ADDIS ABABA MEDICAL AND BUSINESS COLLEGE

Department of Public Health

Community Based Assessment on Household Solid Waste Management and hygiene practice in Woreda 15 Kolfe Keranyo Sub-city, Addis Ababa

By

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Statement of the Author

First, I declare that this thesis is my own work and that all sources of materials used for this thesis has been fully acknowledged. This is to certify that the thesis prepared by Hadush Atsbha Gebremaryam entitled: Community Based Assessment on Household Solid Waste Management and hygiene practice in Woreda 15 KolfeKeranyo Sub-city, Addis Ababa; submitted in partial fulfillment of the requirement for the Degree of Master of General public health complies with regulation of the College and meets the accepted standards with respect to the originality and quality. I declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

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External Examiner   Signature   Date

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List of Acronyms

SW: Solid Waste

SWM: Solid Waste Management

MSW: Municipal Solid Waste

MSWM: Municipal Solid Waste Management

USEPA: United States Environmental Protection Agency

HHs: House Holds

NGO: Non-Governmental Organizations

MSEs: Micro and Small Enterprises

ISWM: Integrated Solid Waste Management

UNEP: United Nations Environmental Program

USAID: The United States Agency for International Development

SPSS: Statistical Package for Social Science

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Abstract

Solid wastes comprise all the wastes arising from human and animal activities that are normally solid, discarded as useless or unwanted materials. Ethiopia is one of the developing countries, the urban areas have problem of solid waste management. This study aimed to assess household solid waste management and hygene practice in woreda 15 from july 5- august 5, 2020. To accomplish the objectives descriptive type of research method was used and both primary and secondary data sources applied for the study. The primary data were collected via questionnaires, interview,FGD and field observations. Whereas the secondary data were extracted from different published and unpublished materials. A total of 370 respondents were used in the study.Data analyses was done using SPSS for windows version 24 after checking for missing values and outliers. The findings of the study revealed that the majority of the households (85.1%) in the study area had no common waste bin container. At household level(92.4%) bottles and glasses were the most difficult wastes to manage. In this study respondent households were asked what type of temporary storage waste container they use and the most common used containers were sacks, followed by baskets and plastics 325 (87.8%), 28(7.6 %) and 7(1.9 %) respectively and the remaining 10 (2.7%) said they used a can container. From the present study most of households (79 %) not separate their waste. The current study revealed that solid waste management practice of the households was poor and improper in the study areawith low awareness and attitude on solid waste management practiceand gap on enforcement of rules and regulations were reasons for low performance of solid waste management. The result from FGD and interview revealed that the problems of the existing system in Woreda 15 was lack of awareness of the household heads towards household solid waste management , rules and regulations of the woreda, lack enforcement of rules and regulation, community members and the household owners. Thus the community has to be provided with adequate education and develop awareness on how to handle its solid wastes at home and about the consequences of disposing solid.Finally, the study forwarded some important recommendations towards improving the waste management practices.

Keywords: Household, solid waste management, Woreda 15

1. INTRODUCTION

1.1 Background:

A substance that is discarded or useless because of animal and human activity designated as solid waste. Improper waste management may have health ,enviromental and economic problems.It serves as best media for different disease vectors like mosquito,flies and rodents. It also causes pollution of water,polluted water the cause of enteric communicable disease.sanitation is a fundamental to human development and security[1].

The magnitude of solid waste management problem is raised because of the increased of human activities that resulted a devastating impact up on the environment. The reasons for improper solid waste are due to lack strict environmental rules ,improper dumping solid wastes, enough infrastructure, migration from rural to urban and increase the population, lack of budget to run solid waste and lack of advanced technology in waste disposing[2].

In order to minimize the problems facing in urban areas related with solid waste management several techniques were applied, like creation of special agencies, incineration, recycling and conversion of waste to wealth.The improper disposal of solid wastes in Addis Ababa city can lead to occurrence of health hazards to the people living and or working near the disposal sites. Accident occurred in Kolfe Keraniyo in 2009E.C in which more than 70 people lost their life. There was a considerable public concern over the possible effects emanating from the improper disposal of solid wastes in the disposal site in Addis Ababa city Administration prior to this study[3].

The factors for inappropriate solid waste management in the community include lack of awareness of households , not participating and considering the households as the main stakeholder , no smooth relationship among waste collectors and households[4].

The aim of this study therefore, was to investigate the solid waste management and hygiene practice in the community of Kolfe Keraniyo Sub-City, woreda 15. Specifically targeted to assess the awareness, knowledge, attitude and practice of the community towards solid

Waste management of improper solid waste disposal towards the community. Investigating the community's attitude and knowledge towards solid waste management practice will bring a better understanding and solution to the problem.

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2. Statement of the Problem

Among the environmental issues, the world is facing, solid waste management is the critical one and becomes a global concern. This is due to as long as humans have been living in settled communities; solid waste generation has been unavoidable and critical issue both in developed and developing nations.However some of the greatest challenges to its management are mostly felt in the developing countries[6].

Every year billions of tons of waste are produced by human activities in the world. Disposal of these wastes are considered as a huge environmental problem with many dimensions. Making the environment unclean with waste products is pollution. Any kind of waste can cause pollution. Waste products can pollute the air you breathe and the water you drink[5].

According to UNESCO, the population growth and the rate of urbanization are alarmingly increasing from time to time throughout the African continent. But the technology, technical knowhow, financial capacity, culture and understanding of the community required to properly manage solid wastes are not adequately available.In most African cities the situation of solid waste management is insignificant and inadequate that could associate with different factors . Solid waste arising from human domestic and social activities is increasing in quantity and variety as a result of growing population[6].

The magnitude of solid waste management problem is raised because of the increased of human activities that resulted a devastating impact up on the environment. The reasons for improper solid waste are due to lack strict environmental rules ,improper dumping solid wastes, enough infrastructure, migration from rural to urban and increase the population, lack of budget to run solid waste and lack of advanced technology in waste disposing[2].

Ethiopia has facing major problems of solid waste management, including inadequate waste collection, transportation systems and inadequate waste handling and improper final disposal resulting urban environmental pollution. These problems are being aggravated by the growing waste generation rates associated with population growth, change of composition of waste and economic condition of population.[6]

 In Addis Ababa   the solid waste generated per day only 65 percent is collected as municipal waste and the remaining 35 percent of the waste is disposed of through informal activities, only

smaller amount is going to incineration and dumped on open sites, drainage, channels, rivers and streets. The uncollected garbage is serious environmental hazard that causes bad smells and become favorable for disease vectors and pests resulting in low aesthetic quality of the towns[3]

The main reasons for improper solid waste management are lack of properly designed collection system and time schedule, inadequate and lack of equipment, open burning of waste, poor condition of the final dumpsite and less awareness creation among community which encouraged illegal dumping are the technical problems. Insufficient budget as well as lack of promotion on-waste reduction, recycling, absence of waste recovery, practice of energy option, waste separation and composting are among the challenges solid waste management[7].

Nowadays the solid waste production rate in the city of Addis Ababa is 0.252 kg /cap /day. According to this rate the total amount of solid waste generated in one year reached about 321,930ton.While the generation of solid waste in most cities of the developing countries is not exactly studied but it is estimated to be between 0.4-0.6 kg /cap /day for developing[6]

There is no concrete data that show level of solid waste disposal management capacity of local population for possible intervention. The main intention of this research paper was to assess the solid waste management practice of the woreda 15 administration and the residence to wards waste disposal.

3.Significance of the Study

This study may have two main significances. First it may give some guide line information to policy makers , enviromental health planers, public health professionals and the decision making process in the health of the community in a country with scarce resource settings. The study may also important in putting base line information to the next work who would like to conduct detailed and comprehensive studies either in Woreda 15 or other study area.

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CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

A substance that is discarded or useless because of animal and human activity designated as solid waste.Human beings for the sake of living dodifferent activities due to this produce wastes. Previously there was slow population growth and used small resoure .So they produce small amount of wastes[1].

Waste can be defined as unwanted materials that is discarded or left as unwanted. These materials are in general considered as byproducts of human activities that are resulted from preparation, manufacture, construction, packing, and renovation of structures and also from mining operations. Everything in the "waste stream" has residual value for someone or some business in the community. Waste represents valuable resources as ground cover to reduce erosion, fertilizer to nourish the crops, the source of energy etc[4].

Almost any substance that discarded which is no longer useful , but it may also be considered as a potential resource. Improper solid waste management negatively affects health, environment and economy of the population.As the result it causes the pollution of water,soil and air of the environment. Every year, because of poor hygiene practice claims the lives of 1.5 million children exposed to several consequences like wasted time, reduced productivity, ill health, impaired learning, environmental degradation and lost opportunities [8].

Improper solid waste management creates favorable condition for multiplication of pathogens causing diseases like cholera and diarrhea and provides suitable breeding site for disease vectors like mosquitoes, flies and rodents .Dumpsites are good sources of environmental pollution due to the fact that they usually contain almost all types of pollutants from the initial collection sources. Industries and urban management systems generate massive amount of solid wastes and most often dumping them in open fields posing a serious detrimental effects on the environment[2].

Solid Waste Management is defined as the control, generation, storage, collection, transfer and transport, processing and disposal of solid waste consistent with the best practices of public health, economics, and financial, engineering, administrative and legal environmental

considerations. Solid waste management explained the various patterns of solid waste handling in terms of collection, transfer and disposal in developed and developing countries[6]

Lack of access to sanitation has impacts on socio –economic and environmental impacts.Moreover lack of sanitation causes for diseases like trachoma, schistosomiasis, ascariasis, trichuriasis and hook worm infestation. Therefore improper solid waste management has health and environmental hazards[9].

In most cities, wastes are not properly collected and where proper collection is ensured; only a small fraction receives proper disposals. Improper waste management has been a challenge for municipalities and governmental officialsin the developing world, generally because of lack of enough infrastructure, bureaucraticcompetenceand lack of strong institutional capacity are major challengesof solid waste management in our country[7].

Since increasing of municipal solid waste production and disposal from time to time it becomes a big problem. Both developed and developing countries faces problems associated with improper solid waste management[10].

 In developing countries due to limited technology, institutional arrangement and cost effectiveness of solid waste management, improper handling and disposal of solid wastes causes high level of mortality and morbidity. Even though the overall goal of urban solid waste management is to collect, treat and dispose of solid waste generated by all urban dwellers, 30%−60% of all the urban solid wastes are uncollected, and less than 50% of the population is served [11].

In urban areas of developing countries many peoples are involved in informal activities as a source of income like doing in waste sector as waste pickers or scavengers, itinerant buyers and small scale recyclers. However since many are poor these people are stigmized by the community. Moreover people working in this sector earn non-negligible incomes. Even though there are many benefits of informal waste sector like economic(providing raw material) and environmental benefits, the local governmental officials do not give recognition and attempt to eradicate informal activities[12].

 The population growth and the rate of urbanization are alarmingly increasing throughout the African continent. But due to lack of technology, financial capacity, and culture, wastes are not properly managed. Urbanization with improper waste management practices, particularly,

widespread disposal of waste in water bodies, dumping inside the road and uncontrolled dump sites aggravates the problems of generally low sanitation levels across the African continent[13].

Waste management becomes a problem in Ethiopia. In most of the cities of the country, poor waste management practice endangering health and attracting vermin. Only 12 percent (8% in the rural and 29% in the urban) of the population use improved sanitation facilities [14].

The daily generation of solid waste in the Addis Ababa city is estimated to be 8,574 m3/day and 3,129,510 m3/ annum. The daily per capita solid waste generation also estimated to be 0.38 kg/capita/day. Other studies have estimated the per capita generation to be 3.5 kg/capita/day[14]. According this author the waste generation different sources constitutes   around 76% from households, 6% from street sweeping, 9% from commercial facilities, 5% from industries, 3%from hotels, and 1% from hospital. This can clearly shows that, the generation of solid waste from households takes the major share of solid waste generated in the city[15] .

Municipal solid wastes can be categorized into two main classifications called biodegradable and non-biodegradable. The biodegradable component of municipal solid waste includes organic wastes like food waste, garden waste, and agricultural waste which changed biological degradation under controlled conditions and can be turned into compost or organic fertilizer. While non-biodegradable wastes includes inorganic materials which can't be destroyed by natural chemical process [15].

Some of typical solid wastes of those sources from which it produced are explained as follows.

Residential solid wastes: wastes emanated from dwelling activities such as food preparation, cleaning, fuel burning, old cloths, furniture, obsolete utensils and equipment, packaging, newsprint, and garden wastes. In developing countries, majority of the solid wastes are foodwastes and ashes. There are also wastes produced shops, buildings and hotels etc. which are commercial wastes[16].

Solid waste management (SWM) in an urban area is a complex activity that involves the collection, transportation, recycling, resource recovery and disposal of solid waste generated in an urban area . Municipal solid waste is composed of different wastes generated by households and different institutions such as schools, hospitals, slaughter houses and public[17].

Measures to combat waste management problems

Integrated Waste Management (IWM)

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Municipal solid waste is the process by which workable alternative programs and plans are developed to solve solid waste problems.The activities involved with management of solid wastes from the point of generation to final disposal have been grouped in to six functional elements. They are: waste generation, on-site handling, storage and processing, collection, transfer and transport, processing and recovery; and disposall[18].

Integrated Solid Waste Management

ISWM is a comprehensive waste collection, treatment, recovery and disposal method that aims to provide environmental sustainability, economic affordability and social acceptance for any specific region[1].Landfilling is the last and least preferred option of the ISWM hierarchy. It involves the controlled disposal of waste on or in the earth's mantle, and it is by far the most common methodof ultimate disposal for waste residuals[17].

If not managed properly, solid waste has social, economic and environmental implications. These implications make solid waste management one of the critical concerns facing the world, and the problem is more pronounced for less developed countries. The central aim of managing waste is to reduce its volume, composition and adverse effects. However, cities in developing countries have great challenges to deal with the solid waste management activities. Budget and infrastructural constraints, rudimentary organization and planning of solid waste collection and disposal, poor or no segregation at source and corrupt public sector, are among the main problems of developing countries in properly managing solid waste[19]

Nowadays, municipal solid waste is increasing in both quantity and composition throughout the world. Most of the world cities are producing an ever-increasing amount of waste,however the solid waste management system is very poor. In African regions, in the urban areas less than 50% of the solid waste generated is collected, and 95% of that amount is indiscriminately thrown away at various dumping sites on the periphery of urban centers, typically empty lots scattered throughout the city[20].

Municipal wastes are not well managed in developing countries due to the alarmingly increasing solid waste production which is more than the capacity of the cities and municipalities. It was reported that, waste collection rates are often lower than 70% in low-income countries and more than 50% of the collected waste is often disposed of through uncontrolled land filling[21].

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Ethiopia is still facing the problem of improper solid waste management. Due to the current rate of urbanization municipal solid waste management system have been a major problem of municipalities in most of the Ethiopian cities. Collection of municipal solid waste in most of the cities is difficult and complex because the production of different types of solid waste is a diffuse process that takes place in every house, every building and every commercial and industrial facility as well as in the streets, parks and even in the vacant areas available within the community[18]

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Conceptual frame work of the study

This part of the study is presented the conceptual frame work of the study in brief and diagrammatically.
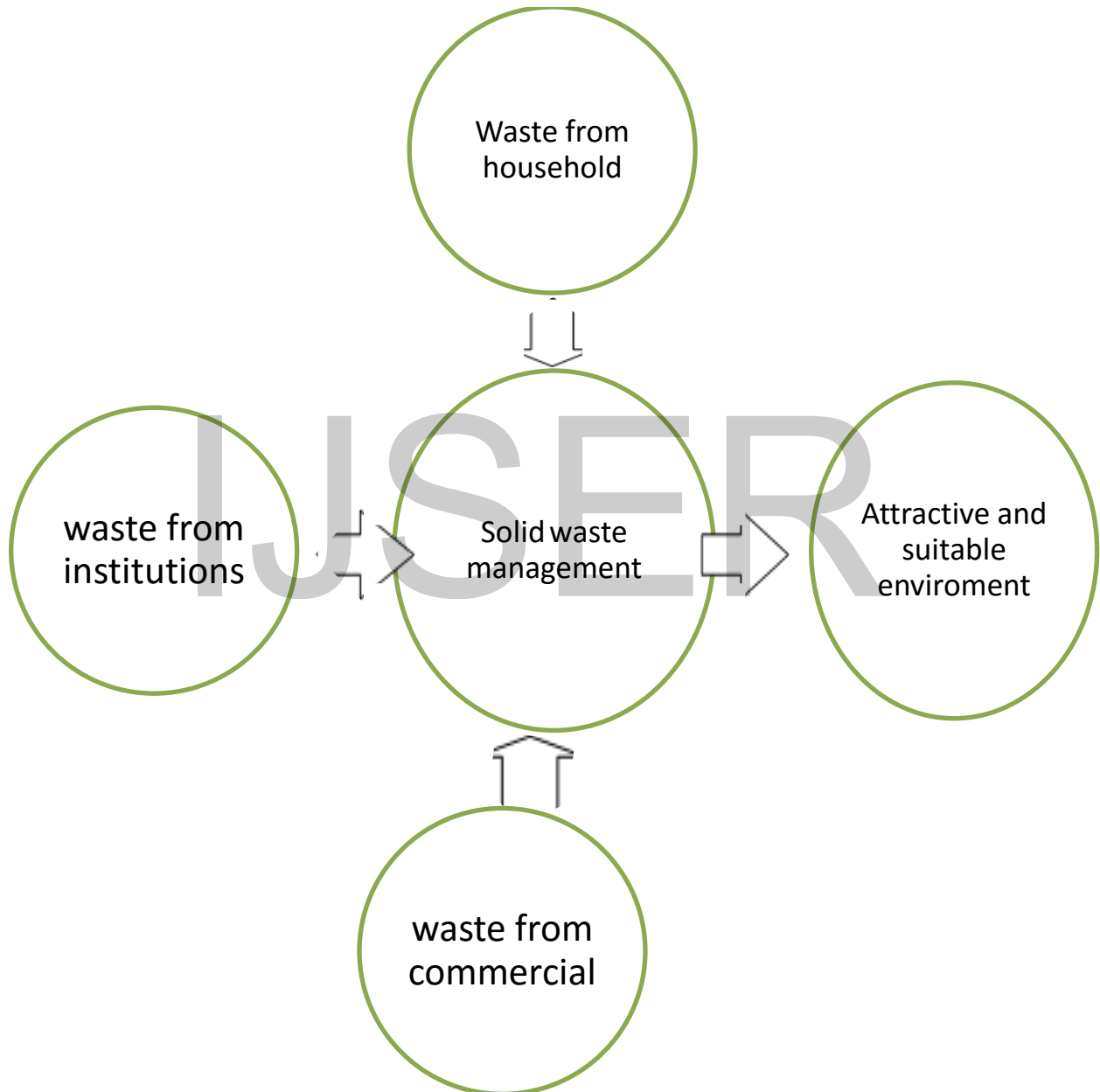
Figure 1: Conceptual frame work of the study in Woreda 15, 2020

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CHATER THREE

3. Objective of the study

3.1 General objective

The general objective of the study is to assess household solid waste management and hygiene practice in Woreda 15

3.2   Specific objective

To assess the existing practice of waste management

To examine the capacity of waste collection and disposal

To examine awareness of the household heads towards household solid waste management

To investigate the attitude of the household heads towards household solid waste management

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3.3 Research Question

1. What do the existing SWM practices of Woreda 15 look like?

2. What are collection and disposal SWM system of Woreda 15?

3. In what ways the problem of solid wastes is reduced in the study area?

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CHAPTER FOUR

4 Materials and Methods

4.1 Background of the specific study area(woreda 15)

Overview of Woreda 15

The former sub city administration unit woreda 15 and 16 were restructured and formed a new administration and introduced as a single administrative unit which today is called Woreda 15. The Woreda is one of the fifteen woredas established under Kolfe keranyo sub city of Addis Ababa city administration . It is about 9 Km away from the center of the city and about 13 Km the western side of woreda reaches from the center. It is located at the western part of Addis Ababa.It bordered in north by Sululta , in west by Burayu, in the south by kolfe keranyo subcity woreda 13 and in the east by Gullele subcity of Addis Ababa.It has an area 5471 heactares.The Woreda has almost similar elevation above sea level between 2400-2500 meters .The population of the Woreda is 32,219 according a report from the Woreda administration and officials in the Woreda.

Also Woreda 15 has one governmental health centers and one private health center. Moreover there are 5 medium clinics in the woreda as the woreda health office says.

Figure 2 : Administrative map of woreda 15.   Source: Administration office of Woreda15.

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4.2 Research Design

In order to achieve the intended objective of the study, the researcher used both qualitative and quantitative methods to answer research questions. For this was a very explanatory study concerned on assessing the current SWM practice , explanatory survey method was applied because it enables to describe the existing situations of the solid waste and the management practice. The methods of sample selection for households and key informants were purposive and probability methods.

4.3 Study period
The study was conducted from July 05 –August 05,2020.

4.4 Source population
Thesource population of the study were all households found in Woreda 15

4.5 Study population
The study population were randomly selected households.

4.6 Study unit
 Randomly selected household heads who lived in the woreda for six or more months and purposively selected the solid waste collection workers and three municipality officers under the solid waste management division and the manager of the Woreda.

4.7 sample size determination
Sample size determination and sampling technique

Sample size calculated using single point population formla assuming that 50% prevalece since there is no well researced documented material,95% confidence interval with margin of error to liable assume to be 5%.

$n=z^2 \ pq/d^2$

Where,n=number of sample size

z= constant=1.96

P=prevalence=50%=0.5

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q=1-p

d=normal deviation=0.05=5%

(margin of error tolarable)

n=$\dfrac{(1.96)^2 0.5(1-0.5)}{(0.05)^2}$=   384.16

Since the sample was taken relatively from small population size(n=3850) the minimum sample

was obtained from the above estimation by making some adjustments

$$n = \dfrac{n}{1+\dfrac{n}{N}}$$

n=384/1+384/3850=352(study subjects)

by assuming 10% the non response rate 352x 0.1=35.2 so 352+35.2=387.2

For the second specific objective the sample size was calculated using Epi-info version 7 a two
population proportion equation was used with the following assumption.

The final sample size for this study was 387 which is the largest to satisfy the two specific
objectives.

4.8 Sampling procedure

Systematic random sampling technique was used to select the households. By dividing the
average number of households by the   by the total number of sample size yield the sampling
interval (K-value) which is 10.   during the selection process, the first   study participant was
selected by lottery method and the rest of the study participants was included in the study using
every 10 household until it reached the final sample size.

N=average number of households

n= sample size

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K=N/n

K=3850/387=10

Finally, Interview respondents were selected from Woreda 15 general manager office employee by using purposive sampling technique as they are key informants.

4.9 Inclusion and exclusion criteria

4.9.1 Inclusion criteria

Household found in the sampling zone and who accepted to participate were included in this study.

household head/spouse who lived in the woreda for six or more months and age greater than 18.

4.9.2 Exclusion criteria

Involunteery household

Those not present during data collection period.

Those less than the age of 18 years and not have adequetate information about the study subject or any new comer to that house hold.

4.10 Data collection instruments

4.10.1 Questioners

A pre-tested structured questionnaire were used to collect data by trained ten data collectors for 2 days. It was collected by ten data collectors and Conducted face to face structered interviews. The data collection tool is developed by reviewing relevant literatures and by adapting the content from related studies. The questioners were also including both open and close ended questions. Particularly open-ended questions are used to extract response and further explanation. The questioners were filled by data enumerators by asking sample respondents from the 5 ketenas. The questionnaire were prepared in English and translated to Amharic (local language) and translated back to check its consistency. The overall data collected process, data completeness and consistently were closely supervised. The quality of data was asured by

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proporly designed and pretested questionaire before the actual data collection.The data was checked for completeness, accuracy, and consistency by the facilitator before accepting from the interviewers and was disscussed on the collected data on daily basis after collecting the information.

4.10.2. Interview

For strengthening and supporting the data collected through questionnaire the researcher also conduct structured interview with the staff of Woreda 15 General Manager Office. The objective of this interview was to solicit ideas which will not be cover by the questioner. The key informants' officers for the interview were selected using purposive sampling method from the staff of the woreda 15 General Manager office. This is because of the fact that the selected key informants assumed to be well aware of the problem and could provide the relevant information required for the achievement of the intended objectives of the study. Accordingly three officers with different responsibilities from the staff of the municipality were selected as key in formals of interview.

4.10.3 Field Observation

By the researcher field observation to 'ketenas' of the woreda was carried out. This observation and experience acquired from just being member of the community were help to assess research questions and objectives in view of supporting and realizing the information obtained from the sampled household respondents using open ended and close ended questionnaire, and from purposively selected key informants using semi structured interview and with the aim of examining and assessing the existing condition of the study area in favoring and affecting the issue under study the researcher also conducted field observation using check list.

4.11 Data analysis

The data that was collected from sampled households , key informants and from field observation the researcher was analyzed and interpreted in accordance with the nature of the data replied by respondents. Both qualitative and quantitative methods were used to analyze the data. Quantitative method was used for close ended questions and qualitative methods for open ended questions and interviews. Quantitative methods include percentages, tabular analysis and frequency distribution. From the   qualitative data perception, opinion, attitude etc. mainly obtained using open ended questionnaire and semi structured interview including the researcher's observation were analyzed, described and interpreted in the form of narration. Questionnaires analyses by using quantitative methods i.e. tables have been widely used to present the collected data by using SPSS version 24 computer software were used to analyze the data**.**

6. Ethical consideration

The proposal was reviewed by Addis Ababa medical college department of public health, ethical clearance committe and official letter was obtained to woreda 15 and the respective offices.During the period of data collection , first the interviewers were clarified the objective and purpose of the study to each respondent ,then their verbal consent requested before actual interview .   Confidentiality of the obtained data was secured.Recording name of the respondent on the questionaire was omitted. Respondents of the households also were assured about the confidentiality of the information obtained and the right of the respondents to differ from being interviewed was respected as well.

7. Dissemination of results

The final result of this paper was given to Addis ababa medical college , department of public health and published to be used as in put for researchers that are interested in the field of study.

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8. Limitation of the Study

The scope of this study is to assess the SWM practices at local level, which is in Woreda 15. The study confined to small geographical area due to pandemic covid-19 crisis and time constraints only Woreda Fifteen, in Kolfe Keranyo sub-city of Addis Ababa was included in this survey. Due to stated constraints other Woredas were excluded from sampling and the findings were also not explained in wider context of literature.

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CHAPTER FIVE

RESULTS

5.1 Result of the Study

5.1 Result of the Study

A total of 387 households were participated. Among these 370 questionnaires were properly filled (95.6%).

5.1.1 House hold Characteristics

Description of the socio-demographic characteristics of the target population shows significant differences in terms of sex, age, educational status, occupation, family size and income of the respondents.

Socio-demographic characteristic of households has its own implication and relation with effectiveness of solid waste management including waste production, collection transportation and disposal.

The underlying table clearly shows socio economic and demographic characteristics of respondents.Among those sample respondents about 222 (60%) of them are female headed households while the remaining 148(40%) are male headed households. On the other handout of the total respondents about 244 (65.9%) of sample respondents belong to adult age group (26-64) which is the biggest group followed by 98 (26.5 %) whose age was above 64 and about 28 (7.6 %) of the sample households are young age 18-25. This indicated that most of the respondents were found to be in the working age group.

 Respondents the educational status of respondent as Table 1 below shows that respondents with no formal education and cannot read and write , those who have only the ability to write and read , completed primary school education, completed grade 10 ,completed grade 12 account for 9(2.4%),50(13.5%) 38(10.3%),84(22.7%),85(23%)respectively. Whereas those with diploma or degree were 98(26.5%).Furthermore, those who have masters were6(1.6%).

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Table1:Socio economic and demographic characteristics of respondents inWoreda 15,2020.

VARIABLES	Category	Frequency	Percent
SEX	MALE	148	40
	FEMALE	222	60
	Total	370	100
AGE	18-25	28	7.6
	26-64	244	65.9
	ABOVE64	98	26.5
	Total	370	100
FAMILY SIZE	1-2	197	53.2
	3-4	86	23.2
	5-9	66	17.8
	above 10	21	5.7
	Total	370	100
EDUCATION	CANNOT READ AND WRITE	9	2.4
	READ AND WRITE	50	13.5
	PRIMARY	38	10.3
	COMPLETED 10	84	22.7
	COMPLETED 12	85	23
	DIPLOMA	48	13
	DIGREE	50	13.5
	MASTER	6	1.6
	Total	370	100
INCOME	<1000	31	8.4
	1001-2500	102	27.6
	2501-4000	93	25.1
	4001-6000	88	23.8
	6001-10000	50	13.5
	>10000	6	1.6
	Total	370	100
HOUSE OWNERSHIP	OWNERRSIDENT	186	50.3
	RENTED PRIVATE	158	42.7
	RENTED GOVERNMENT	26	7
	Total	370	100

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Furthermore table 1 illustrates income of the respondents according to their saying, Only 31 of the total respondents (8.4%) earned less than 1000 birr per month and102(27.6 %) of them earned between 1001-2500 birr. About93 (25.1%) and 88(23.8 %)of the respondents earned (2501-4000 birr) and (4001-6000 birr) respectively, While,50(13.5 %) of them were included under those who earned greater than 10000 birr. The remaining 6(1.6%) percent belongs to those who cannot mention their monthly income.

5.1. 2 Household Solid Waste Storage

The household is responsible for storing the daily wastes produced inside their compound since there are almost non transfer stations. In Woreda Fifteen, 315 (85.1 %) of the sample respondents said there were no common waste bin containers in their neighborhood while 55 (14.9%) said there was a common waste bin container in their neighborhood.

Table 2: **Availability of waste bin container in woreda 15,2020.**

Availability of waste container in the area			
		Frequency	Percent
Valid	Yes	315	85.1
	No	55	14.9
	Total	370	100.0

The sample respondents stored waste in different types of temporary containers mostly used plastic (festal), sacks, basket and others. In this study respondent households were asked what type of temporary storage waste container they use and the most common used containers were sacks, followed by baskets and plastics 325 (87.8%), 28(7.6 %) and 7(1.9 %) respectively and the remaining 10 (2.7%) said they used a can container.

It is also observed that most of the households who use the Festal, as a storage material for their solid waste at home, throw it away together with the waste it contains most of the time during the evening and early morning. This experience of the households shows that storage materials are for use and throw only. However, one way to manage solid waste is to reduce the waste

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we generate at the source and hence storage materials have to be designed for many times use so that these items do not wear out so quickly and become part of waste instead.

The sample respondent 43 (11.6 %) said they put their waste in a closed container, while 317(88.4%) said they use an open container for the waste produced by their household.

Photo by: Researcher 26 August, 2020

Figure 3 : Waste substances thrown out in unauthorized areas in Woreda 15

Table 3: Waste container closed or not in woreda 15, 2020.

Waste container closed or open		
Category	Frequency	Percent
Closed	43	11.6
Open	327	88.4

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Total	370	100.0

5.1. 3 Household Solid Waste Collection

In the study area, solid waste collection was handled differently by different households. However, the data gathered indicated that the collection system was mostly covered by the municipality household solid waste collection service, which is currently available in almost all ketenas in Woreda 15.

Concerning the waste collection, 356(96.2 %) of the respondent households mentioned that they used a household solid waste collection service to dispose the solid waste produced by their house hold, 3 (0.8%) said they disposed the solid waste produced by burning it, 3 (0.8%) said they disposed the solid waste produced by dumping on common dump sites like road and streets and only 8(2.2%) said they disposed by using the community waste bins..

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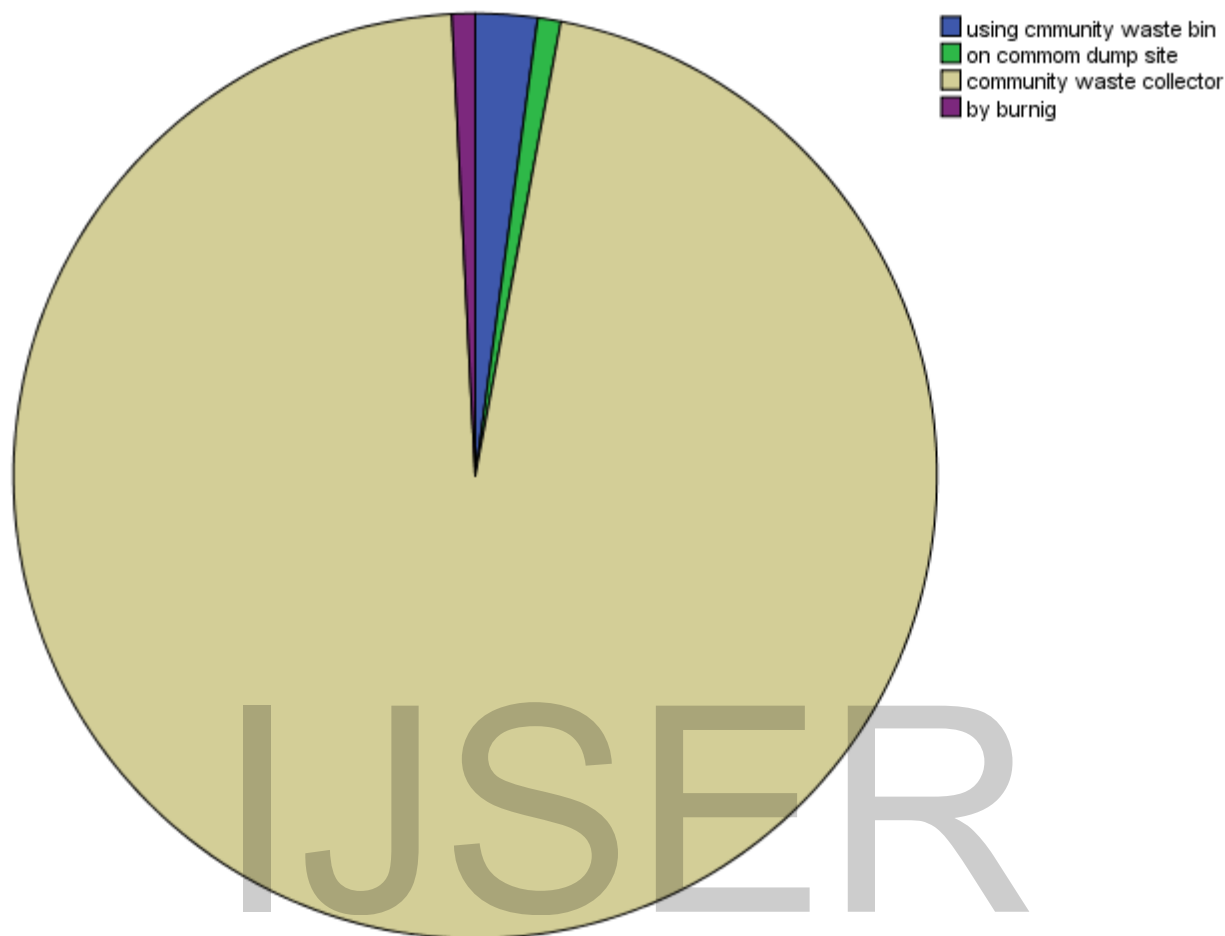
Figure 1: Ways of disposing solid waste in Woreda 15, 2020.

The FGD participants also mentioned in the discussion that the main challenge in the current waste management work was that people are not changed and most people are still trapped in the traditional dumping and unclean habits they have developed before the current household management system. The participants mentioned that the households if we miss one week they would take out the trash and throw it on the street because it's how they have always done it and all they care is that it's out of their own house.

The other methods used by the community members to remove wastes produced besides dumping was by burning the waste inside or outside their compound. Burning is still practiced as an alternative means of waste management method by some households. The FGD participants and one of the interviewed respondents from   woreda 15 general manager office   mentioned

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burning as waste management method still practiced by community members because there were some sites that were still not covered by the waste collection service.

5.1.2. Household Solid Waste Transportation and Disposal

Based on the field observation by the researcher, solid waste transportation process in Woreda 15 took place as follow: the solid waste collected from every house would be put on the side of the road by the waste collection workers and picked up by waste collection trucks. Then, when the trucks came, the collection workers would load the sacks filled with waste and take it to dump site.

However, the waste is sometimes left on the road until late in the afternoon or even for a week or so until the next round of waste collection. This caused a stink and animals such as dogs and cattle would spread it on the road seeking to feed from it which is both unhealthy and unpleasant to see. The collecting truck (tractors) were not ready or available to pick up the waste on time because they were small in number and they got broken all the time and second the places where the waste collectors put the waste sacks were already known by the community members and, therefore, even after the truck picked up the waste and left, some people would bring and leave their waste on the same place so that it would be taken on next round.

Once picked from all over the places, the waste would be directly driven to the dump site used by the city. The part of the waste collected by the municipality through waste collectors was disposed in a place called Repi.

Photo by: Researcher 25 August, 2020

Figure 2: Typical solid wastes container and transfer stations

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5.1.4 Waste Separation

The researcher observed from households' solid waste separation activities in the woreda solid wastes that are sold to 'Quraleos' people who buy recyclable materials door to door, exchangeable to 'Liwach' are separated.Separation took place at different places and stages in Woreda 15. Waste was separated at the household stage, and then waste was separated again to some extent by waste collection workers and waste loaders.

Regarding the separation practice 78(21 %) house hold respondents said they did separate their wastes and 292 (79 %) said they did not separate their wastes.

Table 4: Waste Separation in Woreda 15,2020.

Waste separation		Frequency	Percent
Valid	Yes	78	21.1
	No	292	78.9
	Total	370	100.0

The separation practice went as follow. First, the household members, separated their wastes by selling the valuable ones such as tins, cans, and some kind of plastics to 'Qorale/ (people who buy recyclable materials door to door), and things left from being sold were burned and some of the wastes produced were reused . However this does not count as full separation because most of the waste produced, both decay able and none decay able, was put in the waste container.

5.1. 5 Household Solid Waste Production

The respondent households were asked to put the estimated kilo of their temporary storage waste container in range. Accordingly 112(30.3%) said their waste container had the weight of bellow 15 kilos, 118 (31.9%) said 16-25 kilos, 122 (32.9%) said 26-50 kilos and 18(4.9%) said above 50 kilo.
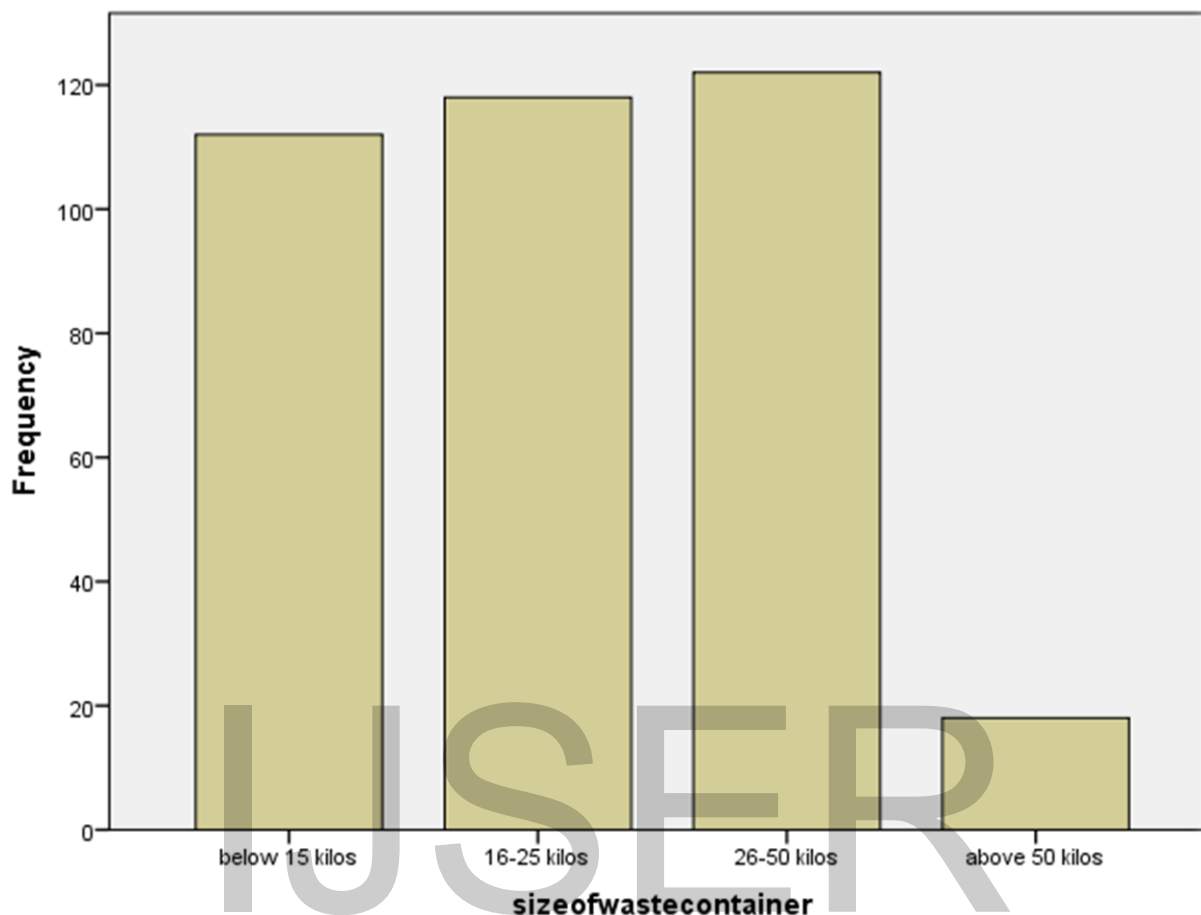
Figure 3 : size of waste container in Woreda 15, 2020.

The sample respondent data with this; it shows that from the sample respondents 342 (92.4%) mentioned bottles and glasses as the most difficult wastes to manage, followed by food waste which is 28(7.6).

5.1.6 The interaction between waste collectors and community members

Concerning the respondents attitude towards the waste collection workers, majority of respondents 282(76.2%) said that the collectors were normal and they fairly performed their work task. However 28(7.6%) believed that the waste collection workers had a difficult and disrespectful attitude and the rest 60 (16.2%) said they have a very respectful behavior while working on collecting the waste.

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The data gathered from the field observation and focus group discussion (FGD) with solid waste collectors conducted with waste collection workers in the study area showed that, although there were all kinds of wastes generated from different households, the collection workers mentioned that bottles and glasses made the job difficult, due to sharpness it cuts   and stab.

The Woreda general manager office used community waste bins as a household waste management approach right before the current system. Community waste bins or common waste dumping garbage bins are now almost completely removed by the Woreda general manager office from the places they had been located. Because said the woreda team leader person in the solid waste management section, the community waste bins had been figured out in time to be a cause of health hazards. He mentioned that it causes respiratory diseases and people leaving nearby the waste bins, since the waste bins were located inside residential areas, and also mentally disturbed person people and street children that had been feeding from dumped food wastes were being exposed to different diseases. During the existence of the community waste bins, people had to bring the produced wastes to the waste bin themselves whenever they wanted to and dumped it inside or around the waste bins. He said the community waste bins were contaminated and used to stink and the FGD participants also said it was the right move to remove the community waste bins because it had been a cause for disease.

Table 5: Attitude of the waste collection teams to their customers in woreda 15, 2020.

Attitude of the waste collection teams to their costumers		
	Frequency	Percent
Respectful	60	16.2
Fair	282	76.2
Disrespectful	28	7.6
Total	370	100.0

On the other hand the waste collection workers said that there were different responses from the community members. One of the respondents said that "Some of the people are cooperative and

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others are not cooperative ". When I asked what she meant by cooperative people and not cooperative people she explained that among the community members some household members did not give them due respect while they were working; they would rather insult them or refuse to cooperate.

5.1.7 Transportation problem of SWM in Woreda 15

Among the three general manager office workers interviewed in the solid waste management section, three of the interviewees and the focus group discussion (FGD) participants mentioned the transportation problem on the solid waste management process. They explained that the cars used for collecting solid waste were tractors which were few in numbers, only 2. Among these sometimes the tractors were broken and it was difficult to get the cars fixed on time.

5.1.8 The waste collection workers in the Woreda

The waste collection workers were organized by the woreda 15 small enterprise sector and the general manager office in collaboration in 2003 E.C. Most of the collection workers were jobless before they became waste collection workers. There were about 43 waste collection workers. When they started, they were four solid collection unions namely 'tsinat' ,Yideneku' , 'Mignot', and 'Fikir' solid waste collection unions. But since 2010 E.c organized in one collection union with the name "Muluna askale ena guadegnechachew yeshirkina mahiber" and giving service for 3850 households in theworeda. The waste collectors each household got the service once in every week because of the workload.

The waste collection work in the town rested highly on the shoulder of these waste collection workers. The waste collection work would begin very early in the morning at 12:00 o'clock and would usually continue until 6:00 o'clock in the afternoon. Since there were no waste transition sites or community waste bins, the waste collectors had to knock on every door to take away the waste from the houses. The collectors would give the household owners empty waste container sacks and carry the sacks filled with waste on their back to take it up to the main roads where the collection car would be able to pick it up. The waste collectors mentioned they had a lot of difficulties on the process of getting the waste collected from each house to the main roads for the cars to pick it up.

5.1.9 Awareness Creation and Education about Solid Waste Management of the   community members

The interviewed staff of woreda 15 general manager office explained the office had been giving awareness creation education on solid waste management for the community members in different ways. They mentioned that they distribute broachers, leafletsand give awareness by preparing programs and different mass meetings were held in each ketenas to teach about solid waste management.

The survey data showed that among the 370 respondents   270 (69.7%) said that they got awareness creation education on solid waste management while 100(30.2 %) said they did not get education on the issue.

5. 1.10 Rules and regulations of the woreda

The respondent household heads were asked if they knew the rules and the regulations about household solid waste management and 20 (5.4%) of the respondents said they didn't even know there are rules, 322 (87 %) said they didn't know the rules and 28(7.6%) respondents said that they knew the rules.

The interviewed Woreda General manager fficers and the manager said that there are rules and regulations on solid waste handling and management. They explained the rules require individual households to clean their surroundings up to 5 meters radius and organizations up to 10 meters radius.

The waste collection workers complained that there was a lack of enforcement of rules and regulation about household solid waste management and that they haven't see anyone being punished until now. The waste collection workers explained that the municipality officials' responsible weres making them confront with the residents of the town and they have been the ones in one conflict with the community members. The main problem was said to be the General manager office was not able to trace the problem or take a measurement on members breaking the rule. The key informant municipality official argued that it was the responsibility of the woreda 'denb askebari' to go and give the punishment according to the rules. The waste collection workers argued that they haven't seen any one who was punished or had paid money.

The FGD participants(the waste collection workers) said that they used to report back, household owners who are not acting according to the rules on waste collection process while working. They said they report back to the woreda general manager office, solid waste management section by writing up the house numbers and their names but the office did not give response appropriately. One of the FGD participants said, "Whenever we report back to them they say they are going to look at the case, we should come back tomorrow or the other week and that they would take a measure but they never do something or give us a solution so it is not on us we are doing our part."

However some of the FGD participants from one of the FGD group, did mentioned that there are people who are punished for breaking the rules by them and also by other authority's although they could not remember a specific example. The municipality workers also all mentioned that people does get punishments if they broke the rule and the procedure is that if a household ownerless are not willing to be included in collection service, are not willing to pay for the service, if they are caught dumping on plain sight and/or are not cleaning their household environment within 5 meters radius the municipality collaborating with the woreda security (DenbAskebary) will give a verbal warning to them first and if they did not responded to that they would go to the next step which was punishment by money.

The survey data also shows that there is a gap on enforcement of rules and regulations on solid waste management hadn't been strong in Woreda 15. The respondent household heads were asked if they have been punished for violating the rules of solid waste handling or if any one they knew was punished and 276(74.6) said any one they knew were not punished while only 94(25.4) said they or someone they knew was punished.

Table 6: Penalty for violating the rules of solid waste management in Woreda 15, 2020.

Penalityforviolatingtherulesofsolidwastemanagement		
	Frequency	Percent
Yes	94	25.4
No	276	74.6
Total	370	100.0

5.1.11 The community members and the household owners

The solid waste collectors   said that the household owners are the first to beblamed , they all should take care of the waste they produce. The waste coming out of the houses is all wait and not separated or properly handled and almost all FGD participants mentioned that the household owners irresponsibly store and dump their wastes and there is a high gap in awareness and mined set of responsibility among the people.

In the survey data the respondents were asked questions to check their level of concern about solid waste management and on their experience and knowledge. Those who said they had never complained about waste pollution concerns were asked the reason why they had not complained about waste pollution concerns and 311(84%) said it is because there was no problem, and 11(3%) said they didn't know where they should complain,28 (7.6) said it is because they think there is no solution even if they do complain, 10(2.7) said it was not their responsibility and 10(2.7%) said they had other reasons.
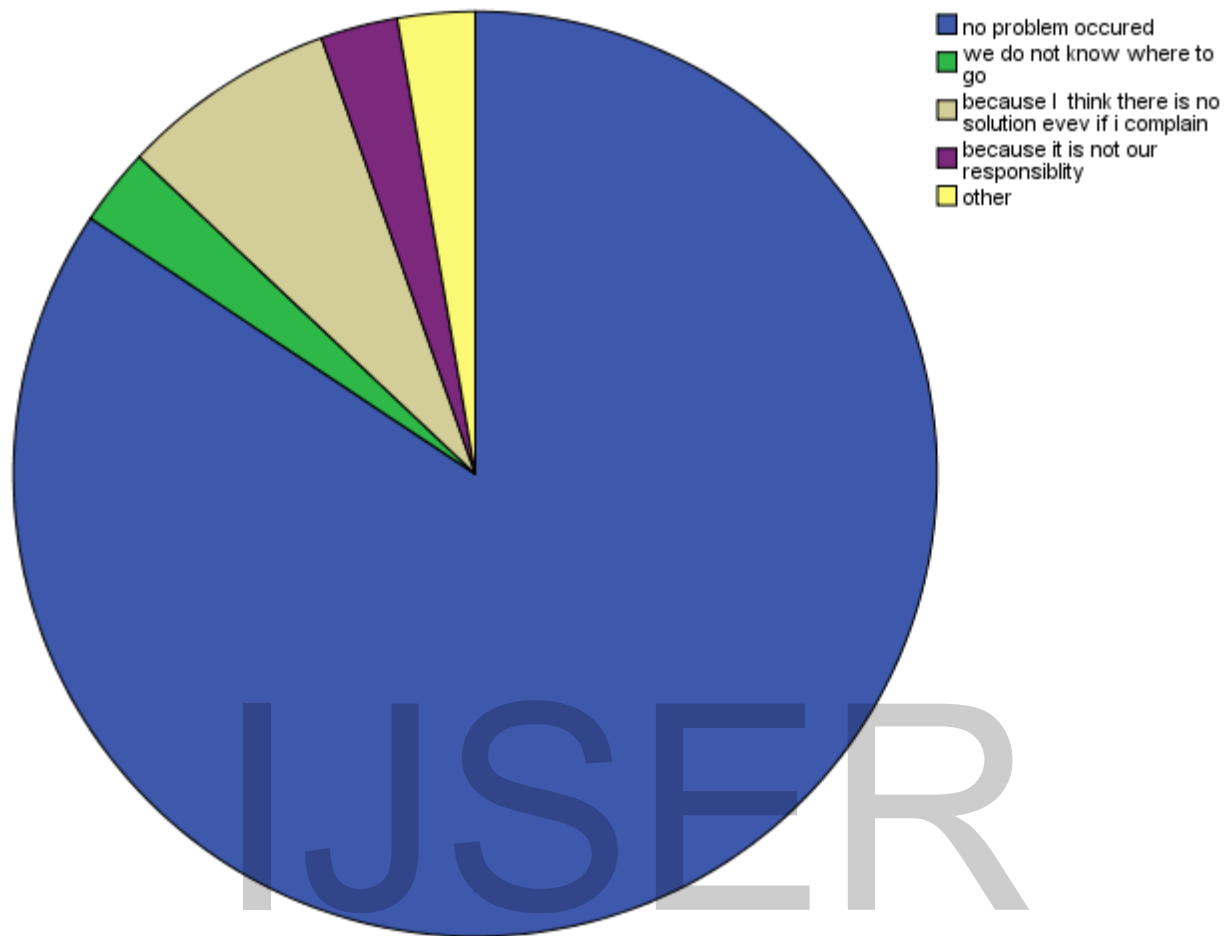
Figure 4: The reason why they did not complain

5.1.8 The Attitude of the Household Heads towards Household Solid Waste Management

The attitude test by the Likert scale shows that most people resulted to have a positive attitude towards proper solid waste handling and management. The majority of the respondents 298(67) scored above 30 in the Likert scale which shows they have a positive attitude and people 72(19.5%) scored below 20 that shows they have a negative attitude towards proper solid waste handling and management.

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Table 7: attitudinal measurement LikertscaleinWoreda 15, 2020

Category	Frequency	Percent
19-10	72	19.5
29-20	50	13.5
30-40	248	67
Total	370	100

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6 Discussion

Socio-economic and demographic characteristics is one of the main factor affecting solid waste effective management. Description of the socio-demographic characteristics of the target population gives some basic information about sex, age, educational status, occupation, family size and income of the respondents.

A total of 387 households were participated. Among these 370 households were properly filled(95.6%) response rate. The response rate achieved in the study corresponds with the response rate 96% a study conducted by Farris inDessietown, 2018.

In this study among those sample respondents about 222 (60%) of them are female headed households while the remaining 148(40%) are male headed households.

Out of the total respondents about 244 (65.9%) of sample respondents belong to adult age group (26-45) which is the biggest group followed by 98 (26.5 %) senior citizens whose age was above 45. and about 28 (7.6 %) of the sample households are young age 18-25. This indicated that most of the respondents were found to be in the working age group.

The study reveals that 215 (85.1 %) of the sample respondents said there were no common waste bin containers in their neighborhood while 55 (14.9%) said there was a common waste bin container in their neighborhood. The finding of this study has agreed with study done by Daniel and Bizatu in Dire Dawa 2017. Most of the HHs, 494(96.7%), reported that no solid waste container available in almost all places of the town. But as an alternative, 411(79.6%) households dispose through private waste handlers (MSSEs) and 7(1.4%) disposed in open dump in the yard. This could be due to involvement of non-governmental organization that focus on waste collection.

In this study respondent households were asked what type of temporary storage waste container they use and the predominantly used containers were sacks, followed by baskets and plastics 167 (90.8%), 8 (4.3 %) and 7(3.8 %) respectively and the remaining 2 (1.1%) said they used a can container. This is in line with outcome of the studyconductedbyAbrhame in Bishoftu 2018, majority 304 (80.4%) of sample respondents were used sacks local name of

"Madaberia",plasticcontainer („festal") about 60 (15.9%) ,basket11 (2.9%) and 3(0.8) used other storage material. This is because of the is sack cheap in price, its suitability for holding and moving solid wastes.

In this study regarding the separation practice 78(21 %) house hold respondents said they did not separate their wastes and 292 (79 %) said they did separate their wastes. Unlike the study done a study conducted by Farris inDessietown ,2018, 98 (53.3 %) house hold respondents said that they did not separate their wastes, 51 (27.7%) said they sometimes separated their wastes and 35 (19.0 %) said they did separate their wastes. The reasons behind this include lack of spaces, cannot see the importance, cannot afford separated bins and separation consuming time etc.

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CHAPTER SEVEN

7 Conclusion and Recommendation

6.1 Conclusion

This study has been conducted to assess household solid waste management practice and hygiene practice in Woreda 15. Based on the general and specific objective, findings obtained, after the whole efforts stated under the research methodology were made conclusions drawn are attempted as follows:

The existing practice of solid waste management in the woreda shows that the practice was ineffective;that means the low awareness of the community, gap on enforcement of rules and regulationswererereasons for the improper solid waste management.

In the study area there is a problem of solid waste storage, collection, separation, transportation and disposal. The study also indicated that there is gap in awareness.

Currently, in Woreda 15 there are no public solid waste storage containers and no transfer stations for the waste produced and therefore the household owners would dump the wastes on the road whenever there is a delay on the collection service.

Penalties should be practiced on those who do not obey the laws. The rules and regulations of the woreda with regard to municipal solid waste collection and disposal are not well known by the community.

There were no adequate awareness raising and provision to proper households with regard to residential solid waste management methods in the town. This has aggravated the waste management problems and challenges.

6.2 Recommendations

The finding of the study shows that the existing municipal solid waste management practice in Woreda 15 was ineffective and the services given by municipality were inadequate. Therefore, to improve this the following recommendations are forwarded:

➢ The residents of woreda 15has to be provided with awareness creation on how to handle and separate solid wastes at home and not disposing solid wastes everywhere illegally by the Woreda general manager and health office.

➢ In the woreda there is inaccessibility of community waste bins. Therefore, theWoreda 15 general manager officeshould prepare additional common waste disposal sites.

➢ The woreda office should create awareness about the specified rules and regulations about the solid waste management and Penalties should be practiced on those who do not obey the laws.

➢ Finally the woreda office should encourage the private sector and NGOs to involve in municipal solid waste management activities particularly in the solid waste collection, transportation and disposal services.

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References

1. Abrhame, E., *Assessment of Municipal Solid Waste Management Practices:*
A case Study of Bishoftu City Administration 2018: p. 1-93.

2. Cheber, W., *Assessment of Knowledge and practice on solid waste management in Addis Ababa city Administration: the case of Kolfe keraniyo sub-city*
2019: p. 1-28.

3. Cheber, W., *Assessment of Knowledge and practice on solid waste management in Addis Ababa city Administration: the case of Kolfe keraniyo sub-city* 2019: p. 1-28.

4. Tekleyohannes, B., *Assessment of Household Waste Management and Hygienic Practice in Yirgalem Town, Dale Woreda, Sidama Zone, South Nation Nationalities and Peoples of Region, Ethiopia.* Journal of Health and Environmental Research 2019. **5**(2): p. 1-19.

5. AMARE, F., *Solid Waste Management in Durame Town: Practice and challenges* 2015.

6. FARIS, S.A., *SOCIO ECONOMIC FACTORS AFFECTING HOUSEHOLD SOLID WASTE PRODUCTION AND EFFECTIVE MANAGEMENT IN DESSIE TOWN* 2018.

7. Yohanis Birhanu1, Genemo Berisa2, *Assessment of Solid Waste Management Practices and the Role of Public Participation in Jigjiga Town, Somali Regional State, Ethiopia.* International Journal of Environmental Protection and Policy 2015. **3**(5): p. 153-168.

8. Bizatu Mengistie1, N.B., *Community based assessment on household management of waste and hygiene practices in Kersa Woreda, Eastern Ethiopia* 2008: p. 103-109.

9. Negasa Eshete Soboksa*, G.N.Y., *Assessment of Household Level Sanitation Practice of Mothers' and Associated Factors in Gedeo Zone, South Ethiopia.* American Journal of Public Health Research, 2017. **5**: p. 43-49.

10. Yenenesh Hailu*, T.H., Abreham Bereta *Municipal Solid Waste Source Identification, Characterization and Physical Composition Analysis, Case Study Wolkite Town, Ethiopia.* American Journal of Environmental Protection 2019. **8**(2): p. 48-53.

11. .

12. Wegedie, K.T., *Households solid waste generation and management behavior in case of Bahir Dar City, Amhara National Regional State, Ethiopia.* Cogent Environmental Science, 2018: p. 1-18.

13. AXEL BAUDOUIN, C.B., YIRGALEM HABTEMARIAM, & ZELALEM FENTA CHEKOLE, *Between Neglect and Control: Questioning Partnerships and the Integration of Informal Actors in Public Solid Waste Management in Addis Ababa, Ethiopia.* African Studies Quarterly 2010. **11**(2&3): p. 1-14.

14. Daniel Shiferaw Alemayehu, M.S.R., Bezatu Mengestie, Tadesse Alemayehu, *Household Solid Waste Management Practice Associated Factors and Service Delivery Performance of Private Solid Waste Collectors in Dire Dawa City, Eastern Ethiopia.* International Journal of Innovative Research in Science, Engineering and Technology, 2017. **6**(10): p. 1-13.

15. Tarekegn2, I.H.A.a.M.M., *Methane Gas Emission and its Management Practices from Solid Waste Stream, Case Study: Addis Ababa and its Surrounding Oromia Special Zone Towns.* Environment Pollution and Climate Change, 2018. **2**(3): p. 1-7.

16. Yenenesh Hailu*, T.H., Abreham Bereta *Municipal Solid Waste Source Identification, Characterization and Physical Composition Analysis, Case Study Wolkite Town, Ethiopia* American Journal of Environmental Protection 2019. **8**(2): p. 48-53.

17. CHERU, S., *ASSESSMENT OF MUNICIPAL SOLID WASTE MANAGEMENT SERVICE IN DESSIE TOWN.* 2011: p. 1-116.

18. • Gorfnesh Lema, et al., *Assessment of status of solid waste management in Asella town, Ethiopia.* BMC Public Health, 2019. **19**(1261 (2019).

46

19.   Abrhame, E., 2018: p. 1-93.
20.   Behzadian, M.A.G.W.B.K., *Households' preferences for improved solid waste management options in Aksum city, North Ethiopia: An application of choice modelling.* Cogent Environmental Science, 2019. **5**(1).
21.   Duguma Erasu, T.F., Amaha Kiros & Abel Balew, *Municipal solid waste generation and disposal in Robe town, Ethiopia.* Journal of the Air & Waste Management Association, 2018(12).

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Appendix: 1 QUESTIONNAIRE

ADDIS ABABA MEDICAL AND BUSINESS COLLEGE

DEPARTMENT OF GENERAL PUBLIC HEALTH(MPH PROGRAM)

Preamble

Dear respondent! This questionnaire is to be filled for the purpose of collecting data about solid waste management and hygiene practice in Woreda 15 KolfeKeranyo, Addis Ababa. The primary purpose of this research is to try to better understand the solid waste management and hygiene practice among households inWoreda 15 KolfeKeranyo, Addis Ababa . Data attained will be used only for research paper purpose and will also be confidentiality kept.

General Instruction: respondents are kindly requested to follow the instructions and attempt all the questions in each of the segments.

Thank you in advance for your cooperation!

Segment 1: Certification

Interviewer's Name: _____

Signature: _____

Date Western (D-M-Y):   _____

Field Supervisor's Name: _____

Signature: _____

Ketena: _____

Questionnaire ID Number: ……………………………………………………………

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Segment 2: Demographic and Socio-economic conditions of the respondents

Instruction: choose the best answer and please put the number of your choice in the box provided

1. Sex (Male=1, Female=2) …………………………………………………….……

2. Age of household heads...

3. Family size (number of people living in the house)…………………..…………………

4. Type of dwelling (1= Villa, 2= Condominium)………………………………………

5. House ownership status (1=owner resident, 2= Rented private, 3= rented government/kebele, 4= If other specify_____)………………………………………………..

6. Household head's Educational status (1= Cannot read and Write,2= Read and write, 3= Primary(18), 4= completed 10, 5= completed 12,6 =

7. Total Monthly income in Ethiopian Birr (1=Less than 500, 2=501-1500, 3=1501-2500, 4=2501-3500, 5=3501-4500, 6=4501- 6000, 7=above 6000)..
Diploma,7= Degree, 8= Masters, 9= If other, please specify_____) ....

8. Household head Occupation: (1=Trading, 2=Farming, 3= civil service, 4= Daily laborer, 5=If other, please specify_____)……………………….…………………………

9. How long have you been leaving in this house? …….………………………..………..…....

Segment 3: Solid waste production and management practice

Problem	Degree of seriousness				
	Extremely	very	quite	not very	not at all
a. safety and security	1	2	3	4	5
b. water portable	1	2	3	4	5
c. solid waste	1	2	3	4	5
d. liquid waste	1	2	3	4	5
e.poor housing condition	1	2	3	4	5
f. traffic	1	2	3	4	5
g. crime	1	2	3	4	5
h air pollution	12	3	4	5	
i.other specify					

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10. Circle the degree of the problems which you consider to be major in this town. (please put a circle on the numbers)

11.What kind of solid waste comes out of your household and to what extent?

	Too Much	Much	Quit	Not Much
a) Papers and cartoons	1	2	3	4
b) plastics (bags and bottles)	1	2	3	4
c) food wastes	1	2	3	4
d) bottles glasses	1	2	3	4
e) tins and cans	1	2	3	4

 f) others specify _____

12. How much money do you spend for house consumption per a month?…………………..…

13. In what type of container (sack)do you collect the waste from your house?(1= plastic bags, 2= baskets/ buckets, 3= fiber bags, 4= tins / cans, 5= if others please specify_____)……………..

14. How big do you estimate is your waste collection container (sack), (1= less than 15, 2=16-25 kg, 3= 26-50, 4= more than 50 kg, 5= I don't know)…………..……..……………………

15. How many sack (container) of wastes do you produce per month………………………..…..

16. Do you have waste storage for your daily generated wastes? (1= Yes, 2= No)…...…………

17. Is there community waste bin (CWB) in your locality? (1= Yes, 2= No)…...………………

18. Where do you usually put away the waste? (1= In the public bin, 2= on the road or street side, 3= There is a collecting truck coming, 4= There is a common dumping site in the neighborhood, 5= if others please specify_____)…………………….…
19. Do you cover your waste containers? (1= Yes, 2= No)…...…......……………………....

 20. How often do you clean your compound? (1= Once a day, 2= Once a week, 3= every two weeks, 4= Once a month, 5= if others please specify_____)…........………
21. Who usually carries this from the house? (1= Father, 2= Mother, 3= Servant, 4= Children in the house, 5= professional collectors come to collect it door to door…………………….…

 22. Do you separate the waste generated by your household? (1= Yes, 2= No)…...……………

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23. How do you dispose your wastes? (1= by using formal pre-collectors 2= Using community waste bins 3= by burning it, 4= if others please specify_____)……………

24. What types of wastes are difficult for you to manage properly? (1= Papers and cartoons, 2= plastics, 3= food wastes, 4= glasses, 5= tins and cans, 6= others specify) ……….…

25. Do you pay to your waste collectors? (1= Yes, 2= No)…………………...…………………

26. If your answer is yes, how much per month? _____

27. Which of the following are the most difficult waste management problems faced by your household? (1=Irregular waste collection (1= we don't know when and where they collect, 2= No availability of waste collection service, 3= the collection price is not affordable, 4= It's just bad habit we are not use to using the service we dump like before, 5= if others please specify_____)……………..………………………………….............……..

28. How do you describe the behavior of the waste collection teams towards their clients? (1= Respectful, 2= Fair, 3=Disrespectful)………...........................….………………………………

29. Have you ever had sensitization education on waste management? (1= Yes, 2= No)…….......…

30. If you answered yes for question number 28, in what way were you sensitized? (1= over radio or TV, 2= Inkebele meetings, 3= In school / work place trainings, 4= with posters, 5= if other please specify _____)……………………………………………….....…..…

30. Do you know who to go to if you have any waste related concerns? (1= Yes, 2= No)…………………………………………………………………………......

31. Have you ever complained orally or in writing for the concerned bodies about waste management? (1=Yes, 2= No)...

32. If you answered no to question number 31, why didn't you? (1=there is no problem occurred, 2= we don't know where to go,3= there isn't been a solution even if we do complain, 4=because it's not our responsibility to do so, 5= if others please specify_____)…………………………………………..……………….

33. Have you ever had talked or discussed with your family about the wise management of solid waste. (1= Yes, 2= No)…..

34. Do you know about the rules and regulations with regard to solid waste management? (1= Yes 2= No)……………………………………………………………………………..

35. Do you believe that waste management problem is related to our cultural habits and believes? (1=Yes, 2= No)…..

Segment: 5 attitudes towards proper solid waste management

Instruction circle one item the answer that most closely express your feelings

1. Waste constitutes non-essential materials that should be destroyed.

    4   3   2   1   Strongly agree

    Agree   Disagree   Strongly disagree

2. I believe waste management is the biggest problem in our town.

    1   2   3   4

Strongly agree   Agree   Disagree   Strongly disagree

3. Solid waste management is the duty of the municipality alone.

    4   3   2   1

    Strongly agree   Agree   Disagree   Strongly disagree

4. We should not be worried about solid wastes, since our main goal is growth and development as a country.

    4   3   2   1

    Strongly agree   Agree   Disagree   Strongly disagree

5. Individuals cannot control (minimize) the amount of waste they generate.

    4   3   2   1

    Strongly agree   Agree   Disagree   Strongly disagree

6. I believe it's proper that I pay for waste collection service.

    1   2   3   4

    Strongly agree   Agree   Disagree   Strongly disagree

7. I think recycling is important.

    1   2   3   4

    Strongly agree   Agree   Disagree   Strongly disagree

8. It is the individual household members who should be separating the waste generated by their household.

    1   2   3   4

    Strongly agree   Agree   Disagree   Strongly disagree

9. Waste generated by individual household is harm full to the Environment.

    1   2   3   4

    Strongly agree   Agree   Disagree   Strongly disagree

10. Environmental hazards are created by wastes generated from factories not from individual households.

    1   2   3   4

    Strongly agree   Agree   Disagree   Strongly disagree

ANNEX: 2 KEY INFORMANT INTERVIEW GUIDE

Part I: Background Information

I. Name of the respondent--

ii. Sex of the respondent--

iii. Age of the respondent--

iv. Responsibility of the respondent-------------------------------

v. Educational background of the respondent--------------------

Vi. Years of service in the current position----

Part II: Interview Questions on Solid Waste Management Practice of the Woreda.

1. The problem of solid waste management practice.

2. Solid waste collection service availability.

3. Solid waste management education to the public.

4. Factors that affect municipal solid waste management practice in the woreda.

5. Attitude of community members towards solid waste management.

6. Level of community member's participation to proper solid waste management.

7. Rules and regulations regarding waste management in the town.

8. Future plans regarding to solid waste management problem at the household level.

9. Recommendation on improving the existing solid waste management practice in the town.

ANNEX: 3 FGD Guide for Household Waste Collection Workers

• The problem of solid waste management practice

• Major problems faced by collectors form the community members while working.

• Attitude of community members towards solid waste collection service.

• Process of collection when, where, how and to where.

• What kinds of wastes.

• Wastes easily manageable.

• Wastes difficult to manage.

• The amount and type of waste produced by different households. (according to status and no of family etc.)

• Rules and regulations regarding waste management in the town at household level.

1.መጠይቅ

የጽሁፍ መጠይቅ

በአዲስአበባ ሜዲካልና ቢዝነስ ኮሌጅ

የህብረተሰብ ጤና ሳይንስ ትምህርት ክፍል

መግቢያ

ውድ ተሳታፊዎች የዚህ መጠይቅ አላማ በወረዳ በደረቅ ቆሻሻ አፈጣጠር፤አያያዝ እና አወጋገድ ትግበራ ስርዓት ላይ መረጃ ለመሰብሰብ ነዉ፡፡የተሰበሰበዉ መረጃ ለጥናታዊ ጽሁፍ አገልግሎት ብቻ የሚዉል እና በሚስጥር የሚያዝነዉ፡፡ስለዚህ ተሳታፊዎች ሁሉንም ጥያቄዎች በትእዛዙ መሰረት እንድትመልሱ በትህትና እጠይቃለሁ፡፡በቅድሚያ አመሰግናለሁ!!

ክፍል አንድ፤መግለጫ

የጠያቂዉ ስም፤ --

ፊርማ፤ --

ቀን፤ወር፤ዓ/ም፤ --

የአጥኒዉ ስም፤ --

ፊርማ፤ --

ቀበሌ፤ --

የመጠይቁ መለያ ቁጥር፤------------------

ክፍልሁለት ፡ የተሳታፊወች የግል መረጃ

መመሪያ ፡ እባክወዎትን የምርጫዎን ሃሳብ የ ያዘዉን ቁጥር በተሰጠዉ ሳጥን ዉስጥ ያስቀምጡ ፡፡

1. ጾታ (ወንድ=1 ሴት =2)--

2. የቤቱ ባለቤት እድሜ --

3. በቤቱ ውስጥ የሚኖሩ የሰዎች ብዛት--

4. የመኖሪያ ቤቱ አይነት (1=ጊቢ ቤት 2=ኮንዶሚኒየም) --

5. የቤት ባለንብረት ነትሁኔታ (1=ባለቤት 2=ተከራይ 3= የቀበሌ ቤት/የመንግስት ቤት 4=ሌላ ካለ-------------------------------------)--

6. የቤቱ ባለቤት የትምህርት ደረጃ
 (1= ማንበብና መጻፍ የማይችል
2= ማንበብና መጻፍ የሚችል
3= አንደኛ ደረጃ
4= 10ኛ ያጠናቀቀ
5= 12ኛ ያጠናቀቀ 6= ድፕሎማ   7= የመጀመሪያ ድግሪ 8= ሁለተኛ ድግሪ (ማስተር) 9. ሌላ-------------------------)

7. የቤተሰቡ አጠቃላይ የወርገቢ
(1= ከ1,000 ብር በታች
2= ከ1001—2,500
3= ከ2501—4,000
4= ከ4,001-6,000
5=ከ6,001-10,000
6=ከ10,000 ብር በላይ------------)

8. የቤቱ ባለቤት የስራ አይነት (1=ንግድ 2=ግብርና 3=የመንግስት ሰራተኛ   4=የቀንሰራተኛ 5=ሌላ ካለ--

9. በዚህ ቤት ውስጥ ለምን ያህል ጊዜ ኖሩ--

ክፍልሶስት ፡ የደረቅ ቆሻሻ አ ፈ ጣጠር ፡ አያያዝ እና አወጋገ ድ ሁኔ ታ ዎ ች

10. በወረዳ 15 ዋና ችግር ነው ብ ለ ው የ ሚ ያ ም ኑ ትን በ ደ ረጃ ያ ስ ቀ ም ጡ

ተ.ቁ	የችግርዓይነት	በጣምከፍተኛ	ከፍተኛ	መካከለኛ	ዝቅተኛ	በጣምዝቅተኛ
ሀ.	የደህንነትእናሰላም	1	2	3	4	5
ለ.	የውሃችግር		2	3	4	5
ሐ.	የደረቅቆሻሻብክለት	1	2	3	4	5
መ.	የፈሳሽቆሻሻ	1	2	3	4	5
ሠ.	የመኖሪያቤትችግር	1	2	3	4	5
ረ.	የትራፊክአደጋችግር		2	3	4	5
ሰ.	የወንጀልችግር	1	2	3	4	5
ሸ.	የድምጽብክለት	1	2	3	4	5
ቀ.	ሌላካለ	1	2	3	4	5

11.ከቤትዎየሚወጣውንቆሻሻበምንንዓይነትእቃያስቀምጣሉ

(1= በፌስታል/በፖላስቲክእቃ2=በቅርጫት 3= በኬሻ4= በቆርቆሮእቃ 5= ሌላካለ--------------

12. የደረቅቆሻሻማጠራቀሚያዎትየሚከደንነው? (1= አዎ2= አይ)-------------------------

13. የቆሻሻማጠራቀሚያእቃዎትበግምትምንያህልክብደትይይዛል?

(1=ከ15 ኪሎበታች2=ከ16-25 ኪሎ3=ከ26-50ኪሎ4=ከ50ኪሎበላይ5=አላውቅም)--------------------

14. ምንያህልኬሻ/ማጠራቀሚያ/ ቆሻሻበሳምንትበዉርከቤትይወጣል-----------------------------------

15. የጋራየቆሻሻማጠራቀሚያገንዳበሰፈራችሁአለ? (1.አዎ 2.የለም)----------------------

16. ግቢዎንበምንያክልጊዜያጸዳሉ. (1= በቀንአንድጊዜ2= በሳምንትአንድጊዜ
    3= በሁለትሳምንት4= በዉር5= ሌላ----------------------)-----------------------------

17. በምንያህልጊዜየተጠራቀመዉንቆሻሻይደፋሉ.(1= በቀንአንድጊዜ2= በሳምንትአንድጊዜ 3= በሁለትሳምንት 4= በዉር5= ሌላ--

18. ይህንቆሻሻማንንነዉከቤትየሚያወጣዉእናየሚደፋዉ (1= አባት2= እናት 3=ልጆች4= የቤትሰራተኛ 5= ሰብሳቢዎችግቢገብተዉይወስዳሉ.6. ሌላ-------------)

19.ከቤትየሚወጣዉንደረቅቆሻሻእንደትነዉየሚያስወግዱት?
1=የጋራቆሻሻማጠራቀሚያገንዳዉስጥ
2=በተለምዶቆሻሻየሚጣልባቸዉታዋቂስፍራዎችአሉ/መንገድ፣ገደልወዘተ/
3= ቆሻሻለሚሰበስቡሰራተኞችነዉየምንሰጠዉ
4=እናቃጥለዋለን
5. ሌላለይግለጹ---)

20. ከቤትዎየሚወጣውንቆሻሻበዓይነትይለያያሉወይ?
(1= አዎ2= አይ3= አልፎአልፎ --)

21.ምንዓይነትቆሻሻዎችናቸውለማስወገድየሚያስቸግሩዎት?
 (1= ወረቀትእናካርቶን
2= ፕላስቲክነክ
3= የምግብተረፈምርቶች
4= ብሎጭቆዎች
5= ቆርቆሮእናብረት
6=ሌላካለይግለጹ---)

22. ለቆሻሻሰብሳቢዎችገንዘብይከፍላሉወይ? (1= አዎ   2= አይ)----------------------------

23. ለጥያቄቁጥር 22 መልስዎ አዎ ከሆነምን ያህል--

24.ከቤትዎ የሚወጣውንቆሻሻ በአግባቡ ለማስወገድ አስቸጋሪ የሚያደርግብዎት ምንድን ነው?
(1= ሰብሳቢዎቹየሚመጡበትቀንአይታወቅም፣ይቀያየራል
2= የቆሻሻሰብሳቢሰራተኞችበአካባቢያችንየሉም
3= ለቆሻሻሰብሳቢዎችየሚከፈለውገንዘብበዙነው
4= እንዲሁበልማድአገልግሎቱንመጠቀምስላልተለመደነው5= ሌላካለ ------------)

25.ቆሻሻ በመሰብሰብ ሥራ ላይ የተሰማሩትን ሰራተኞች ባህሪ እንደት ይገልጹታል?

ከናንተ ከደንበኞቻቸዉ ጋር ያለዉ ግንኙነትምን ይመስላል?
(1= በጣም ሰዉ እናስራቸዉን አክባሪናቸዉ
2= መካከለኛ ናቸዉ
3= በጣም አስቸጋሪ ናቸዉ ሰዉ ይንቃሉ)---
ክፍልአራት፤የደረቅቆሻሻአያያዝእናአወጋገድግንዛቤእናትምህርት

26.የቆሻሻንበአግባቡአያያዝእናአወጋገድንበተመለከተትምህርት   (ግንዛቤ)
ተሰጥቶዎትያዉቃል? (1=አዎ2= አይ)---

27.ለጥያቄቁጥር 26መልስዎአዎንከሆነምንመንገድነዉትምህርቱንያገኙት (የት) ነበር?
(1= በመገናኛብዙሃን 2= በቀበሌስብሰባ   3= ትምህርትወይምስራቦታ
4= ከሚለጠፉፖስተሮች 5= ሌላካለ---)

28.ቆሻሻንበተመለከተቅሬታወይምስጋትእናችግርቢያጋጥመዎወደትመሄድእንዳለበዎት
(የሚመለከተዉንአካል) ያዉቃሉ? (1=አዎ2=አይ)----------------------------

29.የቆሻሻንችግርበተመለከተበቃልወይምበጽሁፍቅሬታአቅርበዉያዉቃሉወይ?
(1=አዎ2= አይ)--

30.ለጥያቄቁጥር29መልስዎ (አይ) ከሆነለምንቅሬታአላቀረቡም?

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(1= ምንምችግርስላልተከሰተነው
2= የትሂጂቅሬታእንደማቀርብስለማላውቅነው
3= ባቀርብምምንምለውጥአላመጣምብየነው 4= ሃላፊነትያለብኝእነስላልሆንኩነው
5= ሌላካለ --)

31.   ከቤተሰብዎጋርተገቢስለሆነየቆሻሻአያያዝናአወጋገድተወያይተውያውቃሉ?1.አዎ2.አይ
)

32.የደረቅቆሻሻንአያያዝናአወጋገድበተመለከተያሉትንህጎችእናደንቦችያውቃሉ?   (1=አዎ2=
አይ3= ህግእንዳለምአላውቅም)

33.የደረቅቆሻሻአያያዝናአወጋግንበተመለከተያሉህጎችእናደንቦችንባለማክበራቸዉየተቀጡ
ግለሰቦችንአይተዉወይምስምተዉያዉቃሉወይ? (1=አዎ2= አይደለም)

33.የቆሻሻአያየዝናአወገገድችግርከባህላችንናከአመለካከታችንጋርይያያዛልብለውያስባሉ?(1
.አዎ2. አይደለም)
34.ከየቤቱየተሰበሰቡቆሻሻዎችበመጫረሻየትእንደሚጣሉ.ያውቃሉ?
(1. አዎ2.አይደለም)

ክፍል፦አምስትቆሻሻንመለየትእናበድጋሜጥቅምላይማዋል
ትእዛዝ፤እባከዎትንበሰንጠረዡውስጥቆሻሻውንእንዴትእንደሚያስወግዱልከት   (X)
በማድረግያሳዩ

ተ.ቁ	የቆሻሻውዓይነት	ቆሻሻውምንይሆናል			
		መሸጥ	ማቃጠል	ቆሻሻውማጠራቀሚያውስጥመጣል	በድጋሜመጠቀም
1	ወረቀትናካርቶኖች				
2	ፕላስቲኮች				
3	የምግብተረፈምርቶች				
4	ብርጭቆዎች				
5	ቆርቆሮናብረቶች				

ክፍል፦ስድስትየማህበረሰቡአባላትአመለካካትበደረቅቆሻሻአያያዝናአወጋግላይትእዛዝ፤በተሰ
ጠዉሰንጠረዡእባከዎትንአመለካከትዎን /ሃሳብዎን/ በትክክልየሚገልጽልዎትንቁጥርያክብቡ፡፡

1. ቆሻሻአላስፈላጊየሆኑነገሮችጥቅምነው፡፡
4   3   2   1
በጣምእስማማለሁእስማማለሁአልስማማምበጣምአልስማማም

2.የቆሻሻአያያዝናአወጋግድችግርበወረዳ 15ትልቅችግርነውብለውያስባሉ?
1   2   3   4

በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

3. የደረቅ ቆሻሻን በአግባቡ ማስወገድ የማዘጋጃ ቤት ኃላፊነት ብቻ ነው፡፡

4   3   2   1
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

4. ስለደረቅ ቆሻሻ አያያዝ እና አስተዳደር ብዙ መጨነቅ የለብንም ምክንያቱም ዋና አላማችን የአገራች ን አብሮነት እና ልማት ነው፡፡
4   3   2   1
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

5. ግለሰቦች የሚያመርቱትን /የሚፈጥሩትን/ የቆሻሻ መጠን መቆጣጠር አይችሉም፡፡

4   3   2   1
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

6. ለቆሻሻ ሰብሳቢ መክፈል ተገቢ ነው·ብየ አስባለሁ፡፡
1   2   3   4
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

7. ከቆሻሻ የሚወጡ ነገሮችን በድጋሜ መጠቀም አስፈላጊ ነው፡፡
1   2   3   4
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም

8. ከግለሰብ ቤት የሚወጣውን ቆሻሻ ለያይቶ ማስቀመጥ የግለሰቡ እንጂ የቆሻሻ ሰብሳቢ ዎች ሃላፊነት ግ ይደለም፡፡
1   2   3   4
በጣም እስማማለሁ·እስማማለሁ·አልስማማም በጣም አልስማማም