



Addis Ababa University

College of Law and Governance

Center for Federalism and Governance Studies

**Decentralization and Municipal Service Delivery: The Case
of Solid Waste Management in Debre Markos Town,
Amhara National Regional State, Ethiopia**

**Thesis Submitted to Center for Federalism and Governance Studies in
Partial Fulfillment of the Requirements for Master of Arts in Federalism
and Governance**

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DECLARATION

I declare this work which is entitled “Decentralization and Municipal Service Delivery: The Case of Solid Waste Management in Debre Markos Town, Amhara National Regional State, Ethiopia” is my own work that is independently produced by the devoted guidance of my advisor. All sources of material used for the thesis have been properly acknowledged.

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ACRONYMS

ANRS	Amhara National Regional State
COVID	Corona Virus Disease
CSA	Central Statical Authority
DSWM	Decentralization Solid Waste Management
ECEP	Ethiopian Country Environmental Profile
EPA	Environmental Protection Authority
ESMF	Environmental and Social Management Framework
FDRE	Federal Democratic Republic Of Ethiopia
MEF	Ministry of Environmental and Forest
MSSE	Micro and Small Scale Enterprise
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MUDC	Ministry of Urban Development and Construction
SBGDU	Sanitation Beautification and Green Development Unit
SWM	Solid Waste Management
UN	United Nation
UNDP	United Nation Development Program
UNEP	United Nation Environmental Program

ABSTRACT

In recent decades, the world has been urbanizing rapidly. It is the consequences Municipal Solid Waste generation and its management challenges, especially; in developing countries including Ethiopia .The impact of inadequate Solid Waste Management Practices is significant on natural and human environment. This study was intended to assess the adequacy of decentralization in municipal solid waste managmnet service delivery with particular reference to Debre Markos town municipality. With specific objectives of identifining the main challenges of service delivery in solid waste management in Debre Markos town, to examaine whether there is institutional deficiency or practical gap in the solid waste managmnet and to sugest alternative options for managing solid waste managmnet in the town . In addressing the investigation questionair, interview, physical field observation, and review of published and unpublished documents were employed as an instrument of data collection. Descriptive research approach and both qualitative and quantitative research design were used to analyze the data. The findings of the study showed that, the existing system of municipal solid waste managmnet in Debre Markos town; waste collection, transportation and disposal activities are the responsibility of municipality. Door to door solid waste collection service by micro and small scale enterprises are not adequate both in terms of coverage and frequency and the secondary storage facilities are also not adequate both in terms of distribution/ coverage and in average distance. Currently only 30 percent of the total solid waste collected by the municipality. In general the status solid waste management service of the town is found to be poor in all aspects of efficient solid waste management such as status, spatial coverage, enforcement law and solid waste management facility. Poor institutional, financial arrangement and capacity and lack of involvement, collaboration and integration among the various stakeholders are found to be the major factors behind the poor performance of municipal solid waste managmnet service of the town. The municipality should give adequate emphasis for solid waste management in general which requires institutional capacity and budget allocation.

Key words: Decentralization, Municipal Solid Waste Mangment, Urbanization, Debre Markos

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CHAPTER ONE

INTRODUCTION

1.1 Background

It is a universal truth that with the rapidly growing population and the expansion urbanization the volume of solid waste generation also increasing across the globe (UN-HABITAT, 2019). Although, its type varies, in urban centers solid waste is generated by households and from different economic sectors.

Being In many urban areas of developing countries solid waste management is one of the function that have been decentralized to local governments, and it is responsible for the management of municipality from the primary point of collection to final disposal. (Pradhan *et., al* 2012).However, with the current high rate of solid waste in urban centers solid waste management became beyond the capacity the responsible government organs..

The problem of solid waste management in urban centers of developing countries emanates not only from rapid urbanization and increasing economic activities and the consequent raise in volume consumption rather the poor institutional capacity of those who are responsible to manage it aggravates the problem. Therefore it urges the involvement of the different stakeholders including the community itself.

Like any developing countries urban centers in Ethiopia are suffering from poor solid waste management system and the larger volume of solid wastes are remain uncollected poisoning environmental and health treats to the inhabitants.

The process of solid waste management in Debre-Markos town is entirely carried out by the municipality with limited involvement of micro and small scale enterprises in door to door solid waste collection. However, this service is far lagged to meet the demand of the people.

Thus this study aims to examine the adequacy of decentralization in municipal service delivery in terms of solid waste management with particular reference to Debre Markos town municipality in general. In particular, the study identifies the main challenges of service delivery in solid waste management in the study area and examines whether there is institutional deficiency or practical gap in the solid waste management.

1.2 Statement of the Problem

In the recent few decades the rate of urbanization has been grown rapidly across the world. Urbanization is a process of relative growth in a country's urban population along with an even more rapidly increase in the economic, political and cultural importance of cities compared to rural areas (Andrea E. ,2015). A study conducted on United Nations projection indicated that, "urban population in the world, which was estimated to be 4 billion in 2015 will grow by 75 percent and reach 6.3 billion in 2050" (Global Environment Department, 2018:2). This implies that, People continue to migrate to cities for better economic, social and create opportunities.

Ethiopia, like many of the developing countries, has urban expansion and the growth of population in the cities and towns. Temesgen and Huseyin write that "the rate of urbanization in Ethiopia is one of the quickest in Africa, the normal yearly rate of development from 1960-1991 was 4.8 percent and this figure developed to 5.5 percent from 2000 to 2010"(Temesgen and Huseyin, 2019:16).

Rapid development of urbanization has facilitated social development in the country like the provision of basic services, including roads, water supply, health, education, land, house and sanitation. However, in low income countries like Ethiopia, the majority of the population faces difficulties in having access to such basic services. In other words basic services provisions are at a very low stage of development.

Out of the foregoing basic services, garbage collection and solid waste management is one of the basic services that, a government should provide to urban population. These indicate that, urbanization continues, solid waste management becomes a major public health and environmental threat in urban areas. In order to overcome these problems, local governments need to give special attention to address the aspiration needs of residents. According to,

Situation of Municipal Solid Waste Management in African Cities Most of the countries especially in developing countries municipal waste management is the responsibility of each municipality (city) or local government (Mitsuo, 2018). However, its implementation capacity is often weak, facilities and equipment are insufficient, and maintenance, management, and waste disposal are often not carried out properly”. In doing so; the government should frame legal and policy frame works. As a result, if there is no adequate solid waste management service in the cities health and environmental related problems would inevitably be the reality. Many countries around the world, typically developing countries, have been implementing in the process of decentralization by transfer responsibilities of the state to lower tiers of government (Kassa T., 2015).

“Ethiopia, like other developing states, is in a process of implementing a decentralization program” (Zemelak A, 2008). Moreover, since the enactment of the 1995 constitution of Federal Democratic Republic of Ethiopia, decentralization policy of the government has given attention to the urban development. Because of this, Debre Markos has been granted a town administration status following the ratification the revised of the Amhara National Regional State proclamation number 91/2003 in 2003.

Debre Markos is the capital of East Gojjam Zone which is, located in the north west of the capital city of Ethiopia, Addis Ababa at a distance of 300 Kms and 265 Kms south of Bahir Dar, the capital of Amhara National Regional State.

The town is characterized by rapid population growth caused by natural increase and migration. According to the 1994 and 2007 population and housing census conducted by Central Statistical Agency, “the population of Debre Markos town was 49,297 and 62,469 respectively”. In addition to, Central Statistical Agency (2018), “the population projection figure of the town had been estimated 132,361 of which 61,647 are male and 70,714 are female” (Debre Markos town administration planning department, 2019).

Given the forgoing population with its unprecedented expansion, it needs an efficient solid waste management tasks. But, the solid wastes are traditionally collected door to door by individuals who are organized as an association. It has been criticized that, the town does not have separate

organized garbage collection and solid waste management services, which in turn exposed the town dwellers to different types of diseases.

However, it is stated under the Federal Democratic Republic of Ethiopia constitution that “everyone has the right to live in a healthy and clean environment“(Federal Democratic Republic of Ethiopia, Constitution 1995 Article. 44(1)).Despite a clear constitutional obligation imposed up on the government to protect, ensure and fulfill human rights of the people, the city dwellers right to live in a healthy and clean environment is claimed to be violated. Here, it has to be noted that the minimum core obligation of the government is supposed to be maintained but in vain due to one or another good governance problems in the town municipality.

In order to improve the living standard of urban residents, local governments are responsible to provide basic services. But, the current condition of the municipal garbage collection and solid waste management service revealed that there is a lack in the competence to effectively manage solid waste in the local governments of Debre Markos town and has becoming a challenge for the municipalities' and the residents of the town too. Such practice and problems have not been well studied in Debre Markos town.

Therefore, this study aims to assess the adequacy of decentralization service delivery in the municipality of Debre Markos town administration in terms of solid waste management and to examine whether there is institutional deficiency or practical gap in the solid waste management.

1.3 Research Questions

Based on the statement of the problem this study attempts to answer the following research questions;

1. What are the main challenges of service delivery in solid waste management in Debre Markos town?
2. Does the municipal solid waste management problem of the town emanate from institutional deficiency or practical gap?
3. What are alternative options for managing solid waste managmnet in the Debre Markos town town?

1.4 Research Objective

1.4.1 General Objective

The general objective of the study is to assess the adequacy of decentralization in municipal service delivery in terms of solid waste management with particular reference to Debre Markos town.

1.4.2 Specific Objectives

Having the above stated general objective, the research also attempts to achieve the following related specific objectives.

1. To identify the main challenges of service delivery in solid waste management in Debre Markos town.
2. To examine whether there is institutional deficiency or practical gap in the solid waste managmnet.
3. To suggest alternative options for managing solid waste managmnet in Debre Markos town.

1.5 Research Methodology

1.5.1 Research Design

In research the research approach to be employed is determined by the nature of the study itself. A case study design was employed to assess the practical scenarios of service delivery of the study area particularly on municipal solid waste management in the town. The case study in obtaining information for this research is preferable due to its ability to provide depth insight in the unit of the studies. Descriptive research approach which is appropriate for describing the existing phenomenon in the study area has been used in this study. In the other hands research design to be followed is determined by the nature and type of data used in a study. Researchers usually determine the data type based on the ability of the data type in terms of providing deep insight regarding the unit of the studies. In order to answer the framed research questions, mixed method research design has been deployed in this study. Therefore, this research used both quantitative and pre dominantly qualitative research design.

1.5.2 Data Source and Methods of Collection

In this study, the researcher used both primary and secondary data sources. For gathering primary data, the researcher used questionnaires, interviews and field personal observations. With regard to questionnaires, Open and closed ended Questionnaire, were employed for town households. These questionnaires were first prepared in English but later it translated in to Amharic for making it easily understandable to samples.

Moreover, primary data were also gathered with the help of semi-structured interviews, that is, closed and open ended interview questions were utilized from various sectors that have stake in solid waste managmnet service delivery of the town, to allow participants express their views freely and to get in-depth information about the problem. The researchers were select interviewees from prominent informants, with the town municipal manager, sanitation beautification green development unit owner and experts, Health and environmental protection office head and experts and solid waste workers. The primary data which is relevant in exploring

the required information regarding the municipal solid waste management service delivery practice of the study area, particularly on local governments.

The study also used field observation with checklist as an instrument of primary data collection. Field observation was employed for assessing spatial distribution of municipal solid waste management infrastructure, households' solid waste handling practice; illegal dumping (sample roads and ditches), solid waste collection and transportation system and disposal site facilities of the town. Photographs were taken during field observation for partial exposure of transfer station, disposal site, illegal dumping of residents and machineries.

On the other hand, Secondary data were obtained from published and unpublished materials, which are available in the form of books, journals, articles, proclamations, policy briefs, federal and regional constitutions, laws, and regulations, and relevant academic papers, performance reports from administrative office, municipality and health office.

1.5.3 Sample Frame and Sample Size Determination

Sampling is a process of selecting a well representative portion of the target population in a manner that any conclusion made based on the sample selected should also be true for the total population. For taking the total population is costly both in terms of finance and time, it is appropriate to take a well representative portion of the targeted population. The town Debre Markos has 11 kebeles with a total population of 132 361 and with 30782 households (CSA projection, 2018). In order collect the required data from the households of their solid waste management practice as well as their attitude towards the municipal solid waste management practice of the town, the sample size was determined through two stages.

In the first place the researcher identified and selected three representative Kebles out of the total eleven Kebles in the town purposively. Number of population, population density, proximity to the center of the town, proximity to the dumping site and availability of the different infrastructures that affects the performance of the municipal solid waste service delivery were used as criteria in selecting the three representatives sample Kebles by the researcher. Accordingly Keble 01 was selected due to its proximity to the center of the town, its population

density and its poor infrastructural facilities and Keble 03 was selected because of the availability of the different infrastructures and its large population size while Keble 05 was selected due to its proximity to the dumping site.

The second stage was determining the sample size of the households to be covered by the survey. A formula developed by Cochran (1977) was employed to determine the sample size of the households from the three selected Kebles. This formula is appropriate when the proportion of the population with the required attribute is known. Therefore, the sample size determination formula applied to determine the sample size of the households in this study is presented below as follows:

$$n = \frac{NZ^2PQ}{d^2(N-1)+Z^2PQ}$$

Where n = total sample size

N= Total number of sample households

Z= standard normal deviation at the required confidence level that corresponds to 95% confidence interval equal to 1.96

d= the level of statistical significance (Allowable error) (0.05)

P= Housing unit variable or the proportion in the targeted population estimated to have the required attribute

Q= 1-P

According to the information obtained from the three selected administration units, out of the total registered 9106 housing units 88% of them is residential houses while the remaining 12% accounts to institutional and commercial houses. For the researcher interest is to determine the sample size for the residential households the value of P is 0.88 and accordingly, based on the formula Q= 1-P, the value of Q equals to 0.12.

Therefore based on the above sampling formula the sample size of households for this was determined as follows below;

$$n = (9106 * 1.96^2 * 0.12 * 0.88) / (0.05^2 * (9106 - 1)) + (1.96^2 * 0.12 * 0.88) = 159$$

Thus the sample size for this study is 159, meaning the survey covers 159 households from the three selected Kebles. Finally proportional allocation method was deployed to determine the sample size of households from the selected three Kebles.

Table 1 : Keble specific sample size of households

Keble	Number of households	proportion	sample size
Keble 01	2893	32%	51
Keble 03	3415	37%	59
Keble 05	2798	31%	49
Total	9106	100%	159

In general to choose the sample, both probability and non-probability sampling techniques were used. A kind of non-probability sampling, which is purposive sampling, was employed to select the sample kables while especially systematic random sampling was used for selecting households living in the selected kebeles of the town. Thus, the sample was selected from the kebeles documented list in which all the target population are listed. To determine the sampling interval of residential units from the target population in each the three selected Kebles in systematic random sampling techniques, the following formula was employed.

$K = N/n$, Where K = Sampling interval

N= Total targeted population in each the selected Kebles

n= Sample size for each selected Kebles

Therefore, the sampling interval for selecting sample households has been calculated

i.e. =9106,

$n=159$

So, $9106/159=57^{\text{th}}$ to the nearest.

Therefore, every 57^{th} household after the first sample household selected using simple random sampling will be selected since the sample size is reached.

This implies that the first household was selected from the total targeted households (9106) from each sampled three kebbles simple random sampling. Then after the first household was selected in lottery method, the next household will be selected by adding the sampling interval on the first selected household order number from the list of the kebble's household number. This step will continue till the required sample size is achieved by avoiding the already selected households from the sampling list.

For the sake of triangulation another set of data collections an interview and physical observation were also employed in this study as an instrument of data collection. An interview was made on selected municipal manager, office heads and employees, coordinators, and micro and small scale associations that have stake in the solid waste management of the town.

Four organizations were selected for the interview proposes namely the town's municipal sanitation beautification and green development unit, environmental protection office of the town health office of the town and solid waste workers.

Therefore, purposive sampling method was applied to select sample respondents for the interview. Accordingly, as presented in the table 2 below 19 respondents were selected for the interview in this study.

Table 2: Sample Size of Interview Respondents

N	Position	N
1	Debre markos town Municipal manager and Sanitation, Beautification and Green Development Unit team leader and expert	3
2	Debre Markos town environmental protection office head and expert	2
3	Debre Markos town Health office head and expert	2
4	Debre markos town Micro and Small scale Enterprises solid waste workers	12
	TOTAL	19

1.6 Methods of Data Analysis

Both qualitative and quantitative techniques were used for data analysis. Quantitative methods that is simple descriptive statically method it includes percentages, ratios, rates and frequency distribution were done to analyze the questioner data using SPSS version 20. In addition, predominantly qualitative data and hence Narrative descriptive and interpretative data analysis technique were employed to analyze the data.

1.7 Significance of the Study

The study had the following significances; first, the study will fill the gap, because there is a research gap which should be filled by conducting further research at local government level specifically at Debre Markos town in connection with decentralization and service delivery in solid waste management. Secondly, the study contributes academically different glance for scholars and practitioners and other stakeholders in identify major legal and practical problems that hinder effective solid waste management service delivery in the Debre Markos town. Thirdly, the study will also forward a significant comments and recommendations that enable the

town administration and municipality to discharge its responsibility effectively as well as to exercise its service delivery regarding to Solid Waste Management.

1.8 Scope of the Study

The scope of the study is limited to assess the adequacy of decentralization in municipal service delivery with particular reference of solid waste management. Even if, there are, towns that are face similar problem as the result of poor service delivery in East Gojjam Zone, this study is limited to Debre Markos town administration. The town municipality office is purposively selected by the researcher to assess the adequacy of decentralization in municipal service delivery interms of solid waste management. Moreover, although both liquid waste and solid waste are demanding subject to study, therefore, because of the constraints of time, budget and availability of information at this level, the study focuses on municipal service delivery practices in solid waste management.

1.9 Limitations of the Study

The researcher did not finish this research without short comings. Some of limitations of this study were lack of secondary data, financial shortage during data collection and respondents denial to provide detailed information. The unwillingnes of some officials, like the town mayor, to provide the required data in the appropriate time, the researcher wanted to have focused group discussion but could not because of the COVID-19. The study was not able to cover the entire kebeles of Debre Markos due to lack of resources such as financial support, time and personnel .Limited knowledge of the researcher also hinder the researcher not to go further much for in depth investigation in the area, these were some of the limitations of the findings. However, the researcher was tried to minimize these problems and at most effort should be made to attempt these problems by handling all the activities as per the schedule as well triangulating the different data collected using different instruments such as questionair, interview and field observation, on the other hand , instead of the town mayor the researcher was interviewed and collected the necessary data from the town deputy municipal manager. There fore, based on the findings of this particular case study, conclusions will be drawn about the sectors in general.

1.10 Ethical Considerations

The researcher was clearly explaining the objectives of the study before anything started. As the study is conducted just only for academic purpose, the researcher was invited respondents to give response freely. Collecting information without the knowledge of the participant is considered as unethical. Moreover, the researcher secured consent from the participants of the study through formal cooperation letters that were written by the department head of federal studies. The researcher properly considered and respected the privacy of participants. Therefore, from the beginning of title selection up to its completion, the research has been done in close consultation with the Center for Federal Studies of Addis Ababa University.

1.11 Organization of the Paper

This research paper is fundamentally organized in to five chapters. All chapters begin with brief introduction of main elements of discussion, Chapter one gives an introductory part of the study and deals with back ground of the study, statement of the problem, research questions, objectives of the study, research methodology, methods of data collection, methods of data analysis, Significance of the study, scope of the study, Limitations of the study, Ethical considerations and finally, organization of the study.

Chapter two tries to give conceptual and theoretical framework for the study. Hence, it discusses the definition and concepts of key terms like solid waste and solid waste management, the relationship between urbanization and solid waste management, the integrated solid waste management and other approaches of solid waste management and the policy, legal and institutional frameworks in relation to solid waste management, decentralization(dimenstions and forms of decentralization) and the role of different hierarchy of governments in the solid waste management have been presented in detail.

Under chapter three the researcher tries to elucidate the discrepancy that exists between the law and practice of solid waste management in Ethiopia. In doing so, the interplay between

urbanization and solid waste management and the existing legal, policy and institutional framework, decentralization in Ethiopia, would be dealt in detail. Furthermore, the issue of how urbanization has a direct impact on solid waste management? And how it could be handled? Also be a center of focus of discussion. Chapter four presents analysis and interpretation of gathered data. Finally, the last chapter is conclusion that it deals with summarizing major findings and arguments of the study and thereby provides reasonable recommendations based on the findings.

Chapter Two

Decentralization, Solid Waste Management and Rapid Urbanization

2.1 Introduction

Solid waste management remained the most challenging and crucial issue for urban centers across the world especially in the developing countries. Hence, this chapter is devoted to answer the main issues like how the municipal solid waste management is done? the relationship between urbanization and solid waste management, the challenges that urban centers are facing and the main sources of the challenges and the best possible options available in mitigating the problem among other things. Besides, for the sake of ensuring clarity, the definitions of the main terms and concepts, which are used thoroughly in the study, have been also presented here in this section. Furthermore, the important concepts regarding the relationship among solid waste, solid waste management, urbanization, institutional arrangements of solid waste and decentralization which are believed to have significant correlation with the concept of solid waste management, are explained with special emphasis in this section.

This chapter being organized in six sub sections, the first section presents the definition and concepts of key terms like solid waste, municipal solid waste and municipal solid waste management while decentralization, concepts, dimensions and forms of decentralization explained in the second section of the chapter. The third section of the chapter discusses of the relationship between urbanization and solid waste management. Approaches to solid waste management is addresses in the forth section. Policy, legal and institutional frameworks for managing solid wastes stated in the fifth section and in the final section of the chapter factors influencing effective solid waste management have been presented in detail.

2.2 Definitions of Key Terms

The definition and concepts of key terms defined in this study are: waste, solid waste, solid waste management.

2.2.1 Solid Waste

The term ‘waste’ has been defined differently by many authors and its meaning may also vary with accordingly. It can be defined “as any kind of material judged as useless and discarded material by its owner, regardless of its form meaning it can take the form of solid, liquid or gas” (Zurbrügg, 2013). A waste with non-liquid and non-gaseous form can be defined as solid waste and it can also be farther categorized into municipal wastes, hazardous wastes, medical wastes and radioactive wastes (Subramani et. al., 2014; Zurbrügg 2013).

Usually waste is considered as something that has no value or useless material. However, ‘useless’ is subjective, as it could be of importance for another person under diverse condition of society (Eawag, 2008). Jeff (2015) explains waste as an incredible resource that can be reused and recycled. Currently across the globe waste is serving as a livelihood for various people who engaged collecting and selling it for reuse and recycling purpose. If properly managed it is a wonderful resource with multiple economic and environmental benefit through creating job opportunity, being source of income and reduction of waste accumulation.

At the same time if not well managed waste is a serious risk to public health and the environment as a whole. Moreover, It is an increasing concern directly linked with the way people produces and consume ever day (Wilson et al; 2015). Thus proper waste management is a process that stretched from generating to disposing that involves different parties from individual consumers /producers to municipal authorities.

2.2.2 Municipal Solid Waste

“Municipal solid waste” (hereinafter referred to as MSW) refers to a diverse gathering of wastes produced in urban center. The nature of MSW varies from place to place, because the characteristics and amount of the solid waste generated in a region a function of multiple factors such as the standard of living and lifestyle of the region's inhabitants, the economic activity and the abundance and type of the region's natural resources differ among countries (UNEP, 2005). Furthermore, MSW is materials produced by human activity commonly and includes everyday items that are thrown away by homes, schools, hospitals, businesses (Alfen, 2008; Sherien et al., 2016; Zurbrügg, 2013).

MSW may also refer to refuse generated by households, non-hazardous solid waste that emanates from industrial, commercial and institutional establishments including, hospitals, schools etc. Furthermore, market waste, yard waste and street sweepings are also sorted as MSW of which municipal authorities are responsible for collecting and disposing (Solid Waste Management in the World Cities 2009; Ugwuanyi&Isife 2012; Vij 2012). According to Konrad (2016), the major types of MSW are food wastes, paper, plastic, rags, metal and glass, with some hazardous household wastes such as electric light bulbs, batteries, discarded medicines and automotive parts. There for, we can summarize that MSW is different types of wastes that are produced in urban areas of different regions across a country.

2.2.3 Municipal Solid Waste Management

According to Zurbrugg Waste management of arrangement is what is repeatedly labeled as “municipal solid waste management” (Zurbrügg.(2013).Here after waste management is considered as municipal solid waste management. However, waste handling practices vary from place to place for instance ,it differs urban and rural areas ,residential and industrial areas and also it has a great variation from developed and developing countries.

According to Konrad (2016), Solid-waste management may be defined as *‘the discipline associated with controlling the generation, storage, collection, transfer and transport,*

processing, and disposal of solid waste in a manner that is in accordance with the best principles of health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes’.

According to the above definition, solid waste management is a challenging and costly process that requires the deployment of multi-disciplinary qualified man power and technologies in the whole process, which can only, be realized with investing a huge amount of fund associated with the so called institutional capacity building. Gray is of the idea that, SWM refers to the activities of planning, financing, Construction and operation of facilities for the collection, transportation, recycling and final disposition of the waste (Gary, 2011; Subramani *et al.*, 2014).

However, no matter costly and complex its solid waste management service non deprivable basic human need, especially for urban dwellers due to the fact that solid waste management has a strong connection with the health of the society and the surrounding environment especially in the case of urban centers. Municipal solid Waste management is an issue which affecting the various aspects of society and the economy. Solid waste management is a very complex and difficult activity; moreover, it can easily become a disaster if it is not properly managed (Solid waste management in the world cities, 2009).

Thus, any failure in providing the solid waste management service may lead to enforce a serious environmental health problem and even it may associate with a cause of bad governances. Poor management of MSW can have serious impacts on human and animal health, local and global environmental sustainability and the economy as a whole (Sherien *et al.*, 2016).

Furthermore, a city that cannot efficiently and effectively handle its waste it cannot be able to manage more challenging basic services of the urban center such as health, education and transportation (Daniel &Perinaz, 2012). On the other hand, (Wilson *et al.*, 2015) argued that Waste management is a basic human need and can also be regarded as a ‘basic human right. Based on these arguments, the municipal over all tasks is to manage and deal with the public sanitation system. Moreover, the main goal of MSWM is to minimize the huge amount of waste

and to protect the health of the urban population particularly that of low-income groups who affected most from poor waste management services (Eawag, 2008).

Due to the increasing urbanization and population growth the demand for municipal waste management service is also increasing to the level that municipalities can't bear it. As the issue of solid waste management has an effect on other basic municipal services, city governments has to lead the solid waste management as effectively as possible in a manner that meets the expectation of the society.

2.3 Decentralization: Concepts, Dimension and Forms

2.3.1 The Concept

The concept of decentralization is not easily defined. It has several dimensions. But for the purpose of the study the following definitions and concepts are taken in to account. Decentralization can be defined as the transference of authority and responsibility from the central government to the lower level of governments allowing with most of planning and administration to take over by local governments which are closer to the public. (Hossain, 2005 as cited in Pradeep, 2011).

In broad term decentralization can be defined as the transfer of a portion of administrative and fiscal functions or powers of a central authority to several local authorities (Hammond & Tosun, 2014). Therefore, through transferring the power and authority of service delivers to the local governments and agencies that are believed to closer to the problem of the local society thereby enhancing the engagement the local community decentralization is expected to contribute to the betterment of the basic delivery for local governments. As the result, the decentralization of the provision of social services such as education, health, water and sanitation may improve service delivery (Akapan, 2007).

Solid Waste Management decentralization refers to the management of municipal solid waste by the engagement of several small waste management centers within the locality with the aim of enabling a favorable condition to a sustainable waste management system that allows the

realization of a clean environment and hygienic living conditions by reducing the amount of waste at the source (Slesha & Mitali, 2018).

More over,decentralized system of solid waste management provide better earnings and employment opportunity to the informal waste collectors and deprived parts of the community , therefore the effective solution to the problem of waste is to reduce segregate, process, recycle and reuse the waste within the local area so that no waste will go out of the society. (Swati .Ar and Sanjay S., 2018)

In countries in transition, different dimensions and forms of decentralization are increasingly attractive among academics, practitioners and international donors.As Linder, 2009 cited in Mohammad etal, 2016 indicates different types and forms of decentralization appeared to be helpful devises in bringing the state closer to the people and allowing development ownership among the local citizens and to express their needs more effectively and enable authorities to enhance local autonomy and deliver public services more efficiently.

2.3.2 Dimensions of Decentralization

Decentralization can be looked at further in terms of various dimensions The process of empowering and improving sub-national governance system involves the three major dimensions of decentralization of power. i.e.political, administrative and financial powers from the central government through varying degrees and various institutional and implementing mechanisms (Mohammad etal, 2016)

Political decentralization is the transfer of political authority to sub national governments. It aims to give citizens or their elected representatives more power to participating the decision making process. It is often related with pluralistic and representative government, but it can also support democratization by giving citizens, or their representatives, more influence in the formulation and implementation of policies. Political decentralization assumes that decisions made with greater participation will be better informed and more relevant to divers interest in society than those made only by national political authorities (Hussain, 2005). In addition, political decentralization often requires constitutional or statutory reforms, the development of pluralistic political parties, the strengthening of legislature's creation of local political units and

the encouragement of effective public interest groups (WB, 2009; Kumera, 2007). Political (or democratic) decentralization: Political decentralization (also called as democratic decentralization) refers the alteration of power structure of central government to the lower levels of government institutions. It is also associated with power sharing through the recognition of federal principles, autonomous regions and the like (Mohammad et al, 2016).

Administrative decentralization seeks to redistribute authority, responsibility and financial resources for providing public services among different levels of government (Hossain, 2005). It means the transfer of responsibility for planning, management, and the rising and allocation of resources from the central government and its agencies to field units of government agencies, subordinate units of levels of government, semi-autonomous public authorities or corporations, area wide regional or functional authorities, or non-governmental organizations or voluntary organizations (Lai & Cistulli, 2005). It is also argued that there are several prerequisites for Administrative decentralization to become effective including the ability to make independent staffing decisions and ability to negotiate conditions of service are the major ones (WB, 2009). Administrative decentralization also directly influences the capacity of sub national governments and administrations by strengthening the systems and procedures that allow these units to perform their assigned tasks (USAID, 2009). Administrative decentralization (sometimes referred as institutional decentralization) involves the full partial transfer of any array of functional responsibilities to the local level institutions such as health care service, the operation of the schools .the management service personnel, the building, maintenance of roads and garbage collections (Mohammad et al, 2016).

Fiscal decentralization is the transfer of financial responsibility in as far as the generating of revenue as well as authority to make expenditure decisions from the central government to the lower levels of government. Which is known as a core component of decentralization is the transfer of or control over resources from federal to regional states or sectors (Jamo, 2005). Generally it comprises of public revenue (taxes, grants, borrowing), expenditure (recurrent and capital), intergovernmental transfers (matching grants for merit goods, grant to ensure minimum service level and grant to correct externalities or benefit spillovers), and domestic borrowings (for stabilization, for long term capital projects) (Chanie, 2007). In other words, political and

administrative decentralization without fiscal decentralizing/financial responsibility can not be effective as these functions would be jeopardized by waiting for someone else to decide on revenues as well as about expenditures (WB, 2009).

According to Kassa T (2015) indicates that, Market Decentralization is also termed as economic decentralization. Market decentralization refers to decentralization of government services to private organizations or firms. This form of transfer of government responsibilities and authority is done in favor of non-public entities where planning and administrative responsibility or other public functions are transferred from government to voluntary, private, or nongovernmental institutions with clear benefits to and involvement of the public. This often involves contracting out partial service provision or administration functions, deregulation or full privatization. This is typically undertaken for services that had been monopolies of the central government and ideally are earmarked for divestment to local entities where the benefits are accruing to the local population

2.3.3 Forms of Decentralization

Many governments have attempted to introduce and implement variety of decentralization policies which have varies in terms of scope and designed to transfer development planning and management responsibilities in to local government units. The existing literatures have categorized decentralization generally in three forms, most commonly termed as de-concentration, delegation and devolution .De-concentration involves a bureaucratic, hierarchical relationships; delegation involves a contractual relationship while devolution involves an arm's length relationship (Schneider, 2003 as cited in Mohammad et al, 2016). A review of these forms helps us to understand the concept clearly.

De-concentration is a situation whereby central government undertakes some of its responsibilities through regional or local offices without transferring power or responsibilities to any other organization (Richard Scott-Herridge, 2002). The aim is to retain full control of service planning, expenditure and delivery whilst achieving greater efficiency and effectiveness; this is the weakest form of decentralization. It is a process that involves the transfer of powers, functions and responsibilities within the central government hierarchy through the shifting of the workload

from central ministries to field offices, the creation of field agencies, or the shifting of the responsibility to local administrative bodies that are part of central government structure (Hossain, 2005). Which is sometimes called administrative or bureaucratic decentralization, is the term used when decentralization takes the form of a transfer of functions from the centre to regional or branch offices, since real decision-making is retained at the centre. According to Stacey White (2011) stated that , de-concentration is a process whereby the central government disperses responsibilities for certain services to regional branch offices without any transfer of authority .Many scholars do not consider this true decentralization ,but the central government simply establishing field offices.

Delegation is atype of administrative decentralization and **it** is more extensive form of decentralization. It involves transfer of responsibilities for decision – making and administration of public functions from central government to local government or semi-autonomous organizations. In this instance, local governments are not fully controlled by central governments but are accountable to them. Since ,these delegated local organizations usually have a great deal of choice in decision-making ,there fore, many developing countries attempt to initiate this kind of decentralization practice . These organizations may include local government, the private sector and non-governmental organizations. (Mohammad et al, 2016).

Devolution is the preferred form of decentralization and it means to transfer of full powers, functions and responsibility, decision making, resources for delivery of public goods and services to the local government bodies, including law making and revenue-raising powers (Hossain, 2005). Moreover, it can also be called political decentralization, meaning that the institutions to which this power is devolved are governed by locally elected people. Under devolution, the central government allows quasi-autonomous and fully independent of the devolving authority and that local government units to exercise power and control over the transferred policy matters compared to the other two forms of decentralization (Mohammad et al, 2016). Akpan H. Ekpo (2008) and Hossain (2005) identified the following five as the fundamental features of devolution;

I. Powers are transferred to autonomous units governed independently and separately without the direct control of central government.

II. The local governments are given legal powers to exercise authority over a recognized geographical area.

III. The units have corporate status and power to secure resources to perform its functions.

IV. It implies the need to develop local government institutions.

V. It is a process of reciprocal, mutually beneficial and coordinated relationships between central and local governments.

Other than the above discussed major forms of decentralization, there are several others that are not as common, such as deregulation, territorial and functional decentralization.

2.4 Urbanization and Solid Waste Management

2.4.1 Global Waste Management Outlook

Urbanization and solid waste management are naturally goes parallel in that the dynamism in the former would have a direct inevitable impact on the later. Hence, one, if truly appreciate the interaction between urbanization and solid management in the globe; he needs to see it in light of the rise of urbanization context. For example, only about 30% of the world's population lived in urban areas in 1950 the proportion rose to 50% by 2007 Projected urban share of global population in 2030 is increased to 60 % (Baqui, 2009). Currently, world cities generate about 1.3 billion tones solid waste per year. This volume is expected to increase to 2.2 billion tones by 2025.waste generation rates will more than double over the next twenty years especially in lower income countries (Daniel &Perinaz, 2012).

Therefore, the continuation of this figure indicates that, when the population of the world increases the waste generation rates also increases. So as it has a direct relationship between urbanization and solid waste. That in turn has a direct implication on the solid waste management aspect of it especially in the urban areas. The poor practice of solid waste

management has a danger on the life and branch of the world population in general and developing countries in particular.

It has been pinpointed above that waste management can be observed in various perspectives including but not limited to the regional continents respect. Many developed countries have made great pace in addressing waste management, predominantly since the environment came onto the international agenda in the 1960s, and there are many good practice examples available for the international community to learn from (Wilson, et al; 2015).

In order to reduce the challenging of waste and due to give serious attention to the developed and particularly developing countries , Waste management is well entrenched within the Sustainable Development Goals (SDGs), being included either explicitly or implicitly in more than half of the 17 goals. it is basically articulated that “by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management. So it helps for a better service for waste management across the region different level of governments. In so far, it is very essential to evaluate the SWM activities whether it is progressive or not towards a range of targets due to SDGs¹ (Sandra &Weghmam, 2019).

2.4.2 Solid Waste Management in Developing Countries

In urban areas, especially in the fast urbanizing cities of the developing world, problems and issues of municipal solid waste management are of in need of attention significance (Da Zhu et al.,2008) .MWS implementing approach of the developing countries is evaluated to be poor because of their inappropriate and inefficient waste management system. (Chen et al.; 2010 as cited in Gupta et al., 2017) .

¹Sustainable development goals (SDGs) to transform our world:GOAL 1: No Poverty,GOAL 2: Zero Hunger.GOAL 3: Good Health and Well-being.GOAL 4: Quality EducationGOAL 5: Gender Equality.GOAL 6: Clean Water and Sanitation.Energy. GOAL 7: Industry, Innovation and Infrastructure.GOAL 8: Reduced Inequality,GOAL 9: Sustainable Cities and Communities,GOAL 10: Responsible Consumption and ProductionGOAL 11: Climate Action,GOAL 12: Life Below Water,GOAL 13: Life on Land,GOAL 14: Peace and Justice Strong Institutions,GOAL 15: Partnerships to achieve the Goal.

In Africa, problems relating to poor solid waste management on the health and environment are going to increase rapidly, as the amount of municipal solid waste is expected to rise quickly, due to growing populations, increasing urbanization, and changing consumption patterns. (Sandra & Weghamam, 2019).

Mitsuo (2018) provides further that the urban population of Africa plays a vital role in the amelioration of the city sanitation environment, which is likely to triplicate in 2050 from about 450 million people (40% of the total population) and was associated with different kinds of economic infrastructure building.

As has been put by (Sandra & Weghamam, 2019) when we see its recent status of waste generation of Africa, in 2015 the annual waste generation for urban Africa was 124 million tones. By 2040, it is expected to reach 368 million tones and further more the total waste collected in Africa was only 55 % of total waste generated. In sub-Saharan Africa including Ethiopia the collection rate is even lower at 44 %. In poor areas the problem is particularly acute, with improper as the same time neglected solid waste collection services (MUDC .2012).

Therefore, in Africa especially the poorer parts of the country non collection part of waste is very high in average nearly it is below 55%. So far a passing mention has been made on the solid waste management aspects of Africa but a close look at the Municipal solid waste management practice in Africa reveals that there is improper waste management practices that is distinguished by municipal solid waste is collected and transported insufficiently rather it is discarded in uncontrolled open dumpsites like , water bodies and isolated places, such unscientific solid waste management practices of the developing countries supposed to increase already existing poor level of sanitation facilities of the countries (Bello and Ahmed K, 2016).

2.5 Approaches to Solid Waste Management

2.5.1 Integrated Solid Waste Management (ISWM)

Integrated solid waste management is a comprehensive waste prevention, recycling, composting and disposal programme that considers how to prevent, recycle and manage waste in ways that most effectively protect human health and the environment (Mohammed and Eyasu, 2017).

Integrated solid waste management is a system improved from the source that is starting from generation and then disposal and constructs around the other management steps including all types of solid wastes (UNEP, 2009). Furthermore, integrated solid waste management is a strategic and systematic approach of solid waste management that incorporates all the sources, functional elements and aspects towards the realization of sustainable solid waste management in a manner that assures better resource use efficiency. Here the basic concern or intention behind the integrated waste management is of bringing about progressive performance in solid waste management system thereby better outcome in solid waste management through designing and implementing a comprehensive solid waste management system that addresses both the technical and non technical aspect .

Due to the fact that both the technical and non-technical aspects dimensions of SWM are equally important and highly interrelated in a manner an improvement in one area frequently affect practices or activities in another area, they both should be analyzed together in the framework of integrated solid waste management (UNEP, 2005).

Waste management is a complex process with many functional elements and aspects that demands the deployment of huge investment and the involvement of various parties. For non integrated and fragmented effort towards solid waste management is no more economic and efficient. In this regard, a new and integrated approach solid waste management that incorporates multiple management aspects that leads towards sustainable solid waste management with the expected outcome of cost effective and efficient solid waste management system. The final goal and purpose of the solid waste management system is to come up with improved outcomes and

solid waste system performance through balancing both the short-term crisis management and long-term vision (Solid waste management in the world cities, 2009).

Solid waste management integrates different features functional elements and involves various stakeholders with diverse activities and responsibilities. Therefore achieving sustainable and cost effective solid waste management requires better strategic approach that identifies short term and long term priority areas, the appropriate techniques and management system taking in to consideration both the technical and non technical aspects as well as the role and responsibilities of each party in the solid waste management system.

Furthermore, according to solid waste management in the world cities, there is now broad international consensus for what has come to be known as Integrated Solid Waste Management Frame work:

“When the modernization process started in developed countries in the 1970s, solid waste management was seen largely as a technical problem with engineering solutions. That changed in the 1980s and 1990s, as it became clear that municipalities could not successfully collect and remove waste without active co-operation from the service users. Cities also learned that technologies depend on institutional, governance, and policy frameworks, which are both highly varied, and complex, and directly related to local conditions” (Solid waste management in the world cities, 2009:13).

Therefore, the concept of integrated solid waste management stands for efficient and sustainable solid waste management system by involving the various technical and non technical aspects and the participation of state and non-state actors and institutions.

2.5.2 Municipal Solid Waste Management

Being a fundamental factor of integrated solid waste management, waste management hierarchy is recognized as the most key basis of modern MSWM practice in the framework of national and regional policy. The very purpose of waste management hierarchy is to make waste management

practices as environmentally sound as possible (UNEP, 2005). On the other hand, the awareness of the community has increased about the issue of waste management, attitudes towards proper disposal methods has been grown. Within the waste management hierarchy or the modern waste management system, disposal is the last phase (Joe, et al; 2007).

The main expected outcomes of integrated solid waste management are to set efficient solid waste management, source reduction and efficient use of resource. Here the idea of waste management hierarchy is the implementation of national and regional policy principles according to the identified order of priority in strategic manner.

According to (Eawag, 2008 & zurbrugg, 2013) stated that there is a universal agreement on the significance of the waste management hierarchy, as a primary strategic concept and the most fundamental basis for modern municipal solid waste management policy across the globe. The waste management hierarchy defines and emphasizes in their order of decreasing priority and is existing as an inverted pyramid because the critical driving force of policy is to take action first and foremost on preventing the generation of waste. The "waste management hierarchy" (See Figure 1) underlines the following policy principles:

Avoid: All waste that can be avoided makes its further management obsolete. Reduce: Waste minimization conserves resources and reduces costs of all further waste handling steps. Reuse: This involves multiple use of a product within its original form. This can be for the same or for a new purpose therefore extending the items' life cycle. Recycle: These may or may not be similar to the original product. Costs and environmental impact may be associated to the reprocessing steps which need careful evaluation. Recover: Extracting energy or material from wastes Treat: This may involve reducing volumes before land filling, or recycling certain waste. Dispose: The final option when waste is disposed in a controlled sanitary landfill disposal site. Implementation of this hierarchy is however, less evident and easy. The first three steps of the hierarchy are also strongly dependant on the awareness and behavior of the population. Here, the main role

of waste authorities involves information sharing and educating citizens to enhance awareness and behavior change in all aspects that relate to solid waste.
Adopted from Eawag, 2008:5 & **Zurbrügg**, 2013:4.

Figure 1: Integrated Solid Waste Management hierarchy diagram adopted from (Eawag, 2008)



Source: (Eawag, 2008:5).

As the figure one above shows, the National local factors (Circular boxes) influence the core concepts of the waste management hierarchy (triangle), in which solid waste elements diminish in priority from top to bottom.

Municipal solid waste management in many cities of the worlds especially in developing countries is institutionally fragmented lacks administrative coherence (Solid waste management in the world cities, 2009).The main challenge in solid waste management especially in developing countries emanates from the absence of adequate policies, enabling legislation, and environmentally concerned citizens (Konrad, 2016)

The poor performance in solid waste management is not only due to poor institutional structure and arrangement rather it is also constrained by lack of financial and human resources too. Therefore, in addition to the institutional structures and arrangements for municipalities to provide properly municipal solid waste management service to the required level they have to be

adequately equipped with financial and qualified man power. These necessitate continued dedication to capacity building and institutional strengthening (solid waste management in the world cities, 2009).

It is the level of the smartness of existing systems of urban planning and administration that highly determines the probability of establishing effective institutional arrangements for municipal solid waste management. As a basis for performance-oriented management, a holistic and meaning full strategic plan for the sector is very vital (Simon, 2012). On the other hand good governance in solid waste management requires transparent, accountable, efficient, and effective institutions (Allison, 2014), so as the significance of solid waste management institutions have a tendency to participate all stake holders and it become successful.

In the concept of integrated solid waste management so as to realize sustainable and efficient solid waste management, the institutional arrangements of municipal solid waste management should be as comprehensive as possible in manner that involves all the parties who have involved in the activity of solid waste management which could be formal or informal sector.

2.6 Policy, Legal and Institutional Frameworks for Managing Solid Wastes

The Roles of National, Regional and Local Governments in Solid Waste Management

Assigning the function to a regional or state government, creation of an area wide special-purpose government, and shared service agreements between two or more government agencies are the common ways of services decentralization (Kanea, 2006). So that, thinking of an effective and efficient service delivery is illusions in the absence of institutions that are capable of carrying out government policies. Effective solid waste management could only be realized through integrated effort of responsible bodies at a national, regional and local level. This requires a collective responsibility from national to at grass root level. (Richard, 2015)

In most countries central government is not focused on waste collection service delivery rather take responsible for the governance of waste management and design national policy and guidelines for waste management (Sandra &Weghmam, 2019; Solid waste management in the

world cities, 2009). On the other side as the role of regional governments vary with countries context to put a distinct role of regional government in solid waste management. The role of a regional government is highly determined by its size. Like national government regional governments also could not be responsible to follow up day to day activities, rather likely to have involved in the financial flow and facilitate machines that are used by different cities (Solid waste management in the world cities, 2009).

Being the third and lowest sphere of government and the one that functions closest to local communities, municipal governments have responsibilities to the improvement and provision of services to communities (Bekink, 2006). Thus, municipalities or local government administrations are usually responsible for day to day operations including solid waste collection across the globe. Therefore, the actual sweeping and collection services may be operated by municipal employees or sourced out to the private sector (solid waste management in the world cities, 2009). Therefore the actual day to day operation activities that are based on the regional and central government policies and strategies are fully the responsibility of local governments.

Formal sector alone doesn't have a capacity to perform sustainable solid waste management; it needs informal sector. There for Informal sector has significant role in solid waste management in many cities especially in low- and middle-income countries basically in the field of waste collection and recycling activities. Engaging this sector to participate in the waste separation process can have different advantages fundamentally it brings about attitudinal change among the communities (Jeff, 2015). As the result, Small family-based enterprises and informal sector rag pickers are often very involved with waste. NGOs and community- based organizations can have important impacts in organizing local services, raising awareness and supporting vulnerable individuals. (Solid waste management in the world cities, 2009).

2.7 Factors Influencing Effective Solid Waste Management

An effective and sustainable SWM could not be practical by the effort of a single government organ rather it requires the involvement of the government organs, private sector and the

community at large. (Ancog, 2012). If a system is to be run sustainably, it is very important that recognized main constraints that affect the process of solid waste management.

Financial Factors

Financial aspects for sustainable solid waste management services are a fundamental concern for cities all over the world. (Solid waste management in the world cities, 2009). On the other hand, in many of developing countries, local governments or municipalities are dependent on national government, to obtain financial access in order to implement day to day activities of waste management services, and national government often does not give attention for these services. (Sandra & Wegmann, 2019). As a result, Financial constraint is one of the main reason for poor disposal of waste, especially where municipalities do not have a capacity to overcome the rapid population growth and inefficient in finance (Zurbrügg, 2013).

Awareness and Attitudes

Hence, public awareness and attitude is one of the crucial issues which determine the success or failure of solid waste management system. . In order to change solid waste management significantly, the behavior and attitudes of individuals and groups in the society will have to change (MUDC, 2012).

Waste management is a cross-cutting issue impacting on many aspects of society and the economy. It has strong linkages to a range of other global challenges such as health, climate change, poverty reduction, food and resource security and sustainable production and consumption (Wilson, *et al*; 2015).

Public awareness and attitudes to waste can affect the population's willingness to cooperate and participate like willingness to pay service fee, collecting waste at the source in general implementing waste management (Zurbrügg, 2013). There for; we can conclude that, improper Public awareness and attitudes can affect the entire SWM system.

Human and Technical Constraints

In its scope, solid-waste management includes all administrative, financial, legal, planning, and engineering functions involved in the solutions to all problems of solid waste (Konrad,

2016). Unfortunately, many municipal officials, having training and experience mainly in technology and public administration procedures, are not well qualified to encourage community involvement in planning and operations (solid waste management in the world cities, 2009). In order to sustain solid waste management system and bring favorable environment for the society there should be provide equal service for the residents' without discriminating those who have lower income people. The waste collection service is usually leads to exposed for different diseases, so the solid waste management system should have a capacity concern about for healthy and safety specially those who have worked in these area. .Technologies and the communities' capacity that afford for the service is also affect the solid waste management system.

2.8 Conclusion

As the rate of solid of generation is increasing as rapidly as the rate of urbanization and population growth across the world solid waste management has become a challenging task for manipulates of urban centers especially for towns in the developing countries who are constrained by not only financial constraints rather by poor institutional, technological and infrastructural advancements. In the decentralized government system the role of the different hierarchy of government bodies from the national to the lower government unites have been found to have a vital role in the achievement of effective solid waste management. So far integrated solid waste management has been recognized as the best possible way of solid waste management. The world is looking for another better alternative approach of solid waste management while municipalities in the developing countries yet are not in a position to deal with the integrated solid waste management. The availability of appropriate policy, legal framework and adequate institutional arrangements are the most important requirements in the realization of effective solid waste management which is rarely practical in developing countries. In general financial, community awareness and technical constraints are among the main factors that affecting the practice of solid waste management especially in the developing countries.

CHAPTER THREE

Decentralization, Urbanization, Solid Waste Management Practice and Laws in Ethiopia

3.1 Introduction

Under this chapter the researcher will try to elucidate the discrepancy that exists between the law and practice of solid waste management in Ethiopia. In doing so, decentralization at national and sub-national level, the interplay between urbanization and solid waste management and the existing legal, policy and institutional frameworks in Ethiopia and Amhara regional state and solid waste management practice will be dealt in detail. Furthermore, the issue how decentralization related with solid waste management, how urbanization has a direct impact on solid waste management? And how it could be handled? Will also be a center of focus of discussion?

3.2 Decentralization in Ethiopia

Decentralization has become an increasingly widespread and significant dimension of political and administrative reform in many developing countries including Ethiopia. The current Ethiopian government officially declared a decentralized ethnic-federal system in its 1991 transitional charter and 1995 constitution which was aimed at devolving political, fiscal and administrative power from the central to sub national governments. As Tegegne and Kassahun (2004) described this phenomena this process involved in the reorganization of the Ethiopian state structure following the 1991 regime change, which is characterized by changes in the form of government from the highly centralized to the decentralized variant were highlighted so as to provide a clear background to the decentralization process. Starting 1995 FDRE established decentralization policy that aimed to transfer powers, responsibilities and resources from the central government to regional, zonal, Wereda and Kebele levels of administration. As per the 1995 federal constitution, regional governments enjoy a considerable degree of self-rule,

According to Tegegne (1998), the first phase of decentralization (1991-2001) concentrated on creating and empowering Regional Governments. This has changed the local and central government systems whereby the Regional Governments have been entrusted with legislative, executive and judicial powers with respect to all matters concerning their areas. The second phase of decentralization, which was initiated, in 2002-03, has been focusing on a series of legal, fiscal, and administrative reforms beginning with four of the largest regions (Amhara, Oromiya, SNNPR, and Tigray). During the second phase, some devolution to the *Woreda* level was undertaken. In urban areas, urban administrations with *Woreda* status and responsibilities were created. Moreover, the second phase of decentralization has worked towards empowering communities to actively participate in development activities, improve local democratic governance, and strengthen the capacity of delivering basic services.

3.3 Urbanization in Ethiopia

Currently, urbanization has become a global concern. However, urbanization is rapidly increasing. According to the UNDP (2018), Ethiopia's current population is estimated to be about 95 million. It is the second-most populous nation in Africa after Nigeria. Ethiopia's population is expected to reach 150 million by 2035 (ibid). Ethiopia is one of the least urbanized countries by African standard .Hence; the present level of urbanization is 17 % in Ethiopia, 51 % in Ghana and 40 % on average in Africa (Tsegaye T, 2010).

However; the rate of urbanization in Ethiopia is one of the quickest in Africa. According to Ethiopian Urbanization Review (2015) study the population growth, the rate of urban population growth is about 3.8 percent per year, and the number of urban population is expected to increase by three fold from 15.2 million in 2012 to 42.3 million by 2037 .

Ethiopia is currently experiencing sharp population increases, which in turn are significantly impacting on the sustainability of livelihoods throughout the country, both in urban and rural areas. According to the World Population Prospects (2010) the Number of cities and towns were registered to be about 927 in Ethiopia in general and 208 in Amhara regional state. Moreover, the

number of urban centers and people living in urban areas has been progressively rising over the last 4-5 decades, especially in the last decade (MUDC, 2012).

Solid waste management is a pressing challenge that an increasing number of cities in the country is facing today .Rapid urbanization, new economic activity, and population growth place multiple pressures on solid waste management systems (World Bank ,2014).

3.4 Policy, Legal and Institutional Framework for managing Solid Waste in Ethiopia

There are many policies, legal and institutional frameworks that are put in place to make an efficient solid waste management in Ethiopia. Hence, it can be said that solid waste management though not comprehensively done is approached in multifaceted aspects. In order to fully understand current waste management practices and their resulting effects it is important to examine the legal system that governs waste.

The supreme law of the land, the Constitution of The Federal Democratic Republic of Ethiopia (Proclamation No.1/1995) contains provisions, which recognize the importance of the environment protection and the need for its proper management (EPA, 2004).Thus, In terms of environmental law, Ethiopia's Constitution is the most important source of environmental law.Morover, Article 44 guarantees the right to live in a “clean and healthy environment,” and Article 92 requires that the design and implementation of programmes and projects of development shall not damage or destroy the environment.(ECMF,2019).

Regarding to Solid Waste Management Proclamation No. 513.Released in February of 2007, the proclamation's mainly states that, to promote community participation in order to prevent the adverse effects and to enhance the benefits resulting from solid wastes; and solid waste management action plans designed by, and implemented at, the lowest administrative units of urban administrations can ensure community participation (Proclamation No. 513, 2007).

The Solid Waste Management Proclamation works hand in hand with the Environmental Pollution Control Proclamation No.300/2002 which addresses the management of hazardous

waste, the establishment of environmental standards for various environmental media (air, water, and soil), and the monitoring of pollution (ECEP,2007). Regarding policy frameworks, the environmental policy of Ethiopia (EPE) which was approved on April 1997 by the councils of Ministers at federal level, it addresses mainly human settlements, urban environment and environmental health (ECMF, 2019).

Institutional aspects of municipal solid waste management concern the institutional structures and arrangements for solid waste management as well as organizational procedures and the ability of accountable institutions which include the following: Distribution of functions, responsibilities and authority between local, regional and central government institutions (MoUDCUPSB, 2012).

The major environmental body in Ethiopia is the Environmental Protection Authority. Thus, the Environmental Protection Authority is responsible for federal level environmental protection by formulating the national environmental policy (Matthew Cheever et al., 2011).According to the Environmental Protection Organs (Proclamation, No. 295/2002) the Regional States have the right to establish their own Regional Environmental Agencies (REA).

3.5 Decentralization in Amhara Regional State

As one of the regional states in Ethiopia, the Amhara Regional State pioneered decentralization from regional to local level, and introduced a number of legal, fiscal and administrative changes. According to Article 91 (1) of the Amhara National Regional State (ANRS) Constitution, the major constitutional powers and duties of the district council include: (1) approving the district social service, economic development, and administrative plans and programs; (2) levying and collection of land use taxes, agricultural income revenues, and other local taxes; (3) utilizing the District's sources of revenues, excluding such other revenues allocated and administered by the region;(4) preparing and approving the district budget; (5) construction and maintenance of lower grade rural roads; (6) administering primary schools and junior health institutions within the District; and (7) directing basic agricultural development activities and administering and protecting the natural resources of the district (ANRS, 1995).

The Amhara regional constitution defined the duties and responsibilities of the district administration and had also given them the autonomy of expenditure prioritization when planning the basic services. Consequently, the districts have been empowered to deliver services such as education, health, water supply, roads and sanitation etc. within their respective jurisdictions (ANRS Revised Constitution, 2001:Art.83-95). There is now a broad consensus that decentralizing power and authority to districts is the key for public service delivery improvement. As a result of decentralization of Ethiopia, the Amhara regional States now focus mainly on rules regulations and on supervisory activities whereas, resources and responsibilities for Solid Waste Management service delivery and project implementation have been moved to the woreda city administrations (ECEP, 2007).

3.6 Amhara Regional State Policy and Institutional Frameworks of Solid Waste Management

The Amhara National Regional states have established their respective environmental organs. The Amhara Environmental protection, Rural land administration and use were reestablished in 2010 based on proclamation no 176/2010 with the aim of “putting in place an organ which is responsible for the protection of nature and environment to leave to the future generation and monitoring of proper implementation government policies and laws on the environment was to establish a body responsible” (Amhara proclamation no 176/2010).

Moreover, the office within the Amhara Regional Health Bureau responsible for health issues around solid waste management is named ‘Waste Management and Environmental Pollution’ (Christian R.2012). The regional environmental protection and rural land administration and use Bureau and Health Bureau have its branches at local level or city administrations.

Integration and coordination of the current institutional arrangement of the solid waste management is not good enough, because each sector is not organized rather there are working independently (ibid). The Regional Bureau of Health as well as the Regional EPA expressed their pity that their advices regarding hazardous waste handling, official collection points/transfer stations and upgrading of the current open dumpsite are not taken seriously by the City Administration (Christian R.2012).

Therefore, towns/cities should have an appropriate institutional arrangement that handles solid waste management in accordance with the amount of generated solid wastes and other related factors. However, in decentralized system of administration local municipal authorities are responsible for the provision of the basic social services such as health, education, security, water and sanitation (AKPAN H., 2008).

Similarly, in the Amhara regional state local governments and municipal authorities are responsible for the provision of the basic social services including solid waste management, under their organizational arrangement many of the municipalities have units that are responsible for the management of solid waste, landfill and recycling operations. “The responsibility of the municipalities is to design the secondary waste collection system, create the infrastructure” (collection points, waste bin installation, maintaining and operating the waste trucks) (Ministry of Environment and Forest, 2015).

In order to facilitate the infrastructure of municipal solid waste management financing is very crucial. Most of the time the system of financing are able to finance insignificant portion of the required capital, because inefficient financing method is used in many cities of Ethiopia so as ,which cannot generate adequate revenue for financing (Tafa M , 2018).

The local authorities have no adequate revenue autonomy because the majority of the taxes and fees are restricted by the regions, high turnover of local government staff, and transfer from higher level of government to local authorities is based on the old data source which is non transparent and inconsistent (ibid). The payment rate for the solid waste collection service has been low until now: Only about 50% of the households pay the collection fee. About 90% of the commercials and institutions receiving waste collection services pay the fee regularly (Biruk A.2017). In addition to, The Urban Local Government Development Project (ULGDP) supports the enhancement of various services by municipalities, including solid waste collection and landfills. Under Capital Investment Plans, the project targets the provision of financial and technical assistance to municipalities to construct sanitary landfills and implement integrated solid waste management (MEF, 2016).

3.7 Solid Waste Management Practice in Ethiopia

In Ethiopia, rapid urbanization coupled with increased urban population in the last decade brought immense pressure on municipal services, mainly in the management of the ever increasing amounts of Solid waste (Mengist&Assegid, 2014). Thus, Urbanization pushes for increased demand for environmental infrastructure and service needs which challenge the capacity of towns and often remain unmet and enables to create the problems of sanitation (Dijk&Fransen, 2008).

In Ethiopia, like other developing countries, the increase of solid waste generation is resulted from the raise of population and rapid urbanization (Zerihun M. 2018). In Ethiopian urban areas of the country, solid waste management services are not satisfactory, which is insufficient and poor (MoUDCUPSB, 2012). In lower-income countries, such as Ethiopia, an estimated 30% - 50% solid waste produced in urban areas is left uncollected. (Addisu *etal.* 2019) .

In Ethiopia, like developing countries, increase of solid waste generation is resulted from rapid urbanization and population booming and the average solid waste generation rate is about 0.221kg per person per day and it is also estimated that only 2% of the population received solid waste collection services (Adimias ,2019).

Addis Ababa city started its solid waste management for the last many years but currently the service cannot meet the changing demands (Ali M. and Eyasu E. 2017). It was reported that , Lemma *et al.*, 2019 about 20 to 30% of the waste generated in Addis Ababa, the capital city, remains uncollected .The implication of this evidence that , the activities which is done on municipal solid waste managmnet service and efforts made to change the inefficient condition and the urban dwellers are served are low (Yebalework B. ,2014). Moreover, the primary objective of solid waste management activity is to make the environment sound and safe in human health via disposed of wastes in a well organized manner. (Daniel S. *et al.*, 2017).

All these are the implication of the poor operational condition of municipal solid waste managmnet service and efforts made in improving the solid waste managmnet. Following the rapid expansion of urbanization municipal solid waste management service delivery (solid waste

collection, transportation and disposal) has been a major challenge for municipal authorities in most of the cities towns in Ethiopian (Endalckachew A. 2018). As the result, it is becoming a major public health and environmental concern in urban areas of Ethiopia. Moreover, with the increasing implementation of decentralization as a system of government, the responsibility to the provision of infrastructure and services has been increasing throughout time (Dijk and Fransen, 2008).

Municipal solid waste management is one of the basic services that are currently receiving wide attention in many towns of Ethiopia (Solomon C.2011). Developed countries are capable to manage the various types of waste to an satisfactory level, contrary to developing nations like Ethiopia which are still struggling to deal with the problem of proper management of solid wastes in most of the Ethiopian cities of municipalities (H. R. Sharmetal., 2014) .

As has been rightly coined by (Ali &Eyasu, 2015) like most of African countries as proved by various studies conducted in different towns including Addis Ababa due to lack of financial and personal and therefore institutional deficiency of municipalities solid wastes are managed in improper way in urban areas in Ethiopia. Moreover, such insufficient waste disposal creates environmental contamination and transfer to communicable diseases like land, air and water pollution. Therefore, Solid Waste management in Ethiopia is important because only a small amount of the country's residents have access to proper solid waste management.

3.8 Conclusion

Although Ethiopia is one of the least urbanized countries by African standard, the rate of urbanization and urban population is one of the quickest in sub-Saharan Africa. With this rapid urbanization coupled with the increasing urban population local governments are facing challenges in providing basic services including solid waste management service. The country Ethiopia follows decentralized system and has regulations, Policies and legal frameworks regarding environmental protection and solid waste management both at national level as it clearly proclaimed in the constitution of the country and at regional government's level. Responsibilities especially in the areas of health, environmental management and planning

including the solid waste management are well presented in line the decentralized government system of the country.

Thus there is a distinct allocation responsibility for the different hierarchies in the government system of the country from national to local governments. However, like most of African countries the poor performance of the country is due to the poor institutional capacity of local governments and municipalities. The creation of adequate institutional capacity remained one of the most challenging issues for the urban governments of the country because of the lack of financial, technological and infrastructural advancements facilities.

CHAPTER FOUR

Description of the study Area, Findings and Discussions

4.1 Introduction

Under this chapter the issues of solid waste management practices in the study area would be discussed. The first section provides a general overview of the study area and the second section presents the findings of the study based on both the quantitative and qualitative aspects per the three specific research questions. It starts with the response rate, demographic characteristics of respondents and then it presents the findings and discussion of the main variables according to the research questions of the study.

4.2 The study area

Debre Markos; the capital of East Gojjam Administrative Zone is found in Amhara National Regional State (i.e. Region three). It is located 300 kilometers North West of Addis Ababa, the capital city of Ethiopia and 265 kilometers South East of Bahir Dar, capital city of the Amhara national Regional State. The town is bounded by two woredas. In the East, it is bounded by Anded Woreda and the remaining three directions (to the West, North and South); it is bounded by Gozamen Woreda.

The geographical coordinates of the study area are located between 10°17'00" to 10°21'30" North Latitudes and 37°42'00" to 37°45'30" East longitudes and its elevation ranges in altitude from 2350-2500 meters above the sea level. In history, Debre Markos town was founded in 1853 by *Dejazmach* Tedla Gualu. Its name was initially called Menkoror. He administered *Menkoror* from 1853-1881. In 1881 church Saint Markos was established and thereafter the area known as Debre Markos (Debre Markos town planning office, 2019). It has recently undergone developmental activities particularly on infrastructures: roads, commercial buildings, education centres and health posts. These development progresses accelerate population growth of the town.

According to the 1994 and 2007 population and housing census conducted by Central Statistical Agency, “the population of Debre Markos town was 49,297 and 62,469 respectively”. In addition to, Central Statistical Agency (2018), “the population projection figure of the town had been estimated 61,647 male and 70,714 are female inhabitants which is a total of 132,361 populations” (Debre Markos town administration planning department, 2019).

The majority of the residents are followers of the Ethiopian Orthodox Tewahido church and 97% of the inhabitants are speakers of Amharic language. The remaining 3% of the inhabitants are speakers of Tigiregna, Agew, Afan Oromo and others. The urban residents mostly are civil servants, merchants and others. (Debre Markos Administration planning office, 2018).

Debre Markos town has an estimated area of 12.76sq.kms. The town enjoys a tropical climate with 1380 mm average annual rainfall and minimum maximum temperatures of 15^oC and 22^oC respectively. The Weather condition, in most of the time is Weinadega. (Debre Markos town Administration Planning office and Economic Development of East Gojjam, 2018).

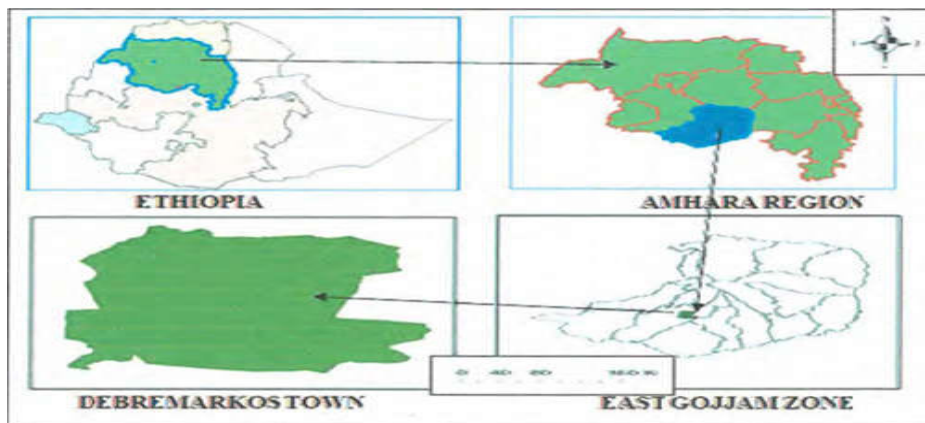


Figure 2: Location of Debre Markos town

Source: Debre Markos town municipality report, 2009 and Tigezew Lamesgen, 2014

4.3 Questioner Response rate

In this study 159 questioners for households were distributed. Out of the total 159 questioners distributed to the households 143 (90%) of the questioner were responded. This makes the

response rate for households' questioner adequate. This indicates that the response rate is good and passable to draw reliable result from the analysis.

Table 3 : Questioner Response Rate

Category	Distributed	Responded	Response Rate
Households	159	143	90 %
Response Rate			90 %

4.4 Demographic characteristics of house hold respondents

The questioner survey was conducted using for house holds. A total of 143 households were participated. Accordingly the demographic characteristics of the respondents for the house holds categories of respondents have been presented under this section.

Demographic characteristics of Sex respondents

As depicted in the table 4 below, from the total of 143 respondents in the household survey males take to about 35 percents of the total share while 65 percents accounts to females. This result shows that the majority of respondents were female.

This might be due to the fact that females tends to stay home and taking care of their family than males or due to their better concern and awareness of the issue they may might be more willing to response for questions related to solid waste management than males household members.

In this regarded the dominance of the female respondents could be an advantage for having more reliable response for the study as they are believed to have more awareness of the solid waste management practice and challenges both at household and municipal level than men.

Age of respondents

According to the result presented in the same table, age wise most of the respondents accounting 48 percent of the total share are in the age group 31-40 followed by those in the age group 21-30 constituting of 33 percent. 17 percent of the respondents fall in the age group between 41 and 50 while the remaining 2 percent goes to those in the age group 50 years. This indicates most of the respondents are old enough to understand the questions and give proper and accurate information in return.

Table 4 : Demographic characteristics of households

Variables	Category	Frequency	Percentage
Sex	Male	50	35
	Female	93	65
	Total	143	100
Age	21-30	47	33
	31-40	69	48
	41-50	24	17
	51-60	3	2
	Total	143	100
Marital Status	Married	123	86
	Not Married	13	9
	Divorced	7	5
	Total	143	100

Educational Level	Illiterate	5	4
	Primary	13	9
	Secondary	10	7
	Certificate	6	4
	Tertiary	109	76
	Total	143	100
Family Size	1-3	83	58
	4-6	44	31
	7-10	12	8
	Above 10	4	3
	Total	143	100
Average Monthly Income	<500	7	5
	500-1000	10	7
	1001-3000	27	19
	>3000	99	69
	Total	143	100
House Ownership Status	Keblle Rental	14	10
	Private Rental	26	18
	Private house	103	72
	Total	143	100

House Type	Villa (compound)	110	77
	Condominium	33	23
	Total	143	100

Marital status of respondents

Regarding the marital status of the respondents, the majority 86 percents are married, 9 percents are single and divorced respondents take the remaining 5 percent share. The dominancy of the married respondents might be due to the fact that almost most of them are adult enough and this will be good for the study since married people are more knowledge of solid waste handling than those of single people in most cases.

Educational Background of the respondents

Of the education level of the respondents those who achieved tertiary level takes the lions share consisting 76 percent while those who completed primary education followed by 13 percent and the reaming 21 percent goes to secondary, illiterates and certificate level completed together. This implies that the majority of the respondents have good educational background to the level they understand the statements in the questions forward their perception well which is good the accuracy of the result of the study.

Family Size of the respondents

Concerning the family size as presented in the table 4 above, the larger proportion 58 percent of respondents are with family size of 1 to 3 followed by those with family size of 4 to 6 accounting for 31 percent of the total while those with family size of 7 and above consists 11 percent of the total share. The result revealed that the majority of respondents are of small family size yet significant numbers of respondents are of medium to large family size. As the volume of solid waste generation and the corresponding solid waste management activities of the households

varies with family size this data set allows the researcher to have the perception and view of a mix of respondents with different family size.

Average Monthly Income of the respondents

The majority of the respondents are with monthly income of greater than 3000 birr consisting of 65 percent of the total share while those with monthly income of between 1001 to 3000 takes the next rank with 19 percent share of the total. Those with monthly average income of 501 to 1000 birr take the 7 percent share while those with less 500 birr average monthly income accounts to 5 percent of the share. In this regards those households with higher average monthly income likely expected to have better access to the solid waste disposal service as they can afford for the private solid waste disposal service as an alternative access for the service than those with low monthly average income.

House type and ownership status

As presented in the above table 4 most of the respondents 77 percent of the respondents live in a villa type house (house with compound) and the rest 23 percent lives in condominium houses. In the other hands those who lives in their own private house takes the majority of the share consisting 77 percent, followed by those who lives in private rental 18 percent and the least share 10 percents goes to those who live in kebele rental house. In terms of the types of housing dwelling, regardless ownership households living in villa type house with enough space with the compound have more access for temporary places for the solid waste disposal than those who live in condominium as they do not have enough space temporary places for the solid waste disposal.

4.5 Practices and Challenges of Solid Waste Management in Debre- Markos Town

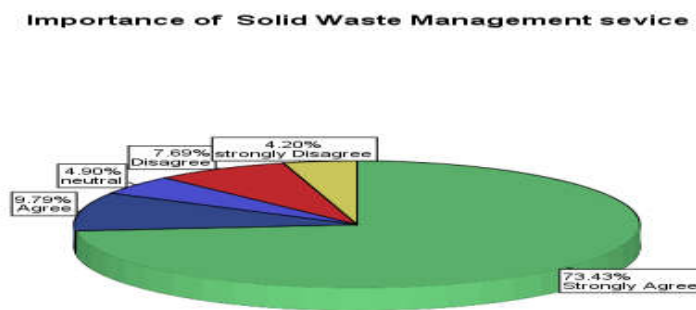
Since municipal solid waste management practices encompasses all the process from generation to the final disposal, it could not be the responsibility a single party rather it requires an integrated effort of the society, the private sector and the responsible local government organs. Therefore, in order to identify the challenges and source of the challenges, hindering the effective municipal solid waste requires examining the whole process through generation to final disposal.

4.5.1 Households Perception and Practice of solid waste Management

The realization of the effective solid waste management starts with individual households. Here respondents were asked of how they perceive the importance solid waste management in their area. As shown in the figure 3 below 73.4 percent of the participant of the survey strongly agrees of the importance the solid waste management in their area and 9.8 percent of them agree with the statement. Those who explained as they disagree and strongly disagree were only 12 percent of the total participants.

This shows that most of the people of the town have good perception towards the importance that solid waste management has on their life in the study area.

Figure 3:- Households' perception on the importance of SWM



Respondent households were also asked of their habit in cleaning their own house and how frequent they clean their house. As depicted in the table 5 below out of the total 143 respondents about 92 percent of them clean their house by themselves while only 8 percent of the respondents do not.

Table 5: Households Habit of house cleaning

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	132	92.3	92.3	92.3
No	11	7.7	7.7	100.0
Total	143	100.0	100.0	

The result, in table 6 below reveals that about 70 percent clean their house explained that they clean their house once a day while 15 percent of them clean twice a day. This indicates that the majority of people of the town have better attitude and reputation of the importance of clean living environment.

Table 6: Frequency House Cleaning

House cleaning	Frequency	Percent	Valid Percent	Cumulative Percent
twice a day	21	14.7	14.7	14.7
once a day	100	69.9	69.9	84.6
once a week	18	12.6	12.6	97.2
twice a week	4	2.8	2.8	100.0
Total	143	100.0	100.0	

4.5.2 Solid waste Handling and Storage Facility at Households Level

In towns of developing countries where the secondary solid waste storage facilities are not available nearby resident and where there is lack of frequent solid waste collection service, household usually need to have temporary solid waste storage facilities.

The result presented in the figure 4 below reveals that about 69 percent of the surveyed households have temporary solid waste storage at household level while the remaining 31 percent of the respondents have no temporary solid waste storage facility.

From this result one understand that the majority of the surveyed households have the primary storage facility. The types of dwelling of households' also another determinant to access primary storage facility, those who have compound and enough space will have more access than those who live in condominium houses.

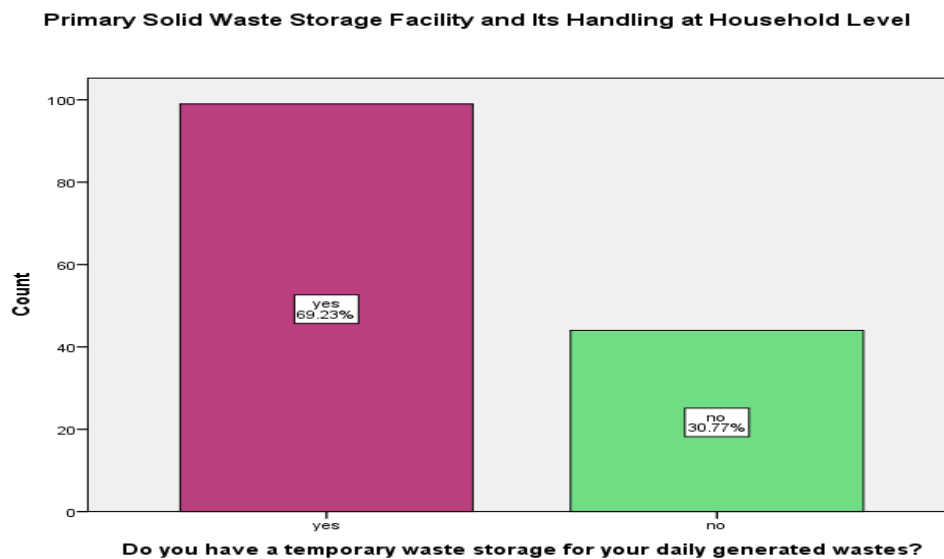


Figure 4: Primary solid waste storage

4.5.3 Solid Waste Separation/Sorting at Household level and link Recyclers

Separation and sorting of solid waste according to their nature and type has an important role in solid waste for effective waste management. Unlike developing countries in developed countries where there is adequate solid waste process and recovery facilities it is common to sort solid wastes as recyclable, compostable and reusable. Here the solid waste sorting or separation practice of the surveyed households was assessed in this study. As presented in the figure 5 below, 92 percent of the surveyed households do not separate/ sort solid wastes while 8 percent of the households do.

As majority of the households do not practice solid waste separation, it can be confirmed that there exist a poor practice of solid waste separation at household level in the study area. However, sorting solid waste by their type and purpose has significance in reducing the volume of solid waste at the point of generation and thereby help improve the solid waste management service. Moreover, where households have linkage with solid waste processing and recovering facilities, the benefit of household level solid waste separation will contribute more to the efficient solid waste management as well as through generating economic benefit in various ways.

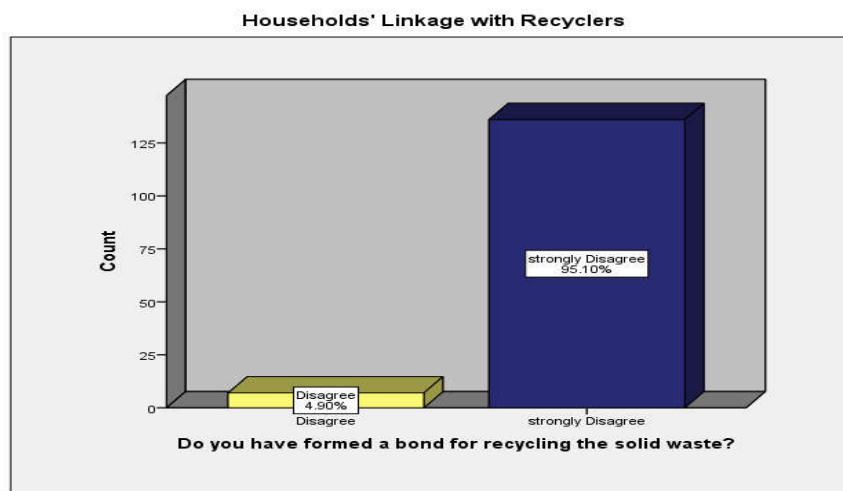
Figure 5: Solid Wastes Separation/Sorting at Household level



Accordingly, households were surveyed they have facilitated to link with recyclers for whom they supply or sell recyclable solid wastes. As shown in the figure 6 below shows that out of the total surveyed households 95 percent of them said that there is no any linkage created by the town municipality with recyclers and only 5 percent of them agreed with the idea. From this one can learn of the poor performance of the town's municipality in creating a link between households and solid waste recyclers or the unavailability of recyclers in the town. Interviewed respondents from the town's sanitation, beautification and Green development unit unit leader, said that currently there is no any practice of waste minimization, reuse, recycle and waste treatment activities in the town. We just collect solid wastes from secondary storages and from street sweepers and bring them to the final disposal site. Having this in mind, some of the

households in the town separate valuable solid wastes only in terms of salability and exchangeability rather than for processing and recovery purpose, it is confirmed by the researcher during the field observation period. Therefore, although households in the study area have not good status in terms of sorting solid wastes at the point of generation due to the absence of access to solid waste process and recovery in the town there contribution towards the effectiveness of solid waste management is limited.

Figure 6: Linkages with recyclers



4.5.4 Access to Door to Door Solid Waste Collection Service

Door to door solid waste collection service is a widely used method of solid waste collection in most of the towns in Ethiopia. In Debre-Markos town this service is provided by Micro and small scale enterprise associations.

Currently in Debre-Markos town there are 9 micro small scale enterprises associations and 223 members who are engaged in providing door to door solid waste collection service to the residents. Households were assessed whether they use micro small scale enterprises for door to door solid waste collection.

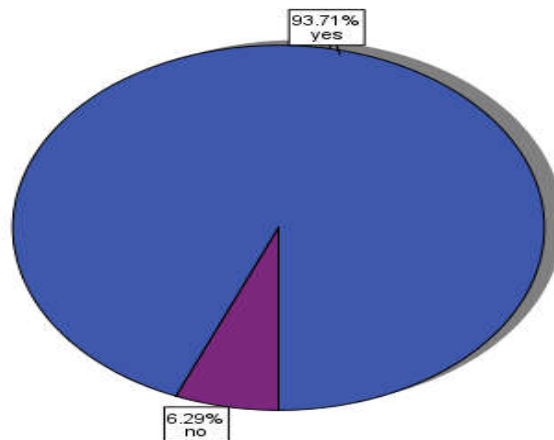
According to the survey result depicted in figure 7 below about 94 percent of the surveyed households use micro and small scale enterprises for door to door solid waste collection whereas

the rest 6 percent of the respondents do not use micro and small scale enterprises for door to door solid waste collection service.

This implies that the majority of the respondents willing to use and have access for door to door solid waste collection service while the few of them either do not have access or not willing to use the service from micro and small enterprises.

Figure 7: Door to Door Waste Collection Service

Households' Access to Door to Door Waset Collection Service



However, all of the total households who claim to use micro and small scale enterprises for door to door solid waste collection service agreed that the micro and small scale enterprises are do not provide the service regularly according to the schedule; obviously this causes over accumulation of the solid waste at household level and may leads to improper dumping. Here according to the interviewed experts from the town's sanitation, beautification and Green development unit the number of the micro and small scale enterprises are to small as compared with the growing demand of the service in addition, there is also lack of transportations and others facilities to micro and small scale enterprises. Therefore, it requires the strict follow up of the town's Municipality. During the physical observation the researcher also learned that micro

small scale enterprises use their back for transporting collected wastes to the secondary storage station.

During the interview with micro and small scale enterprises and the street sweepers have pointed out the following financial, Social, technical and institutional issues as a core problems of the town's solid waste management service; Regarding the financial issues Workers and leaders of the 9 door to door solid waste collection associations and street sweeping team under the town's municipality agree that they are not paid enough for their service according to the heaviness of their work. Moreover, due to lack of budget they do not get their salary on time and they are not also provided with safety equipments like heavy duty glove, safety shoes, clothing and sanitizer. During physical observation the researcher has noticed the problem; the workers are not equipped with the required safety equipments and tried his best by distributing 40 heavy duty gloves to all the 40 street sweepers under the town's municipality. Moreover, Of the technical issues lack of transportation equipment to transport collected solid wastes to transfer stations was one of the most important points mentioned by solid waste workers during the interview, due to the absence of such equipments the workers currently transport the collected waste to the transfer station by their back and they suggested that the municipality of the town should have to provide them at least hand push lorries/gary.

The solid waste workers also mentioned that the number of temporary stations is not enough as compared the size of the town and the volume of the daily generated solid waste, due to this problem they are forced to travel long distance to bring the collected waste to the secondary storage containers. Finally they also said that they don't get frequent trainings on solid waste management system and safety related issues to.

From the institutional perspective of solid waste management the interviewed solid waste workers believe that the town's municipality and the sanitation, beautification and green development unit do not have enabling institutional arrangement and capacity both in terms of organizational structure and manpower to improve the municipal solid waste management system of the town.

For instance the unit has no different departments for a certain specific responsibility like traning and awarnes crating team, door to door solid waste collection followup and monitoring team and

since the unit has one team leader and one expert in implication the man power is not adequate as the mandate of the unit is broad.

Access and willingness to use door to door solid waste collection service alone can not a guarantee for proper disposal of solid; rather the service should be delivered regularly and as per schedule with fair price. Here respondents were asked whether the price for the door to door solid waste collection service is fair. As shown in the figure 8 below, Out of the total respondents about 64 percent of them disagree with the statement, those who strongly disagree constitute 19 percent, while those who chose neutral and agree takes 16.78 together. From the result one can learn that the majority of the surveyed respondents believe that the price charged for solid waste collection service is not fair. They justified that we pay 15 birr per month with water bill for only the solid waste service. However since the service is not provided by MSSEs as per scheduled frequently the price we pay is high as compared with the service we are delivered. Here when people feel that the service is not provided as required and at fair price they tend to see other option than micro and small scale enterprises like dump solid wastes illegally that leads to adverse environmental health problem. Therefore, in order to avoid such problem and prevent improper dumping the town's Municipality should follow up the activity of micro and small enterprises at regular basses.

Figure 8: Price for Solid Waste Collection Service by MSSE



4.5.5 Access to Secondary Storage Facilities, Distance and Frequency of Transportation

Secondary storage facilities refers to different types of solid waste containers which involve keeping solid waste generated from different households at a common or central point from where collection vehicles can pick it and transport to final disposal site (Zebenay, 2010) as cited in (Gedefaw,2015). These secondary storage containers however a temporary storage sites and should transported to the final disposing sites as frequently as possible.

In realizing efficient solid waste management system having in place the right capacity in waste collection and transportation is one of the most important prerequisite. Meaning what matters in the efficiency solid waste management is that the Collection and transportation capacity such as collection frequency, size and number of the containers, types and number of trucks.

Currently in Debre-Markos town there is only one truck, 20 containers (one container per 1520 households) and one disposing site according to the town's sanitation, beautification and Green development unit expert. As compared with the total growing demand and volume solid generation we could not address the growing demand with this capacity. Although we do not have data on the exact volume of the annual solid waste generation our estimated capacity is to collect only 30 percent the total volume the waste generation added the municipal sanitation beautification green development unit expert. This shows that there is a shortage of transportation and secondary storage facilities and about 70 percent of the solid waste generated do not properly collected, which exposed the town residents to serious public health problem and disease.

As shown in the figure 9 below that the majority 92 percent of the respondents rated the secondary storage facility as insufficient, while the rest 8 percent of them agreed that the facility is adequate. Here from the data above it one can understand that the majority of households in the town do not have access to secondary storage at their residential area. Access to secondary storage facility is one of the important facilities in assuring effective solid waste management in a given urban center where solid waste generation rate is increasing over time. Coupled with in

adequate door to door solid waste collection service when there is shortage of such facilities at residential centers in accordance with the population concentration and waste generation rate, it is obvious that people forced to simply dump solid wastes illegally by the side of main streets, in side ditches and other open area that in turn leads to infrastructural, environmental and health damage at the end of the day. As agreed by 100 percent of the surveyed households and confirmed by the researcher during his physical observation currently illegal dumping is highly practiced in Debre-Markos town, it is for sure due to poor access to door to door collection service and secondary storage facilities in the town. Therefore, the town Municipali should give due attention to increase the number of the secondary storage containers number and allocate it based on the number of residents in each locality.

Besides access to secondary storage facilities the average distance of a container from each residential house is also determines the solid waste management practice of a society. In this regard,as depicted in the table 7 below, out of the surveyed 143 respondents about 66 percent of them agree that they find a container at a distance of 500 meter and beyond while only 19 percent of them access a container at a distance of 300 meter and below from their home.

The other factor that influences the effectiveness of solid waste management is the frequency transportation from the temporary storage stations to the final disposing site. The secondary storage containers do not removed frequently by the town municipality as all of the respondents agreed and it takes at least 8 days to remove a container. According to the respondents of the municipal deputy manager, the municipality of the town has only one truck for transporting waste containers to the disposal site.

According to the above findings, there are incompetent numbers of secondary waste container and the long distance between these containers, increases the possibility that inhabitants will dump waste in open places and along the road side

This shows that how complex the problem of solid waste management in the town is and that the source of the problem is more of institutional deficiency of the town's municipality. In general from the result analysis it can be concluded that there is poor door to door collection service in terms of frequency of service delivery and poor secondary storage facility both in terms of access

and distance as well as frequency of secondary storage transportation. All these problems and challenges are an indication for the poor solid waste management practice in Debre-Markos town among others.

Figure 9: Accesses to Secondary Solid Waste Storage Facilities

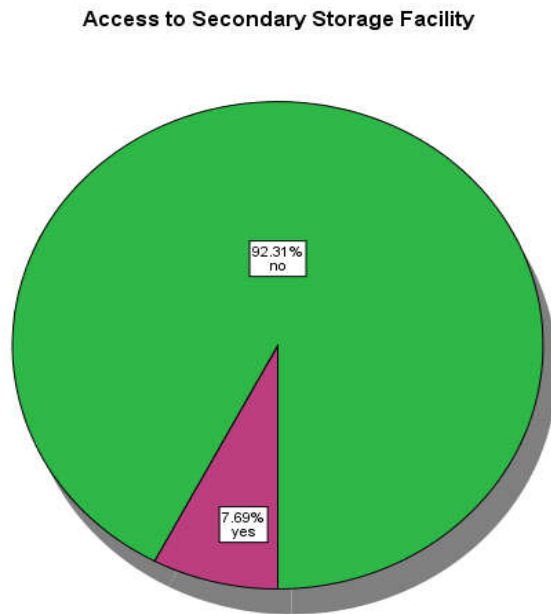


Table 7:- Distances to the Secondary Storage/Container

Distance	Frequency	Percent
100m	14	9.8
300m	27	18.9
500m	91	63.6
1KM	5	3.5
above 1KM	6	4.2
Total	143	100.0

4.5.6 Overall institutional structure, mandate and functions of SBGDU.

Solid waste management is a very complex, multi disciplinary and costly task. Therefore, in order to assure efficient solid waste management system local governments in urban centers primarily put in place the right institution in a manner equipped with the appropriate organizational arrangement, adequate management system and man power, adequate financial and technology resources. In addition a clearly stated rules and regulations regarding the solid waste management practice and the capacity and ability to enforce them should also create.

Sanitation, Beautification and Green Development Unit (SBGDU) was organized under Debre-Markos town municipality office. Provision of municipal solid waste managmnt service, awareness creation of the importance of MSWM and follow up and law enforcement are among the main responsibility of the unit. However, the unit is not equipped with the required preconditions to provide efficient solid waste management system both in terms of special coverage and frequency solid waste collection. Although, the responsibly given to the unit is very broad yet there is no adequate man power for instance its organized under the municipality with one team leader, one expert and one secretary. In general it has no adequate budget, do not independent prepare plan and has shortage of equipments, as the researcher informed during the interview with the head and an expert from the unit. From this one simply can understand the poor institutional capacity of responsible organization for solid waste managmnt service that can be explained by lacks appropriate organizational arrangement and financial, technical, financial and human capacity.

For instance the result presented in the figure 10 below shows as that among all the surveyed respondents about 82 percents of the respondants have never obtained any training and education about solid waste management when only 18 percent of the respondent households obtained. This clearly shows that the sanitation, beautification and Green development unit poor in achieving one of its main mandate which is awareness creation. In other hand as presented in the table 8 below shows that 91 percent of the resepondants do not know anything of the Policies, rules and regulations regarding waste management system. While only 9 percent of them know

about the Policies, rules and regulations regarding waste management system. All the surveyed respondents believe that illegal dumping is widely practiced in Debre-Markos town; the researcher also confirmed it during the field visit. Yet out of those respondents who claimed that they know of the Policies, rules and regulations regarding waste management system 100 percent of them agree that there is low implementation of polices and poor law enforcement capacity by the responsible body. Polices, rules and regulations are already there and we have the mandate to implement policies and enforce the law, the problem is that we do not have the right man power and financial capacity said the unit leader. This implies that the unit had performed poor both in terms of awareness creation and low enforcement which is a clear indication for the poor institutional arrangement and capacity of the responsible body.

Figure 10 :- Training and Education Provision

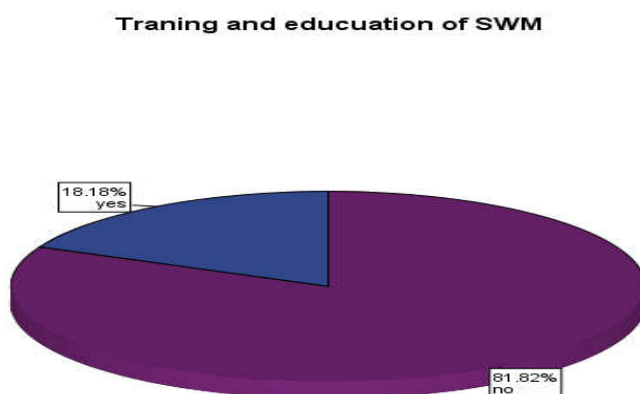


Table 8: Awareness of Policies, rules and regulations regarding waste management system

Awareness of Policies, rules and regulations regarding waste management system i	Frequency	Percent
Yes	13	9.1
No	130	90.9
Total	143	100.0

The unit is not well organized as compared with the responsibility and mandate it has been given. In all aspects we can not say that sanitation, beautification and Green development unit is in a position to perform the tasks and meet the demand of the people in such organizational appearance, as an interviewee from the unit expert. The unit should independently organize as an organization and much more budget should also be allocated in order to fulfill the required manpower and equipments. Further the task also needs to be decentralized to Keblle level according to an interviewed deputy manager from the town municipal.

Keeping it in mind, respondent were asked to rate the status of solid waste management. According to the survey result presented in the figure 11 below, the solid waste management service delivery of the town was rated as very unsatisfactory by about 40 percents of the respondents, as unsatisfactory by about 38 percent of the respondents, as neutral by 18 percent of them while it was rated as satisfactory by only 3.5 percent of the respondent. All these facts are confirming that the solid waste management service in the Debre-Mrkos town is poor in terms coverage and quality and the municipality office is also unable to meet the growing need for it lacks the required institutional capacity.

Poor institutional arrangement and financial /budget constraints are the major factors that hinder the municipality not to provide the solid waste management service to the level that meets the need of the people of the town according to deputy manager from the town municipal.

Therefore, it can be concluded that all the problems behind the poor performance lack of institutional capacity or institutional deficiency. That can be explained by lack of financial budget as the total allocated budget for solid waste service delivery and the amount of revenue generated from service fee is not adequate for providing the service at the required level.

In addition due to the inadequacy of the amount budget allocated and other source of revenue also resulted in poor structural, human or material capacity of the municipal solid waste service delivering institution or the municipality of the town.

Table 9: The annual amount of revenue collected from service users of solid waste management

Year	Revenue Collected with water bill only for solid waste workers	To be paid for solid waste workers	Budget deficit
2018	1 222 300	3 169 610	1 947 310
2019	3 000 020	4 212 360	1 212 340
2020	4 149 000	4 726 560	577 560
Total	8 371 320	12 108 530	3 737 210

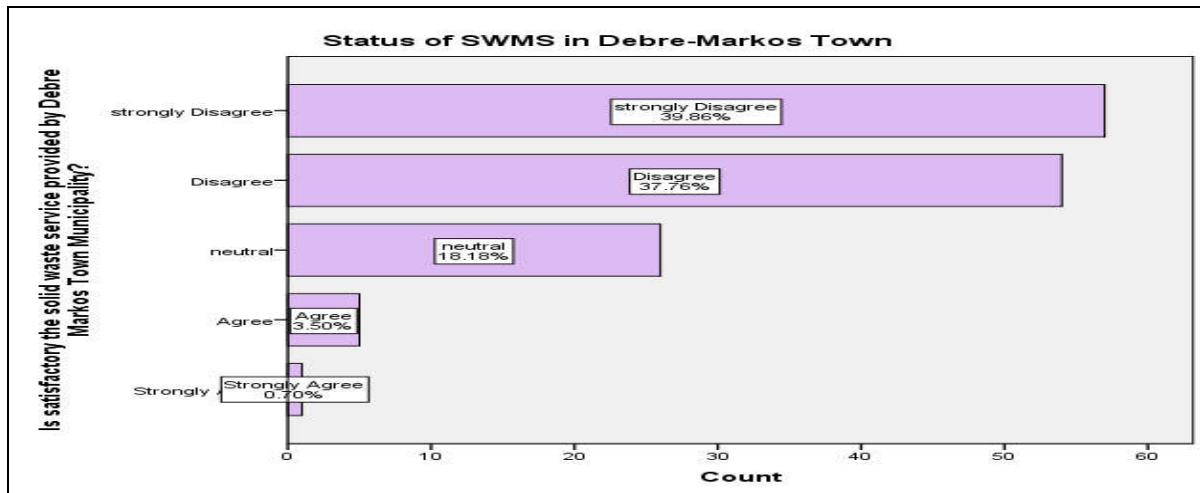
Source: Debre- Markos town municipal service office, 2020.

For collecting service fee for solid waste management in the town was started in 2018. According to the town municipal service office depicted in table 9 above clearly shows that, the household's willingness to pay was increasing since then, the amount of the annual revenue collected could not cover the required budget to provide the service of solid waste management as demanded. For example, during the last three years from 2018-2020, waste collection fees only brought in ETB 8 371 320 while expenditure for the same years was ETB 12 108 530. Basically, revenue from solid waste collection and disposal covers only 69 percent of the cost and the remaining 31 percent is a budget deficit. Thus, the town's solid waste management service is suffering from budget deficit.

The main reason behind is the mismatch between the revenue and the demanded budget amount, but the less attention given to the service by the government of the town is also another hindering factor. According to interview participants of municipal deputy manager, there is no regular budget allocated to the service.

Fiscal decentralization believed to enhance the efficiency of public service delivery in general and solid waste management service in specific. But not without preconditions; adequate political and institutional environments, sufficient degree of revenue and expenditure decentralization are among the basic precondition. In this regard the town lacks fiscal decentralization especially that explained in terms of lack of revenue and expenditure decentralization.

Figure 11 the Status of MSWSD in Debre-Markos Town



4.5.7 Health and Environmental Impact of Improper Solid Waste Disposal

Due to the poor status of municipal solid waste management in the Debre-Markos town improper and unsafe disposal is widely practiced. The inadequacy of the door to door solid waste collection coupled with the shortage of secondary storage and vehicles to transport solid waste to the final disposing site makes the illegal disposal to be aggravated. Such improper disposal practices obviously believed to have adverse environmental and health effect to the inhabitants of the town. Therefore, in order to assess the environmental and health effect of the improper solid waste disposal the researcher had conducted an interview with experts and heads of the health office and environmental protection office of the town.

The interviewed respondents heads and experts from environmental protection office of the town claim that the improper solid waste disposal became a serious problem to the people of the town; it is common to see solid wastes disposed here and there across the town even by the side of the streets and near to the residential areas. The solid waste is consists different bio degradable and non biodegradable components. The degradable components usually cause releases polluting

and unpleasant odor to the environment while the non biodegradable one releases some harmful chemicals to the soil; both will affect the environmental and the inhabitants in the environment. To this end we are trying to work with the town' municipality and other stakeholders but to avoid or at least to reduce the problem it requires a vast and integrated work of all stakeholders both in the short run and sustainably.

Similarly respondents of heads and experts from the health office also claim that the improper solid waste is a major health threat to the people of the town. In justifying their agreement based on data they told to the researcher that among the top ten diseases recorded in 2019/2020 the first top 4 diseases are respiratory, water and air borne disease which have fully or partially related to the improper solid waste management.

Table 10: Ten Top Number of Cases in Debre Markos Town, in the year, 2019/2020

N0		No of cases
1.	Upper Respiratory Tract Infection	12860
2.	Dyspepsia --A de order of digestive function (Stomach Upset)	7550
3.	Parasite Diseas	5165
4.	Acute Feverial illness	7284
5.	Urinary tract in infection	4730
6.	Disease of the eye and adnexa	4690
7.	Dental and Gum Disease	4523
8.	Typhoid fever	4412
9.	Masclaw Skeletal System and Connective Tissue Disease	4185
10.	Trauma(Injury,harm,hurt)	3684

Source: Debre Markos town health office, 2020

4.5.8 Conclusions of the Findings of the Study

This study was intended to assess the adequacy of decentralization in municipal solid waste managment service delivery with particular reference to DebreMarkos town municipality. With specific objectives of identifying the main challenges of service delivery in solid waste management in Debre Markos town, examining whether there is institutional deficiency or practical gap in the solid waste management and suggest alternative options for managing solid waste managment in the town.

The result of the analysis of the sample survey data revealed that most of the households have an awareness of the importance of solid waste management and most of the households clean their houses at least once a day. Similarly, majority of the households have temporary storage and but do not separate solid wastes at household level.

From the result of the analysis it was confirmed that majority of households have access to door to door solid waste collection from micro and small scale enterprises but the service is not adequate in terms of coverage and frequency collection. It is also learned that the in adequate secondary storage facility and transportation facility to the final disposal site.

The result of the study also found that the overall performance of the solid waste management service is poor both in terms of coverage and frequency of service delivery thus in turn causes the problem of improper dumping in the town.

In the study it is also confirmed that poor institutional arrangement, low institutional capacity that explained by lack financial, man power, technical resources and inappropriate organizational structure are the major factors responsible for the poor performance of solid waste management in the town.

Finally, the study revealed that the improper disposal practice that emanate from poor status of solid waste management in the town became the major health and environmental threat for the inhabitants of the town.

CHAPTER FIVE

Conclusions and Recommendations

5.1 Introduction

This study attempted to assess the adequacy of decentralization in service delivery in terms of solid waste management with particular reference to Debre Markos town municipality in general. The main research question that this study intends to answer was of what are the main challenges in service delivery of the solid waste management in the study area through the whole process, from the point of generation to final process while investigating the source of the challenges being the secondary focus of the study. This consists of two sections; the first section presents the conclusive statements drawn from the discussion of the findings while the second section of the chapter presents the forwarded recommendations to Debre-Markos town municipality on the best strategies to solve the problems of poor solid waste management sustainably.

5.2 Summary of the study

In this study an attempt was done to assess the adequacy of decentralization in municipal service delivery in terms of solid waste management with particular reference to Debre Markos city municipality in general. In particular, the study identifies the main challenges of service delivery in solid waste management in the study area and examining whether there is institutional deficiency or practical gap in the solid waste management..

In addressing the investigation semi structured questionnaires to households, structured and unstructured interview for municipal deputy manager, SBGDU heads and employees, solid waste workers that are organized as an association of MSSEs and street sweepers, health and environmental protection office heads and employees. Physical field observation and review of published and unpublished documents were employed. Finally, to analyze the data both qualitative and quantitative designs were also used. Accordingly the conclusion drawn from the findings of this study were summarized as follows.

Most of the households in Debre-Markose town have an awareness of the importance of solid waste management and most of them clean their houses at least once a day. Similarly, majority of the households have temporary storage at household level.

Although, Waste reduction through waste process, reuse and recovery is known to play a significant role in waste reduction at the stage of waste generation, so far there is no any effort made by the sanitation, beautification and Green development department unit of the town. Due to the absence of such access 92 percent of the households do not separate/ sort solid wastes (metal, glass, plastic and organic) at household level before disposing of it..

In Debre-Markos town the Door to door solid waste collection is provided by micro and small scale enterprises waste collectors and about 94 percent households use this service. These MSSEs usually collect and transport from residential area to the transfer stations or secondary containers. However, this service is not adequate both in terms of coverage and frequency collection as well as transportation. The presence of small number of micro and small scale enterprises and their poor institutional capacity made the service not to be adequate as compared with the growing demand of the service.

Currently there are only 20 secondary storage facilities all over Debre-Markose town. These secondary storage facilities are also not adequate both in terms of distribution/ coverage and in average distance from the residential houses. Coupled with the poor door to door solid waste collection service by MSSEs the low access to secondary storage or transfer stations aggravated the problem of solid waste management service provision and improper solid waste disposal practices of the town.

The collection and transportation of solid wastes from transfer station/ secondary storage to the final disposal site is solely carried out by the municipality of the town. However, currently the municipality has only one truck for this service due to this fact secondary storage left uncollected for more than a week.

Currently, due to the under capacity of the municipality of the town only 30 percent of the total volume the daily generated volume of the solid waste collected by the municipality while the

remaining 70 percent of the solid waste irresponsibly disposed in an authorized areas in the town and posing health and environmental problem on the inhabitants of the town.

Improper and illegal solid waste disposal is widely practiced in Debre Markos town. In this regard the policies, rules and regulations of the solid waste management are already there however, due to the poor low enforcement capacity of the Sanitation, Beautification and Green Development unit of the town this improper solid waste disposal practice has continued as a problem yet.

In general, the finding of the study confirmed that the Debre-Markos town municipal solid waste management service is very poor in all aspects of efficient solid waste management such as status, spatial coverage and solid waste management facility. And households are also less satisfied with the quality and amount of the municipal solid waste disposal service.

On top of this the study identified two major factors behind the poor solid waste management service of the Debre-Markos town. These are: The poor institutional arrangement and capacity of the Sanitation, Beautification and Green Development unit and municipality of the town. This can be explained by poor financial capacity, inadequate manpower resource and management system, lack of technology, inadequate decentralization and poor organizational structure. Lack of collaboration and integration among the various stakeholders in the solid waste management of the town. This can be explained by the limited participation and involvement of stockholders like the civil societies, NGOs, the private sector and the community as a whole. In general, it could be concluded that the poor solid waste management service of the town is due to institutional deficiency and aggravated by lack of performing functional responsibility by the stakeholders.

Despite of its institutional deficiency the local governments failed to shoulder its minimum core obligation as has been stipulated in the solid waste management laws. This has its own negative consequences on the satisfaction of the community on the municipal solid waste management service.

5.3 Recommendations

Based on the research findings and the conclusion drawn, the researcher has forwarded the following valuable recommendations as the best possible solution to solve the problems associated with the poor status of solid waste management of the study area.

- The ANRS should strictly implement the policies and laws governing solid waste management in the town so that its minimum core obligation could be shouldered like at least modernizing environmental friendly dumping sites, consolidating collaboration and integrity among stakeholders in the area of solid waste management, decentralizing solid waste management service to kebele levels and among responsible sectors.
- The town municipality office should organize the Sanitation, Beautification and Green Development unit separately as an independent organization with adequate financial, human and organizational resource so that work on the access to process, reuse and recovery of solid waste could be done properly. Particularly on the coverage and frequency of the Door to door solid waste collection service.
- As secondary storage or transfer station facilities have the most important role in mitigating improper solid waste disposal practice when they are distributed well and be available in average at fair distance or at central point to a given residential area, the town's Sanitation, Beautification and Green Development unit together with the municipality need to increase the number of secondary storage facilities and distribute the facilities based on data population density and waste generation rate.
- In order to solve the long stay of a collected secondary stations being the town's Sanitation, Beautification and Green Development unit together with the municipality should to increase the number trucks for transporting the secondary storages to the final disposing sites.
- Since solid waste management is a very complex and costly process it could not be the responsibility of a single party. Therefore, the town's Sanitation, Beautification and Green Development unit together with the municipality should have to work hard in increasing the involvement of the private sector, the civic society, NGOs and the community as a whole in the solid waste management service of the town.

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APPENDICES

APPENDIX-1

Addis Ababa University
College of Law and Governance
Department of Federalism and Governance Studies

Research Questionnaire prepared for sample households in Debre Markos Town

Dear Respondent

First, I appreciate your cooperation to give me your time for the success of this research thesis..

I am undertaking a study on “Decentralization and Municipal Service Delivery: the case of Solid Waste Management in Debre Markos town Administration in partial fulfillment of the requirements of the thesis for the Masters Degree in Federal studies at Addis Ababa University”. I feel that your contribution and information obtained from you is essential for the success of this research thesis. I assure you that the information you share me will be used only for academic purpose and kept confidential.

Thank you for your cooperation!

Yours sincerely!

Nebiyu Minale

Mobile No 0910601922

General Instructions:

This questionnaire consists of two sections. The first section required personal information of the respondents, while the other section required gathering information about the challenges of solid waste management service.

Part one: Background information about the respondents

Instruction: In order to answer the following questions, put a right sign (✓) in the boxes that located in front of your choice or alternatively you can write your additional answer from blank space.

1. Sex: 1. Male-----2. Female-----
2. Age (in years) 1. Under 20 year 2.21-30----- 3.31-40 ----4.41-50----- 5.51-60 ----- 6. Above 60 ----
3. Marital status 1.Married----- 2.Not married----- 3. Divorce-----
4. Type of dwelling 1.Villa ----- 2.condominium -----
5. Household head's Educational status: 1). No formal education 2). Primary 3).Secondary 4). Certificate 5). Tertiary
6. House ownership status : Kebelle rental house ----- private rental house -----
- private house-----If other specify -----
7. Family size (number of people living in the house) 1. 1-3----- 2. 4-6 -----3. 7-10---
--- 4. 10 and above -----.
8. Average monthly income (in ETH Birr): Less than 500----- 501-1000-----
1001-3000 ----- greater than 3000-----
9. Household head Occupation 1. Unemployed -----2.Employed-----3.Selfemployed-----
4. If other please specify-----
10. Kebelle _____

Part II:

Instruction: In order to answer the following questions, put a right sign (✓) in the boxes that located in front of your choice or alternatively you can write your additional answer from blank space.

1. Do you believe that it is important to have a solid waste management service in your area?

1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

2. Do you clean your house every day? 1. Yes 2. No

3. If yes for question number 2 how many times clean your house?

a. Twice a day -----b. Once day ----- c. Once a week-----

d.. Twice a week. -----e. if other please specific it-----

4. Are there other sources of solid waste in the area other than the house hold?

1. Yes 2.No if yes describe it -----

5. Do you have a temporary waste storage for your daily generated wastes?

1. Yes 2. No

6. Are there sufficient Solid waste containers that are available in your area?

1. Yes 2. No

7. How far is the Solid waste container from your home?

a.100meters ----- b.300 metres----- c.500meters----- d.1kilometer-----

e. above 1killo meter-----

8. When the solid waste accumulated by the container will be removed?

1. In 24 hours 2. In 48 hours 3. 3 days 4 . 4-5 days 5 .6-7 days 6. . more than 8 days .

9. Do you separately store/sort/ solid wastes that are generated in your house at the source? (metal, plastic, food waste) 1. Yes 2. No

10. Do you have formed a bond for recycling the solid waste?

1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

11. Do you use micro and small enterprises for door to door solid waste collection from your residence? 1. Yes 2. No
12. If your answer is yes for number 11; you will get the service on time according to the programme? 1. Yes 2. No
13. If you use micro and small enterprise, you think that the cost you paid for the service is reasonable?
1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
14. Is satisfactory the solid waste service provided by Debre Markos town Municipality?
1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
15. Have you ever complained orally or in writing for the concerned bodies about solid waste management? 1. Yes 2. No if yes what is the reasons -----
16. Do you think that unfair solid waste service is provided?
1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree
17. Have you ever obtaining training and education about solid waste management?
1. Yes 2. No if yes which Topic -----
18. Are there any people in the town who dump garbage in the middle of the road, the streets and opining? 1. Yes 2. No
19. If the answer yes for question number 18 when they mostly dump? -----

20. Do you know Policies, rules and regulations regarding waste management system in Debre Markos town at community level?
1. Yes 2.No
21. If your answer is yes for question 20,do you think that policy, rules and regulation are practical -----
1. Strongly agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

Respondents: -If you have any suggestions or further information on Solid Waste management and disposal service, you are well come to provide in this given space below. -----

Thank you Very much for your cooperation!

APPENDIX-2

Interview Guide questions prepared for municipal manager, municipal Sanitation, Beautification and Green Development Unit process owner and Experts of Debre Markos town.

General Instructions:

This questionnaire consists of two sections. The first section required personal information of the respondents, while the other section required gathering information about the challenges of solid waste management service.

Part one: Background information about the respondents

1. Name _____
2. Position _____
3. Years of service in the office _____

Part two:-Give your answer according to the question.

1. Explain the overall institutional structure, mandate and functions of Design preparation sanitation, beautification and Green development department.
2. Do you have a work plan for solid waste management?
A. Yes----- B. No-----
3. Does your department have specific job description for its employees regarding to solid waste management?
A. Yes----- B. No-----
4. Is there anybody who works coordinately with the Debre Markos town solid waste management department on that waste is properly collected and transported to the disposal site? 1/ Yes 2/ No If yes, who is it ? _____
5. Do you have contractual agreement with (MSE) that collect and transport wastes to containers? 1/ Yes 2/ No. If yes, how much do you pay them monthly? _____

6. How many (MSE) are engaged on waste collection and transport system in Debre Markos town? _____
7. Do you believe that the current solid waste management service delivery system is adequate when you compare to the growing number of urban population? If no, why? If yes, how?
8. Mention the types and total number of equipment that your department uses for collection, transportation and disposal of municipal solid waste of the town?
9. Are the solid waste equipments available to cover all the different parts of the town?
A. Yes B. No
10. If yes, do you believe that it is enough for the town's people?
11. How much solid waste is generated in Debre Markos city in daily, monthly and yearly in kg, m³, tone)?
A..... B..... C.....
12. Is Solid waste is regularly collected in Debre Markos town
A. yes ----- B. no -----. If no what do you think the major reasons for the problem?;
13. Do Debre Markos town Designe preparation sanitation, beautification and Green development unit practice different types of resource recovery, waste minimization or waste treatment activities?
A. yes----- B. No-----
14. If your answer is "Yes" for question 13, how does your Department treat solid waste?
A/ Composting B/ Reducing C/ Recycling D / Disposing E/ All
F/ Any other-----
15. Does the municipality have a capacity to mobilize human and financial resource in order to improve the provision of solid waste management service delivery?
A) Very high B) High C) Moderate D) Low E) Very low
- 16 Do you believe that, the municipality has a capacity to implement the Solid waste management plans independently?
(a) Very high (b) High (c) Moderate (d) Low (e) Very low

17 What is the source of the municipality income for solid waste management services? Dose it enough for you to provide the service at the required level ? If yes how, If no, from where did you get subsidy to solve such problem?

18. did your department give education, training or information to the community about the impact of environment resulted from poor solid waste management?

A. Yes

B. No (if No, tell the reason:

19. Is solid waste management service decentralized in your organization?

a) Yes b) No

20. How do you evaluate the follow-up by the responsible bodies to practice the rules and regulations of solid waste management in Debre Markos?

A. Very strong B. Strong C. Weak D. There is no follow up

21. What are the common challenges faced by the unit while facilitating solid waste management? -----

-----.

22. What can be done to improve solid waste management service delivery in municipality?

23. Explain the major positive and negative impact of the existing structure, performance and proper institutional set-up for solid waste management service municipal solid waste management of the town.

24. If you have any additional comments, suggestions, or would like to elaborate on any of your previous answers?

Thank you Very much for your cooperation!

APPENDIX-3

Interview questions prepared for organization providing Municipal Solid Waste (MSW) service Workers

1. Do you believe that the current solid waste management and service system have proper institutional set-up for solid waste management service?
a/ Yes ----- b/ No
2. If you answered “yes” to the number “1”, how would you describe it? If No, explain your reason?-----
-----.
3. Do you believe that there are adequate and modern Solid Waste management equipment?
a/ Yes ----- b/ No
4. If you answered “yes” to the number “3”, how would you describe it? If No, explain your reason?-----
-----.
5. The municipality office is well planned and gives regular training or awareness creation strategy for solid waste workers?
a/ Yes ----- b/ No
6. If you answered “yes” to the number “5”, how would you describe it? If No, explain your reason? -----
7. Do you believe that solid waste workers have available safety clothes , protective gloves and sanitizer ?
a/ Yes ----- b/ No
8. If you answered “yes” to the number “7”, how would you describe it? If No, explain your reason?-----
-----.
9. Is the monthly salary adequate and sufficient paid for solid waste workers?
a/ Yes ----- b/ No
10. If you answered “yes” to the number “9”, how would you describe it? If No, explain your reason? -----
11. The salaries of solid workers are paid on time?
a/ Yes ----- b/ No
12. If you answered “yes” to the number “11”, how would you describe it? If No, explain your reason? -----

Thank you Very much for your cooperation!

APPENDIX-4

Interview guides prepared for Environmental protection and Health office head /concerned experts

1. In your observation, have you been observed any environmental pollution due to improper solid waste disposal system from households in Debre Markos town?
a. Yes b. No
2. If your answer for question “1” is “yes”, how serious is the degree of the pollution?
3. In your opinion, do you think that the improperly managed solid wastes in your town affect the environment and health of the residents? How?
4. Do you provide environmental pollution and health awareness education on solid waste management to the residents?
a / Yes b / No
5. If your answer is “Yes” for question no “4” what challenges have you faced while you were providing solid waste management education?
6. In your opinion, are there sufficient and appropriate solid waste managing facilities in your city?
a / Yes b / No
7. If you answered “yes” to the number “6”, how would you describe it? If No, explain your reason?
8. What are the policy, rules and regulations regarding waste management in the town at household level? Are the policies, rules and regulations are practical?
9. Finally, what do you suggest to alleviate the problem of solid waste management?

Thank you for your cooperation!

APPENDIX-5

CHECKLIST FOR FILED OBSERVATION

Town -----

Date-----

No	Item	Yes	No
1.	Is there enough vehicles and machinery to collect, transport and dumping solid waste?		
2.	Do clothes and materials have available for solid waste workers to keep healthy while collecting solid waste?		
3.	Are solid waste disposal facilities available at the community level?		
4.	Are the materials put in right place and distance?		
5.	Did communities use those materials?		
6.	Are there well solid waste management practice?		
7.	Does community follow solid waste disposal procedure properly?		
8.	Is there a suitable place for a proper solid waste disposal?		

APPENDICES

APPENDIX-1

በአዲስ አበባ ዩኒቨርሲቲ

የሕግ እና አስተዳደር ኮሌጅ

የፌዴራሊዝም እና የአስተዳደር ጥናት ማዕከል

በደብረማርቆስ ለተመረጡ የከተማው ነዋሪዎች የተዘጋጀ የጽሁፍ መጠይቅ
የተከበራችሁ ተጠያቂዎች

በቅድሚያ ለዚህ የምርምር ፅንሰ-ሀሳብ ስኬታማነት ጊዜዎን ስለሰጡኝና ስለትብብርዎ
አመሰግናለሁ።

በአዲስ አበባ ዩኒቨርሲቲ በፌዴራሊዝምና አስተዳደር ትምህርት የማስተር ድግሪ ድህረ-ምረቃ
ተማሪ ስሆን የዚህ መጠይቅ ዓላማም “በደብረ ማርቆስ ከተማ ያልተማከለ አስተዳደር በደረቅ
የቆሻሻ አያያዝና አወጋገድ ረገድ” የከተማ አገልግሎት አሰጣጥ ላይ መረጃ ለመሰብሰብና
ለጥናታዊ ጽሁፍ አገልግሎት ብቻ ለማዋል ነው። ስለዚህ ለመጠይቁ ትክክለኛ እና ግልፅ ምላሽዎ
ለዚህ ጥናት ስኬት እጅግ ዋጋ ያለው ነው። መረጃው ለአካዳሚያዊ ዓላማ ብቻ የሚውል እና
ሚስጥራዊ በሆነ መልኩ እንደሚቆይ ለአረጋግጥ እወዳለሁ።

ለትብብርዎ አመሰግናለሁ !

ከአክብሮት ጋር!

ነቢዩ ምናለ

የሞባይል ቁጥር 0910601922

አጠቃላይ መመሪያ

ይህ መጠይቅ ሁለት ክፍሎች ያሉት ይዟል። የመጀመሪያው ክፍል አጠቃላይ የግል መረጃ
የሚመለከት ሲሆን ሁለተኛው ክፍል ደግሞ በደረቅ ቆሻሻ አያያዝና አስተዳደር አገልግሎት
አሰጣጥ ያሉትን ተግዳሮቶች መረጃ ለመሰብሰብ የሚያስችል ክፍል ነው።

ክፍል አንድ- የተሳታፊዎች የግል መረጃ

መመሪያ:- የሚከተሉትን ጥያቄዎች ለመመለስ፣ በመረጡት ፊት ለፊት በሚገኘው ክፍት ቦታዎች
ላይ ትክክለኛ ምልክት (✓) ያድርጉ፣ እንዲሁም ተጨማሪ መልስ ካለዎት በክፍት ቦታው ላይ
ይጻፉ።

1. ፆታ :- 1. ወንድ ----- 2. ሴት -----

2. ዕሜ (በዓመታት) 1. ከ20 አመት በታች 2.21-30 ----- 3. 31-40--- 4.41-50--- 5.51-60----
6. ከ60 በላይ-----
3. የጋብቻ ሁኔታ 1. ያገባ ----- 2.ያላገባ ----- 3. ፍቺ -----
4. የመኖሪያው ዓይነት 1. ቪላ ----- 2. ኮንደምንየም -----
5. የቤተሰብ ኃላፊ የትምህርት ሁኔታ- 1.መደበኛ ትምህርት የለም -----
2. አንደኛ ደረጃ ክፍሎች ተጠናቀዋል ----- 3. ሁለተኛ ደረጃ ክፍሎች ተጠናቀዋል ----
4. የምስክርወረቀት ----5. ዲፕሎማና ከዚያ በላይ ----
6. የቤት ባለቤትነት ሁኔታ:የቀበሌ ኪራይ ቤት -----የግል ኪራይ ቤት ----- የግል ቤት ---- ሌላ ካለ ይገለጽ -----
7. የቤተሰብ ብዛት (በቤቱ ውስጥ የሚኖሩት ሰዎች ብዛት) 1. 1-3 ----- 2. 4-6 -----3. 7-10 ----- 4. 10 እና ከዚያ በላይ -----.
8. አማካይ ወርሃዊ ገቢ (በኢትዮጵያ ብር) :ከ 500 በታች----- 501-1000 ----- 1001-3000 ----- ከ 3000 በላይ -----
9. የቤቱ ባለቤት የስራ ሁኔታ 1. ሥራአጥ ----- 2. ተቀጣሪ ----- 3. የግል ስራ 4. ሌላ ካለ እባክዎን ይግለጹ-----
10. የሚኖሩበት ቀበሌ _____

ክፍል ሁለት

መመሪያ:-የሚከተሉትን ጥያቄዎች ለመመለስ፣በመረጡት ፊት ለፊት በሚገኘው ክፍት ቦታዎች ላይ ትክክለኛ ምልክት (✓) ያድርጉ፣እንዲሁም ተጨማሪ መልስ ካለዎት በክፍት ቦታው ላይ ይጻፉ።

1. የደረቅ ቆሻሻ አያያዝና አወጋገድ አገልግሎት በአከባቢዎ መኖር አስፈላጊ ነው ብለው ያምናሉ ?
ሀ. በጣም እስማማለሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----
2. ቤትዎን በየቀኑ ያጸዳሉ ?
ሀ.አዎ ለ.የለም
3. ለጥያቄ ቁጥር 2 መልስዎ አዎ ከሆነ ቤትዎን ለምን ያህል ጊዜ ያፀዳሉ?
ሀ. በቀን ሁለት ጊዜ-----ለ. በቀን አንድ ጊዜ----- ሐ. በሳምንት አንድ ቀን መ. በሳምንት ሁለት ቀን -----ሠ. ሌላ ካለ እባክዎን ይግለጹ -----

4. ከቤትዎ ውጭ ሌሎች በአካባቢው የደረቅ ቆሻሻዎች ምንጮች አሉ?
ሀ) አዎ ----- ለ) የለም ----- አዎ ከሆነ ያብራሩ-----
5. በየቀኑ ለሚፈጠሩ ቆሻሻዎች ጊዜያዊ ቆሻሻ ማጠራቀሚያ አለዎት?
ሀ. አዎ ----- ለ. የለም.....
6. የተጠራቀመውን ደረቅ ቆሻሻ ማስቀመጫ በአካባቢው በቂ ኮንቴነር አለ ?
ሀ. አዎ ----- ለ. የለም.....
7. የቆሻሻ ማጠራቀሚያው ከቤትዎ ምን ያህል ርቀት አለው?
ሀ. 100ሜትር---- ለ.300ሜትር----- ሐ.500ሜትር----- መ.1ኪሎሜትር-----
ሠ. ከ1 ኪሎሜትር በላይ-----
8. በኮንቴነሩ የተጠራቀመው ደረቅ ቆሻሻ በየስንት ጊዜ ይነሳል ?
ሀ.በ 24 ሰዓት ለ.በ 48 ሰዓት ሐ.በ 3 ቀን መ. ከ 4-5 ቀን ሠ. ከ 6-7 ቀን ረ. ከ 8 ቀን በላይ
9. በቤትዎ የሚሰበስቡትን ደረቅ ቆሻሻ ለይተው ለየብቻ ያስቀምጣሉ ?(ብረት፣ ጎማ፣ የምግብ ቆሻሻ ወዘተ)
ሀ.አዎ ለ.የለም
- 10.የተለዩትን ደረቅ ቆሻሻ እንደገና ጥቅም ላይ እንዲውል ትስስር ፈጥረዋል ?
ሀ. በጣም እስማማልሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----
- 11.ከመኖሪያ ቤትዎ በር ለበር ደረቅ ቆሻሻን የሚሰበስቡ አነስተኛና ጥቃቅን ማህበራትን ይጠቀማሉ ?
ሀ.አዎ ለ.የለም
- 12.ለጥያቄ ቁጥር 11 መልስዎ አዎ ከሆነ፣ አገልግሎቱን በወጣው ፕሮግራም መሰረት በወቅቱ ያገኛሉ?
ሀ.አዎ ለ.የለም
- 13.ጥቃቅንና አነስተኛ ማህበራትን የሚጠቀሙ ከሆነ ለአገልግሎቱ የሚከፈሉት ክፍያ ተመጣጣኝ ነው ብለው ያስባሉ ?
ሀ. በጣም እስማማልሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----

14.በደብረማርቆስ ከተማ በደረቅ ቆሻሻ አያያዝ ላይ የሚሰጠው አገልግሎት አጥጋቢ ነውን?

ሀ. በጣም እስማማልሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ
እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----

15.ስለ ደረቅ ቆሻሻ አስተዳደር እና አገልግሎት ለሚመለከታቸው አካላት በቃል
ወይም በጽሑፍ ቅሬታ አቅርበው ያውቃሉ?

ሀ) አዎ ----- ለ) የለም ----- አዎ ከሆነ ምክንያቱን ያብራሩ-----

16.ፍትሃዊ ያልሆነ የደረቅ ቆሻሻ አገልግሎት ይሰጣል ብለው ያምናሉ?

ሀ. በጣም እስማማልሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ
እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----

17.ስለቆሻሻ አያያዝና አወጋገድ በሚመለከታቸው ተቋም የግንዛቤ ትምህርት ተሰጥቶታል
ያውቃል ?

ሀ) አዎ ----- ለ) የለም ----- አዎ ከሆነ በምን ርዕስ ዙሪያ-----

18.በመንገድ መሃል፣ዳርና በዲች እንዲሁም ክፍት ቦታዎች ያለአግባብ ደረቅ ቆሻሻ
የሚጥሉ የከተማው ነዋሪዎች አሉ ?

ሀ) አዎ ----- ለ) የለም -----

19.ለጥያቄ ቁጥር 18 መልስዎ አዎ ከሆነ በየትኛው ወቅት ነው በብዛት ቆሻሻ ያለአግባብ
የሚጥሉት? -----

20.ቆሻሻን የማስተዳደር ስርዓት በተመለከተ ፖሊሲዎች፣ህጎችንና ደንቦችን በህብረተሰብ
ደረጃ ያውቃሉ ?

ሀ) አዎ ----- ለ) የለም -----

21.ለጥያቄ ቁጥር 20 መልስዎ አዎ ከሆነ ፖሊሲዎች፣ህጎችንና ደንቦችን ተግባራዊ
ይደረጋሉ?

ሀ. በጣም እስማማልሁ ----- ለ. እስማማለሁ ----- ሐ. በመካከለኛ ደረጃ
እስማማለሁ ----- መ. አልስማማም ----- ሠ. በጣም አልስማማም-----

ውድ ተጠያቂዎች:- ተጨማሪ ሃሳብ ካለዎት በባዶ ቦታ ይጻፉ-----
-----::

ሰለትብብርዎ ከልብ አመሰግናሁ!

APPENDIX-2

ለደብረ ማርቆስ ከተማ አገልግሎት ፅ/ቤት ስራ አስኪያጅ፣ የሳኒቴሽን ውበት እና አረንጓዴ ልማት ክፍል ቡድን መሪና ባለሙያዎች የተዘጋጀ የቃለ መጠይቅ ጥያቄዎች ክፍል አንድ- የተሳታፊዎች የግል መረጃ

1. ስም _____
2. ኃላፊነት _____
3. በስራው የቆዩበት የአገልግሎት ጊዜ _____

ክፍል ሁለት- እባክዎን በእያንዳንዱ ጥያቄ ትዕዛዝ መሰረት መልስዎን ይስጡ

1. የዲዛይን ዝግጅት የንፅህና አጠባበቅ ውበት እና የአረንጓዴ ልማት ቡድን አጠቃላይ ተቋማዊ አወቃቀፍን፣ ግዴታዎችን እና ተግባሮችን ያብራሩ።
2. ለደረቅ ቆሻሻ አያያዝና አስተዳደር የሥራ ዕቅድ አለዎት?
ሀ. አዎ ----- ለ.የለም -----
3. የደረቅ ቆሻሻ አያያዝን በተመለከተ የእርስዎ ክፍል ለሠራተኞቹ ልዩ የሥራ ዝርዝር አለው?
.ሀ. አዎ ----- ለ.የለም -----
4. ቆሻሻው በትክክል ተሰብስቦ ወደ ቆሻሻ ማጓጓዣ ጣቢያው እንዲጓጓዝ ከደብረ ማርቆስ ከተማ አስተዳደር የደረቅ ቆሻሻ አያያዝ ቡድን ጋር በትብብር የሚሠራ አካል አለ? አዎ _____ የለም _____ መልስዎ አዎ ከሆነ ማነው?-----

5. ቆሻሻን እንዲሰበስቡ እና እንዲያጓጓዙ ከአነስተኛ እና ጥቃቅን ማህበራት ጋር የኮንትራት ስምምነት አለዎት? አዎ----- የለም _____ አዎ ከሆነ በየወሩ ምን ያህል ይከፍሏቸዋል?-----
6. በደብረ ማርቆስ ከተማ ውስጥ በደረቅ ቆሻሻ ማሰባሰብ እና ትራንስፖርት ሥርዓት ውስጥ ስንት የአነስተኛና ጥቃቅን ማህበራትና አባላት አሉ _____
7. እየጨመረ ካለው የከተማ ህዝብ ብዛት ጋር ሲነፃፀር የአሁኑ የደረቅ ቆሻሻ አያያዝ አገልግሎት አሰጣጥ ስርዓት በቂ ነው ብለው ያምናሉን? ካልሆነ ለምን? አዎ ከሆነ ያብራሩ?
8. የከተማው የደረቅ ቆሻሻ ለማሰባሰብ፣ ለማጓጓዣ እና ለማጠራቀሚያ ቡድኑ የሚጠቀሙባቸውን የመሣሪያ አይነቶች እና ጠቅላላ ብዛት ይጥቀሱ?

9. የከተማውን የተለያዩ አካባቢዎች በሙሉ ለመሸፈን የሚያስችል የደረቅ ቆሻሻ መሣሪያዎች አሉ?

ሀ. አዎ ----- ለ. የለም-----

10.አዎ ከሆነ ለከተማው ህዝብ በቂ ነው ብለው ያምናሉን?

11.በደብረ ማርቆስ ከተማ ውስጥ በየቀኑ፣በየወሩ እና በዓመት ምን ያህል ደረቅ ቆሻሻ ይወጣል (በኪሎ ግራም)?

12. በደብረ ማርቆስ ከተማ ደረቅ ቆሻሻ በቋሚነት ይሰበሰባል ?

ሀ. አዎ ----- ለ. በቋሚነት አይሰበሰብም-----መልስዎ “ለ” ከሆነ ለችግሩ ዋና ዋና ምክንያቶች ምን ይመስልዎታል?

13.የደብረ ማርቆስ ከተማ የዲዛይን ዝግጅት፣ንፅህና አጠባበቅና ውበት ፣የአረንጓዴ ልማት ቡድን ቆሻሻን መቀነስ ወይም ቆሻሻን እንደገና መልሶ መጠቀም ላይ ይሰራል?

ሀ.አዎ ----- ለ.የለም -----

14. ለጥያቄ ቁጥር 13 መልስዎ “አዎ” ከሆነ ፅ/ቤቱ ወይም ቡድኑ ደረቅ ቆሻሻን ምን ጥቅም ላይ ያውላል ?

ሀ / ብስባሽ (ፍግ)----- ለ / ከምንጩ ቅነሳ----- ሐ / እንደገና ጥቅም ላይ ማዋል----- መ / መጣል----- / ሁሉም----- ረ / ሌላ ካለ ይገለጽ-

15. የደረቅ ቆሻሻ አያያዝና አስተዳደር አገልግሎት ለማሻሻል ከተማ አገልግሎቱ የሰውና የገንዘብ ሀብትን የማሟላት አቅም አለው?

ሀ) በጣም ከፍተኛ-----ለ) ከፍተኛ-----ሐ) መካከለኛ-----መ) ዝቅተኛ-----ሠ) በጣም ዝቅተኛ-----

16.ከተማ አገልግሎት ፅ/ቤቱ የደረቅ ቆሻሻ አያያዝ እቅዶችን ራሱን ችሎ የመተግበር አቅም አለው ብለው ያምናሉን?

(ሀ) በጣም ከፍተኛ----- (ለ) ከፍተኛ----- (ሐ) መካከለኛ----- (መ) ዝቅተኛ----- (ሠ) በጣም ዝቅተኛ-----

17.ለደረቅ ቆሻሻ አያያዝ አገልግሎቶች የከተማ አገልግሎቱ የገቢ ምንጩ ምንድን ነው?ገንዘቡ አገልግሎቱን ለመስጠት በቂ ነው ብለው ያምናሉ ?አዎ ከሆነ እንዴት ?መልስዎ አዎ ካልሆነ የገንዘብ ችግሩን ለመፍታት ድጎማ ከየት ታገኛላችሁ ?

18. የደረቅ ቆሻሻ አያያዝ ጉድለት በአካባቢው ላይ የሚያደርሰውን ተጽዕኖ አስመልክቶ በክፍሉ አማካኝነት ትምህርት፣ ስልጠና ወይም መረጃ ለህብረተሰቡ ይሰጣል?

ሀ. አዎ ለ. የለም (የለምከሆነ፣ ምክንያቱን ይናገሩ)

19. የደረቅ ቆሻሻ አያያዝ አገልግሎት በተቋሙ ውስጥ ያልተማከለ አስተዳደርን ተግባራዊ ያደርጋል?

ሀ) አዎ----ለ) አያደርግም-----

20. በደብረ ማርቆስ ውስጥ የደረቅ ቆሻሻ አያያዝ ፖሊሲዎች፣ ህጎችና እና ደንቦችን ተግባራዊ ለማድረግ በኃላፊነት የሚሰሩ አካላት ክትትል እንዴት ይገመግሙታል?

ሀ. በጣም ጠንካራ----ለ. ጠንካራ----ሐ. ደካማ----- መ. ክትትል የለም
ሠ. ሌላ ካለ ይገለጹ

21. የደረቅ ቆሻሻ አያያዝ በሚመቻችበት ጊዜያት የሚያጋጥሙ የተለመዱ ተግዳሮቶች ምንድን ናቸው? -----
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22. በከተማ አገልግሎት ውስጥ ደረቅ ቆሻሻ አያያዝ አገልግሎትን ለማሻሻል ምን ሊደረግ ይገባል?-----

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23. የከተማ አገልግሎት መዋቅር፣ አፈጻጸምና ተቋማዊ አደረጃጀት በደረቅ ቆሻሻ አያያዝና አስተዳደር ጠንካራና ደካማ ተጽዕኖዎችን ቢያብራሩ፡፡-----

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24. ማናቸውም ተጨማሪ አስተያየቶች፣ ጥቆማዎች ካሉዎት ወይም ቀደም ሲል ለነበሩዎት ማንኛውም መልሶች በዝርዝር መግለፅ ይችላሉ?-----

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ሰለትብብርዎ ከልብ አመሰግናለሁ!

APPENDIX-3

በደብረ ማርቆስ ከተማ በደረቅ ቆሻሻ አገልግሎት ላይ ለተሰማሩ ሰራተኞች የተዘጋጀ የቃል መጠይቅ

1. በእርስዎ ግንዛቤ ተገቢ የሆነ የደረቅ ቆሻሻ አያያዝና አገልግሎት አሰጣጥ እንዲሁም ተቋማዊ አደረጃጀት አለብለው ያምናሉ ?
 ሀ/ አዎ ----- ለ/ የለም-----
2. ለተራ ቁጥር “1” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----
3. የከተማ አገልግሎት ጽ/ቤት በቂ እና ዘመናዊ የቆሻሻ አያያዝ መሳሪዎች አለው ብለው ያምናሉ ?
 ሀ/ አዎ ----- ለ/ የለም-----
4. ለተራ ቁጥር “3” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----
5. የከተማ አገልግሎት ጽ/ቤት በደረቅ ቆሻሻ ማንሳት ስራ ለተሰማሩ የተደራጀ እና በቋሚነት ስልጠና ወይም የግንዛቤ ማሰጨበጫ ትምህርት ይሰጣል ?
 ሀ/ አዎ ----- ለ/ የለም-----
6. ለተራ ቁጥር “5” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----
7. በደረቅ ቆሻሻ ማንሳት ስራ ለተሰማሩ ሰራተኞች የንጽህናና የጤና መጠበቂያ የእጅ ጓንት፣ጫማዎች፣ልብሶችና ሳይኒታይዘር ያገኛሉ ?
 ሀ/ አዎ ----- ለ/ የለም-----
8. ለተራ ቁጥር “7” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----
9. በወር የሚከፈለው ደምዎዝ በቂ ነው ብለው ያምናሉ ?
 ሀ/ አዎ ----- ለ/ የለም-----
10. ለተራ ቁጥር “9” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----
11. ደመዎዛችሁስ በወቅቱ ይከፈላል ?
 ሀ/ አዎ ----- ለ/ የለም-----
12. ለተራ ቁጥር “11” መልስዎ “አዎ ” ከሆነ እንዴት ይገልጹታል?አዎ ካልሆነ ምክንያትዎን ያብራሩ?-----

ለትብብርዎ አመሰግናለሁ!

APPENDIX-4

ለደብረ ማርቆስ ከተማ አካባቢ ጥበቃ መሬት አስተዳደር ጽ/ቤትና እና ጤና ጥበቃ ጽ/ቤት ሃላፊና ባለሙያዎች የተዘጋጀ ቃለ መጠይቅ ጥያቄዎች

1. በእርስዎ ግንዛቤ ተገቢ ባልሆነ መንገድ የነዋሪዎች የደረቅ ቆሻሻ አያያዝና አወጋገድ የአካባቢ ብክለት በደብረ ማርቆስ ከተማ እንዳለ ይገነዘባሉ ?

ሀ/ አዎ ----- ለ/ የለም-----

2. ለጥያቄ ቁጥር “1” መልስዎ “አዎ” ከሆነ የብክለቱ መጠን እንዴት ገልጹታል?

3. በእርስዎ አስተያየት በከተማው ውስጥ ያልተገባ የደረቅ ቆሻሻ አያያዝና አወጋገድ የነዋሪዎችን አካባቢና ጤና የሚጎዳ ነው ብለው ያስባሉ? እንዴት?

4. በደረቅ ቆሻሻ አያያዝ ላይ የአካባቢ ብክለትና ጤናን በተመለከተ የግንዛቤን ትምህርት ለህብረተሰቡ ይሰጣሉ?

ሀ/ አዎ ----- ለ / የለም -----

5. ለጥያቄ “4” መልስዎ “አዎ” ከሆነ ስለ ደረቅ ቆሻሻ አያያዝ ትምህርት በሚሰጡበት ጊዜ ምን ፈታኝ ሁኔታ አጋጥሞዎታል?

6. በእርስዎ አስተያየት በከተማው ውስጥ በቂ እና አግባብነት ያላቸው የደረቅ ቆሻሻ አያያዝ አገልግሎቶች አሉ?

ሀ / አዎ ----- ለ / የለም-----

7. ለተራ ቁጥር “6” መልስዎ “አዎ” ከሆነ እንዴት ይገልጹታል አዎ ካልሆነ ምክንያትዎን ያብራሩ?

8. በከተማ ውስጥ ያለውን ያልተገባ የደረቅ ቆሻሻ አያያዝ ሰርዓት ለማስያዝ የተዘጋጁ ፖሊሲዎች፤ ህጎችና እና ደንቦች ምንድን ናቸው? በተጨማሪም ተግባራዊነት ይሆናሉ ወይ ?

9. በመጨረሻም፤ የደረቅ ቆሻሻ አያያዝንና አወጋገድን ችግር ለመቅረፍ ምን መሰራት አለበት ብለው ያምናሉ?

ለትብብርዎ አመሰግናለሁ!

APPENDIX-5

የመስክ ምልክታ ቼክ ሊስት

ከተማ -----

ቀን -----

ተራ ቁጥር	የስራው ዓይነት	አዎ	የለም
1.	ደረቅ ቆሻሻን ለመሰብሰብ፣ ለማመላለስና ማስወገጃ ቦታ ለመጣል በቂ ተሽከርካሪዎችና ማሸኖች አሉ?		
2.	ደረቅ ቆሻሻ በመሰብሰብ ለተሰማሩ ሰራተኞች ጤንነታቸውን ሊጠበቅ የሚችል በቂ አልባሳትና ሌሎች ቁሳቁስ አላቸው ?		
3.	በማህበረሰብ ደረጃ የደረቅ ቆሻሻ ማስወገጃ አማራጮች ይገኛሉ?		
4.	የደረቅ ቆሻሻ ማስቀመጫ ቁሳቁሶች በትክክለኛው ቦታ እና ርቀት ላይ ተቀምጠዋልን?		
5.	ማህበረሰቡ እነዚህን የደረቅ ቆሻሻ ቁሳቁሶችን ይጠቀማልን?		
6.	ጠንካራ የደረቅ ቆሻሻ አያያዝ ልምድ በህብረተሰቡ አለ?		
7.	ማህበረሰቡ የደረቅ ቆሻሻ አወጋገድ ስርዓትን በትክክል ይከተላል?		
8.	ትክክለኛ የሆነ ደረቅ ቆሻሻ ማስወገጃ የተመቻቸ ቦታ አለ?		

PICTURES



Picture 1: Over flowing of wastes from Municipal Container(Source:own field survey,2020)



Picture 2: Illegal dumping of solid waste in ditch (Source:own field survey ,2020).



Picture 3: Partial view of waste dumping site (source: own field survey, 2020)



Picture 4: Waste disposal on open space (source: own field survey,2020)



Picture 5: Accumulation of waste out side the container (source: own field survey, 2020)



Picture 6: Solid waste transportation practice (source: own field survey, 2020)



Picture 7.A place where separated waste items are bought and sold.(Source:own filed survey,2020)



Picture 8 Partial view of SWWs, during glove's gift . (Source: Own filed survey, 2020).