EFFECTIVENESS OF SOLID WASTE MANAGEMENT SYSTEMS IN LOCAL GOVERNMENT AUTHORITIES IN TANZANIA:

THE CASE OF MOSHI MUNICIPAL COUNCIL

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THE CASE OF MOSHI MUNICIPAL COUNCIL

By

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A Thesis submitted to the School of Public Administration and Management in Partial Fulfillment for the Requirements of the Award of Degree of Master of Public Administration (MPA) of Mzumbe University, Tanzania

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a Thesis entitled **Effectiveness of Solid Waste Management Systems in Local Government Authorities in Tanzania: The Case of Moshi Municipal Council** in partial fulfillment of the requirements for the Award of Master of Public Administration Degree of Mzumbe University

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DEDICATION

This dissertation is dedicated to my lovely family of Olympia Shao and Ally Hamis Shikony who contributed to my well-being through love, respect, moral and financial support which enabled me to accomplish this level of education. I appreciate all of you, may almighty God bless you.

LIST OF ABBREVIATIONS

ADB	African Development Bank
CBDs	Central Business District
CBOs	Community Based Organizations
KCMC	Kilimanjaro Christian Medical Centre
NEMC	National Environmental Management Council
NGO's	Non Governmental Organizations
UN	United Nations
USEPA	United States Environmental Protection Agency

ABSTRACT

This research report was about the effectiveness of Solid Waste Management System at Local Government Authorities in Tanzania, the case of Moshi Municipal Council. It specifically describe the solid waste management systems deployed by Moshi Municipal Council and assess the extent to which solid waste management systems enhance the management of solid waste in the Municipality and challenges which impact on the effectiveness of the solid waste management systems in the Municipality. The research approach used is qualitative which was appropriate to the study as it helped the researcher to collect data in the selected wards and process it without the use of any statistical or mathematical operation. The research design used was case study design which enabled the researcher to gather data on relatively large number of people at the same time, for instance during the focus group discussion data were obtained from more than four people in a group. Population of this study includes all people who have the role in overseeing and managing the solid waste management systems in the Municipality and all the selected wards. Data were collected by using both primary and secondary sources. The major findings showed several systems that were used by the Moshi Municipal Council to ensure both effective and efficient Solid Waste Management in the area. For example, formulating of By-Laws, availability of cleanness facilities, wards cleanness competitions as well as provision of incentives to cleaners. The study recommends that, Moshi Municipal Council and the government of Tanzania should prohibit the use and manufacturer of plastic bags because they contribute more in environmental pollution. This will help to reduce the amount of waste collected in both residential and commercial areas as it has been in Kigali Rwanda. The study concluded that solid waste management systems are a major problem in developing countries especially in Tanzania Municipalities. Studies conducted in other areas of the region including Dar es Salaam, Arusha, Mbeya and Mwanza have exposed the problem to be amongst the most urgent concerns which is clearly found to increase with the growing cities of developing nations.. However the Moshi Municipal has proved to be more efficient in dealing with the solid waste management issue than other Municipalities in the country through different systems.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the problem

Solid waste is any material which comes from domestic, commercial, and industrial sources arising from human activities which has no value to people who possess it and is discarded as useless. In the early days, waste disposal did not pose difficulty as habitations were sparse and land was plentiful. Waste disposal became problematic with the rise of towns and cities where large numbers of people started to congregate in relatively small areas in pursuit of livelihoods (Shafiul and Mansoor, 2003). While the population densities in urbanised areas and per capita waste generation increased, the available land for waste disposal decreased proportionately. Solid waste management thus emerged as an essential, specialised sector for keeping cities healthy and liveable.

Solid waste management system as described by Kreith, (2002) is a complex process as it involves many technologies and disciplines. The system includes technologies associated with the control of generation, handling, storage, collection, transfer, transportations, processing and disposal of solid wastes. The collection, transfer and disposal of waste have been generally assumed by Municipal governments in both developed and developing world. This constitutes a basic and expected government function. The format varies in most urban areas where solid waste is collected either by a government agency or private contractor. Despite the fact that developing countries do spend about 20 to 40 per cent of metropolitan revenues on waste management, they are unable to keep pace with the scope of the problem (Zerbock, 2003). In fact, when the governments of African countries were required by the World Health Organization (WHO) to prioritize their environmental health concerns, the results revealed that solid waste was identified as the second most important problem after water quality in some of the Local Government Authorities (Senkoro, 2003 cited by Zerbock, 2003).

Solid waste management systems in East Africa have undergone several changes since the colonial era in the 1940's, 1950's and early 1960's. During that period, the systems

of management were somewhat efficient due to the existence of low population in urban areas as well as the availability of resource compared to the current situation whereby the management system is not efficient in some of the areas (Okot and Nyenje, 2011). Consequently, this resulted into the introduction of the centralized waste management system in the current management mixture which involves also the private sector. Speedy urbanization has plagued the national and local authorities of the third world nations when they try to plan for it (Okpala 1999).

The main reason is that currently we experience massive increase of people in urban areas which has mainly caused by frequent migration of people from rural areas. At present, various organizations fail to manage the whole process of solid waste accordingly (World Bank, 2006). Poor solid waste management caused by having shortage of fund and inability of some of the urban authority to manage the solid waste.

Consequently, the inability to handle the stated challenges, the government authority is nowadays looking for some approaches such as establishment of cooperation between private sector in managing the solid wastes in their working environment (Ntakamulenga, 2012). Among the initiatives taken by the government to ensure Municipals are clean, include but not limited to: implementing various laws, policies, and regulations for the sake of making the environment clean for the betterment and wellbeing of both nationals and non-nationals, for instance in Moshi Municipal Council where, a total of 200 tones of solid waste is generated daily. Commercial waste 145 tones, institutional 8 tons, hospital 2 tons and industrial 45 tons.. The Council manages to collect and dispose of 100 tones of waste daily. The remaining waste is burnt, buried, used as compost and animal feed. The council has allocated 34 skip buckets in areas with high generation of waste although some of the Municipal residents do not dispose waste in skip buckets properly (Moshi Profile, 2008). Most of the residents are willing to pay for solid waste collection due to Moshi Municipal By-Laws. Solid waste is disposed of at Kaloleni landfills which occupy 4.475 hectares. Regular collection of waste in households leads to success in solid waste management. The landfill site is located at Kaloleni ward.

1.2 Statement of the Problem

The United Republic of Tanzania (2004) establishes that it is the liabilities of the Local Government and each person to ensure reduction of solid waste. The National Health Policy of 1990 has also the role of ensuring that there is proper mechanism of managing waste where by each citizen and institutions should make sure that the environment is clean and they have to ensure proper disposal of solid waste.

The government of the United Republic of Tanzania enacted Policies concerning solid waste management such as National health policy of 2007 and Management Act of 2009 which in section13 state that it is the duty of Local Government to minimize solid waste. Despite of all these, some municipalities and cities for example Dar es Salaam fail to control cleanliness.

This study intends to realize the effectiveness of solid waste management systems in Local Government Authorities. This is due to the reason that many authors have been concentrating much on the challenges facing solid waste management systems rather than the effectiveness in some of the Local Government Authorities such as Moshi Municipal Council. Based on literature and views of scholars, there is a need to identify and describe the system deployed by Moshi Municipal Council to control waste and become the leading Municipal amongst the 17 Municipalities in Tanzania for more than five years from 2007 to 2013. (Environmental Profile of Moshi Municipality, 1999).

1.3 Research objectives

1.3.1 Main research objective

The major aim of this study was to assess the effectiveness of solid waste management systems in Local government authorities in Tanzania, using Moshi Municipal Council as a case study.

1.3.2 Specific Objectives

i) To describe the solid waste management systems deployed by Moshi Municipal Council.
ii) To assess the extent to which solid waste management systems enhance the management of solid waste in the municipality.
iii) To identify and assess the challenges which impact on the effectiveness of the solid waste management systems in the municipality.

1.4 Research questions

The study was guided by the following research questions:

i) What are solid waste management systems deployed by Moshi Municipal Council?
ii) What extent does the solid waste management systems enhance the management of solid waste in the municipality?
iii) What are the challenges that impact on the effectiveness of the solid waste management systems in the municipality?

1.5 Significance of the Study

i) This study is said to be important to the Local Government Authorities as through it the solid waste management systems deployed by Moshi Municipal Council have been identified where the legal and policy framework have been one among the systems used to manage solid waste.
ii) The study also is important as it can use the posed recommendations in order to improve the system of solid waste management in their area and reduce challenges which impact the system such as unfenced landfill site and rapid urbanization.
iii) Through this study the ways determined to reduce the challenges impacting the solid waste management system can be used to make improvement in some of the parts hence make the municipality perform well in cleanness worldwide.

1.6 Scope of the Study

The study was conducted in Moshi Municipal Council where solid waste management systems were effective. Municipal Director, Head of Department and other Ward leaders were involved. The researcher choose Moshi Municipal Council because it is among Local Government found in Tanzania with the effective solid waste management systems. Therefore, the study intended to describe the systems of solid waste management that made the Municipal to perform well.

1.7 Limitation of the Study

This study faced some limitations as there were some difficulties in gathering data as some of the participants such as the Wards Executive Officers in Mawenzi ward and Njoro ward were not faithful to the appointments they made during interview session. This affected the researcher as she got some difficulties in achieving data from those wards in a planned time. To deal with this, the researcher use more time to wait for them so that they assist her with the required information. Also some of the participants did not show Full Corporation with the researcher especially some of the cleaners. Some of the cleaners want the researcher to pay them so that they can join in focus group discussion. This affected the study data were not obtained within a given time. To overcome this, more time was used in one group to inform the cleaners who refused to join the discussion that the researcher is just a student conducting her research and she did not have money to pay them.

1.8 Definition of Key Terms

1.8.1Institution

The study by Meyer(1994) defined institutions as the traditional rules giving joint meaning and value to particular entities and activities incorporating them in to larger schemes.

1.8.2 Solid Waste

According to Section 2(2) of Environmental Management Act of 2004 states that, Solid waste means non liquid materials arising from domestic, street, commercial, industrial and agricultural activities and includes refuse or garbage, non-liquid materials arising from construction and demolition activities, garden remained pieces and mining operations, dead animals and abandoned cars scraps.

1.8.3 Solid Waste Management

Solid waste management is a method associated with the controlling of production, storage, assortment, carriage, processing and discarding of solid wastes in such a way that it serves the best interests of public health and takes into considerations environmental concerns. Tchobanoglous (1993).

1.8.4 Local Government Authorities.

It refers collectively to administrative authorities over areas that are smaller than a state. Local government only acts within powers delegated to it by legislation or directives of the higher level of government. Shedrack (2003).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section consists of both theoretical and empirical review of the previous studies. The review of literature is done for the aim of ascertaining what has been researched by other scholars and identify the knowledge gap which is going to be covered by the present study. The conceptual framework of this study is also presented in this chapter.

2.2 Concept of solid waste management.

Solid Waste Management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering and other environmental considerations (Okpala 1999).

In its scope, solid waste management includes planning, administrative, financial, engineering and legal functions in the process of solving problems arising from waste materials. The solutions might include complex inter-disciplinary relations among fields such as public health, city and regional planning, political science, geography, sociology, economics, communication and conservation, demography, engineering and material sciences.

Solid waste management practices can differ for residential and industrial producers, for urban and rural areas, and for developed and developing nations. The administration of non-hazardous waste in metropolitan areas is the job of local government authorities; on the other hand, the management of hazardous waste materials is typically the job of the generator, subject to local, national and even international authorities. The primary goal of solid waste management is reducing and eliminating adverse impacts of waste

materials on human health and environment to support economic development and superior quality of life.

2.3 Solid waste management systems.

Solid waste management involves different systems, activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things, collection, transport, treatment and disposal of waste together with monitoring and regulation (Okpala 1999). It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling.

The systems of solid waste also depend in each other, for instance if there is insufficient number of cleaners then cleanness cannot be done as it is planned, the cleaners also need to be provided with cleannes equipment and safety gears whereas after cleaning there must be some dustbin and waste trucks to collect waste to the landfill site. Supervision is very important as well as laws to be used so that people can avoid the habit of littering the environment. Each part depend to other part so that there can be effective solid waste management systems in local government authorities. Cooperation in solid waste management system is very important so as to avoid failure. If one part fail to perform its responsibility then the whole system can fail.

2.4 Theories of solid waste management

2.4.1 System theory

System approach has helped to provide new insight of how solid waste should be managed. The concept of system theory was borne out of von Bertalanffy's mathematical field of a 'general theory of systems', which was first presented in Chicago in 1937 and published in a German journal in 1949 (Drack & Schwarz, 2010). The principle aim of formulating this theory was to promote the 'Unity of Science' by providing a language and theory for systemic problem solving in many different disciplines, which were independently stumbling upon general system characteristics and principles (von Bertalanffy, 1950).

He emphasized that real systems are open to, and interact with their environments and how changes can impact the organization. An open system is one in which the system has both inputs and outputs which are very important in solid waste management systems.

Today system approach is used in many disciplines to analyze different phenomenon which seem to be a stabling stone. For example, Kenneth (1956) sees system approach as the skeleton of science in the sense that it aims to provide a framework or structure of systems on which to hang the flesh and blood of 42 particular disciplines and particular subject matters in an orderly and coherent corpus of knowledge. In the field of solid waste management, the theory sees this activity as complex phenomenon that requires appropriate technical solutions, sufficient organizational capacity, and co-operation between wide ranges of stakeholders (Zarate et al., 2008). Seadon (2010),in his attempt to analyze system approach, argued that the interdisciplinary and multi-sect oral considerations is needed for the proper management of solid waste manufacturing, transportation, urban growth and development, land use pattern and public health. He further argued that when waste is seen as part of a system, the relationship of waste to other parts of the system is revealed and thus the potential for greater sustainability of the operation increases.

The theory views solid waste management as systematic processes, which involve waste generation, collection, and disposal. All these operations should be considered independently, though each is interlinked and influenced by the others (Seadon, 2010). In response to the increasing challenges at the intersection of policy, risk, and environment, Funtowicz and Ravetz (1993) developed a problem-solving framework called “post normal science” based on the assumptions of incomplete control, unpredictability, and multiple legitimate perspectives. The post-normal science paradigm recognizes the relevance of both process and location, in place and time, and is ‘issue-driven’ as opposed to the ‘curiosity-motivated’, ‘mission-oriented’, or ‘client-serving’ goals of core science, applied science, and professional consultancy, respectively (Funtowicz & Ravetz, 1993).

The authors viewed this emerging science as a platform from which issues that traditional scientific methodologies fail to handle can be approached. Such issues have either high uncertainties (i.e. the scientific, technical, and managerial complexities of the system being considered, and the array of potential results) or high decision-making stakes.

The only criticism is that the paradigm does not suggest the best way which can be used to collect and manage sold waste whereas system theory does. Because of this, system approach has been opted for in order to describe a frame work which used to manage solid waste. For example, in managing solid waste, system theory suggests different factors to be considered such as fund, labor, laws, policies, institutional framework and damping places. All these function as system and at the absence of one interdependent part, the whole system will fail. Experience developed from system theory has provided new insight for the researcher on the systems used by Moshi Municipal Council to manage solid waste.

2.4.2 Institutional economic theory

Institution economic theory is described by North (1990) as the role of institutions set up by Municipalities to manage solid waste systems present in their respective areas. The theory was pioneered by North (1990). North observed institutions from an economic point of view that they were the rules of the game in a society. They are the human devised constraints that shape human interaction. The theory is based on the conception that individuals are socially constructed identities. The theory fundamentally challenged the neo-classical theory which assumes that the political, economic and social surroundings is composed of groups of independent individuals, each practicing their own preference in order to get hold of material fulfillment.

The theory further advocates the ways of seeing and knowing the environment and ways of acting in it are understood or constructed in political, economic and social relations with others. In the course of life, people are continuously involved in reflecting and actively setting out to transform their conditions of life.

With respect to this, therefore, the theory tries to assess the understanding that no institution that can exist on it's entirely but through interaction with others. According to the economic institutional theory, the term institution embraces individuals, households and organizations with diverse behaviours.

Both North (1990) and Bandaragoda (2000), agree upon each other that institutions being rules or role structures, practices and norms but not direct performers or actors. It is the management or actors in the institution who actually perform. Institutions affect the performance of individuals, groups or organizations, a country or its economy through the effect of institutions on the cost exchange and production.

Consequently, they structure incentives in human exchange whether political, social or economic. In essence, the theory underpins the evolution of institutions and the way they basically affect economic performance as determined by the technology employed, costs of transacting and production. This aspect is of paramount role in this study as it seeks to assess the behaviour of institutions in providing the municipal solid waste management services

The justification for this study to employ the institutional economic theory is clearly summarized as follows. Firstly, it is a useful urban planning and management theory for monitoring operations of services amongst institutions, thus minimizing conflicts. (Majani, 2000:56). Secondly, it has been tested and proven workable in Majani's (2000) study on institutionalizing Enterprise Management Programme for solid waste management in Dar es Salaam City. This took place when a Central Government Commission replaced the Dar es Salaam City Council from 1996-2000 due to its urban management inefficiency.

2.5 Solid waste management in the systems theory perspective

In the systems theory perspective, solid waste management include inputs, outputs as well as process. The theory has been a helping tool in giving an understanding of the system as it is used to measure performance, control and compute the interactions

among individuals in each department of the organization. When the system theory is presented in an organization it helps in growth and development. The theory also is important in explaining various subsystems involved such as work groups, business units and individual employees (David, 2015). All these must work together so as to ensure effectiveness of solid waste management.

On the other hand institution economic theory is used to support bringing out the alterations between environmental attitudes towards waste management and the actual practices of waste management systems in an institutional context. This theory is also valuable in explaining the role of various stakeholders from solid waste management systems showing the disparity on how they respond in their resources, activities as well as their capabilities. As a result the theory has been revealed to be a useful tool in providing an awareness of the system of effective solid waste management.

2.5.1 Inputs for solid waste management systems

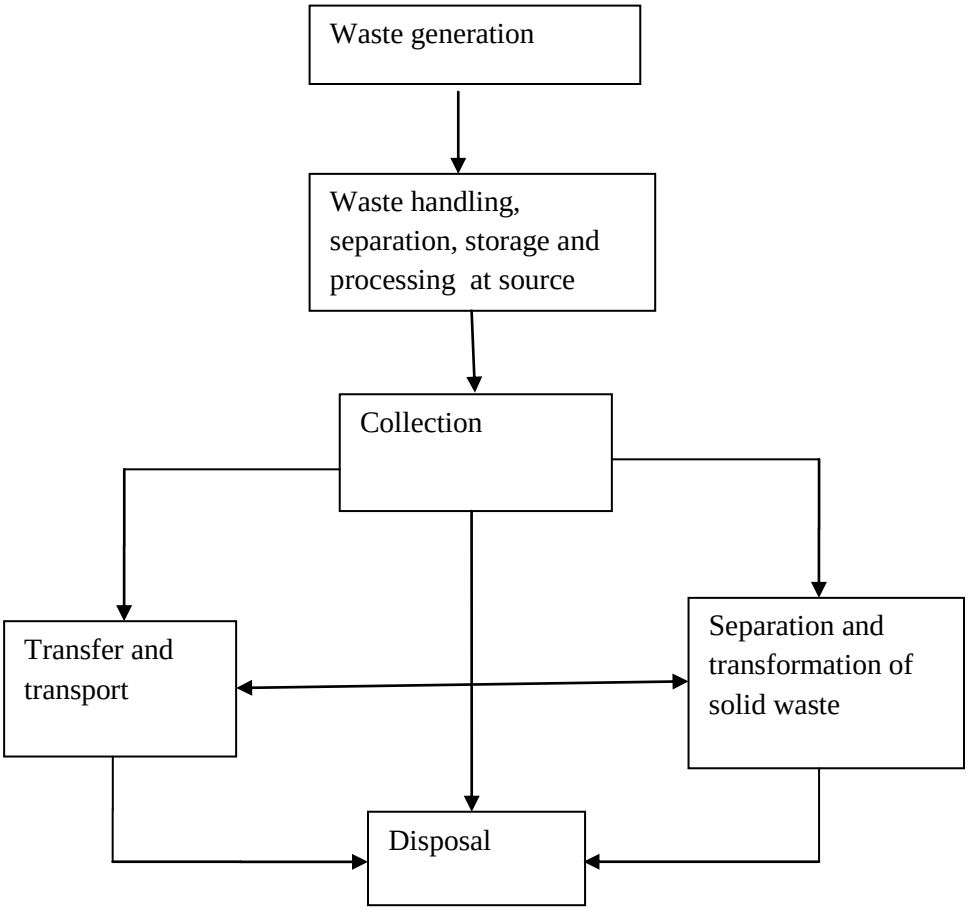
Inputs of solid waste management include all the necessary requirement needed to manage solid waste such as resources which can be human resource, financial resources, cleanness equipments as well as time. Legal and policy framework on environment conservation also can be used as input as it help people to obey the law and stop littering the environment hence success in solid waste management. For example Moshi Municipal By-Laws have been used by the Municipality as an input. Through it the number of people littering the environment has decreased as they know that there is punishment as per Moshi Municipal By-Laws, for example paying of Tsh 50,000/= or be jailed for not more than 12 months.

2.5.2 Transformation process in solid waste management system

Solid waste can be treated in different ways after it has been generated where as it can involve the process of identifying materials which are no longer usable and are either gathered for systematic disposal or thrown away.

After identifying the materials it can be stored so as to facilitate easier collection. For example, waste bins and skip buckets can be placed at the sites which generate sufficient waste where the waste trucks can collect and transfer it for disposal after separation of waste to be recovery as it has shown in the figure hereunder.

Figure 2.1 Transformation process of solid waste



Source: Researchers own construction (2015)

2.5.3 Outputs in solid waste management system

The output of a system is in general a direct or indirect result from the input. Success in solid waste management is an output which results from the input. Resource allocation and By-Laws can be used to ensure effectiveness of solid waste management (Krista, 2015). Having man power, financial, cleanness equipments and time can lead to

effective cleanness as the cleaners can use the cleaning equipments during conducting their duties where they can also be paid their wages on time hence resulting to (output) effectiveness in solid waste management

2.5.4 Feedback mechanisms in solid waste management system

In solid waste management system feedback mechanism is very important as it help to have information on areas to be improved so as to succeed more (Davidson 2011). The mechanism involve different strategies such as creating different windows for receiving feedback, providing accurate and timely follow up to the user and incorporating user ratings in employee evaluation and reward systems so that the workers also modify their behavior.

Much feedback is related to complaints such as reports of illegal dumping or non-compliance with the expected collection frequency and time schedule. Here is essential for the Municipality to provide rapid follow up in order to establish the nature of non-compliance and to correct it. This requires involving the private service provider if collection is outsourced. From the provider side feedback needs to go beyond recording and immediate response. Patterns of complaints need to be analyzed and corrected, resulting perhaps in adjustment of collection routes and established times and locations.

2.6 Prerequisites for effective waste management systems.

Resources allocation is one among the prerequisites for effective waste management systems. When there is sufficient fund, landfill site, availability of cleaning equipments and man power the issue of managing waste can be effective. By-Laws and Guidelines also can lead to effective waste management system. However, solid waste management systems can be poor if there is lack of strong governance of the resources as some leaders can use it illegally. Efforts are required so as to have sustainable solid waste management systems all the time in Local Government Authorities especially in Moshi Municipal Council (David, 2015). If the prerequisites cannot be considered important for the whole time then the areas which perform well in cleanness can fail to maintain the status hence poor solid waste management systems.

2.7 Empirical literature reviews

Eco, (2010), conducted a study about solid waste management in Canada to help individuals build meaningful environmental careers, provide employers with resources to find and keep the best environmental practitioner and informs educators and governments of employment trends to ensure the ongoing prosperity of this growing sector. The finding showed that the current size of the solid waste management industry is likely in excess of 70,000 employees. The survey concluded that there were approximately 59,869 private sector employees and 9,354 public sector employees.

Between 2004 and 2006, the solid waste management industry grew 17% in terms of revenues but shrunk by 14% in terms of number of businesses, in part due to mergers and acquisitions. Based on the employer survey, solid waste management employment in Canada showed that over the next three years is expected to grow by an annual compound rate of 6%. Over 4,000 new solid waste management employees will be required, with the growth by job classification varying widely—80% of employers expect increases in the number of laborers (45%) and operators (35%), while only 14% of employers expect higher management positions to grow.

Experience from this finding has shown that waste management is a source of employment whereby a number of people can be employed. Moshi Municipality for example, has employed some cleaners whose responsibility is to make sure that the environment is clean at all times. Eco's study looks similar to that of the researcher although there some differences. For example, while Eco's study was conducted in Canada, that of the researcher was conducted in Moshi Municipality. The only reason to cite this study is to get knew knowledge and experience of what is investigated by the researcher.

CSIR (2011), in the book entitled "Municipal waste management- good practices" attempted to investigate good practices in each of the stages of waste management, from the point of collection through transport, storage and treatment to final disposal. The principles of the waste hierarchy which include waste minimization re-use and recycling

is supported to reduce disposal at landfill. The argument was developed that Municipalities should determine the suitable programs for their specific circumstances. The Integrated Waste Management Plan can evaluate and recommend the most appropriate systems for each municipality. In South Africa the majority of waste ends up in landfills as mixed waste. However, the management of domestic waste in South Africa faced many challenges. For example, according to South African Constitution (Act No. 108 of such 1996), waste management service delivery is a local government function. Despite these mandate, Local government face many challenges such as financial management, equipment management, labor (staff) management, and institutional behavior (management and planning). This study has been cited because it looks similar to that of the researcher though there some differences. For example whereas this study was conducted in South Africa, that of the researcher was carried out in Moshi Municipal Council. Experience from this empirical review has provided an insight and a real picture of what is going to be investigated. A mix of experience from this empirical review and that of the researcher will help to build a new knowledge of the effective way of waste management.

Annepu,(2012), conducted a study about Sustainable Solid Waste Management in India to examined the present status of waste management in India, its effects on public health and the environment, and the prospects of introducing improved means of disposing Municipal solid waste in India. The main objective of the study was to find ways in which the enormous quantity of solid wastes currently disposed off on land can be reduced by recovering materials and energy from wastes, in a cost effective and environmental friendly manner. The result showed that role of the informal sector in solid waste management in developing nations is increasingly being recognized. There is a world-wide consensus that the informal sector should be integrated into the formal system and there are numerous initiatives working with such goals.

The report further argued that every ton per day of recyclables collected informally saves the urban local body USD 500 per year and avoids the emission of 721 kg of carbon dioxide per year.

There is no sufficient information on the performance of India's municipal solid waste composting facilities of potential refuse derived fuel in the form of composting rejects that will also be land filled. The report concluded that waste disposal system includes integrated informal recycling. Informal recycling should be integrated into the formal system by training and employing waste pickers to conduct door-to-door collection of wastes, and by allowing them to sell the recyclables they collected. Waste pickers should also be employed at material recovery facilities to increase the percentage of recycling.

On the other hand a report on Solid waste management in the world cities conducted by (UN-HABITAT 2010) showed that India have succeeded to control solid waste and become a world leader by applying other strategies apart from recycling such as enforcement of legislation, training and education, development of common treatment facilities on solid waste as well as research into uncharted areas are the common denominators in achieving good practice and a stable effective solid waste management systems. Also in order to have more success in the system of solid waste management the country make sure that there is a mix of the municipality and private operators to provide a direct, daily door-to-door primary collection system to 70 per cent of cities like Bengaluru citizens in high-income, middle-income and some low-income and slum areas. They also make sure that private contractors provide services in the CBD and in the better-off residential areas.

This finding is very important to the researcher's topic because it has provided a new insight of what ought to be investigated and she can find out the strategies used by Local Government Authorities in Tanzania in solid waste management systems. However, the only criticism is that it was carried out in India while that of the researcher was carried out in Tanzania, focusing in Moshi Municipality.

Moreover a report of solid waste management in the world cities by (UN-HABITAT, 2010) showed that some of the countries in Africa have succeeded in solid waste management through different strategies such as Legal and Policy Framework. The National Environmental Policies formulated by the Environmental Council of Zambia

that are in place consider effective solid waste management as part of the policy of environmental protection and pollution control even though the method to Municipal solid waste in Lusaka is still focused on defending public health. For most waste generators, the public health dimension is more persuasive than the environmental one and this becomes noticeable during the rainy season, when most areas for the most part the jammed and heavily populated peri-urban areas, experience outbreaks of epidemics such as cholera. Moshi Municipality also has succeeded to use legal and policy framework to control waste in the area as people afraid to litter due to punishment provided to those who litter as per By-Laws.

The report revealed that, funding for solid waste management is generally limited though central government and the cooperating partners tend to realize supplementary funds to mitigate the spread of cholera through regular clean-up of uncollected waste in the communities. Lusaka is a city which has determined to actively design and manage a mixed collection system. The dual waste management system is based on the municipality administration and monitoring a zonal monopoly system adapted to the demographics of different communities. In most of the municipalities operators are accountable for collecting fees for solid waste which is also not enough for the solid waste management systems; the operators are responsible also in implementing solid waste collection as well as meeting targets. Formal private-sector operators collect waste door to door, or provide skip buckets for larger generators or housing estates in the planned areas.

The report also point out that, the Legal and Policy Framework in Zambia on solid waste management systems has brought waste management to status in terms of environmental protection. Partially through support from the Danish International Development Agency (DANIDA) and other donors. Lusaka is a city where environmental sound disposal is being developed parallel with collection. The finding is very important as it can help the researcher to increase knowledge on her research. Also the researcher can have more information on the solid waste management systems in

Local Government Authorities for instance Moshi Municipality on how they collect fees and if there is involvement of stakeholders or not.

However, the same report on Solid Waste Management in the World Cities showed that in Kenya, the main driver for solid waste management in cities such as Nairobi is public health. Policy-makers, citizens and other actors in the city all share knowledge that insufficient waste management is directly linked to poor human health. Nairobi is a city where, for the last two decades, the private sector has been leading the way in waste collection and materials recovery initiatives. The successful private waste collection sector consists of more than 100 companies, Micro- and Small Enterprises and Community Based Organizations registered to collect waste, recyclables and compostable. The involvement of actors has made Nairobi to have strong system in solid waste management compared to other cities in Kenya. The report relate to the researcher although it was conducted in two different countries. In Tanzania the Local Government Authority for instance Moshi Municipality involve Community Based Organizations in solid waste management systems.

Bazinyemera (2010) report on Solid Waste Management from Rwanda showed that the urban population growth rate was 5% per year in 1978-1991. Currently, the growth rate stands at 9% per year and continues to increase hence batch of wastes can be seen in various spaces such as roads, riversides and many other open spaces. Regarding these changing issues the country analyzed the current solid waste management systems in Kigali City and proposed some methods which can be used to solve the problems associated with it, where recycling and composting were found to be more suitable.

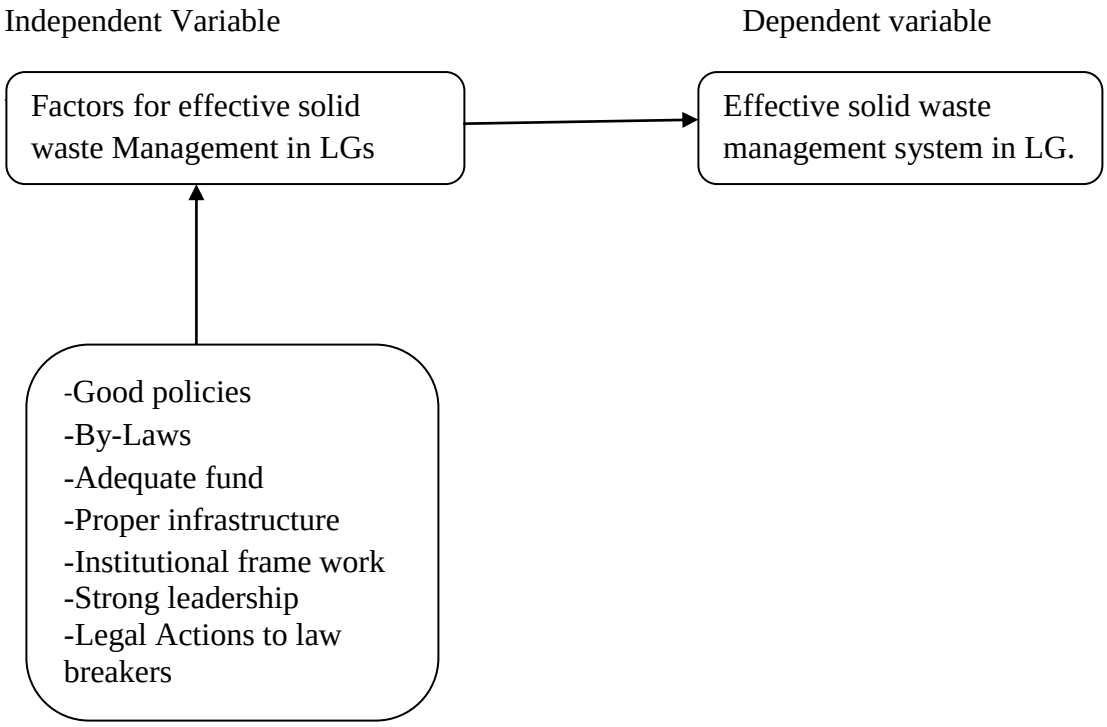
The use and manufacture of plastic bags in Kigali was banned in 2008, which has greatly cut down on extra trash. The fine for using one can be over $150. If store owners are caught providing them, they can be sent to prison for six to 12 months. Kigali also has one day each month of mandatory community service, when citizens remove litter and beautify certain areas. Additionally, the city employs street sweepers that routinely sweep up trash with broom (Karangwa, 2014).

Through this the country succeeded in solid waste management at its areas especially Kigali and regarded as clean country in Africa. This can also be applied in Local Government Authorities in Tanzania, for example Moshi Municipality can ban the use of plastic bags which pollute more the environment. This can be done by cooperating with the Central Government where the laws which prohibit the use of plastic bags can be enacted so that all people in Tanzania can stop the use of plastic bags which are also dangerous to human health.

2.8 Conceptual framework

The main focus of this study was to assess the effectiveness of solid waste management in Local Government Authorities in Tanzania where the researcher focused on identifying the systems used by Moshi Municipal Council to ensure effectiveness of solid waste management. To address this phenomenon, the study adopted system approach in solid waste management whereby examination was about whether various factors as suggested by system approach when tested can help to bring the expected result. Therefore, the study employed two stages of analysis. The first stage of analysis attempted to examine the factors for solid waste management in Moshi Municipality such as By-Laws, good policies, adequate fund, proper infrastructure, institutional framework, strong leadership, community participation and so on. The first box on the left of the conceptual framework shows the independent variable in which these factors pinpointed out and the last box on the right side shows the dependent variables whereby the outcomes of the mentioned factors in the former side are achieves that is effective solid waste management system. See Figure 2.2 below

Figure 2.2 Conceptual frameworks for Effective solid waste management in Moshi Municipal Council.



Source: Author (2016) based on System approach in SWM and other literature related to the topic of study.

2.9 Research gap

From the two concepts, theoretical review and empirical review the literatures have not specifically shown how the governments play their role in ensuring effectiveness of solid waste management. It does not show clearly the solution applied to minimize the impact of the challenges towards the effectiveness of solid waste management systems in many urban areas in African countries including Tanzania as well as steps taken for the law breakers and environmental litters. Now using Moshi Municipal Council as the case study, the researchers' study was; to assess the effectiveness of solid waste management systems in Local Government Authorities. However, with the roles of

Local Government Authority at hand the researcher also got to know challenges which impact on the effectiveness of the solid waste management systems in the municipality and, thus the researcher was in a good position to finish what other researchers failed to exhaust.

2.10 Conclusion

From the reviewed literatures it is shown that resources, rules and regulations in many urban areas in the world are more useful in maintaining the effectiveness of solid waste management systems. It is one of the ways used to control littering in most of the areas.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section describes the process used under research methodology. These include; research design, description of the study area, data collection tools, types and sources of data, techniques of data collection, sampling and techniques of data analysis. The above items were used as the guidelines that enabled the successful completion of this study.

3.2 Research Approach

The approach used is qualitative. It was appropriate as it helped the researcher to collect data in the selected wards and process it without the use of any statistical or mathematical operation. It was also appropriate as the researcher get some pictures to be used for the study during direct observation.

3.3 Research Design

The researcher used case study design. This design was selected due to the fact that it assesses the phenomenon with the actual context of life (Tylor 2011). The design was useful to this research as it enabled the researcher to gather data on relatively large number of people at the same time, for instance during the focus group discussion data were obtained from more than four people in a group.

The design enabled the researcher to increase knowledge about social phenomena and help to understand fully the behaviour pattern of the concerned unit during data collection. Moreover, this design was important to the research as the researcher select some of the units which were four wards among the 21 wards and study them intensively where enough information were obtained.

3.4 Area of the Study

The study was conducted in Moshi Municipality in four smaller administrative Wards which were Mawenzi ward and Bondeni ward from Central Business District and two wards namely Njoro and Mjimpya from peripheral area.

Mawenzi and Bondeni wards from Central Business District were selected as they are among the wards which perform well in cleanness competition compared to other wards while Mjimpya and Njoro wards from peripheral were selected as they perform poor most of the time.

Researcher decided to select Moshi Municipal Council amongst other municipalities due to Moshi Municipal Council report of 2011 under Bernadette Kinabo who was the Municipal Director which explains that Moshi Municipal Council has been leading in cleanliness for more than 7 years and it seems as the right panacea to identify on the system used by Moshi Municipal Council to ensure effectiveness of solid waste management. Map of Moshi Municipal Council is attached as appendix G and Organization chart as appendix H.

3.5 Population of the Study

The population of the study is defined as the group of people or items from which the sample size to be used in a particular study is being selected (Kombo and Tromp 2006). Thus, the target population of this study includes all people who have the role in overseeing and managing the solid waste management systems in the municipality and all the selected wards. The population is organized as follows:

3.5.1 Population of the study at the Municipality (Headquarter).

The key individuals in the municipality who are concerned with waste management issues include Head of Department of Environment and Cleansing together with the Cleansing Officer who cooperates with other stakeholders to make sure that there is effectiveness in solid waste management systems.

3.5.2 Population of the study at the selected wards.

Population of study in the selected wards involved Ward Executive Officers, Mtaa Executive Officers, residents as well as cleaners. Sixty four participants were used in the selected wards. Out of these, thirty two participants were residents from Mawenzi ward, Bondeni, Njoro and Mjimpya ward. 2 females and 1 male were selected from Hindu street and 2 females and 1 male from Rengua street, both in Mawenzi ward hence made a total number of 6 participants of whom 4 were females and 2 males.

In Bondeni ward 1 female and 2 males were selected from Mbuyuni Street and 2 females and 1 male from Sokoni street hence made a total of 6 participants, that is 3 were females and the remaining 3 were males. Also in Njoro ward 1 female and 2 males were selected from Railway street, 2 females and 2 males from Sokoni street as well as 1 female and 2 males from Viwanda street, therefore made a number of 10 participants where 4 were females and 6 were males.

A total number of 10 participants were selected in Mjimpya ward where 5 were females and the other 5 were males. In this 2 females and 1 male from Kwakomba street, 2 females and 2 males from Sokoni street as well as 1 female and 2 males from Langoni street. All these participants from the streets in all four wards were selected randomly and made a total number of 32 residents.

Other participants such as cleaners were selected purposively while they were collecting the cleanness equipments at MMC office ready for work in their areas. 2 females and 3 males were selected from Mawenzi ward, 2 females and 3 males from Bondeni ward, 2 males and 3 females from Mjimpya ward as well as 3 females and 2 males from Njoro ward hence made a total number of 20 cleaners where as 10 were females and 10 others were males.

Mtaa Executive Officers were also selected purposively whereby 1 Mtaa Executive Officer (male) from Hindu Street in Mawenzi ward was one of the participants. He also act for Rengua Street as this street did not have Mtaa Executive Officer for that time.

In Bondeni ward 2 Mtaa Executive Officers were selected, 1female from Mbuyuni Street and 1 male from Sokoni Street. 3Mtaa Executive Officers were selected from Mjimpya ward, 2 females from Kwakomba Street and Sokoni Street as well as 1 male from Langoni Street. Moreover 2 Mtaa Executive Officers were selected from Njoro ward, 1 male from Railway Street and 1 male from Sokoni Street who also act in Viwanda Street. All these made a total number of 8 Mtaa Executive Officers whereby 3 were females and 5 were males.

Furthermore, 4 Ward Executive Officers were also selected purposively from all four wards. 3 Ward Executive Officers were males from Mjimpya, Bondeni and Mawenzi while Ward Executive Officer from Njoro was female. All these were selected as they are the one who manage solid waste in their wards.

Table 3.1: Showing the population categories in both levels.

Categories	Level	Population
Municipal Level	Municipal Director	1
	Heads of Department	13
Wards Level	Ward Executive Officers	21
	Mtaa Executive Officers	60
	Cleaners	42
	Residents in selected wards	35,409
Total		**35,546**

Source: Researcher own adaptation (2015)

3.6 Sample size and Sampling Techniques

Sampling technique is the way in which the researchers use to choose sample size to be used in the study (Tromp and Kombo, 2006:77). Sixty seven (67) participants were used in this study and seems to be truly representative sample to be applied for the whole population due to availability of data from them which were enough. Yamaney formula (1967) was used to find the sample size as it is shown below.

$$n = \frac{N}{1+N(e)^2}$$

where:- n = Sample size

N = Total population

e = error in prediction

Therefore:- $n = \frac{35,546}{1+35,546\ (0.122)^2}$

$n = \frac{35,546}{1+35,546X0.014884}$

$n = \frac{35,546}{1+529.066664}$

$n = \frac{35,546}{530.066664}$

n = 67

3.6.1 Sample size at the Municipality headquarters

The sample size at the Municipality headquarter was 3 participants. In this, the Municipal Director was included as he is the one who supervise all activities to be done in Moshi Municipal Council including cleannes activities. Others were two participants from Environment and Cleansing Department.

They were selected purposively as they were the one who were responsible with the issues of solid waste management and the Environment Office by that time had only two staffs, that is the head of department and one officer. The Municipal Director was also selected purposively as he was the one who manage all issues taking place in Moshi Municipality including solid waste management issues. Therefore, purposive sampling was used to obtain key informants from the Municipality.

3.6.2 Sample size at the selected wards

In this 64 participants were involved to form the sample size from the wards. The Wards Executive Officers were selected purposively as they were the one who responsible for managing solid waste issues in their areas. Other participants such as cleaners were also selected purposively as they were few in number and each ward has got five cleaners. Simple random sampling was used to select residents. This technique was used to avoid bias in obtaining participants and it was suitable for large numbers. Also it was used as it does not depend much upon the existence of detailed information about the universe for its effectiveness. From the each ward the researcher made a list of ten pieces of paper in each ward with the ward Yes and No matching the number of 10 residents in each ward. The researcher collected the pieces into container prepared for each ward. The researcher mixed up thoroughly pieces of paper in all containers, after mixing up each resident select one piece of paper (without looking the ward in it) and continued until the researcher obtained the required number of respondents in each ward. Those who picked yes were the one who participated in the study.

Table 3.2: Showing summary of the selected sample size

Type of respondents	**Sample size**	**Technique for selecting**
Municipal director	1	Purposive sampling
Head of department	1	Purposive sampling
Environment and Cleansing Officer	1	Purposive sampling
Ward Executive Officers	4	Purposive sampling
Mtaa Executive Officers	8	Purposive sampling
Cleaners	20	Purposive sampling
Residents	32	Simple random sampling
Total	**67**	

Source: Researcher own adaptation (2015)

3.7 Data Collection Methods and source of data

This section gives a detailed description of various research instruments used to gather research data. Both primary and secondary data were used in this study. Primary data were obtained directly from the Moshi Municipal Council residents and Officials. The purpose of primary data is to get fresh information from the participants which were used to generate new knowledge. These data complemented corresponding secondary data. Secondary data were obtained from secondary sources, mainly publications, reports from Moshi Municipal Council offices, Moshi town Library and internet sources. The intention of secondary data was to supplement primary information in order to bring meaningful logic (Taylor, 2011).

Four methods of data collection were used in this study. These include focus group discussion, documentary review, in-depth interview, and direct observation. According to Giddens (2004) the above methods support in complimenting and verifying obtained information using triangulation. This was used to cross-check different types of information by taking the outcomes of one method and comparing them with the results of the other methods involved in this study.

3.7.1 Primary Sources

3.7.1.1 In-depth interview method

The interview guide was used to collect data from key informants like staff and wards leaders. Through key informant interviews, confidential information were obtained such as how the Municipal employer ensures solid waste management systems, factors affecting solid waste management systems at Moshi Municipal Council, as well as challenges facing the solid waste management systems in Moshi Municipal Council and the ways used to overcome it. This method allowed flexibility so as to anticipate relevant information (Adam &Kamuzora, 2008).

3.7.1.2 Focal Group Discussion

The methods assisted the researcher to solicit more information for short period of time. Researcher used this method to collect data through group discussion where she acted as a guide for the discussion. Moreover, cleaners were selected and divided into four groups (one group from each ward in all four wards) constituted a mixture of men and women to participate in Focus Group Discussion. Each group include five participants.

The method was used so as to draws upon participants attitude, feelings, behavior, reaction and experience which is difficult to get by using other instruments and might be overlooked (Desai and Potter, 2006).

Moreover the method was used as it was relatively low cost and provided quick results. The actual time and cost for planning, conducting and analyzing data was relatively small when compared to alternatives such as individual interviews. Also through interaction between the researcher and participants it allowed the researcher to probe issues in depth, address new issues as they arose and to ask participants to elaborate on their responses.

The method was also used as to make the participants more comfortable talking in a group than in an individual interview. Interactions generated more discussion and therefore, more information. In this the data were the participants own words and it was easily understood and provided insights into how respondents think about the solid waste management systems.

3.7.1.3 Direct Observation

After the interview and Focus Group Discussion with targeted participants, the researcher took short walk in areas specifically the targeted wards of Mawenzi, Bondeni, Mjimpya and Njoro as well as in Kaloleni where the landfill site is found so that she attentively watch local situations, behaviours and surroundings and have more information on how the residents and officials control solid waste at Moshi Municipal Council. The researcher observed cleanness facilities such as push carts, waste trucks,

breakdown, skip buckets, the Moshi Municipal Council landfill site as well as cleaners from Moshi Municipal Council.

The researcher wanted to observe the cleanness facilities, cleaners and other related issues in solid waste management so as to find out if it relate to the information obtained from the key informants, residents and cleaners so that some of the information can be added to the study. According to Kothari (2004), direct observations do offer additional information on the study and what activities have been taking place. Different field pictures were taken during the observation.

3.8.2 Secondary Sources

3.8.2.1 Documentary review

This method was used to collect the background information on Moshi Municipal Council and its general strategies on solid waste management systems in the study area. The method included various documents which were used to support the data findings at Moshi Municipal Council. For instance the report of solid waste management in the world cities which explain about the effectiveness of solid waste management systems in Moshi Municipality and other cities by Yhdego the year 1995. Further literature was obtained from the websites such as www.moshimc.go.tz, unhabitat.org, journals like Environmental Profile of Moshi Municipality 2010, newspapers, newsletters and libraries especially at Moshi Municipal Council archives where policy and act were also found. Other documents such as Moshi Municipal By-Laws were useful as it helped in data findings especially on the issues of obeying laws and punishment to be taken to those who break laws.

3.9 Data analysis methods.

Data obtained were summarized and analyzed manually due to the type of approach used and information obtained from the participants. Pictures taken during direct observation were presented so as to support information which were obtained through interview and

focus group discussion. Data obtained from documentary review were used to support this study.

3.10 Research Ethics

As a researcher you must remember that the research process intrudes on people's lives, some of the people who take part in the research may be vulnerable because of their age, social status or position of being powerless (Dawson, 2007). So, the study covered all ethical protocols which were needed in the process of collecting data which were to make the participants be informed, observing their rights to privacy, protecting them from harm which may be physical or emotional by the way a researcher asking questions and report findings.

This study also adhered to all ethical issues of researches. After successful writing of the proposal, the researcher obtained a letter from Mzumbe University for data collection and also a letter from Moshi Municipal Council which allows her to collect data in Moshi Municipal Council headquarter, Bondeni ward, Mawenzi ward, Mjimpya ward as well as Njoro ward.

Participants were also informed on the purpose of the study and they were assured of the confidentiality of the information they provided during data collection. The letter from Moshi Municipal Council is attached as Appendix D.

3.11 Reliability and Validity

Validity and reliability are two concepts that are important for defining and measuring the quality and consistence of research instruments (Golafshani, 2003).

According to Kavale (1996), validity refers to the issue of truth and knowledge. Validity in other words refers to the quality that a procedure or an instrument (tool) used in the research is accurate, correct, true, meaningful and right. The validation of instrument is the process of establishing document evidence, which provides high degree of accuracy that specific process consistently produces meeting its predetermined specification and quality attributes (Cohen et al, 2000).

In order to ensure validity of data, a multiple data collection techniques known as triangulation was applied in this study. Furthermore the technique involved the use of more than one method of data collection such as Focus Group Discussion, interview and observation. Consequently permits the researcher to combine strength and correct some of the deficiencies of some source of data. This technique helped to overcome the problem of relying on only one method while at the same time increased the validity of the data obtained on the topic of "Effectiveness of Solid Waste Management Systems in Local Government Authorities in Tanzania.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter reports mainly the findings and discussion after analysing the data which were collected through in-depth interviews, Focus Group Discussion, direct observation and documentation. Furthermore, the chapter continues to present findings by describing the solid waste management systems deployed by Moshi Municipal Council, to assess the extent to which solid waste management systems enhance the management of solid waste in the Municipality, identify the challenges which impact on the effectiveness of the solid waste management systems in the Municipality as well as to determine the ways the Municipality can deploy to minimize the impact of the challenges towards the effectiveness of solid waste management systems.

4.2 Research findings

4.2.1 Solid waste management systems deployed by Moshi Municipal Council. In order to achieve this objective, the interview guide was adopted. The interview findings as reported by Municipal Director is Policy and Legal framework, involvement of key stakeholders, encouraging public-community participation, and ensuring good governance in the process of solid waste management systems. The use of system that aim at ensuring effectiveness of solid waste management at Moshi Municipal Council. The following are the description of the actors involved in the system as well as description of Policy and Legal Framework and how the system operates.

The findings of the research were presented as follows:

4.2.1.1 The history of solid waste management in Moshi Municipality

The importance of solid waste management in Moshi has its root since 1950's when it was found to be the role of every individual to manage solid waste for the sake of protecting the health of public. Later on, each individual was advised to have a sanitary

dustbin at their premises. However, at that time all cleanliness activities were financed by the central government. Likewise, although the Public Health Act was endorsed in 1966, its working environment was not conducive and hence only 60 percent of the cleanliness was done. Thereafter the United Republic of Tanzania through the Ministry of Health modernized the solid waste management systems through enactment of the 2004 Environmental Management Act.

Prior 1961, the problem of solid waste management was dominant in local wards and villages but not at municipal level. During that time, the flow of water in those areas was able to degrade the small quantity of dumped organic waste. However, these local practices did not progress because of the increased population densities in urban areas which led to increase of the quantity of wastes. This situation increased the threats to public health because of absence of good way of managing solid waste (Moshi Municipal Profile, 2008).

Currently, waste collection services are provided by the Moshi Municipal Council, a private contractor on a pilot basis known as VAIKI contractor. The private contractor provides services in one of the three wards in the Central Business Districts which are Kiusa, Bondeni and Mawenzi wards (of 21 in total in Moshi Municipality). The arrangement is that, private contractors collect both waste and fee pay 3 percent of the total fee collected to the Municipal Council (UN-Habitat, 2010). The Moshi Municipal Council serves the urban area and provides secondary collection in peri-urban areas.

4.2.1.2 Public-community participation

In Nairobi, waste management stakeholders include Nairobi City Council, Ministry of Environment, Water and Natural Resources, Ministry of Lands, Housing and Urban development, Non-governmental Organizations (NGOs), Community Based Organizations (CBOs) and the private sector. The National Government is responsible for establishing the institutional and legal framework for Municipal solid waste management and ensuring that county governments have the necessary authority, powers and capacities for effective solid waste management.

County government through the Nairobi City Council is generally responsible for the provision of solid waste collection and disposal services (Njoroge 2014).

One way of minimizing waste is by allowing the public to be aware of the problems posed by ineffective management of waste (Robertson, 2002). During the interview, Municipal Director stated that the involvement of community members in managing solid wastes has created a sense of individual responsibility in ensuring no waste is found loitering around residential areas as well as business centers. To emphasize on that, Municipal Director said, *"The method of cooperating residents in solid waste management programs has simplified the work of Moshi Municipal Council in the collection of wastes since the residents assemble themselves to clean their residential and business areas every Saturday morning to keep their surroundings clean".*

However, this method of public community participation in solid waste management has yield positive outcomes since people are motivated to contribute required finances such as the refuse collection charges on timely basis for managing solid wastes in the Municipal, hence create sustainability in solid waste management at Moshi Municipal Council. Table below shows the amount of fee every resident contribute for waste collection as required considering whether it is commercial or residential.

Table 4.1: Showing Waste Collection Fee per year in Moshi Municipal Council

S/N	Item	Fee paid per year
1	Hotel	180,000/=
2	Restaurant	60,000/=
3	Wholesales Shop	60,000/=
4	Industries & Institutions	780,000/=
5	Small Industries	260,000/=
6	Other Businesses	36,000/=
7	Residential Houses	12,000/=
8	Market/Bus Stand	15,000/=
9	Dumpsite Fee	5,000/=
10	Fumigation	5,000/=

Source: Moshi Municipal Council Waste Management By-Laws (2006)

4.2.1.3 Key Stakeholder participation

This information was found to be crucial in ensuring environmental sustainability as it links key stakeholders like central government, private sectors, city council, potential individuals as well as CBOs (Robertson 2002). Involving key stakeholders such as the central government, city council, private sectors, CBOs and potential individuals, to take part in solid waste management can be viewed as a very important component in ensuring sustainability of solid waste management (Robertson, 2002).

All through during the interview, Municipal Director spoke on the method of involving key stakeholders in promoting solid waste management. He said that, *"Every stakeholder, be it Central Government, Private Sector such as Tigo, Vodacom, Airtel, Serengeti Breweries, Bonite Bottlers or Individual Person has an essential role to play in the effectiveness of solid waste management at Moshi Municipal Council"*.

Most of the financial resources and equipments come from the Central Government, while Private Sector assist in awareness creation about the environmental impacts resulting from waste disposal of solid waste management to the residents of Moshi Municipal Council.

The Municipal Director revealed that, many companies, organizations around the Moshi Municipal Council have accepted to join efforts with Moshi Municipal Council in ensuring proper and sustainable solid waste management around the Moshi Municipal Council. Companies like Bonite Bottlers provided cleanness equipments and Asante Tours have contributed in constructing road side fixed dustbins for pass-byres who wants to throw used items like fruits, empty cans, papers, and large dumping metal containers at dumping areas.

VAIKI company has employed cleaners who joins efforts with the Moshi Municipal Council cleaners to keep the town area clean. This was due to insufficient number of cleaners employed by Moshi Municipality. These cleaners from VAIKI company perform their duties more in Central Business District wards which are Mawenzi and Bondeni while those employed by Municipal Director perform their responsibilities in peripheral wards of Njoro and Mjimpya.

Figure 4.1: Cleaners from VAIKI Company

Source: Field picture (2016)

There are also companies like Insignia Ltd in Mawenzi ward which is in Central Business District that specialize in painting adverts that advocate for keeping the township clean. The company insist on the issue of keeping the town clean in the Central Business District as it is the area with large number of people compared to peripheral wards of Njoro and Mjimpya and this can help to send a message to large number of people as the adverts is found near the Moshi bus terminal.

Figure 4.2: Insignia company advert advocating for Moshi Municipal Council residents to keep their town clean

Source: Field picture (2016)

4.2.1.3 Legal and Policy Framework.

In literature review legal and policy framework seems to be used more in different countries such as India and Zambia in solid waste management as it has been explained in chapter two. In Moshi Municipal Council legal and policy framework has been used as follows:

4.2.1.3.1 Environmental Management Act of 2004 revised 2009

United Republic of Tanzania (2009), Environmental Management Act section 13 and 14 page 12 states that it is the duty of local government to minimize solid waste at source by ensuring that every occupier of premises, business, industry or any activity generating solid waste minimizes the waste through separation of waste. Also Local Government shall make sure that waste are collected into waste storage receptacles of specified standards, types, sizes, shapes, colours, easy to carry or move of waste containers, comply with and other specifications as the case may be. Local Government has the duty to make sure that the residents are aware of waste segregation. Through this Act Moshi Municipal Council has succeeded to explain to its people on the importance of waste segregation and the resident has started to implement it hence solid waste management systems. The residents also keep their domestic waste in storage and when the waste truck pass it collect it to Kaloleni land fill site for disposal as it is seen in the figure below.

Figure 4.3: Waste collection at Mji Mpya Ward

Source: Field Picture (2016)

4.2.1.3.2 Moshi Municipal Waste Management By-Laws

Moshi Municipal Waste Management By - Laws of 2006 section 5 page 2 ascertains that it is the duty of every citizen in his or her area to conserve the environment and pay fees required so as to ensure effective solid waste management in their places. Through Waste Management By-Laws 2006, the Moshi Municipal Council has succeeded to shape people who disobey laws and litter anywhere they want. In this, a person who litter the environment has to pay 50,000/= or be sentenced for not more than 12 months as per Moshi Municipal Council Waste Management By-Laws section 9 page 3. This also helped in solid waste management in peripheral wards as people obey By-Laws and reduce the habit of littering.

4.2.1.3.3 Health Policy of 2007

Health policy of 2007 section 6.10 subsection (a) concerning environment explain that it is the duty of every citizen to conserve the environment through planting of trees, conserving water sources, avoid air pollution as well as environmental littering of solid waste. It state that the government take effort to prepare the system of solid waste disposal. This policy has been used also by Moshi Municipal Council and it helped in solid waste management systems as the institutions like schools and hospitals such as KCMC and Mawenzi found in Mawenzi ward are responsible for solid waste they generate.

4.2.1.3 Good governance

According to Kironde L and Yhidego M, (1997), the achievement of any Municipal in solid waste management depends on the presence of good governance. Thus, the responsibility in terms of power between the government, local authorities and the communities is of paramount important.

When conducted the interview, the Municipal Director stated that, *"The Central and Local Government relationship has an important implication in the governance of Municipal solid waste management in terms of approval of laws and policies related to*

waste management and funds allocation". At Moshi Municipal Council the respective authorities have been on the forefront in establishing laws and policies that guide the whole process of solid waste management from the stage of refuse generation, collection, storage and disposal. These laws are enacted not only by residents, but also non-residents who visits Moshi Municipal Council area, and the penalties imposed cut across the two parties equally hence solid waste management systems as everyone obey law.

4.2.1.4 Proper allocation of resources

The good allocation of resources as reported by the Municipal Director point out that the refuse collection charges accumulated from the residents and business areas, as well as the funds that come from the central government are all channeled into promoting solid waste management effectively. This aims at ensuring there is enough supply of cleaning equipment, maintenance of destroyed equipment, hosting public solid waste management education to residents, paying of wages to cleaners at a timely manner, as well as managing the whole process of refuse collection, storage, transportation and disposal. Resources as it has been explained in system theory it help to have positive results as without resources solid waste management systems is difficulty.

Figure 4.4: Availability of cleaning equipment

Source: Field picture (2016).

4.2.2 The extent to which solid waste management systems enhance the management of solid waste in the Municipality.

An in-depth interview with the Municipal Director revealed that, the major factor leading to the effectiveness of solid waste management at Moshi Municipal Council is the integrated solid waste management approach used in operating the whole solid waste management activity from the household level to Municipal level. He asserted that, integrated solid waste management is the key approach that has worked best for Moshi Municipal Council since year 2000 when they first applied it on its environment.

According to USEPA, (United States Environmental Protection Agency 2002) Integrated Solid Waste Management is an approach to waste management that is most compatible with an environmentally sustainable development. It refers to the complementary use of a variety of practices to safely and effectively handle Municipal solid waste.

The strategy used to develop an integrated waste management system is to identify the levels at which the highest values of individual and collective materials can be recovered. The most favorable is reduction, which suggests using less to begin with and reusing more, thereby saving material production, resource cost, and energy. The least desirable is land filling. The approach not only aims at maximizing recovery of reusable and recyclable materials, but also reduces pollution and protects human health and the environment.

Therefore, the following are the three system's operation found in integrated solid waste approach that the Moshi Municipal Council uses to ensure effectiveness of solid waste management in Moshi Municipal Council.

4.2.2.1 Reduction

The main idea behind waste reduction is to minimize the amount of solid waste generated from the household level to industrial level. The Moshi Municipal Council ensures that there is effective solid waste reduction by building up people's capacity and awareness on the effect of excessive generation of solid waste in their lives and the environment, hoping that these people will change their attitude and culture that leads them to generate massive solid waste in their areas.

During a Focus Group Discussion cleaners acknowledged that, waste reduction strategy is one of the most effective and promising way of dealing with solid waste management as the amount of waste for disposal is minimized and kept in check. However, this highly depends on the perception of local citizens' behaviour and attitude on the matter.

The researcher took a short walk and observe one of the resident in Bondeni ward who reduce waste to be taken to the landfill site by sorting the remain of food and other waste materials which can be used to make manure as it is seen in the figure below.

Figure 4.5: Showing the process of making manure by using waste materials.

Source: Field picture (2016)

4.2.2.2 Reuse

Reuse is to use an item again after it has been used. This includes conventional reuse where the item is used again for the same function, and creative reuse where it is used for a different function (Kamala, 2012).

During a Focus Group Discussion with the Moshi Municipal Council cleaners, they explained on the concept of reusing produced waste instead of disposing them. One of the cleaner stated that, "*When we collect solid wastes from the streets, we tend to segregate waste materials such as plastic bottles, cans, bags and cardboards that can be reused once presented to commercial centres which they also sell it to the end users. The materials, therefore, only enter the waste trucks when they cannot be of use for domestic consumption".*

The waste products to be reused has helped in solid waste management systems as the amount of waste to be taken to the landfill site has decrease and the waste trucks can have trips for waste disposal. Also few people in Moshi Municipality got employment. These waste products to be reused are collected more in Mawenzi and Njoro wards which are the Central Business District wards. See figure 4.6

Figure 4.6: Bottles to be taken to commercial centres.

Source: Field picture (2016)

One of the resident in Mjimpya ward explained that they reuse also the plastic bottle caps to make different things like basket as seen in figure 4.7 below. The remain of glasses also used in building of fence as it is placed on the top for security purpose and the plastic bottles are used for decorations in some of the areas.

Figure 4.7: Showing the basket made by plastic bottle caps

Source: Field picture (2016)

4.2.2.3 Recycling

During direct observation done by the researcher in the wards, a young man was seen collecting a stock of metal cans in a big plastic bag at Bondeni ward. After a while, the researcher approached the young man for clarification on the usage of these dirty metal cans. The young man explained, "*Collecting used metal cans is my daily activity. Once I collect these cans, I soak them in soapy water and leave them to dry. After that I tear them into half and design them into a metal candle holder or create a local kerosene lamp out of them. This activity of recycling has been my main economic activity for more than 7 years. My father inherited the skills to me and my other half-brother*"

This helped in solid waste management in Moshi Municipality as it help to make the environment clean and simplify separation in the landfill site as sometime they do not need to employ people for waste separation where as the amount for waste separation can be used for other solid waste management activities.

Figure 4.8: Man preparing dirty metal cans for uses

Source: Field picture (2016)

According to ADB (2002) Recycling is regarded as a self- employment activity for the low income population or for the individuals who cannot manage to be employed in the formal sectors. At Moshi Municipal Council, the Municipal Director agrees on the notion that recycling has not only helped the Municipal in solid waste management but also creating employment to out-of-school youths, hence reduce the increase of immoral social acts like theft, prostitution, and gangs as they earn some amount of money from the fuel lamps and other products they made which help them to improve their living standards. Plastic bottles and other materials are used to make different facilities for instance desks which are made in Arusha city by one of the companies. Also fuel lamps

made by metal materials in Moshi Municipality helps people in the area with low income and who cannot afford to by other electric lamps or use of other services such as solar power and electricity as they are sold in low price and they are affordable. This help to keep the environment clean as it is the peoples job so when they find those materials in the areas they live they collect it for their activities and other sell it to those who are in need of it.

Figure 4.9: Recycled metal cans that were turned into fuel lamp by the youth

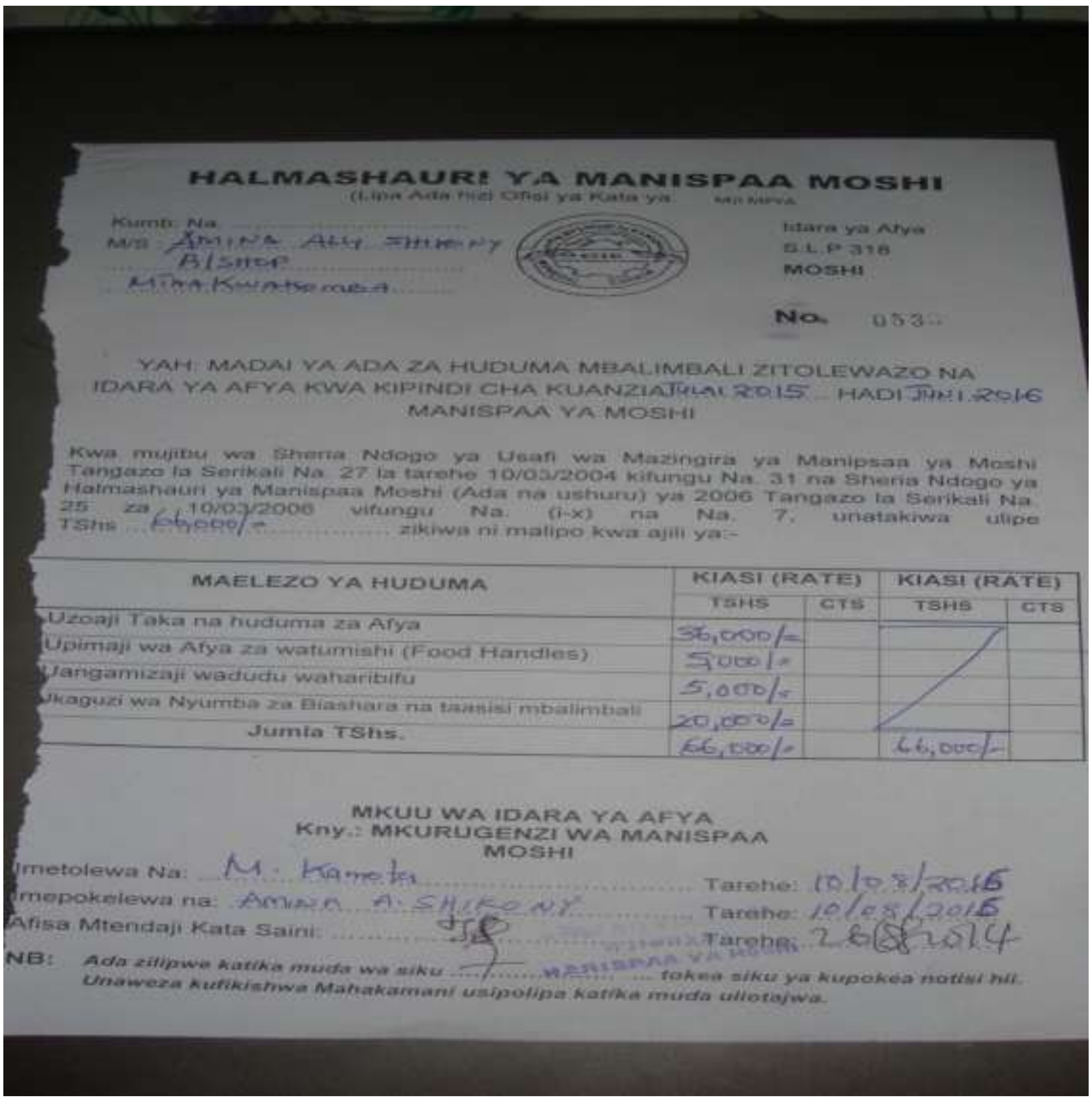
Source: Field picture (2016)

Furthermore, the Municipal Director stated that with the implication of integrated solid waste management, the Moshi Municipal Council stakeholders supporting solid waste management have played a big role in ensuring total effectiveness of solid waste management in the area. The knowledge offered by the stakeholders to the people, has helped to shape the aspect of culture such as the behaviour of people living with waste in their premises, or letting their toilet wastes flow into the streets during rainy seasons. These acts of filthiness had caused eruption of diseases such as cholera in the former years. For now, the strong By-Laws especially Moshi Municipal By-Laws has helped much as residents have reduced the habit of letting their toilets flow into the area.

4.2.2.4 Fair amount charges

Among the charges to the service offered include waste collection charges which vary from household, hotels and industries. There are other fair charge such as fumigation charges, food handling charges, latrine inspection charges, as well as waste sorting charges (sorting of liquid and solid wastes) before dumping.

Figure 4.10: Invoice from Moshi Municipal Council to one of the residents in Mjimpya ward



HALMASHAURI YA MANISPAA MOSHI

(Lipa Ada hizi Ofisi ya Kata ya: [illegible])

Kumb: Na. ....

M/S [illegible]

Idara ya Afya
S.L.P 318
MOSHI

No. 053[illegible]

YAH: MADAI YA ADA ZA HUDUMA MBALIMBALI ZITOLEWAZO NA IDARA YA AFYA KWA KIPINDI CHA KUANZIA Julai 2015 HADI Juni 2016 MANISPAA YA MOSHI

Kwa mujibu wa Sheria Ndogo ya Usafi wa Mazingira ya Manipsaa ya Moshi Tangazo la Serikali Na. 27 la tarehe 10/03/2004 kifungu Na. 31 na Sheria Ndogo ya Halmashauri ya Manispaa Moshi (Ada na ushuru) ya 2006 Tangazo la Serikali Na. 25 za 10/03/2006 vifungu Na. (i-x) na Na. 7, unatakiwa ulipe TShs 66,000/= zikiwa ni malipo kwa ajili ya:-

MAELEZO YA HUDUMA	KIASI (RATE)		KIASI (RATE)	
	TSHS	CTS	TSHS	CTS
Uzoaji Taka na huduma za Afya	36,000/=			
Upimaji wa Afya za watumishi (Food Handles)	5000/=			
Uangamizaji wadudu waharibifu	5,000/=			
Ukaguzi wa Nyumba za Biashara na taasisi mbalimbali	20,000/=			
Jumla TShs.	66,000/=		66,000/=	

MKUU WA IDARA YA AFYA
Kny.: MKURUGENZI WA MANISPAA
MOSHI

Imetolewa Na: M. Kameta .... Tarehe: 10/08/2016

Imepokelewa na: Amina A. Shirony .... Tarehe: 10/08/2016

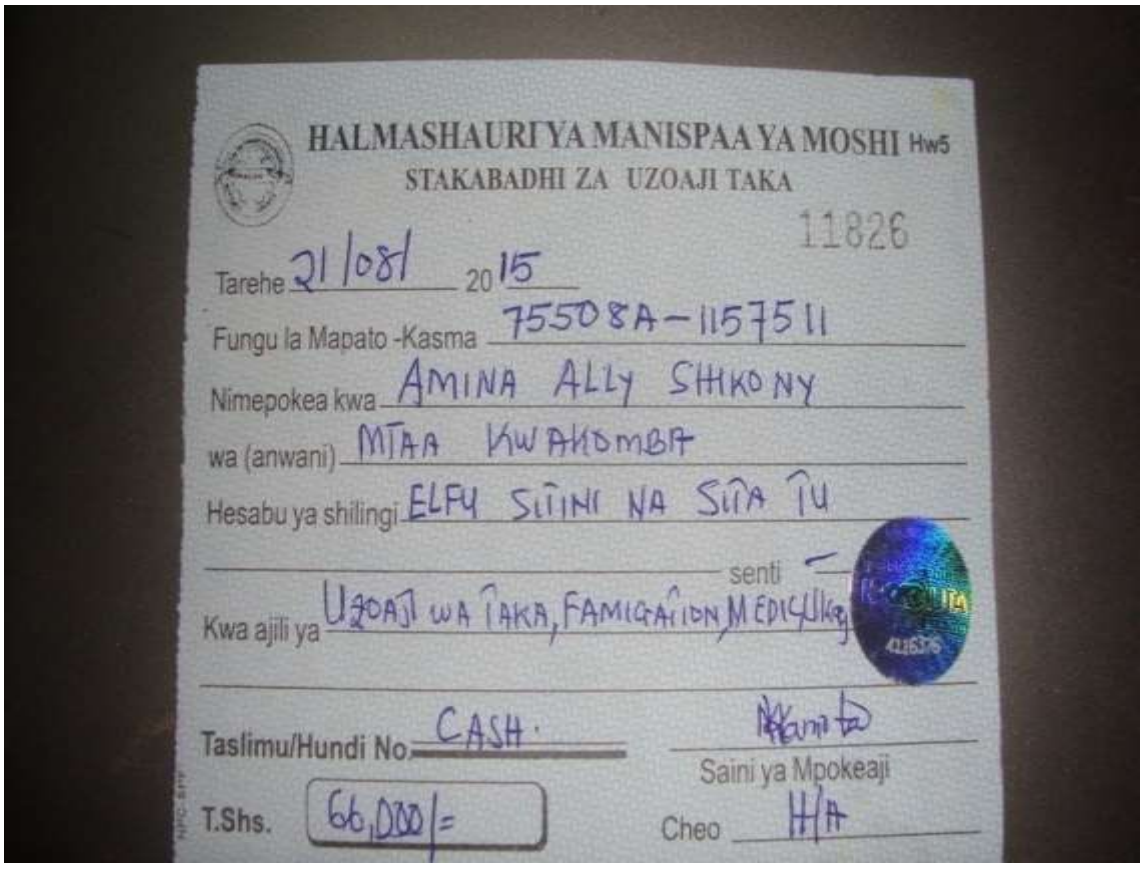
Afisa Mtendaji Kata Saini: .... Tarehe: 28/8/2014

NB: *Ada zilipwe katika muda wa siku .... tokea siku ya kupokea notisi hii. Unaweza kufikishwa Mahakamani usipolipa katika muda uliotajwa.*

Source: Field picture (2016)

Residents participate in solid waste management by paying the amount of fees required as it is indicated in the Moshi Municipal By-Laws of 2006 section 6 which needs all residents to pay fees for fumigation, waste collection, inspection as well as fee for landfill site where they are given receipt after payments. After payments they are given receipt for the payment and those who refuse to pay they are punished as per Moshi Municipal By-Laws of 2006. This helped in solid waste management as each person has to pay for that amount of fees required so that he or she cannot be punished for disobeying the law.

Figure 4.11 Receipt from one of the participant at Mjimpya ward.



Source: Field picture (2016)

Additionally, the Council convenes seminars and workshops in all 21 wards in the Municipality and offer capacity building course aiming at empowering the waste collectors to efficiently execute their duties timely which helps in maintaining the status of the Municipality in terms of cleanliness. In making sure a degree of sustainability is enhanced, the Council allocates funds as the extract below validates.

Table 4.2: Trends estimates of revenues for solid waste management in Moshi Municipal Council for the year 2014/2015.

Particular	Estimates	Revenues as at November 2014	Estimates 2014/2015
Solid waste collection	153,055,000	90,000,400	324,980,000
Latrine rental fee	29,352,000	22,000,000	39,480,000
Seminars and workshops	12,000,000	6,000,000	15,000,000
Total in Tshs	**194,407,000**	**118,000,400**	**379,460,000**

Source: Moshi Municipal Council Office (2016)

4.2.2.5 Ward environmental competitions

The Moshi Municipal Council has been conducting ward environmental competitions. The main objective behind these competitions is to motivate the public to be involved in keeping their surroundings clean as well as participate in solid waste management activities. These competitions have proved to be effective in solid waste management since residents of Moshi Municipal Council have positively responded to its tasks, and the Moshi Municipal Council has been providing awards such as certificates to the winning wards. All wards make effort so that they can perform well in the competition although the records showed that those perform best are the wards from the Central Business District such as Mawenzi ward and Bondeni ward while the peripheral wards such as Njoro and Mjimpya ward perform in low quality.

This is due to the number of manpower found in central business district as well as number of people who live in those areas. The peripheral wards have large number of people compared to the central business district and also the buildings in the peripherals wards are unplanned hence difficult to make cleanness in some of the areas which are not easy to pass and this lead to low marks to the peripheral wards.

Figure 4.12: Competition held the year 2013 in all wards.

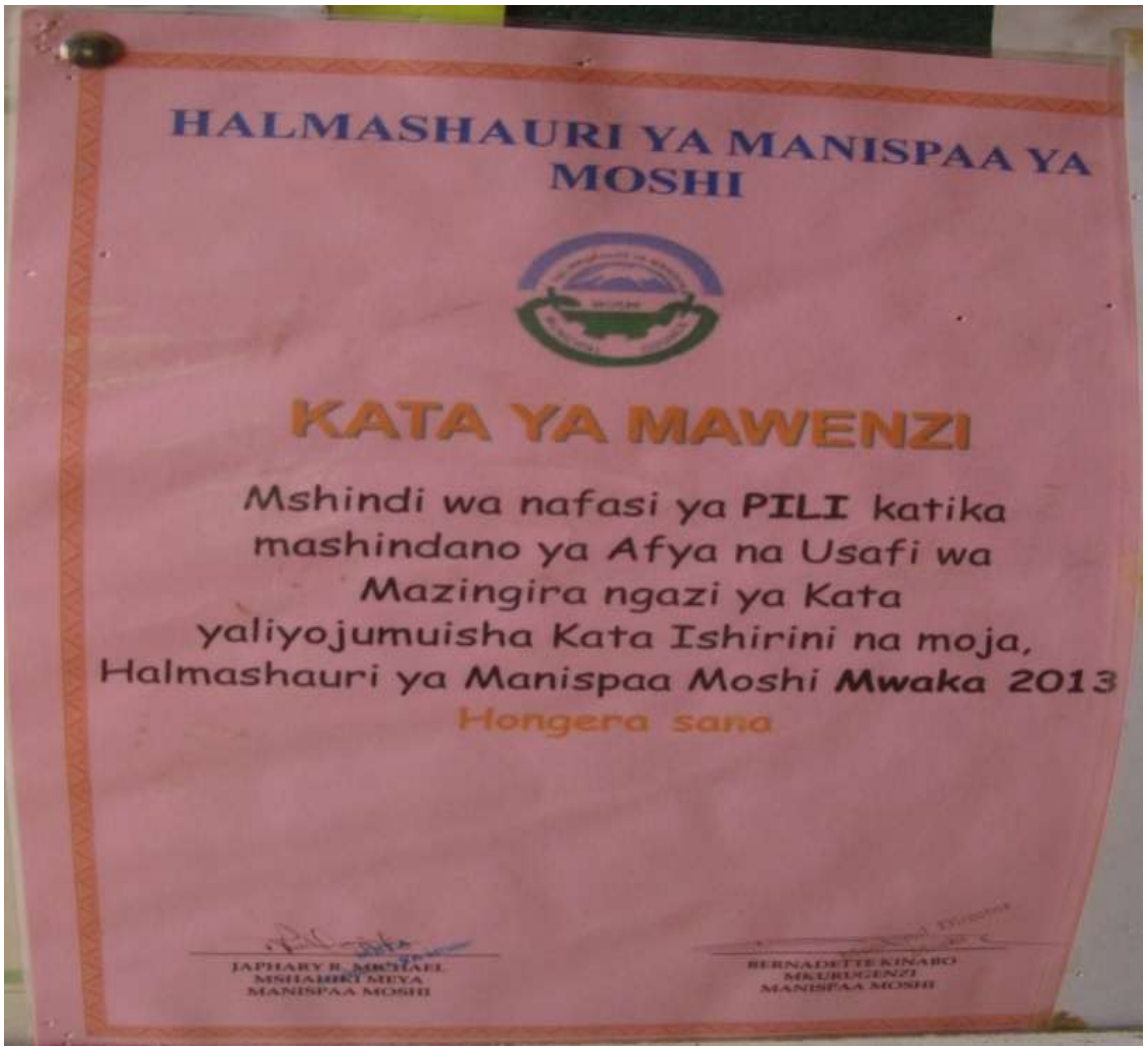
MATOKEO YA HAKIKI MASHINDANO YA AFYA NA USAFI WA MAZINGIRA IKIJUMUISHA KATA ISHIRINI NA MOJA (21)
NGAZI YA MANISPAA - 2013

NA.	KATA	ALAMA	ASILIMIA%
1	KILIMANJARO	112	86
2	MAWENZI	109	84
3	SOWETO	106	82
4	MAJENGO	104	80
5	MFUMUNI	103	79
6	KIUSA	101	77
7	RAU	100	76.9
8	BONDENI	100	76
9	KORONGONI	97	75
10	BOMAMBUZI	96	74.5
11	PASUA	95	73.2
12	MIEMBENI	95	73
13	LONGUO	4	72.5
14	KARANGA	94	72
15	SHIRIMATUNDA	91	70
16	MJI MPYA	88	68
17	KIBORLONI	85.8	66
18	MSARANGA	83	64
19	NG'AMBO	81	63
20	NJORO	80	62.6
21	KALOLENI	79	62

Source: Moshi Municipal Council Health and Environment Department (2013)

After wards competition the winner is awarded certificate. This make people in their wards to keep cleaning their environment daily so that during the next competition they can make their ward to be the winner and be awarded hence solid waste management in the Municipality. This can be applied in other local government authorities in Tanzania so as to have effective solid waste management systems in our country. Wards such as Mawenzi perform the best the year 2013 where it became the second runner winner and be awarded a certificate.

Figure 4.13: Showing Mawenzi ward certificate 2nd Runner - winner



Source: Moshi Municipal Council Health and Environment Department (2013)

The response when interview was conducted with Environment and Cleansing Officer portrays that, *"Wards competition is among the reasons of making the Municipal clean. The issues of cleanliness being a duty of every one assist the Municipal to compete globally on solid waste management"*. This made the Municipal to be the winner more than five years, for instance the year 2015 where the Municipal became the winner and awarded a certificate of first runner winner.

Figure 4.14: Shows Moshi Municipal Council certificate First runner-winner

Source: Moshi Municipal Council Health and Environment Department (2015)

4.2.3 Challenges which impact on the effectiveness of the solid waste management systems in the Municipality.

One of the challenges revealed during an in-depth interview with the Municipal Director incorporated rapid urbanization, insufficient number of expertise in the field of Solid

Waste Management, accident and harassment to cleaners, inadequate financial resources to provide for the requirements of correct Solid Waste Management, shortage of solid waste management experts, aspects of culture as well as unfenced landfill site in Moshi Municipal Council areas. These challenges were also acknowledged by the cleaners, residents, Ward Executive Officers and Mtaa Executive Officers during Focus Group Discussion and interview.

The following are the description of challenges identified by Municipal Director, Ward Leaders, Cleaners and Residents.

4.2.3.1 Rapid urbanization

World Bank (1992) estimate that between 0.7 and 1.8 Kg per capita of waste is generated daily in industrial countries' built-up areas and about 0.4 to 0.9 kg is generated in the cities of third world countries. Waste production as a result tends to add to with an increase in population and growth of economic which jointly increase to the difficulty of solid waste management posed not only on the surroundings but also on the community health. When asked about the effect of rapid population growth at Moshi Municipal Council in relation to Solid Waste Management, the Ward Executive Officers said that, for the past five years the population of Moshi Municipal Council has speedily increased due to movement from rural to urban. This situation has led to an increase in littering the surroundings around the township areas as most of the outsiders are not aware of the environment rules set by Moshi Municipal Council. He added that, despite the increase in waste production at family level, even the residential settlement areas have become informal due to unceremonious construction of houses to cater for the increased population size. This situation of unofficial settlements has made it hard for Moshi Municipal Council waste trucks to discover ways to collect and transport solid waste from the inner housing areas, hence creating challenge in ensuring correct Solid Waste Management.

When the citizen were asked on the issue of speedy urbanization and its effect on their surroundings, the majority of them agreed on the existence of increased production of wastes on the streets, and since the waste trucks cannot make a way into the informal settlement areas, most of these solid waste are uncovered in open areas, leading to formulation of informal dumpsites near housing areas. These dumpsites have been the major causes of diseases such as malaria, diarhoea, cholera, and tetanus. One resident was recorded saying that, *"Two years ago, I had lost a 10 years old boy to tetanus. He had visited the informal dumpsite in search for used cans to make toy cars for his young siblings. He was cut by a metal cylinder that was rusty, after a while he fell sick, and died due to the tetanus"*

4.2.3.2 Accident and harassment to cleaners

During the Focus Group Discussion with the cleaner's one of them from Mawenzi ward said that they face a big challenge as they are being harassed by some of the people during performing their duties. She proceeded saying that they are being harassed because they do not have education and they end up doing low paid jobs. Another cleaner said that some of the car drivers knock down the red color corn used by them to show that people are working and most of the time they are in risk of being knocked by the drivers who do not follow rules. This impact the solid waste management systems as other cleaners fail to perform their duties as planned as they fear to be knocked.

4.2.3.3 Shortage of solid waste management expertise

Until today the Municipal Director says that the Moshi Municipal Council has a shortage of solid waste management expertise. The workforce of solid waste management at the Moshi Municipal Council level is filled with candidates of different areas of career specialization rather than environmental specialists. This shortage has created poor performance in monitoring of solid waste management activities, poor importation of new solid waste management technologies, creation of unsafe environment for workers, and conducting of researches in the solid waste management field area. All these problems combined have led to a new bigger problem of staff turnover from the cleaners

level to the Moshi Municipal Council administration level, hence creating a gap between areas of solid waste management. He adds that, the Moshi Municipal Council workforce has many times failed to find direct solutions to inhibit the initiation of informal dumpsites at local interior residential areas leading to epidemic of diseases like cholera. The Municipal Director believes that with enough expertise in the solid waste management sector, researches could have already been conducted and solutions obtained could have already been applied to do away with this problem long time ago, but due to this shortage, these problems still exists today.

4.2.3.4 Insufficient Financial Resources

Another big challenge that the Moshi Municipal Council faces in operating its solid waste management activities is the insufficient financial resources. The Municipal Director says that, ever since the duty of solid waste management was shifted to local government, the issue of obtaining finance to cater for the needs of solid waste management at the Municipal level have been very tough on them. He states that, *"the Central Government budgets assigned to Municipal solid waste services can only be used to reach less than 50% of the population. Moreover the collection and transport vehicles face frequent breakdowns sometimes reaching up to 74% of the total budget offered for solid waste management activities. They involve high expenses in maintenance, repairs as well as when new spare parts have to be imported".*

The Municipal Director also explained that, they face other challenges in maintaining the skip buckets which have been provided in all wards as some of the residence do not take care of them as they make fire in it to destroy waste such as papers and plastics. He continued saying that they need a lot of money to transfer them in each week after they have been overloaded. This impact the solid waste management systems as sometimes they fail to collect waste on time especially when there is breakdown.

Furthermore, the budget received have to be distributed up in so many areas such as paying of wages, public awareness creation seminars, buying of equipment and maintaining of the dumpsite where all the wastes are taken for disposal.

When asked about the money obtained from the law breakers as penalties, the waste collection fees; the Municipal Director explained that, *"all these money are put into a pool where it is then distributed to the wards so that it can assist in daily monitoring of the cleaning activities, and sometimes it is used to pay the wages for cleaners".*

Figure 4.15: Showing overloaded skip bucket at Bondeni ward

Source: Field picture (2016)

4.2.3.5 Aspects of culture

Due to the policy of socialism that Tanzania adopted after independence, most of the services offered by the government were accessed for free by its citizens. However, this same culture still exists today in many areas, especially when it comes to solid waste management. One of the ward leaders is recorded saying that, *"Most of the residents question on their involvement in keeping their surroundings clean while they pay tax to the government to offer them free services. These people argue that it's the work of the Local Government to ensure there is proper solid waste management in every area they occupy and not the people".*

During an interview with the residents, a woman between the age of 35-45 exclaimed, *"It is my duty to clean my house, but the duty to clean the streets rest upon the Moshi Municipal Council. I have to work for at least ten hours a day, I cannot have any time left in my hands to get involved in street cleaning. We pay waste collection charges, let them do their work. These cleaning services have no difference from health, education services that are offered for free due to the tax we pay. So even the solid waste management activities should be freely offered since we pay tax and the collection charges".* Another man was recorded responded by saying that, *"cleaning the environment is a woman's job".* This impact the solid waste management systems as some of the residents refuse to perform their duties hence their areas remain unclean especially in peripheral wards of Njoro and Mjimpya and lead to poor performance of the wards.

4.2.3.6 Unfenced landfill site

Open dumping of waste can cause irreparable damage to the environment by polluting land, water, and air; adversely affecting human health; and lowering people's quality of life. Due to this situation some of the rules in other countries such as India prohibit open dumps and require Municipal authorities to safely dispose of solid waste in engineered landfills (UN-HABITAT 2010). During interview, the Head of Department Cleansing and Environment at Moshi Municipal Council was recorded saying that, *"we face a great challenge as the landfill site at Kaloleni is not fenced hence some of the waste are taken by wind from the landfill site to the area of residence"*.

The researcher tour to Kaloleni landfill site to observe the situation as it has been explained by the Moshi Municipal Council Environment and Cleansing Officer. This impact the solid waste management systems in Moshi Municipal Council as the waste materials such as plastic bags are taken by wind to the resident's areas and litter the environment hence create dirty environment. Also animals like dogs can take some of the waste to the areas where people leave and it can cause spread of diseases such as cholera. When the waste has been taken to the people's area it has to be collected again

and the Municipality incurs some cost to collect it again to the landfill site for disposal. Due to this the systems of solid waste management in the area can be impacted hence poor solid waste management.

Figure 4.16: Showing unfenced Kaloleni landfill site at Moshi Municipal Council

Source: Field picture (2016)

4.2.3.7 Stealing of standard dustbins

During interview with the Ward Executive Officer at Mawenzi it was revealed that, they face a big challenge as some of the people steal the fixed road side dustbin and make pass buyers to walk a long distance with their waste at hand. He added that, it impact the solid waste management systems as some of the people decide to throw waste along the road after missing the dustbin and make some of the areas to become much dirty than other areas in Moshi Municipal Council. He said that they are finding ways in which they can deal with those people who stole the roadside dustbins so that they can end up this bad habit. These people still the roadside dustbin and sell it to other people to make other equipments for sell. The researcher took a short walk and observe some few road side standard dustbin remained in areas like Nyerere road at Mawenzi ward.

Figure 4.17: Showing one of the remaining roadside dustbin in Mawenzi ward

Source: Field picture (2016)

4.2.3.8 Lack of safety gears to VAIKI cleaners

During Focus Group Discussion one cleaner from VAIKI Company complained that they work in hard condition and they are not given the cleanness gears. She said that, they get injury during working and sometimes they have to collect waste with their hands without gloves. The researcher decided to take a short walk after the discussion so as to observe the real situation facing the cleaners from VAIKI Company and cleaners employed by Moshi Municipal Council. The researcher observed cleaners from VAIKI Company working without safety gears as they are seen in figure 4.1. In order for Moshi Municipal Council to continue doing well in solid waste management it should insist the

companies which cooperate with Moshi Municipal Council in solid waste management to provide working gears to the cleaners as well as to pay the cleaners competitive wages in a timely manner so that they can be motivated to work hard and achieve both the organization goals and individual goals.

The researcher observed cleaners employed by Moshi Municipal Council having all the necessary gears for their safety during working as they appear in the figure below.

Figure 4.18: Cleaners employed by Moshi Municipal Council working with safety gears.

Source: Field picture (2016**)**

4.3 Discussions

4.3.1 Reflection of Conceptual framework to data presentations

In this study availability of resources, adequate funds and legal framework in findings show that there is a relation with the conceptual framework as it also show that By-Laws like Environmental Management Act of 2004 revised 2009 in chapter four and

availability of resources such as cleanness equipments as it has been showed in figure 4.5 in chapter four contribute to the effectiveness of solid waste management systems in Local Government Authorities. These act as input and output in both findings and the system theory.

The resources in system theory are the input which after the process it lead to output which is the effectiveness of solid waste management systems. Without input, process and output then there is no effective solid waste management.

4.3.2 Increase number of solid waste management experts

There should be an effort to employ more experts in solid waste management so as to overcome the problem of shortage of experts in solid waste management in all wards. By having a large number of experts from Wards level to Municipal level it can help to overcome the challenge that happen due to shortage of experts hence sustainable solid waste management systems in Local Government Authorities in Tanzania.

4.3.3 Improvement of financial resource.

Municipal decision makers in some of the countries such as Ghana provide enough priority to Solid Waste Management. Monetary allocation goes for solid waste management systems as the primary priority, and what is left is used up on other projects. Some of the financial plan for Solid Waste Management is consumed in salaries of cleanliness workforce and transportation of waste (Shymala 2008). Moshi Municipal Council should make an effort to convince more stakeholders to assist them in finance so that they can continue doing better in solid waste management systems in all wards and worldwide.

4.3.4 Improvement of waste separation and storage at source

It is essential to take in hand the solid waste matter from the production of waste. Citizen, as the one who generate waste, need to work together through solid waste management. No government effort can create a Municipality hygienic unless its people

work together and obtain an active part in waste management. People must be well informed, knowledgeable, and motivated not to litter on the streets so they build up the practice of storing waste at its source in at least two separate dust bins where as one can be for eco - friendly waste and one for recyclable waste. People also need to be well-informed on risk to individual health and the surroundings as well as trained to separate household dangerous waste and infectious waste from the other two types of waste (World Bank 2008).

Local Government Authorities have to build an effort to inform people on the significance of waste separation as a small number of people still do not make separation of waste to be reused or recycled. By doing so it will be simple for them at some stage in waste dumping at Kaloleni landfill site as they will not hire people for waste separation anymore and the amount of funds to give them can be used in other solid waste management activities.

4.3.5 Hiring of environment guards

In order to deal with people who litter the environment the Local Government Authorities can hire environment guards who watch after those littering the area especially in peripheral wards. Once they catch a person littering the area he or she have to pay a fine of 50,000/= and if the person do not have such amount of money they can take him or her to the police station where as if the person delays to pay he or she can be jailed for not more than 12 months as per Moshi Municipal Council Waste Management By - Laws. This can help to improve the solid waste management systems in Local Government Authorities in Tanzania and reduce the number of people who litter the environment as they know that if you litter the area there are environment guards everywhere who can catch you.

4.3.2 Involvement of selected wards in solid waste management systems

The selected wards perform well in solid waste management systems so as to ensure the effectiveness. The ward leaders (Ward Executive Officers and Mtaa Executive Officers)

have the duty to make sure that their areas are clean and people who refuse to join in cleanness activities they are punished as per Moshi Municipal Council By-Laws of 2006. In every cleanness day they join the residents and make sure that all areas are clean and also all they participate in wards cleanness competition which is conducted each year by Moshi Municipal Council as it has appeared in figure 4.9 in chapter four.

The competition make each ward to put more effort so as to achieve effectiveness in solid waste management systems so that they can be the winner and awarded certificate as it has seen in figure 4.10 in the findings where Mawenzi ward became the second runner winner in the competition the year 2013.

Also the ward leaders insist the residents in their areas to keep waste in different dustbins that is segregation of waste and when the waste truck pass they have to take it out so that it can be collected as it has appeared in figure 4.4. Despite the effort done by the ward leaders, more education is needed to some of the people who still mix waste which can be recycled and waste which is for disposal as it has appeared in figure 4.16.

4.3.3 Comparison of solid waste management in all four wards.

Mawenzi and Bondeni ward found in CBD perform well in solid waste management compared to the peripheral wards Mjimpya and Njoro. This is due to the reason that in CBD wards the waste collection trucks pass everyday to collect waste that is from Monday to Saturday while in the peripheral wards the waste trucks pass only three days per week. This is caused by waste production as the CBD wards produce large amount of waste due to big markets and shops found in this area than the peripheral wards.

The CBD wards also perform well in cleanness than the peripheral as they introduced the system of having ambassador in cleanness who make sure that a total number of ten shop owners in his area clean their environment daily while the peripheral wards do not have such system. Bondeni ward and Mawenzi ward also perform well as it have the group known as Jitolee Group and VAIKI Company which deal with cleanness issues

and planting of trees. This made the CBD to perform well in cleanness than the peripheral wards as they do not have the groups to support for cleanness.

4.4 Conclusion

The effectiveness of solid waste management systems require laws and acts, sufficient resources such as financial, human, equipments as well as time so that it can be sustainable. Sufficient resources can help to reduce the number of challenges which impact the system of solid waste management, hence poor performance and the goals cannot be achieved as it was planned.

CHAPTER FIVE

SUMMARY, CONCLUSION, RECOMMENDATIONS AND POLICY IMPLICATIONS

5.1 Introduction

This section contains the conclusion of the study. The summary is a recapitulation of the purpose and the research tasks, conclusions are then drawn from the study findings, recommendations for action and policy implication.

5.2 Summary

The research report aimed at understanding the success of solid waste management in Moshi Municipal Council. Specifically, the study aimed to describe the systems used by Moshi Municipal Council in controlling solid waste and becoming the first Municipal for more than seven years. The study involved 67 respondents whereas 31 were females and 36 were males. Simple random sampling and purposive means were used. The study used both primary and secondary means of data collection.

The research findings revealed success of solid waste management is achieved via efforts from various people like cleaners, residents, Moshi Municipal Council management together with the stakeholders. Availability of cleanness tools including enough dustbin or skip buckets as well as strong By-Laws made residents from Moshi Municipal Council to be accountable on the whole issue of cleaning their environment and maintaining it. However, in Moshi Municipal Council the issue of recycling and re-use need to be improved by constructing industries which can be for recycling where youth can employ themselves and reduce the amount of solid waste to be taken to the landfill site at Kaloleni.

5.3. Conclusion

The study concluded that solid waste management systems are a major problem in developing countries especially in Tanzania Municipalities. Studies conducted in other areas of the region including Dar es Salaam, Arusha, Mbeya and Mwanza have exposed the problem to be amongst the most urgent concerns which is clearly found to increase with the growing cities of developing nations.. However the Moshi Municipal has proved to be more efficient in dealing with the solid waste management issue than other Municipalities in the country through different systems.

5.3.1 Solid waste management systems deployed by Moshi Municipal Council.

5.3.1.1 Legal Framework and Policies

Most of the citizens in Moshi Municipal observe laws and policies made by both Central and Local Government. They stay away from littering as they recognize that it is against legal framework and policies. They also concentrate and attend in cleanness activity freely as it is for their own advantage. Municipal Director with his panel arranged some strategies whereby each Saturday residents have to go to cleanness activities in their areas. Head of Department Environment and Cleansing, Environment and Cleansing Officer, Ward Executive Officers and Mtaa Executive Officers join the community in cleanness activities where as they supply them with clean-up tools from Municipality and after cleanness the tools are taken back to a store in Moshi Municipal Council. This has also contributed to the success of solid waste management in Moshi Municipal Council for more than seven years compared to other Municipalities.

Though improvements on the solid waste management sector in Moshi Municipal Council have been observed such as straight involving part of the public to deal with Municipal solid waste issues, still a number of institutional factors that pressure the performance of solid waste management system remain crucial for improving the sanitary conditions of the Municipalities. This study set out to recognize the method of Moshi Municipal Council administration and public-community involvement in solid waste management in Moshi Municipal Council.

5.3.1.2 Resource allocation

Resources allocated by the Moshi Municipal Council from different sources of revenue also assist in solid waste management as through it they can have fund to procure the cleanness tools including diesel for the trucks to collect waste, to pay cleaners as well as paying for the maintenance of the trucks. This is supported by table 4.1 in chapter 4 which shows the trends estimates of revenues for solid waste management in Moshi Municipal Council.

The Municipal Director ensures that cleaning gears are readily available and are in good situation. Equipments like wheelbarrows, safety boots, brooms, gloves, vehicles and skip buckets are in great quantity, thus collection of solid waste from the households and later on to the allocated skip buckets ready for dumping are well achieved.

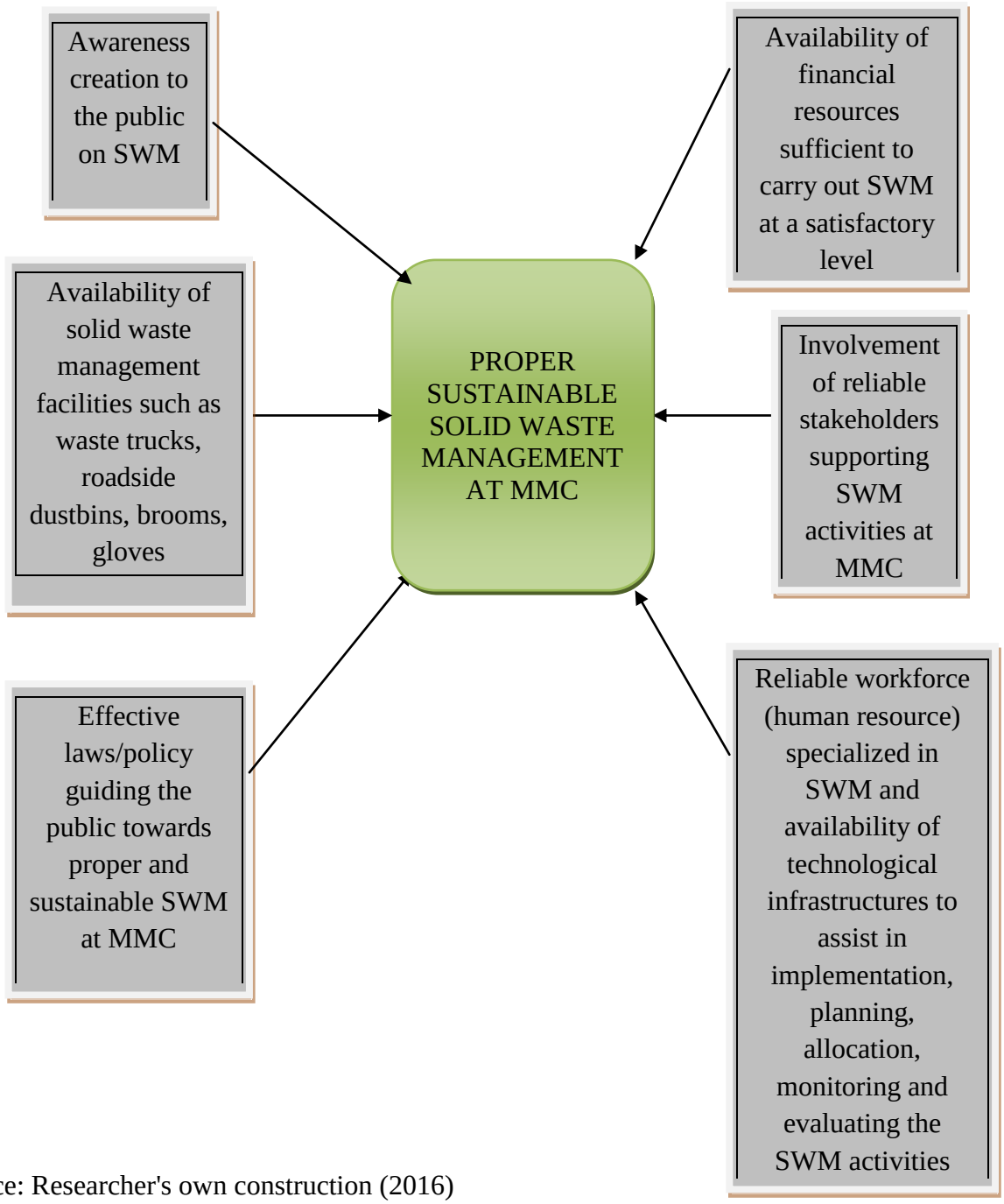
From the discussion, the key problem with solid waste management system in Municipal is seriously observed to have link with the solid waste collection services in the four wards which have not been successful in reaching out for the whole population within their areas therefore making the collection rates to have remained below 75 percent of the total waste generated. Although this can be connected to the fact that nationally approximately 70 percent of the urban populations live in squatter/unplanned settlements and that around 60 percent of urban housing are found in these settlements (Ntobi 2008). However this cannot fully clarify the reason as to why the condition of solid waste management in these cities is the way it is.

5.3.2 The extent to which solid waste management systems enhance the management of solid waste in the Municipality.

Thus, the study concludes on the reasons to achieving proper waste management system in most Tanzanian Municipalities to be contributed by the following factors. The factors are presented according to either governance influences or community influences. This is due to the reason that some factors have been observed to be connected to the control of solid waste management system in place while some are connected to the community itself in general.

Nevertheless in some cases some effects may be contributed by pressure of factors that are, governance and community. Figure below show the summary of the effects

Figure 5.1: Summary of the effects.



Source: Researcher's own construction (2016)

5.3.3 Challenges which impact the effectiveness of the solid waste management systems in the Municipality.

5.3.3.1 Insufficient fund

Although the system of solid waste management in Moshi Municipal Council face challenges in financial resource and shortage of solid waste management experts still it succeeded in solid waste management. There should be more efforts from the central government to all Municipals and Districts in managing solid waste management so that our country can be the leading country in cleanness within Africa and outside.

5.3.3.2 Accident and Harassment to cleaners

Despite the harassment situation the Moshi Municipal Council cleaners face, still they managed to perform their job as required and make the Municipal to be leading in cleanness for more than 5 years

5.4 Recommendations

Recommendations under this study are based on the challenges encountered by Moshi Municipal Council when promoting solid waste management system in their area.

5.4.1 Challenges which impact the effectiveness of the solid waste management systems in the Municipality.

5.4.1.1 Rapid urbanization

The study recommends on the provision of adequate public awareness creation seminars/ public meetings from the ward level to the whole Municipal. This will help in educating the general public that constitutes with outsiders who are not aware of the policies and laws guiding solid waste management activities at Moshi Municipal Council.

Also, Moshi Municipal Council at its urban planning department should recognize the needs of ensuring proper building permits are issued to the residents so as to limit unstructured and unplanned building allocations in the residential areas such as Mjimpya and Njoro wards.

By doing this, the roads to most interior residential areas will be accessible; hence the waste trucks and other waste incentives such as roadside dustbins will be available at a nearby location.

5.4.1.2 Insufficient number of Solid Waste Management expertise

The Central Government together with academic institutions should foresee the need to establish courses that support solid waste activities in the country. By doing this, the human workforce will be well equipped and advanced in tackling issues that arise due to improper solid waste management such as eruption of epidemic diseases like cholera.

Yet, there should be intensive application of advanced technology in the field of solid waste management. This means that, the facilities offered for managing solid waste should cater for human safety, such as wearing of bold gloves and head gears/masks when collecting wastes, functional waste trucks that don't breakdown very often, sanitizers for cleaners, and other small facilities like brooms, slashers, rakes.

5.4.1.3 Insufficient financial resources

This study recommends that, the financial budget from the central government to the Municipals should at least cater for not less than 85% of the total solid waste management budget. This advancement in solid waste management budget will contribute to at least 80% of proper solid waste management at Moshi Municipal Council since the Moshi Municipal Council will be able to recruit more workforce in the field areas, do maintenance of waste trucks that breaks down often, purchase cleaning facilities, conduct public awareness creation of meetings, as well as support in formulation and implementation of new policies.

5.4.1.4 Aspects of culture

Due to the negativity of some of the residents on solid waste management involvement, this study encourages the Moshi Municipal Council to put more effort in educating the public on the importance of solid waste management and its effect on public health.

Moreover; Moshi Municipal Council should put overseers in every street/ward that will do the work of monitoring residents who don't comply with the set rules, regulations, laws and policies guiding proper and sustainable solid waste management at Moshi Municipal Council.

5.4.1.5 Establishment of waste recycling centre

Municipal authorities are likely to set up a plan for composting waste or to adopt waste to-energy technology as may be appropriate. Presently, private entrepreneurs are advocating several technological ways for the handing out and treatment of organic Municipal solid waste. Some of the technological ways have been used in countries like India in the earlier period such as microbial composting and vermin composting, whereas some are based on applications used in foreign countries that have yet to be tried in India or that have failed in India. It is time now for Moshi Municipal Council to apply technologies as well as establish waste recycling centers and alternative use industries to absorb some of the waste materials and create employment to the youth hence improve their living standards.

5.4.1.6 To put more effort on public adverts

Finally, Moshi Municipal Council should put efforts in displaying more public adverts on the streets that instructs the public not to litter wastes, and should impose a high penalty to the law breakers so as to stimulate the audience to act on the imposed laws.

5.4.1.7 More effort on solid waste education

To put more efforts in educating people especially in peripheral wards on solid waste management as well as to put more effort on waste segregation and insisting them to obey By-Laws so that the Moshi Municipal Council can continue being the leading.

5.4.1.8 Community mobilization

Mobilization of community participation by sensitizing the people to be more conscious of their environment and to take the initiative of improving and developing it for the people's common good.

5.4.1.9 To ban the use of plastic bags

The Moshi Municipal Council and the government of Tanzania should prohibit the use and manufacturer of plastic bags because they contribute more in environmental pollution. This will help to reduce the amount of waste collected in both residential and commercial areas as it has been in Kigali Rwanda.

5.4.1.10 Improvement of the Kaloleni landfill site

A modern landfill is now a must for all Municipal authorities, and they require to invest in one either by participating in a regional facility or by linking the private sector to set up the facility and paying tipping fees for the dumping of waste as may be commonly agreed on. World Bank (2008).

It is important to have utilization of modern technology because reliance on collection and disposal of wastes in open dumpsites is a threat to nearby residents. Landfill sites must be fenced and must be provided with a suitable gate to check incoming vehicles or other type of transport.

Also the Landfill areas must be well protected to avoid entrance of unauthorized people.

There must be method and other inner roads for free movement of vehicles and other machines that are required at the landfill place.

Moreover Landfill sites should have a waste check up facility to observe waste brought to the landfill, an office facility for record keeping, and a protection for tools and machines, including pollution-monitoring tools.

In order to continue having effective solid waste management system in Moshi Municipal Council a weigh bridge to quantify the amount of waste brought to the landfill, fire security tools, and extra facilities should be provided as necessary.

Also Moshi Municipal Council should have at least waste sorting truck to be used so as to simplify the work of sorting done by the temporary employees. The road towards Kaloleni landfill site should also be repaired so that during rainfall people and trucks can pass easily when collecting waste to the landfill site. This will improve the waste collection and disposal during rainfall as for now when it rain some of the drivers refuse to go there as the road is not friendly hence overload of waste which remain uncollected during this season.

5.4.1.11 Provision of posters

There should be provision of posters to the public transport buses from one region to another so that outsiders can be aware with solid waste management. This can be done by providing forty posters to each bus driver at Moshi bus terminal where twenty posters can be provided to passengers in a bus during the journey so that they can read it and the remaining twenty posters can be provided to the passengers in other regions on returning to Moshi so that when they enter Moshi Municipal Council they can be aware with the issue of solid waste management in Moshi Municipal Council. By doing this they will not litter the environment when passing in Moshi or after reaching their destination.

5.4.1.12 Improvement of cleaner's working condition.

There is a need to improve working conditions for the cleaners because cleanness is a day to day task. Therefore, the distribution of work should offer rotating time so that the cleaners also can have time to rest at their homes with their families. Also improvement of their salaries can motivate them to work hard than present hence make the Moshi Municipal Council continue be the leading in solid waste management.

Moreover, the stakeholders such as VAIKI Company should be insisted to buy cleanness gears for the cleaners employed by that company so as to protect their health. (as they have appeared in figure 4.2 in chapter four).

5.4.1.13 To increase number of days in cleannes

In order for the Moshi Municipal Council to succeed more in solid waste management system they should add the number days for cleaning the environment from one day to four days in a month. That is, cleanness should be done every Saturday instead of waiting for single day in a month. By doing this amount of waste in people's surroundings will be reduced hence effectiveness of solid waste management in all areas.

5.4.1.14 Selection of cleanness ambassadors

In order to control waste in business areas especially in Bondeni and Mawenzi ward the residents in those areas have decided to select the ambassador of cleanness. Each ten shop has their own cleanness ambassador and when one of the area seems to be dirty the ambassador has to state on it. This made the Mawenzi and Bondeni ward to be good in solid waste management.

5.5.3 General finding and Discussion

Municipal Director in cooperation with his working team should continue on insisting residents on cleanness activities and the issue of controlling solid waste so that the Moshi Municipal Council can continue doing well in cleanness.

Also to find means of having recycling industry so as to reduce the amount of solid waste taken to landfill site as well as youth to be employed and improving their living standard.

To find out on other modern ways of controlling waste from other countries such as Denmark, Ghana and Rwanda as they are among countries with effective solid waste management systems compared to other countries.

5.6 Need for further study

Due to the results shown in this study there is a need for further study so as to find out more technological ways which are more friendly for the system of ensuring solid waste management in Moshi Municipal Council especially in peripheral wards.

5.7 Policy implication

From the current study some policies and acts should be modified and have some parts to insist in solid waste management system and the construction of modern landfill site instead of using the open damping sites in some of the areas in this globalised era

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APPENDICES

APPENDIX A: INTERVIEW GUIDE TO KEY INFORMANTS. (HoD, E&COs, WEOs, MEOs and MD).

Q1. When did you start working in Moshi Municipal Council?

Q2. Do you provide your employees with instruments for cleanness?

Q3. What strategies do you use to make sure that Moshi Municipal Council is doing well in cleanness?

Q4. How effective is Solid Waste Management in Moshi Municipal Council?

Q5. Do you face challenges in Solid Waste Management?

Q6. Do you train your residents on the importance of cleaning the surrounding environment?

Q7. Are there any challenges that face the residents in keeping their area clean?

Q8. What do you think can be done to ensure that Moshi Municipal Council continues to be the first in Solid Waste Management in Tanzania and later worldwide?

THANK YOU SO VERY MUCH FOR YOUR WHOLEHEARTEDLY COOPERATION

KIAMBATISHO B: MWONGOZO WA HOJAJI KWA MKURUGENZI WA MANISPAA, MKUU WA IDARA, MKUU WA SEKSHENI, MAAFISA WATENDAJI WA KATA NA MAAFISA WATENDAJI WA MITAA

S1. Ulianza lini kufanya kazi HMM?

S2. Unawapatia vifaa vya usafi watumishi wako?

S3. Unatumia mbinu gani kuhakikisha kuwa HMM inafanya vizuri katika usafi?

S4. Vikwazo vipi unakabiliana navyo katika udhibiti wa taka ngumu katika HMM?

S5. Unakabiliana na changamoto zipi?

S6. Huwa unawapatia elimu wakazi wa mji kuhusu umuhimu wa kufanya usafi katika maeneo yao?

S7. Changamoto zipi huwakabili wakazi katika kusafisha maeneo yao?

S8. Unafikiri nini kifanyike ili usafi wa HMM uwe endelevu na kuifanya Moshi kuendelea kuwa ya kwanza hapa Tanzania na hatimae duniani

AHSANTE SANA KWA MOYO WAKO WA UKARIMU NA USHIRIKIANO

KIAMBATISHO C: MWONGOZO WA HOJAJI KWA WAKAZI WA MANISPAA YA MOSHI HUSUSANI KATA ZA BONDENI, MAWENZI, NJORO NA MJIMPYA

S1. Unatumia njia gani katika kudhibiti taka ngumu kwenye eneo lako na maeneo mengine?

S2. Je, ipo michango yoyote ya fedha itolewayo katika shughuli za uzoaji taka ngumu?

S3. Je, Manispaa huwa inatoa ushirikiano gani kwenu kila ifikapo siku ya usafi wa jumla?

S4. Unakutana na changamoto zipi katika mfumo wa uzoaji taka ngumu?

S5. Unakabiliana vipi na changamoto unazokutana nazo katika shughuli za uzoaji taka ngumu?

S6. Je, unaridhishwa na kasi ya udhibiti wa taka ngumu katika Manispaa ya Moshi?

S7. Unafikiri nini kifanyike kuhakikisha kuwa halmashauri ya Manispaa ya Moshi inaendelea kuongoza kwa usafi mipngoni mwa Manispaa nyingine hapa Tanzania?

SHUKRANI SANA KWA UKARIMU NA USHIRIKI WAKO KATIKA KUBORESHA MANISPAA YA MOSHI ILI HATIMAYE IWEZE KUWA JIJI.

APPENDIX D

MOSHI MUNICIPAL COUNCIL

(All correspondence be addressed to the Municipal Director)

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MOSHI.

Ref. No. MMC/A.40/13/1/VOL.I/149

04/02/2016

Amina Ally Khamis,
Mzumbe University,
P.O. Box 63,
MOROGORO TANZANIA.

RE: PERMISSION TO CONDUCT RESEARCH

Please refer to the above heading and the letter with Ref. No. MPA/MZC/022/T.14 dated 1st January, 2016 from The Vice Chancellor – Mzumbe University introducing you for a research permit.

With this letter, permission has been granted to you to conduct a research regarding **"Solid Waste Management in Moshi Municipal Council"** especially in Mawenzi, Bondeni, Mjimpya and Njoro Wards as per your request of 02\02\2016.

With regards.

Grace N. Sylivester
For. MUNICIPAL DIRECTOR
MOSHI

C.C. : Head of Department,
Cleansing & Environment - Please assist.

C.C. : Ward Executive Officers,
Mawenzi, Bondeni, Mjimpya & Njoro,
MOSHI MUNICIPAL COUNCIL.

APPENDIX E

ACTION PLANS FOR RESEARCH WRITING

SN	Activity	Time frame											
Activity		2015							2016				
		July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Marc	Apr	may	June
1	Developing a research proposal												
2	Research proposal submission and amendments												
3	Questionnaire pretesting and data collection												
4	Data processing (editing, classification, coding, transcription and tabulation)												
5	Data analysis												
6	Report writing												
7	Report submission and amendments												

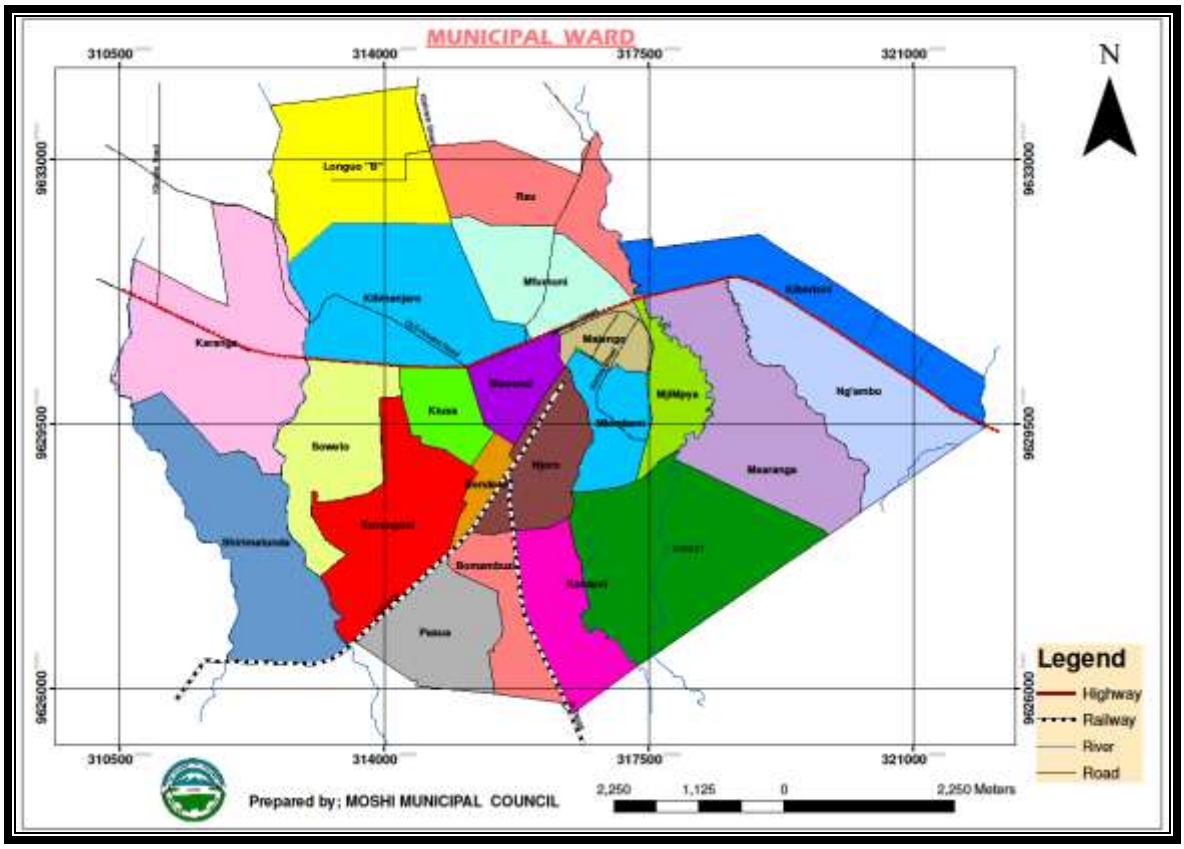
Source: Researcher's study plan (2015)

APPENDIX F: BUDGET PLAN/ ESTIMATES

Folio	Particular	Price @	Amount
1	Papers	2 reams @10,000	20,000
2	Ball Pen & Pencils	1 box @ 3000	3000
3	Camera	1 @ 300,000	300,000
4	Bag for carrying instruments	1 @ 30,000/=	30,000
5	Electricity Bill - 7 month during field work and analysis	Approximately 5000/= @ month	35000
6	Food (Lunch) for about 20 field days	Approximately plate 2000/=@	40000
7	Transport Faire (Morogoro - Moshi) to meet supervisor and last day submission	Approximately 5 journeys @30,000/=	150000
8	Lodging and food during travel to meet the supervisor at Morogoro	Approximately 10 nights @ 40,000/=	400000
9	Flat files for Data Storage	3 files @ 2000/=	6000
10	Printing charges during work progress stage by stage	Approximately 5 times @ 15,000/=	75000
11	Final Findings (Printing and Binding several Copies)	Approximately 6 copies @ 40,000/=	180000
		TOTAL	**1,239,000**

Researchers study plan (2015)

APPENDIX G: Moshi Municipal Council MAP



Source: Moshi Municipal Council (2015)

APPENDIX H

MOSHI MUNICIPAL COUNCIL ORGANIZATION CHART 2012