than it is composed and result of social relations. Organizational capabilities depend on the emergence of network of actors involved in other person project. Furthermore, effective agency necessitates the strategic manipulations of specific items. This actor oriented perspective is a very relevant approach that involves analysis of the interplay of different stakeholders, the inherent power relations between them, the available options and constraints and therefore suits very well in my study of solid waste management

2.2.3 Solid Waste Management

Due to nature of the waste management arrangements in developed countries, municipal solid waste accounts for only a small percentage of the total solid waste in stream. This is due to the fact that developed countries use scientific methods in the management of solid waste example use of incinerators and recycling of the wastes (UN-HABITAT, 2010). In developing countries, the proportions of solid waste are considerably higher because safe and scientific disposal arrangements for various types of solid waste are not in place and waste from multiple sources is abandoned in municipal limits (Dhamija, 2006)

In 2000, Mbeya city council started to use a community approach in the management of solid waste as solid waste started to be a great problem in the city. The household as well as the business places were supposed to have the litter bins in their premises where they can collect the solid waste and then bring them to the collection points. Also, they have to inform their ward leader or solid waste manager about anyone littering the solid waste in the street. In the year 2011, Mbeya city council enacted the solid waste management bylaw where the each one who produce waste either at household or through his/her business should pay for solid waste collection fee

which will help the council in serving the city. Each household was supposed to pay 1000 per month, and for businesses the fee depends on the kind of the business itself. The minimum amount was 2000 and the maximum amount was 200,000.
The total collection of the fee is distributed as follows;
10 percent will go to a ward, 20 percent will go to sub wards and 70 percent go to the solid waste department in the council (Mbeya City Council, 2013).

Moreover, apart from the planning and implementation of the sound SWM systems it is the responsibility of waste managers to operate based on sustainable development goals. Management should be facilitated by the Monitoring and Evaluation (M&E) systems which would guide collective action on an on-going and periodic basis. SWM control has to address the likely impacts on air quality (odor and noise), solid ground water, marine environment and impacts on human safety and health. EGSSAA, (2009) put forward the impacts of improper SWM activities as follows;

i. Increase disease transmission or otherwise threatens public health.

Rotting of organic materials poses greater public health risks, because it serves as breeding grounds for disease vectors.
Waste handlers and waste pickers are especially vulnerable and may also become victors, contracting and transmitting diseases when human or animal excreta or medical waste stream.

ii. Contaminate ground and surface water.

MSW streams can bleed toxic materials and pathogenic organisms into the leachate of dumps and landfills. If the landfill is unlined, this runoff can contaminate ground or surface water, depending on the drainage system and the composition of the underlying soils.

iii. Create greenhouse gas emissions and other air pollutants.

When organic wastes are disposed of in deep dumps or landfills, they undergo anaerobic degradation and become significant sources of methane, a gas with 21 times the effects of carbon dioxide in trapping heat in the atmosphere.
Garbage is often burned in residential areas and in landfills to reduce volume and uncover metals. Burning creates thick smoke that contains carbon monoxide, soot

and nitrogen oxide, all of which are combustion of polyvinyl chlorides generates highly carcinogenic dioxins.

iv. Damage ecosystems.

When solid waste is dumped into rivers or streams it can alter aquatic habitats and harm native plants and animals. The higher nutrient contents in organic waste can deplete dissolved oxygen in water bodies, denying oxygen to fish or other aquatic life form. Solid can cause sedimentation and changes in stream flow and bottom habitat. Sitting dumps or landfills in sensitive ecosystems may destroy or significantly damage their valuable natural resources and the services they provide.

v. Discourages tourism and other business.

The unpleasant odor and unattractive appearance of piles of uncollected solid waste along streets and in fields, forests, and natural areas can discourage tourism and the establishment and/or maintenance of businesses.

2.2.3.1 Waste Categorization

Waste categorization is one of the features of waste management that require consideration. Waste can be classified into different categories based on different attributes including the physical state, original use, material type, physical properties, origin and safety level (McDongall et al, 2008 cited in Gugssa, 2012). This study will base on the solid waste as categorized in its physical state.

Uniyal, (2006) classified SW into various categories as given below;

a) Garbage: Decomposed waste from food, slaughter, houses, canning etc.

b) Rubbish: These are either combustible or non-combustible. Combustible wastes would include paper, wood, cloth, rubber, leather and garden wastes. Noncombustible wastes would include metal, glass, ceramics, stones, masonry and some chemicals.

c) Ashes: Residues of the combustion of solid fuels for heating and cooling or the incineration of SW of municipal, industrial and apartment house incinerators.

d) Dead animals: Households pets, birds, rodents, zoo animals etc. There are also anatomical and pathological wastes from hospitals.

e) Large wastes: Demolition and construction rubble (pipes, plumber, bricks, plastics, roofing insulating materials), automobiles, furniture, refrigerators other home appliances, tires, tires etc.

f) Sewage treatment process solids: Screening, settled solids, and slugs.

g) Industrial solid wastes: Chemicals, paints, sands, explosive etc.

h) Mining Wastes: Tailing, slag heaps, culm piles at coal mines.

i) Agricultural wastes: farm animal manure, crop residues etc.

2.2.3.2 Solid Waste Generation and Collection

Mbeya city council produces 232 turns of SW per day excluding the agricultural wastes. The SW produced due to agriculture activities is said to be 50 turns per day, which makes a total of 282 turns of SW per day. From 282 SW produced only 190 turns are collected per day which is about 82%, while the remaining 92 turns was discarded through incineration or land filling where by all the work are done by the council itself. The council fails to collect the SW in 100% due to breakdown of trucks due to old age, shortage of funds, limited trucks, inadequate awareness of the community as they think SWM is the responsibility of the council only ideas (Mbeya City Council, 2013).

Mbeya city council has 164 collection points situated in 27 wards where the solid waste collection service is done. There are 130 refuse bays and 34 skip buckets (Mbeya City Council, 2013). These collection points are situated in different areas such as bus stands, market places, open spaces and around institutions, but these collection points are few compared to the number of people present in an area. Table 4.6 shows how the respondents admit the presence of collection points in their wards, while table 4.7 indicated the number of wards present in the wards where the study was done.

Table 2.1 Number of Refuse bay/Skip buckets in Wards

Collection Points	Ghana Ward	Mwakibete Ward	Igawilo Ward
Refuse Bay	6	8	2
Skip Bucket	0	0	2

Source: Field Data, (2013)

2.2.3.3 Economics of Solid Waste

Urban economic activities depend on the availability of infrastructure and services example water, transport, electricity and solid waste services (Kyessi, 2002). However SW is a service and a resource. As a service, it is important in the process of production, in a filthy environment causes various diseases that affect humankind. In turn they affect the quality and quantity of human labor needed in productivity resulting in low output. Solid waste as a resource, contains re-usable materials which can be recovered directly from the waste by way of sorting or indirectly by recycling and other resource recovery ways (Kaseva, 1996). Thus both service and resource utility can be obtained from solid waste to meet social economic human needs.

Regular provision of solid waste services can improve both human life and recreation in the urban environment. It emphasizes the importance of solid waste services for human livelihood. Therefore, poor quality or inadequate levels of solid waste services can compel enterprises and residents to provide for the service on their own (Kyessi, 2002). Out of this necessity, solid waste service provision by different actors can stimulate a competitive market by investors (WB, 1994 cited in Kalumani, 2009).

The foregoing information prompts the need to search for effective means and systems for the provision of solid waste service particularly to the residents living in informal settlements in developing countries. However, as seen before, developing countries resource constrained governments failed to provide public social services. Moreover, the majority of the residents in informal settlements are too poor to afford paying for the user services. Kyessi (2002) argues that the incomes of the poor can be increased if better infrastructure services, involving solid waste ones, allow

household members to devote more time to income earning activities. Then, they can be able to afford paying for the user service charges. However, this presupposes the presence of solid waste service provision may lead to lower prices or affordable user service charges. This is possible, where appropriate regulatory mechanism prevails example proper quality and quantity of services provided to protect consumers and the investors (World Bank, 1994). When such conditions hold in a competitive market situation, they may lead to sustainable solid waste service provision, productivity, and community development in an urban settlement.

2.2.3.4 Community Participation in Municipal Solid Waste Management

Daniel et. al, (2004) provides the key reasons to why community participation is essential, these are;

- Active participation of the local residents is essential to improve democracy, and service accountability.
- It enhances social cohesion because communities recognize the value of working in partnership with each other and with statutory agencies.
- It enhances the effectiveness as communities understand knowledge, and experience essential to the regeneration process. Community definitions of needs, problems, and solutions are different from those put forward by service planners and providers.
- It enables policy to be relevant to local communities.
- It adds economic value both through the mobilization of voluntary contributions to deliver regeneration and through skill development which enhances the opportunities for employment and an increase in community wealth.
- It gives residents the opportunity to develop the skills and networks that are needed to address social exclusion.
- It promotes sustainability because community members have ownership of their communities and can develop the confidence and skills to sustain developments once the extra resources have gone.

According to (Malberg et al, 2001 cited in Tsiboe and Marbell (2001), there are two main rationales for participation namely, instrumental rationale and political

rationale. Under instrumental rationale, participation is seen as management and planning strategy as a means for making regulations more effective. With respect to participation as a political rationale, they wrote that it is a way of strengthening local and weak stakeholders who do not have any say in the planning process.

Experience has shown that popular participation and decentralization are the most effective instruments for local/grassroots governance (Eade, (1997 cited in Tsiboe and Marbell, 2004). This is because through participation, local commitment and involvement is guaranteed since the locals do not feel alienated. Participation has also a synergy with empowerment, the link between empowerment and participatory approach is that, as stated that the waste disposal problem in developing countries is garnered since it is often the women who are in charge of household maintenance Tsiboe and Marbell (2004). As such any talk of empowerment must reflect how to engage men as well in the waste management.

Groenewald and Smith (2003) have buttressed it the ultimate result of empowerment must be the release and transformation of the self- help skill of the community. They have argued further that through empowerment, human needs are addressed, problems solving skills are developed, people are mobilized to act collectively and according to mutual interest, last but not the least self awareness is created and internal potential within the community is developed (Groenewald and Smith, 2003: p. 38).

Municipal solid waste is defined to include refuse from households, non-hazardous solid waste from industrial, commercial, and institutional establishments (including hospitals), market waste, yard waste and street sweeping (Schubuler, 1996). Municipal solid waste management (MSWM) has also defined by Schubuler as the collection, transfer, treatment, recycling, resource recovery, and disposal of solid waste in urban areas. The three main purposes of the MSWM are to protect the health of the urban population, particularly that of low income groups who suffer most from poor waste management. It also aims to promote environmental conditions by controlling pollution (including water, air, soil, and cross media pollution) and ensuring the sustainability of ecosystems in the urban region.

Moreover, MSWM supports urban economic development by efficient use and conservation of valuable materials and resources. Lastly, MSWM aims to generate employment and incomes in the sector itself.

Municipal solid waste management is an essential public service which benefits all urban residents. It is not feasible to exclude from the service those who do not pay, because public cleanliness and the safe disposal of wastes are essential to public health and protection of the environment. As a result, solid waste management is a public good for which local or metropolitan governments are typically responsible but due to the fact that most municipalities in developing countries has low capacity to manage these solid wastes the role of the community and that of private sectors come into play (Hope, 1998). Due to this, community participation is the cornerstone of the management of the municipal solid waste, all stakeholders need to cooperate in order to ensure the solid waste in their municipality are managed. The government of Tanzania is also emphasizing community participation as a means to ensure environmental protection as stated in the fifth objective of the National Environmental Policy (NEP) (1997) "to raise public awareness and understanding of the essential linkages between environment and development, and to promote individual and community participation in environmental actions".

Moreover, environmental issues are best handled with the participation of all citizens at the relevant level. It is widely recognized that interventions which are likely to have positive impacts are those which enjoy the greatest support from the grassroots (NEP, 1997: p15) .Therefore, Solid Waste Management (SWM) is an activity in which public participation holds the key to success. An Urban local body can never be successful in SWM without active community participation. The solution is not in the hands of one stakeholder but depends on the interest and participation of all stakeholders.

NGO's can be helpful instruments in the process of public participation. They can help both, the people in the communities by increasing their capacity on playing an active role in local solid waste management, and the authorities by intermediating

discussions with community members. Schubeler, (1996) gave out some of the ways in which NGO's can actively participate in solid waste management, which are;

• Increase people's awareness of the waste-related problems (education).

• Stimulate or improve organizational capacity and the formation of community based organizations (CBO).

• NGO's can be a channel of communication between authorities and the CBO.

• Facilitate the access to credit funds.

• Support the informal sector of waste workers, assisting their organization, improving their working conditions, increase their earning Tanzania it is stated out that the major responsibilities of the government institutions and non-governmental organizations is to assist local communities become aware of their own situation and support them to become responsible for their own destiny. Local communities will participate if they are persuaded that it is right and necessary to do so; when they have sufficient incentive, and the required knowledge and skills (NEP, 1997: p 15)

It is also more important to consider the role of women, since they normally carry the main responsibility for household waste management. So, in order to achieve high participation in recycling or composting programs it is important to involve the women.

One could argue that due to limited education and specific knowledge about waste management issues among the general population, and specifically in low-income areas, it would be better not to involve them as early as during the planning phase. Instead, in these cases the engagement of community members could be encouraged in more practical activities, during the implementation phase. Activities such as the provision or management of the local waste collection services could involve people from the community, creating employment and a higher sense of ownership. Moreover, the most important aspect of public participation is to get each and every individual to cooperate in the daily waste management activities. These activities include waste separation, proper storage, and placement of household waste in containers, discipline in the use of public collection points, placement of waste bags in the collection points on the right day of collection, participation in composting

activities, etc. These aspects can be enhanced with the help of continuous education campaigns.

2.2.4 Concept of Institution and Capacity Building

In solid waste management the issue of institution and capacity building also need to be addressed. This part explained in details about these concepts.

2.2.4.1 Concept of Institution

The concept of institution is central to institutional theory. Institutional theory refers to the meaning of something that is well established or has been established for a long time and in place for many years (Johnson, 2009).

North (1993) has defined an institution as the rules of the game. It exhibits both a formal nature (constitutions, rules, regulations, laws, rights etc.) and an informal nature (sanctions, customs, mores, and traditions).

Also, Scott (2003) described the institution, as it consists of cognitive, normative, and regulative structures and activities that provide stability, and meaning to social behavior. He refers these as the Three Pillars of institutions.

- The regulative pillar refers to how institutions constrain and regulate behavior. Regulation is coercive through the application of rules, laws, and sanctions.
- The normative pillar refers to normative rules that place prescriptive, evaluative, and obligatory dimensions of social life. Normative pressures are applied through social obligation or belief by the organization that it will be viewed as acting inappropriately if it does not comply with these norms and thus it will not be considered legitimate.
- The cognitive pillar refers to the rules that constitute the nature of reality and the frames through which meaning is made. This refers to the idea that organizations should look and behave like similar types of organization.

The improvement of solid waste management requires promotion of an institutional framework that is transparent and has very well defined roles and responsibilities for the different actors. Authorities and service providers should be accountable to the public in accordance with principles for good governance.

Moreover, the professionalization of the solid waste management sector and its workers is essential to improve the provision of such an important service that affects the health, environment, and quality of life of urban populations.

Solid waste management is a responsibility of the local authorities. Municipalities are therefore responsible for the collection, sweeping, storage, transfer, treatment, and final disposal of waste. In many cases, however the provision of these services is not efficient and the providers are not accountable to the residents and business established they serve. Also, the solid waste management services come under municipal departments without expertise to handle them, such as public health departments (Zhu et al, 2007). This has also shown by Tanzania National Urban Profile that there is a general lack of awareness regarding environmental issues and resource mobilization on the part of local authorities (TNUP, 2009: p 23)

To improve the service, solid waste management needs to be professionalized, and solid waste departments should be managed by those trained to handle these systems. Local authorities need to understand how solid waste affects environment, health, and quality of life and to take appropriate actions toward improving the system.

Although in most cases the responsibility for solid waste management systems remains within the municipal government, specific tasks can be delegated to others, including the private sectors, nongovernmental organization, community based organization and even the informal sector. Also the link between environmental management and institutional coordination is of prime importance (TNUP, 2009: p 22).

2.2.4.2 Capacity Building

Capacity building has defined as a process pursued by individuals, organizations, and social systems to enhance their capabilities and performance in terms of their objectives, financial, human resources and environment at large (Vernis et al, 2006).

Also, according to the European commission, capacity building refers to develop and strengthen structures, institutions, and procedures that help to ensure: transparent and accountable governance in all public institutions, improve capacity to analyze, plan, formulate, and implement policies in the economic, social, environmental research and technology (WB, 2005).

World Bank went beyond to provide the key features of capacity building, which are;

I Enhanced capacity should be treated as a goal in its own right, not merely as a means for achieving other development objectives. The capacity building approach, emphasized that a root cause of poverty, illiteracy and ill-health was a lack of capacity in government to design and implement proper development strategies and in society to hold government accountable for its actions. Only if political and economic institutions functioned properly would develop achievements are scalable and sustainable. Therefore development success lay not merely in outcomes on the ground, but in outcomes on the ground that were the result of effective public and private institutions.

II The support for public sector capacity building needs to address three dimensions of public sector capacity;

- Human capacity: individuals with skills to analyze development needs, design and implement strategies, policies, and programs, deliver services and monitor results.
- Organizational capacity: groups of individuals bound by a common purpose, with clear objectives and the internal structures, processes, systems, staffing and other resources to achieve them.
- Institutional capacity: the formal “rules of the game” and informal norms- for example, in collecting taxes, reporting on the use of public resources or regulating

private business that provide the framework of goals and incentives within which organizations and people operates.

Most of the Tanzanian municipalities have a low capacity to manage the solid waste within their municipalities. The evidence is shown by Mungure (2008) in her study on governance and community participation in municipal solid waste which shows the capacity of Dar Es Salaam and Arusha to collect and transport municipal solid waste from the collection site to dumpsites is low compared to the waste generated due to old age trucks used as well as lack of regular services and maintenance because of insufficient sources of funds. So, Tanzanian municipalities need to overcome these problems through the increasing capacities such as attaining more trucks with high carrying capacity and the use of pushcarts in areas with unplanned settlements.

2.3 Empirical Literature Review

This part consists of three sections which includes the role of education in community participation, the impact of community involvement in SWM other countries and the impact of community involvement in SWM in Tanzania.

2.3.1 The Role of Education in Community Participation

Education and community participation play important roles in the waste management process. Education campaigns raise awareness among the community about the importance of a clean environment. The level of commitment to the ongoing waste management strategies in a certain area will certainly be increased if people are involved and their views and needs respected and addressed.

Visvanathan and Trankler (2003) in their study about municipal solid waste management in Asia found out that through the education given to the community, local NGO called Muskan Jyoti Samiti in Lucknow, India was formulated to help in solid waste management provision services. It serves a population of an over 100,000 in nearly 20,000 households which includes 20,000 person living in 22 of the 460 slums in Lucknow city. It also employs 235 people, including 215 garbage collectors

and rag pickers. It operates 250 handcarts and 5 tractor trolleys. By doing so community approach has been used effectively in Lucknow city resulted in improvement of solid waste management.

Mazinyo (2009: p 58-59) in his study concerning community participation in solid waste management in high density-low-income areas in Duncan South Africa, noted that 63 percent of the interviewed households were unaware of the presence of municipal persuasive instruments geared towards waste minimization and some respondents gave the evidence of the extent to which there is no community awareness about the importance of waste minimization and disposal due to dumping of waste outside erected collection points is a daily occurrence. But through environmental education some of the respondents made it clear that it had helped them become aware of the dangers associated with poor household waste management and they had gained valuable knowledge concerning the benefits associated with appropriate solid waste management.

2.3.2 Impact of community involvement in SWM in other countries

There are different studies conducted concerning the community involvement in the management of solid waste, because this study aimed at examining the effectiveness of the community approach in solid waste management, it is crucial to understand how community approach has been helpful in the management of solid waste in various countries.

According to the study about the Improving of Municipal Solid Waste Management in India (Chriss et. al, 2008).Overall changes were noted in different areas,

In Kannur , The center for environmental education (CEE) is working on a project focused on solid waste management in eight schools. The students are made aware of the prevailing waste scenario. Eco clubs are formed and the students conducted surveys of the waste generated in their schools, houses, and towns. They also observe the ways in which people contribute to waste generated by using products unwisely. On the basis of this information and their and their work with CEE, they formulate action plans to minimize waste. The students also engage in green games, activities

with strong environmental messages, community walks, clean up drives, street plays and natural wax.

Also an NGO mobilized 350 rag pickers for door to door waste collection. Each waste collector was allotted 125 houses, sixteen supervisors (one supervisor per 20 to 25 waste collectors) were also appointed at a fee of Rs 1 per households per month (Rs125 total). Because several households were involved, the amount for supervisor was substantial (Rs 125x20=Rs 2,5000). The rag pickers involved in door to door collection also earn extra income from the sale of recyclable materials that they collected. This has made has made the city to be clean and reduce the scattered solid waste in the city (SWM Learning program in India, 2006 cited in Chriss et al, 2008).

Clairvair (2006), in his study about public participation in solid waste management in small island in developing states indicated that in the Carribean, the private sector participation in SWM has been significant. In the Barbados, the private sector participation has been mainly in waste collection and transportation on to the disposal site as well as recycling. Apart for indoor and outdoor storage, some of communities facilitate the collection process by placing waste out at curbside for collection. Sorting at source is limited to returnable containers at household level and cardboard, plastics and glass by the commercial waste generators (supermarkets and business houses).
Primary plastics bottles are recycled as manufactured roofing materials. This has helped to improve management of special and hazardous waste and diminished littering and illegal dumping.

In Cairo, a partnership formed by local, national, and international actors has successfully transformed a community through the Zabbaleen Environment and Development Program. Since the program began in 1985, quality of life has improved in a formerly neglected community, thousands of jobs have been created as an improved municipal waste collection and recycling system have been implemented. At the intersection of poverty and the environment, the Zabbaleen

Environment and development program fashioned productive solutions example is production of paper and rugs from waste paper and clothing (ADB, 2002).

Also, there were negative impacts occurred in different countries due to improper solid waste management. Uncollected solid wastes, blocks the drain, and cause flooding and subsequent spread of water borne diseases. Example in Surat in India in 1994, which resulted in an outbreak of a plague like disease, affecting 1000 people and killed 56 (UN-HABITAT, 2010). Annual floods in East and West African and Indian cities are blamed at least in part on plastic bags blocking drains. UN-habitat data, show solid waste collection average for cities in low and middle income countries ranging from a low of 10 percent in peri-urban areas with a high of 90 percent or more in the commercial city center. This means that many households in many cities receive no services at all, with the result that too much waste ends up in the environment. Even in Europe and North America uncollected solid waste can still hit the headlines as in the year 2008, example of Naples, Italy where mountains of solid waste lined the streets for months, collectors stopped picking up the wastes because all the region's landfills were full and residents protested fiercely. The UN-habitat health data also show that rates of diarrhea and acute respiratory infections are significantly higher for children living in households where SW is dumped or burned in the yard, compared to households in the same cities that receive a regular waste collection service.

2.3.3 The General impact of community involvement in SWM in Tanzania

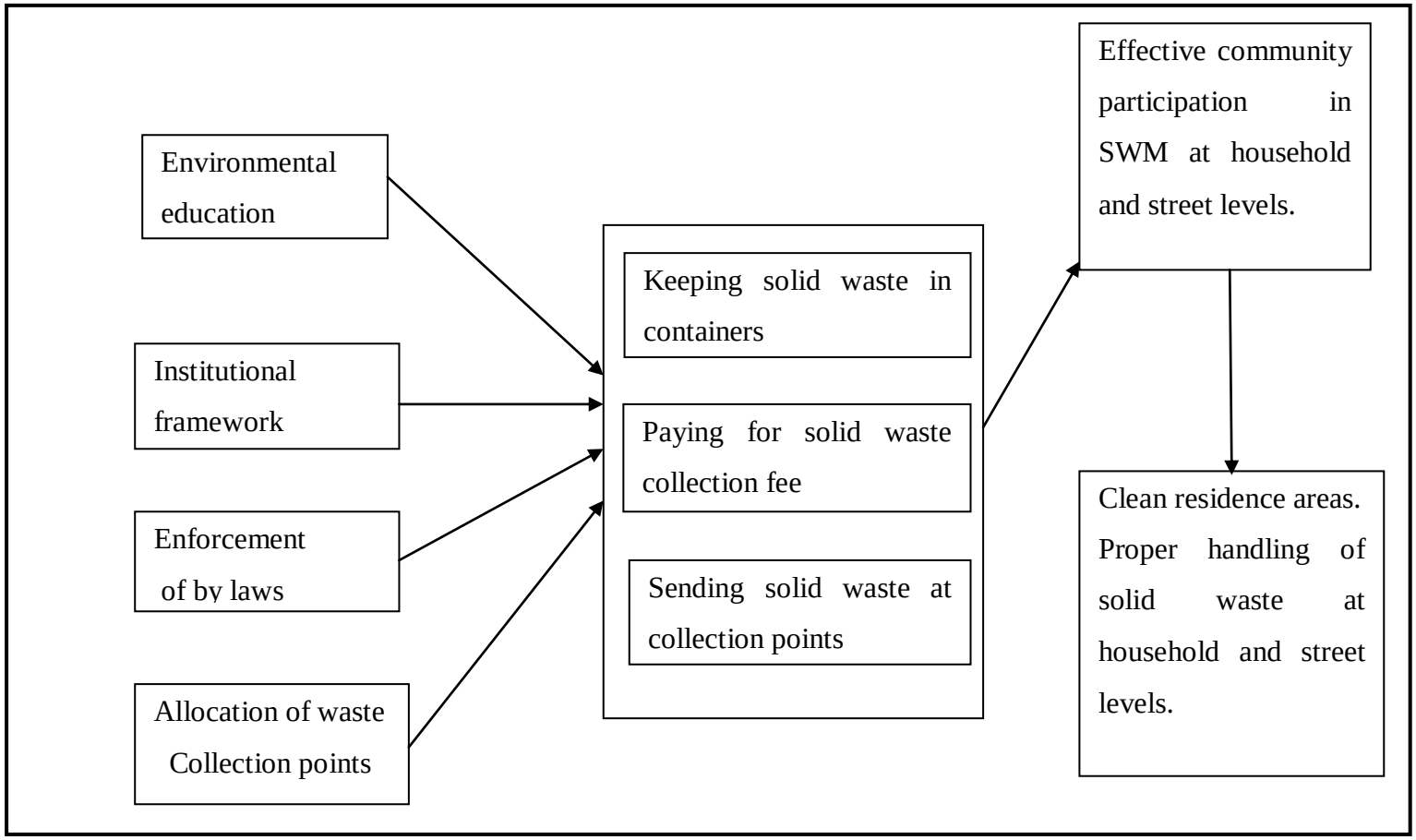
In Tanzania, the involvement of the community in solid waste management has brought a positive impact due to the fact that people are now engaging themselves in the economic activities generated by the solid wastes. Example which the role of the informal sector in waste recycling activities in capital city such as Dar Es Salaam. Kaseve and Buligwe (2005) estimate that daily 267 tons (= 11% of total was generated daily) are recycled for different uses. It is assumed that 50 percent of the recycled waste is recovered from the collected waste by both the city council and the private contractors, while another 50 percent is recovered by scavengers from the

uncollected waste. The informal sector is involved in collection and processing. Informal waste collectors use handcarts to collect wastes from residents charging about 100-300 Tanzanian Shillings per collection trip depending on the quantity of the waste. The collected waste in turn is cleaned, refurbished, and sold. According to Simon, 2008 cited in Riedijk, (2010) the amount of these unregistered informal waste collectors has increased in Dar Es Salaam since the recent introduction of the market for recycling of plastic water bottles from Chinese companies. Interestingly, the role of Community Based Organizations (CBOs) in waste collection and processing is an important one in Tanzania since a significant amount of waste is managed by CBOs in Tanzania. CBOs are a step higher in the 'hierarchy of informal sector recycling' since most of them are under contractual agreement with the Municipal Council, giving them the exclusive right to provide waste management services in a designated area. Formal players on the waste processing market operate on a larger scale.

2.4 Gap in the Literature

The reviewed literature has revealed that in developing countries, most of the cities its local authorities have low capacity of collecting the waste generated by 100 per cent, Tanzania being one of them. The studies also show how community approach is essential in order to help solid waste management to be sustainable. Poor institutional coordination between the community and local authorities hinder the sustainability of solid waste management (TNUP, 2009). This study will fill this gap by evaluating the effectiveness of the community approach in solid waste management in the MbeyaCityCouncil.

Figure 2.1 Conceptual Framework



Source: Researcher's own Construct, (2013).

2.5 Conceptual Framework

The conceptual framework is an assembled set of research concepts cum variables together with their logical relationships often represented in the form of diagrams, charts, graphs, pictographs, flowcharts, Organogram, or mathematical equations (Ndunguru, 2007). In the above figure, it is assumed that if the community will have environmental education, they will increase their level of awareness on the problem of improper management of the solid waste and change their cultural attitudes towards waste management. Good institutional framework, allocation of waste collection points and enforcement of bylaws will lead into the community to keep the solid waste in containers, paying for solid waste collection fee and sending of the solid waste to the collection points timely. This will create effective community participation in solid waste management at the household and in the streets which eventually leads into proper handling of solid waste and clean residence areas. The factors which lead into effective community participation are independent variables while effective community participation, proper handling of solid waste and clean residence areas are dependent variables.

CHAPTER THREE

RESEARCH METHODOLOGY

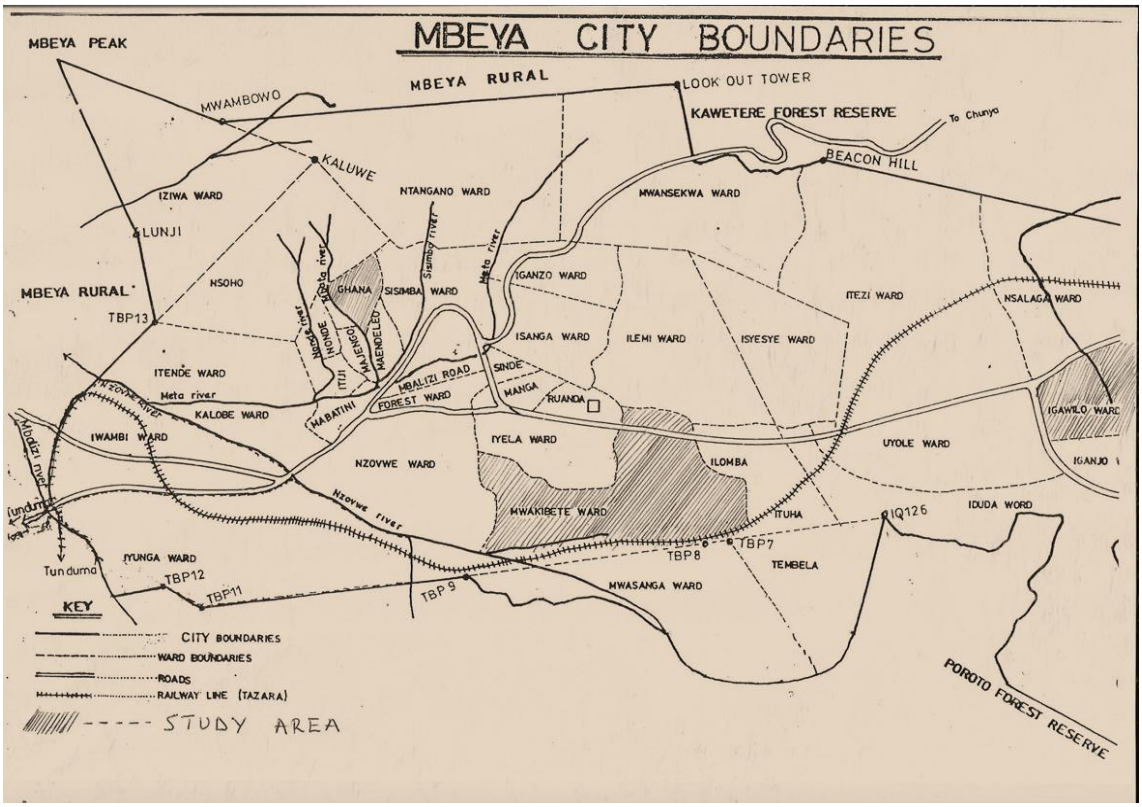
3.1 Introduction

This chapter presents the research methodology used in this study. It describes the study area, research design, sample size, sampling techniques, study population, data collection methods, data analysis and data presentation.

3.2 The Study Area

The study was carried out in Mbeya city Sisimba and Iyunga divisions were involved. Igawilo, Ghana and Mwankibete wards were the ones selected for the study .Mbeya city is located in Southern part of Tanzania at latitude 80^{30}-80^{57} South of Equator and longitude 33^{030}-35^{035} East of Greenwich (MCIP, 2010: p 2). The city is almost surrounded by Mbeya districts in all directions

Figure 3.1 Map of Mbeya City



Source: Mbeya City Council Profile, (2013)

Mbeya city was chosen in this study because it is among the city experiencing increased population, social activities and industrial activities. These created high rates of solid waste produced and found scattered and piled up in the city.

3.2.1 Administrative Profile

Mbeya city covers a total area of 222 square kilometers. Administratively, the city is divided into two divisions of Iyunga and Sisimba. It has 36 Wards and 180 streets. 115 streets are found in Iyunga and 65 streets are found in Sisimba. Among 36 wards only 24 wards are provided by the service of solid waste management and were involved in the management of solid waste.

3.2.2 Climate

Mbeya City has a mean annual rainfall of 1200mm while the mean annual temperature is 25^0C, ranging from a mean minimum of 11^0C and a mean maximum of 28^0C.The City is generally considered a highland characterized by moderate climate and sufficient rainfall.

3.2.3 Main Economic Activities

Major economic activities in the City include commerce and trade, agriculture and livestock keeping, small-scale industrial production, and service provision e.g. transport hotel, medical services, and civil service. It is estimated that 33.3 percent of City residents depend on agriculture for their livelihood; 21 percent are employed in the public sector which is mainly service providers and 43.4 percent are engaged in the informal sector which is mainly small scale production, petty trade and selling of agricultural crops and 2.3 percent home works and others (MCIP, 2010)

3.3 Research Design

Research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It constitutes the blueprint for the collection, measurements and analysis of data (Kothari, 2004: p 31).

This study adopted case study research design, due to the fact that it offers the researcher with an opportunity of doing an in depth examination of the study of the student population as it covers a variety of characteristics ranging from individual to community level. It helped the researcher to get the detailed information and data about the problem of municipal solid waste management in Mbeya. The case study design is also flexible in data collection and analysis.

3.4 Study Population

Population refers to a group of individuals who have one or more common characteristics (Kothari, 2004). The total population was about 2,250(MCC,2013). For the purpose of this study, the population consists of all community members of household and market sellers of the selected wards from Igawilo, Mwakibete and Ghana wards as well as the officials from Mbeya City council. This type of population has been chosen due to the fact that they gave relevant information concerning the study.

3.5 Sample Size

This study covered a sample of 65 respondents including household members, market sellers from Ng'osi street (Mwakibete ward), Chemchem street (Igawilo ward) and Mbata street (Ghana ward), Mbeya City Health Officer, Mbeya City Solid Waste Manager and the ward leaders. These wards were selected purposefully because they are among the wards that are under solid waste management services. From these wards Ng'osi, Mbata and Chemchem streets were selected by systematic random sampling. Market sellers were also selected purposively as well as ward leaders, Mbeya city health officer and Mbeya city solid waste manager . City officers were selected in order to assist the researcher to obtain more clarification based on

the information obtained from the respondents. While the household were selected through systematic sampling, for every 10th number of the household were selected. In every street there were about 600 houses and fifteen households were selected. The sample respondents employed both male and female. Table 3.1 shows the distribution of respondents by geographical location respectively from the study area.

Table 3.1 Respondents by Location

S/n	Ward	Street	Community members		Officials	Total
			Household members	Market sellers		
1	Igawilo	Chemchem	15	05	01	21
2	Mwakibete	Ng'osi	15	05	01	21
3	Ghana	Mbata	15	05	01	21
					02	02
Total number of respondents						**65**

Source: Field data, (2013)

3.6 Sampling Techniques

Sampling procedures are planned for getting the right number of the right people within the constraints of time and resources. There are different types of sampling of sampling procedures. For the purpose of this study, systematic random sampling and purposive sampling were employed in selecting study respondents.

3.6.1 Systematic Random Sampling

This refers to a method of selecting members from a larger population according to a random starting point and a fixed, periodic interval (Castillo, 2009). Typically, every 10th member was selected from the total population for inclusion in the sample population. This was used when selecting the houses and the markets to be studied. All the calculation was done based on the nth factor which is equal to Total population/Sample size.

3.6.2 Purposive Sampling

Purposive sampling is also known as judgmental, selective, or subjective sampling, reflects a group of sampling techniques that rely on the judgment of the researcher when it comes to selecting the units example people, case/organization, events or pieces of data that are to be studied (Castillo, 2009). The researcher used this technique to select the market sellers, Mbeya City Health Officer, Mbeya City Solid Waste Manager, Ward leaders.

3.7 Data Collection

This part explained the types of data used in the study, source of that data and method of data collection.

3.7.1 Types and Sources of Data

Both primary and secondary data concerning the study were collected. Primary data are the data collected by the researcher himself/herself or by research assistants from the field for the purpose of answering a research question/issue (Adam and Kamuzora, 2008: p 146). The sources of data used in this study included the respondents and data from researcher observations. Secondary data are those which have already been collected by someone else and which have been already passed through the statistical procedures (Kothari, 2004). The sources of data used in this study included policy documents, intensive reviews of literature, and various publications related to solid waste management such as different reports from the city solid waste department.

3.7.2 Methods of Data Collection

This study used interview, questionnaire, observation, and documentary review methods for collecting data.

3.7.2.1 Questionnaire

Questionnaire is a specific set of closed or open ended questions that respondents must answer (McNabb, 2008: p 135). This study used both structured and unstructured questionnaire to obtain the information concerning the researched topic.

The questionnaire was given to respondents aiming at obtaining the information concerning the involvement of the community in solid waste management. The 60 questionnaires were given to household which have been selected for the study. Due to the fact that questionnaires have demerits, in order to minimize time used and to obtain the required number of the respondent close supervision was done.
These questionnaires were used to gather information about solid waste management in the house places.

3.7.2.2 Interview

This is a technique of gathering data from humans by asking questions and getting them to react verbally (Potter, 1996). This was important because the researcher had a chance to come into contact with individuals to get access to facts and opinions and to receive facts directly from the persons. The interview was done with Mbeya City Health Officer, City Solid Waste Manager who provides solid waste management services and ward leaders who interact with the community directly in implementing solid waste management activities such as collected the solid waste collection fee.

The study used an interview as a complement of the questionnaire which will show directly the inner feeling of the respondents concerning solid waste management within the area of the study. The main objective of the interviews was to gather information on the roles played by the community in solid waste management and to explore their views, challenges, and suggestions in the management of solid waste.

The interview from Mbeya City Health Officer provided information on the current situation of solid waste management and their strategies on how to improve solid waste management. Interview with city solid waste manager gave information concerning the roles the community play in solid waste management, community awareness of solid waste management, and impact on solid waste management toward involving the community as well as views on how to improve solid waste management in Mbeya City. Interview from ward /sub ward leaders gave information on how they interact with the community on issues of solid waste

management, the support they get from City authority as well as their views to improve solid waste management.

3.7.2.3 Observation

This offers an investigator the opportunity to gather" live" data from naturally occurring social situation. In this way the researcher can look directly at what is taking place in situ rather relying on second hand accounts (Cohen et al, 2007).The researcher used non participant observation, she did not become part of the system but had used a pre determine set of issues to be observed in the field such as community general altitude towards management of solid waste, how solid waste was discarded at houses, the number of skip buckets/refuse bay available in a village/street, the way people threw the solid waste in a skip bucket/refuse bay , types of solid waste collected in the skip bucket/refuse bay as well as quantity of solid waste present in a skip bucket/refuse bay per week. Where necessary photographing took place for justification.

Table 3.2 Observation Schedule

Item Observed
Community general attitude towards solid waste management
How solid waste was disposed at houses
The number of skip buckets/refuse bays available in a street
Types of solid waste collected in a skip buckets/refuse bays
Quantity of solid waste present in a skip bucket/refuse bay per week.

Source: Field Data, (2013)

3.7.2.4 Documentary Review

A documented community participation strategy profile, National Environmental policy, publication about a community approach from relevant ministries as well as various community approaches related research reports were reviewed.

3.8 Data Analysis

Analysis refers to the computation of certain measures along with searching for patterns of relationship that exist between data groups (Kothari, 2004: p. 122). This study used descriptive statistics to analyze the data. Descriptive statistics are the methods of organizing, summarizing, and presenting data in a convenient and informative way (Castillo, 2009). The data collected were analyzed by using the descriptive analysis in which frequency and cross tabulation were chosen to analyze the variables. All this was done through Statistical Package for Social Sciences (SPSS) version 17 as well as Excel software. The qualitative data obtained through personal judgments, comments from other stakeholders and results from interviews were used to analyze using content analysis and interpretation of the information.

3.9 Data Presentation

The findings were presented by using tables, photographs, figures, and text to simplify interpretation and discussion of the findings.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF THE FINDINDS

4.1 Introduction

The purpose of the study was to examine the effectiveness of the community approach in solid waste management at household and street levels in Mbeya City Council, Tanzania. This chapter provides the study findings focusing on specific objectives thus divided into six sections, including introduction, demographic profile of the respondents, the role played by the community in the management of solid waste , the impact of community involvement in the management of solid waste , the factors that affects community participation in solid waste management at household and street levels respectively and finally stakeholders views/opinion on improvement of solid waste management at household and street levels in Mbeya City Council.

4.2 Characteristics of the Respondents

Below is the data analysis under the characters on gender, age, marital status, level of education and residence.

4.2.1. Gender

The research examined the views of the community members where a total number of 60 respondents gave their opinions through the questionnaires during the exercise of data collection. The researcher was interested to out if gender aspect has any influence in solid waste management at household and street levels. The gender of the respondents is shown in table 4.1.

Table 4.1: Distribution of Respondents by Gender (N=60)

Gender	Number	Percent (%)
Male	18	30
Female	42	70
Total	60	100

Source: Field Data, (2013)

Table 4.1 indicates that 18 (30%) out of 60 respondents were males and 42(70%) were females. This shows that females were twice in number compared to males which indicates that more females were engaging themselves in solid waste management at household and street levels.

The findings agreed with Bulle, (1999) who said that women are the first ones to be affected by deterioration in the environment and the urban framework. They bear the brunt of the daily load of unhealthy situations on a domestic level, infectious diseases, and childhood diseases, lack of clean water, accumulation of waste and lack of sanitation. Since they are responsible for maintenance of domestic spaces and the health of children, they are endowed with a sense of civic responsibility and a desire to improve their living conditions and health situation.

4.2.2 Age

The inclusion of age groups of respondents in this study was done so as to find out whether age of the respondents influencing community involvemen in solid waste management. Age was also anticipated to have an influence on the role played by the community in solid waste management at household and street levels. Data on age of the respondents was presented as appeared in table 4.2.

Table 4.2: Distribution of Respondents by Age (N=60)

Age	Number	Percent (%)
Under 18	1	1.7
19-30	24	40.0
31-50	18	30.0.
50+	17	28.3
Total	**60**	**100.0**

Source: Field Data, (2013)

Table 4.2 shows that, 1(1.7%) respondents were under 18 of age, 24 (40%) were at age group of 19-30, 18(30%) were at age group of 31-50, 17 (28.3%) were at age group of above 50.This suggest that the study sample had people between 18 and 50

and above which means that both youth and adults were involved in involved in the study.

According to the interview with the ward leaders, all people are targeted in the management of solid waste even those children who have started schooling, because they believe if children will be taught concerning the management of the solid waste, they will grow up with the good habit of managing any kind of waste they produce. This will help the solid waste management to effective with the inclusion of the community members.

4.2.3 Marital Status

Data on marital status were considered to determine if marital status has any influence in community involvement in solid waste management. The result are found in table 4.3

Table 4.3: Distribution of Respondents by Marital Status (N=60)

Marital Status	Number	Percent (%)
Single	11	18.3
Married	40	66.7
Separated/divorced	1	1.7
Widow	8	13.3
Total	**60**	**100.0**

Source: Field Data, (2013)

Table 4.2 reveals that the majority of the respondents were married 40 (66.7%) while 11(18.3%) were single respondents, 8(13.3%) were widow while the rest 1(1.7%) was divorced/separated. This indicates that married ones exceeded the single nearly four times.

According to the interview with the city solid waste manager, marital status has nothing to do with solid waste management because both people are generating waste, but it was noted that most of the female respondents who are married are

house wives and are the ones highly handling solid waste at their household. Out of 40 married respondents, 13 were males and 27 were females.

4.2.4. Education level

The researcher was interested to know the education level of most of the respondents in the study area to see if education level influences participation in solid waste management. Data on education level was presented in table 4.4.

Table 4.4 Distribution of Respondents by Education Level (N=60)

Education level	Number	Percent (%)
Not attained	3	5.0
Primary	29	48.3
Secondary	18	30.0
Higher Learning	10	16.7
Total	**60**	**100.0**

Source: Field data, (2013)

Table 4.4 shows that 29 (48.3%) respondents attained primary education, 18(30% secondary education, 10 (16.7%) respondents higher learning education and 3 (5%) who did not go to school. The findings imply that most of the respondents had gone to school. This showed that if education about solid waste management and the need to participate in it will be given to the respondents most of them were likely to understand, because community education is widely accepted as a room in social construction to form better community institutions and active participation in local initiatives. The research agreed with the theory of Mull (2005), which say that education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues.

4.2.4. Residence Stay Period

The researcher was interested to know if the residential stay period of the respondents will give her the insight on the impact of involving the community in solid waste management. Information on residence of the respondents was presented in table 4.5.

Table 4.5: Distribution of Respondents by Residence Stay Period (N=60)

Residence	Number	Percent (%)
Less than 1 year	2	3.3
1-3 years	3	5.0
4-6 years	10	16.7
6+	45	75.0
Total	**60**	**100**

Source: Field Data, (2013)

Table 4.5 shows that 45 (75%) respondents had stayed in their areas for more than six years, 10 (16.7%) had stayed for four to six years, 3(5%) respondents had stayed for one to three years 2(3.3%) had stayed less than one year. This indicates that the majority of the respondents were those stayed in their residential areas above six years. These can provide the information on the community approach in the management of solid waste in comparison to the time when they were not directly involved.

4.3 The Role Played by the Community in Solid Waste Management at Household and Street levels

Under this objective the researcher wanted to identify the roles played by the community in solid waste management at household and street level. The findings presented in table 4.6.

Table 4.6 Roles Played by the Community members in SWM at Household and Street levels

Role played by community members in SWM	Frequency	Percent (%)
Packing in bins and send solid waste to collection points	48	80.0
Separate recyclable from organic waste	10	16.7
Paying for solid waste collection fee	12	20.0
No response	**9**	**15.0**

Source: Field data, (2013)

Table 4.6 that, 48 (80%) respondents were packing in bins and send their solid waste to the collection points, 10 (16.7%) were separating the recyclable waste from organic waste while 12 (20%) were paying for solid waste collection fee. The findings imply that most members of the community at household and street level are participating much in sending the solid waste in the collection points rather than in paying for solid waste fee. According to an interview with the city solid waste manager, community members were not cooperative in paying for solid waste collection fee, this hinder the effective provision of solid waste management services by the city council resulting into delayed collection of solid waste at the collection points at the street level. See figure 4.2.

According to Zender, (2009), inorder for the community to play their role effectively, critical solid waste issues should be diagnosis by themselves. The communities have to be informed, educated, and empowered about those critical issues. Then let the community identify and solve solid waste problems instead of introducing the solution for their problems.

4.4 The Impact of Community Involvement in Solid Waste Management at Household and Street levels

In this objective the researcher wanted to find out if since 2000 when Mbeya city council introduced the community approach strategy in solid waste management there had been any improvement so far. Data for this information was presented in table 4.7.

Table 4.7 Distribution Respondents on the Impact of Community Approach in Solid Waste Management

(N=60)

Is there an impact of community approach in SWM	**Number**	**Percent (%)**
Yes	50	83.3
No	10	16.7
Total	**60**	**100.0**

Source: Field Data, (2013).

Table 4.7 explains how the respondents gave their views about the impact of been involved in SWM. It shows that, 50 (83.3%) respondents said that, involvement of the community in the management of solid waste has brought more positive impacts due to the fact that now their environment are clean, the outbreak of diseases such as cholera, diarrhea as been reduced. They have learnt to use the waste bins, also in the street especially in markets and bus stands now days there are waste bins for collecting solid waste. 10 (16.7%) respondents said the situation is still the same may be if more knowledge will be given to the community things will change. This suggests that there is an improvement on the management of solid waste in Mbeya city compared with those days when community was not involved.

On an interview with the ward leaders they said, "***still there are few people who are still ignorant concerning the management of solid waste, others are still dumping solid waste in holes situated in front of their houses while in the street people may throw solid waste on the ground while the waste bins are there***".

This shows that knowledge of solid waste management has to continue given to the community now and then so that the community will be aware that if they don't manage their solid waste they are the ones who are going to suffer their consequences.

In order to have a continuing impact in solid waste management, community should be involved at different stages and degrees of intensity in the solid waste management system. Example community member can be involved in awareness raising activities, participate in meetings which is essential to generate a broad based understanding of solid waste issues among community members (Danny et al, 2004).

Although the researcher aimed at effectiveness of the community approach in solid waste management, but the question of factors which hinders the community to participate fully in managing the solid waste was also asked to community members and to obtain general public opinion on this issue. The findings was presented in table 4.8.

Table 4.8 Factors Affecting Community Participation in SWM

Factors affects community participation in SWM	**Frequency**	**Percent (%)**
Inadequate knowledge on SWM	10	16.7
Collection points are too far	21	35
Secondary solid waste collection and transportation is unreliable	31	51.7
Reluctant of the city official on issues of SWM	18	30
Lack of transparency in the expenditure of the fee collected for SWM services	25	41.7
Few skip buckets and refuse bay for collecting solid waste	19	31.7

Source: Field Data, (2013)

Table 4.8 show that, inadequate knowledge on SWM were mentioned by 10 (16.7%) respondents as factor limiting community participation in solid waste management while farness of the collection points were mentioned by 21 (35%) respondents. Also, unreliability of the solid waste collection and transportation was mentioned by 31 (51.7%) respondents, reluctant of city officials on issues of SWM was mentioned by 18 (30%) respondents while lack of transparency in fee collected for SWM services was mentioned by 25 (41.7%) respondents and presence of few skip buckets and refuse bay was mentioned by 19 (31.7%) respondents.

The findings indicate that, the major factors affect community participation in solid waste management are: unreliable solid collection and transportation, lack of transparency in fee collected for SWM services, farness of the collection points, reluctant of city officials on issues of SWM as well presence of few skip buckets/ refuse bay for collecting solid waste.

Through observation, the researcher noted a number of things as evidenced by the pictures taken during site visits, see figure 4.2, 4.3 and 4.4)

Figure 4.1: This picture shows the piled up of solid wastes at a collection point at Ng'osi street in Mwakibete Ward

Source: Field survey, (2013)

Figure 4.1 shows that the accumulation of solid waste at collection point were the refuse bay was broken, no sorting was done also it shows a child sort the waste at the collection point.

Figure 4.2: This is a picture show piled up of solid wastes at a collection point at Mbata street in Ghana Ward

Source: Field Survey, (2013).

Figure 4.2 shows solid waste accumulated on an open space along the Ghana street, no refuse bay constructed for collecting the solid waste also no sorting was done, both degradable and non degradable solid waste were mixed.

Figure 4.3: This picture show piled up of Solid wastes at a the collection Points at Chemchem street (Igawilo ward)

Source: Field survey, (2013)

Figure 4.3 shows that solid waste was accumulated in the collection points. The waste was not collected at the bay rather scattered on the ground and no sorting was done. The bay were solid waste are collected had situated near peoples business area. This suggested that the health of the people around this area can be affected due to diseases organisms breed from the rotted waste.

4.6 Stakeholders Views/Opinions on improvement of Solid Waste Management

The views / opinions were based on two aspects which are potentiality of community approach strategy and the ways to improve solid waste management in Mbeya city were given. The stakeholders involved were all respondents involved in the study including 45 household members, 15 market sellers and 5 city officials. The questions to gather their views/opinions were included in the different tools used to collect data.

4.6.1 Potentiality of Community Approach

To obtain stakeholders views on this aspect, the researcher asked them to comment on whether the community approach is still important in solid waste management in Tanzania. 60 (92.3%) stakeholders out of 65 said community approach is still important and more emphasize have to be given to the officials as well as the community themselves so as to improve solid waste management in Tanzania. Generally, I agree with stakeholders on the fact that community approach is very potential in solid waste management due to the important role they play to ensure effective solid waste management attained in their household and streets as well. Because communities are the ones produce waste if they continue to be educated on negative impact of improper solid waste management in their health and the environment and the need to participate in managing those waste in the future community approach will be effective in solid waste management.

4.6.2 Stakeholders Opinions on Improvement of Solid Waste Management

The opinions were generally given and the researcher summarized them as in table 4.9 .Only one main suggestion was supposed to be given by each respondent in order to come up with the most suggestions regarding the objectives.

Table 4.9 Stakeholders Suggestions/Opinions on Improvement of Solid Waste Management

Opinion/Suggestion	Frequency	Percent (%)
Provision of environmental education to the public on SWM	58	89.2
Involve CBOs, NGOs, private sector and institutions to supply SWM services at household and street levels	21	32.3
Involve the community from decision making to implementation level	11	16.9
Solid waste collection fee system has to be transparent.	20	30.8
Regular and timely collection of SW by authorities responsible	27	41.5

Source: Field Data, (2013)

Table 4.9 reveal that, 58 (89.2%) stakeholders suggested on the provision of environmental education to the public on SWM where as 21 (32.3%) stakeholders recommended involvement of CBOs, NGOs, private sectors and institutions to supply SWM services at household and street levels. Involvement of the community (from decision making to implementation level) was suggested by 11 (16.9%) stakeholders while transparency of solid waste collection fee system was suggested by 20 (30.8%) stakeholders. Regular and timely collection of solid waste by the authorities responsible was suggested by 27 (41.5%) stakeholders.

Stakeholders suggested that environmental education need to continue given to the public based on the solid waste management because it is only through education the community members will understand what does solid waste management mean and why it is important to participate in it. The suggestions concur with the result from Visvanathan and Trankler ,(2003) in their study about municipal solid waste management in Asia, were through education local NGO was formulated as serves over population of 100,000 in nearly 20,000 households. So education may influence

the community to start an institution or CBO which can help the in serving the informal settlements were the large trucks of the city authority cannot pass to go and collect the solid waste collected in the collection points for final disposal.

Involvement of CBOs, NGOs, private sectors, and institutions was another suggestion from the stakeholder. In Mbeya city still there are no other stakeholders such as CBOs, NGOs, private sector, and institutions registered to provide solid waste management services rather people have been volunteering themselves in cleaning the environment, this is not the permanent activity. So, stakeholders said if the city council will officiate the legislation system more NGOs, CBOs, private sectors and institutions will be formed and provide the services permanently. Example can be seen in a study of Moningka, (2000) who suggested the work which can be done by CBOs and small enterprises. She said CBO can be involved activities such as promoting re-use and recycling of materials, collecting fees for waste removal and making arrangements with local authorities while small enterprises who can be involved in recycling and collecting of waste at low cost so that member of the community can also benefit from them. This will improve solid waste management in cities specially Mbeya city.

However, transparency in solid waste collection fee system was suggested (refer table 4.9). Stakeholders pointed out that the system was not transparent because they don't understand the need to pay for the fee while no any improvement done. So, the officials concerning this system have to give out the report at least in every three month about the money collected, the expenditure of the money and the community should changes done concerning the money they pay. If this will be done more members of the community will be willing to pay for it hence improvement of solid waste management.

Stakeholders also mentioned regular and timely collection of the solid waste by the authority responsible from the collection points, because community play their role of bringing the solid waste on the collection points but the waste accumulate for long time creating the breeding sites for vectors, people near those sites found to be

affected by the situation because sometimes the waste rotes and start to produce unpleasant small. So as suggested above if more stakeholders will come in, this problem will be reduced or eliminated in Mbeya city.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the summary of the findings, conclusion, policy recommendations, and area for further studies. The chapter begins with summary which provides the major findings of the study followed by conclusion which provides the main arguments developed. The policy recommendations which provides the policy direction towards solid waste management, the final section which suggests the areas for further studies by other researchers.

5.2 Summary

The main objective of this study was to examine the effectiveness of the community approach in solid waste management at household and street levels in Tanzania, particularly to Mbeya City Council. It focused specifically to roles played by the community in the management of solid waste, the impact of involving the community in solid waste management, identifying the factors that affect community participation in solid waste management and to gather the stakeholders' views/opinions on improvement of solid waste management.

The study revealed that, community approach in solid waste management in Mbeya City Council was partially effective. This is because although community has been involved in solid waste management at household and street levels 80 percent of the respondents are sending their solid waste at collection points at household level while only 20 percent of the respondents are paying for solid waste collection fee at street level. The impact of community approach in solid waste management was noted by 83.3 percent of the respondents while 16.7 percent did not see any impact.

Some factors affecting community participation were found out by this study. These include inadequate knowledge on solid waste management which was mentioned by 10(16.7%) respondents, farness of the collection points mentioned by 21 (35%)

respondents, unreliability of secondary solid waste collection and transportation mentioned by 31 (51.7%) respondents, reluctant of the city officials on issues of SWM mentioned by 18 (30%) respondents, lack of transparency in the fee collected for SWM services mentioned by 25 (41.5%) respondents and presence of few skip bucket and refuse bay for collecting the solid waste at primary level which was mentioned by 19(31.7%).

The study finalized by gathering various stakeholders views/opinion on the improvement of solid waste management at household and street levels. According to 60 (92.3%) stakeholders views community approach is still a relevant and an important strategy to improve solid waste management. The most important opinion to improve solid waste management at household and street levels were provision of environmental education to the public on SWM, involvement of CBOs, NGOs, private sectors, and institutions in provision of SWM services at household and street levels, regular and timely collection of solid waste by the authority responsible for it at the collection points as well as transparency in solid waste collection fee system.

5.3 Conclusion

Community approach has found to be partially effective in the Mbeya city since it has started in the year 2000.This approach has not yet remedy the problem of solid waste management because still has there is no great change particularly in the solid wastes managements. Huge wastes were scattered especially in areas far from towns. Also, awareness of the community concerning solid waste management was found to be low, most of them are still believe that solid wastes management are the responsibility of city solid wastes management department. .

Moreover, most of the people in Mbeya city nowadays have learnt to collect at source the solid waste in their container and then discard it in the communal container where the council will collect for the final disposal in the dump sites but they don't pay for solid wastes collection fee which would help the city council in the management of the solid wastes by either maintaining their trucks.

It has also noted that, the solid waste department in Mbeya city is not capable of serving all the wards, so more solid wastes are piling up in the collection points for a long time without collected. Therefore the city council authority needs to involve other stakeholders example private company, community based organizations which will help them to collect the waste from the collection points to the dump sites especially in the peripheral wards where most of the time the refuse bay are found piled up and the council will be monitoring the work. Also, they have to enforce the bylaw which is in practice so as to let the community involve in solid wastes management.

5.4 Recommendation

The study recommended the following;

- More education and campaigns are needed to be given to the community so that they can be willing to fully participate in SWM especially in paying for the solid waste collection fee.
- Young people should be given an education about how to raise their income through solid waste management activities such as collection of plastic bottles which can be sold to companies which deals with recycling of solid waste.
- More refuse bay /skip buckets are needed to increase in each street so as to facilitate the dumping of the solid waste in a required place.

- Each ward in Mbeya City should open special Bank Account to keep all money collected for solid wastes management, and use the collected money to pay for those who collect wastes from wards.
- City leaders who are responsible for SWM should see the alternative of increasing the number of trucks with the large capacity of collecting the SW so as to easy collection of the solid waste in the streets in time, this will reduce the problem of solid waste to accumulate in the collection points for a long period of time.
- Urban local bodies may approach NGO'S, community based organizations (CBOs), secondary schools, college students, or the member of other institutions for help in the task of managing the solid waste.

- City Officials who are concerned with management of solid waste should be trained so that they can understand their roles and the relationship with the rest of the community .They should understand that in any community participation projects, city/municipal officers need to take back seat and share their powers with the waste management committee. Also they need to enable the training and capacity building of residents' welfare association.
- To date there is no policy for SWM at the national level, rather there are scattered pieces of legislation on SWM in different policies and city or municipal bylaws which are for that matter not supported by a principal law or policy on SWM. Owing to the state of affairs, the city and municipal authorities in the country handles solid waste management issues according to bylaws they set for themselves.

Therefore, government should formulate a SWM policy accompanied by the enabling legislation, to regulate the operations in SWM.

5.5 Area for Further Studies

- The same study can be done in other wards of Mbeya City to see if the community approach has been effective in solid wastes management

- A study should be carried out to evaluate the impact of solid waste management bylaw in solid waste management in Mbeya City Council.

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APPENDICES

Appendix 1: Community members' Questionnaire

I am **Josephine Ferdinand Nguge**, a student at Mzumbe University pursuing Master Degree of Science in Environmental Management. I am requesting you to spare some few minutes to respond to my questions. I assure you that all the information given will be used for academic purpose only.

A: Background Information

Ward name ……. Street……

1. Respondent name……..

2. Gender

a) Male [ ] b) Female [ ]

3. What is your age?

a) Less than 18 [ ] b) Between 19-30 [ ] c) Between 31-50 [ ] (d) Above 50

4. Marital status

a) Single [ ] b) Married [ ] c) Divorced/Separated [ ] d) Widow [ ]

5. Highest level of education attained

a)Not attained [ ]

b) Primary [ ]

c) Secondary [ ]

d) Highest learning [ ]

6. How long have you been a resident of this ward?

a) Less than 1 year [ ]

b) 1-3 years [ ]

c) 4-6 years [ ]

d) Above 6 years ( )

B: THE ROLE PLAYED BY THE COMMUNITY IN SOLID WASTE MANAGEMENT AT HOUSEHOLD AND STREET LEVELS

7. How do you handle the waste that has no value to your household/market?

a) Burn [ ]

b) Leave it on the street [ ]

c) Send it in a communal container [ ]

d) Bring it to the dump site [ ]

e) Leave it to be collected from the house [ ]

f) Don't know [ ]

8 What do you do with your recyclable products?

a) Discard them with other solid waste [ ]

b) Separate them for selling [ ]

c) Separate them for own reuse [ ]

d) Separate them and give it away to others who will it again [ ]

e) Don't know [ ]

9. What do you do with your organic waste?

a) Use as compost [ ]

b) Feed the animals [ ]

c) Leave it to be collected from the house [ ]

d) Discard it in a communal container [ ]

e) Don't know [ ]

10Are the solid waste collected from your house/ market?

a) Yes [ ] (go to 10)

b) No [ ]

10. How many times per week is your solid waste collected from your house?

a) Daily [ ] b) Twice a week [ ] c) Once a week [ ] d) now and then [ ] e) there is no collection [ ] f)don't know [ ]

11 Are you paying for solid waste collection fee?

a) Yes (b) No (go to number 12)

12 Give reasons which made you not to pay for solid waste collection fee.

13 Are you ready to pay money for facilitating solid waste management in your ward/sub ward?

a) Yes b)No(go number 14)

14. Give your reasons why you're not ready.

C: THE IMAPACT OF COMMUNITY INVOLVEMENT IN SOLID WASTE MANAGEMENT

15What was the situation of solid waste management in your ward/street before community involvement?

……

……..

16 Are there any changes you observed in the management of the solid waste after been directly involved in it?

D: THE FACTORS AFFECTING COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT

17 Mention the factors which affects your participation in solid waste management**.**

…….

18 Have you been educated on how to manage solid wastes?

a) Yes (b) No

19 If the answer is Yes, who provided the education?

a) Ward leaders b)NGO c) Health officer d) Individuals

E: STAKEHOLDERS VIEWS ON IMPROVEMENT OF SOLID WASTE MANAGEMENT

20 To what extend has community approach manage to improve solid waste management?

a) Little b)very little c) Great extent d) Very great extent

21 What are your opinions about community approach in the future?

a) Still it is important, should continue b) Not important, should be stopped

22 What are your opinions for improvement of solid waste management at household and street levels?

1)……..

2)……..

THANK YOU FOR YOUR COOPERATION

Appendix 2: Interview for City Officials

I am **Josephine Ferdinand Nguge**, a student at Mzumbe University pursuing Masters Degree in Environmental Management. I am requesting you to spare some few minutes to respond to my questions. I assure you that all the information given will be used for academic purpose only.

Respondent No…….. Date …….

1. May you introduce yourself, your profession and what you do?
2. What has been the problem with municipal solid waste management?
3. Have set any standards for waste collection to be achieved in your municipality? If so, do you reach this goal? If not, why?
4. When did you start to involve the community in the management of solid waste?
5. What are the roles played by the community in the management of solid waste?
6. What would you say about community awareness on the issue of solid waste management, do you think there is enough general knowledge about waste handling or even the need to pay for solid waste services?.....
7. Do you see any impact after involving the community in the management of solid waste management?

…….
.

8. Is there any cooperation that enables community waste collectors to suggest new measures to municipal waste management? If yes, how? If not, why?

……
……

9. How is the communication strength between you and the various bodies involved in solid waste management? .....

10. What do you think should be the way forward? If you have a chance, what would you say to the government and the community should do, that will bring better solid waste management services in the municipality

THANK YOU FOR YOUR TIME AND COOPERATION