WOLKITE UNIVERSITY

COLLEGE OF SOCIAL SCIENCE AND HUMANITIES

DEPARTMENT OF SOCIOLOGY

ASSESSMENT OF SOLID WASTE MANAGEMENT: THE CASE OF MENAHARIA KEBELE, WOLKITE TOWN

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A SENIOR ESAY PAPER SUBMITTED TO DEPARTMENT OF SOCIOLOGY IN PARTIAL FULFILMENT FOR THE REQUIRMUT OF BACHELOR OF ART DEGREE IN SOCIOLOGY

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MAY, 2023

WOLKITE, ETHIOPIA

ACKNOWLEDGEMENT

The first and foremost place of honor and praise goes to almighty of God. Next our first and foremost gratitude goes to our adviser Aschale Kassie (Ass .professor) for his assistance, encouragement and constructive comment starting from research proposal to the preparation of this research paper. Our deep appreciation and thanks also go to Wolkite university department of sociology and all our teachers for their cooperation of this research work. In addition, we would like to express our appreciation tanks to all people who participate in this research by giving important information through different method and we would like to express our deepest tanks to our family and class mates for their support.

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CSA	Central statistical agency
FDREPCC	Federal Democratic Republic of Ethiopia Population Census Commition
GHG	Greenhouse Gases
MDG	Millennium Development Goal
MSEs	Micro and Small scale Enterprises
MSWM	Municipal solid waste management
MSW	Municipal solid waste
NGOs	Non-Governmental organization
NMA	National Meteorology Agency
SBPDA	Sanitation, Beauty, Parking and Development Authority
SNNPR	Southern Nation Nationality and people region
SW	Solid Waste
SW	Solid Waste Management
UK	Environmental protection United Kingdom Environmental Protection
UNDP	United Nation Development Program
UNICEF	United Nation Children's fund
USEPA	United States Environmental Protection Authority

ABSTRACT

Now a day, in all over the world proper managing of solid waste is becoming a serious problem of cities all over the world especially in developing countries like Ethiopia. Wolkite town is one of developing countries which face the problem of solid waste .The volume of solid waste in the town is becoming increase and but the administration could not be able to adequately collect and dispose the waste. This study is conducted in Wolkite town, Meneharia kebele with the aim to assess and analyze solid waste management practice and Specifically to identify the cause of poor solid waste management and disposal practice, to examine the participation of the community and institution in solid waste management and disposal practice, to identify challenges of solid waste management and in the last to assess consequence of solid waste on human health and the environment in the study area. The study employed mixed research approach and a cross sectional descriptive research design. The researchers used data obtained from primary and secondary source of data, it has questionnaire and interview. Moreover, secondary source documents were also reviewed. A total of 358 household respondents were included from Meneharia kebele based on probability and non-probability sampling techniques. The quantitative data were analyzed using descriptive statistics and the qualitative data has been used as a supplement for the quantitative data. The study finds that the lack of awareness by the people about proper solid waste management system, different challenges and weak coordination among the stake holders poses problems on the management of system. Thus, the studies recommend that creating awareness of the people with the collaboration of other stake holders and building the institutional capacity are critical for its improvement.

CHAPTER ONE

1. INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Solid waste is unwanted or unusable solid materials generated from combined residential, industrial and commercial activities in a given area. It may be categorized according to its origin domestic, industrial, commercial, constructional or institutional solid wastes. According to its contents organic material, glass, metal, plastic paper etc. or according to hazard potential toxic, non-toxin, flammable, radioactive, infections etc. solid wastes are all the wastes arising from human and animal activities that are normally solid and discarded as useless or unwanted .The term solid waste is all inclusive; encompassing the heterogeneous mass of throws away from the urban community as well as more homogeneous accumulation of agricultural, industrial and mineral solid wastes (Techobanglous, 1997).

Globally, 2.6 billion people or 39 percent of the world population do not use improved sanitation. Some 1.1 billion people still defecate in the open air. Ten countries, including Ethiopia are home to 81 percent of them. Open defecation is largely a rural phenomenon, most widely practiced in Southern Asian and Sub-Saharan Africa. At current rates of progress, the world will miss the MDG sanitation target by almost 1 billion people. The magnitude of the hygiene challenge also remains. Waste management is a critical issue worldwide. Open unregulated dumps are still the predominant methods of waste disposal in most developing countries (UNICEF, 2009).

Most of the solid waste is ends up in open dumps and wetlands, contaminating surface and groundwater and posing major health hazards. When we see specifically sub-Saharan African countries, the problem that related to solid waste is very enormous. Most of sub-Saharan Africa countries solid waste generation exceeds collection capacity and scattered solid wastes in markets, residential or offices could result soil,

water and air pollution, emit nauseating odor and GHG that contribute to the climate change (Kaza et al. 2018).

Ethiopia, like other developing countries, the increase of SW generation and illegal disposal practices are resulted from rapid urbanization, fast growth of economy and population growth. The amount of solid waste in Addis Ababa and other fast growing area in the country has been increasing over time, largely attributed to rapid population growth rate. As a result, poor solid waste management and disposal practices are a result of various factors that are relate to low participation of organizational, institutional and individual participation (Walelign and Alebele, 2003). Wolkite is one of the swiftly urbanizing centers but has been tackled with an increasingly growing urban waste generation and solid waste disposal problems (Kiros et al. 2018).

In addition to that, solid waste management and disposal practices are a problem getting complex because of urbanization, population growth, expansion of informal settlements and business, lack of proper regulatory mechanism, poor awareness and attention problem, carelessness, incapacitated approach of municipal authorities coupled with poor governance exacerbating the municipal solid waste management and disposal practice problem (Tekahun, 2007).

In addition to that, community, individual and family's participation gives efficiency and effectiveness to reduce the problem of illegal solid waste disposal practices. Community individual and investor's, NGOs participation on solid waste management and disposal practices are important because the involvement of the important stakeholders participation are reduce the impact and create the awareness of the society and for the investors and privet sector a sources of income. According to (Meyer and Schertenleib, 1992).

Ethiopia has a range of solid waste management problems, 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 (Degnet Abebaw 2008; Getahun Tadesse, 2011)

Consequently, the uncontrolled waste that sometimes has significant amounts of animal and human excreta is discarded indiscriminately in drains and on the streets contributing to insect breeding, flooding, and increase of rodent vectors. It also

contributes to the spread of diseases like cholera. The core objective of SWM is to decrease and eradicate the adversarial effects of waste on human health as well as the environment while increasing the quality of life and supporting economic development (Zurbugg, 2007).

1.2. STATEMENT OF THE PROBLEM

Solid waste management has been a big challenge to both developed and developing countries. Many researchers at different times have reported that there are solid waste management (SWM) problems in Ethiopia. For instance a research conducted by Lea C. Garcia and Maria Lourdes C. Aguirre,(2020) have studied the issue of "A STUDY ON THE ASSESSEMENT OF THE KNOWLEDGE, ATTITUDE AN AWERNESS ON SOLID WASTE MANAGEMENT OF COLLEGE STUDENTS" by using quantitative research approach . They findings indicated that results revealed that for Environmental awareness and SWM, the general population indicates idea on SWM at 85.4%, SWM is not a problem at 51.8%, "satisfactory" opinion on the janitors, on solid waste disposal, on the sewage treatment and on the SWM in the university at an average of 74.6%, the waste disposal in the university is twice weekly at 48.7%, waste items not reused at 71.1% and dirtiness not felt due to solid waste at 60.4%. The "sometimes" behavior for the not littering attitudes and practice indicates an occasional practice of important pro-behavior for not littering. Students do not reuse waste items indicates lack of awareness with regard to what solid waste materials can be recycled. It is recommended that a program on solid waste management be developed in the university to initiate and expand recycling practices and other conservation actions. On good behaviors of not littering, it is recommended that the university creates programs that will involve the whole school community in environmental stewardship.

Shalom Ali, (2018) "SOCIO ECONOMIC FACTORS AFFECTING HOUSEHOLD SOLID WASTE PRODUCTION AND EFFECTIVE MANAGEMENT IN DESSIE TOWN" The result revealed the problems of the existing system are institutional and social factors such as transportation problem for the waste collected, Low motivation and attrition of the waste collection workers, financial constraint of the municipality, lack of awareness of the household heads towards household solid waste management, unwillingness to pay for the service, problems of sharing accountability and

responsibility among household owners, town security waste collection workers and the municipality.

Aklilu Abebaw, (2002) has studied the issue of "WILLINGNESS TO PAY FOR IMPROVED SOLID WASTE MANAGEMENT THE CASE OF ADDIS ABEBA" on his finding indicated most of the community unwillingness to pay.

(Lemma Asefaw, 2007; Melaku Tegegne, 2008 and Abiyot Hailemeskel, 2014) on "HOUSEHOLD GENERATION RATE OF WASTE AND COMPOSTION ANALYSIS".

The research conducted by (Lea C. Garcia and Maria Lourdes C. Aguirre, 2020).deals with only the assessment the knowledge ,attitude and awareness on solid waste management of college students by using quantitative method .Our study try to fill the gap in terms of methodology and thematic point of focus.

The second research conducted by (Shalom Ali, 2018). Her study focused on the socio economic factors affecting household solid waste production and effective management in Dessie town. The researchers try to fill the thematic point of focus and geographical gap of this research.

The studies conducted on the issue such as, "willingness to pay for improve solid waste management the case of Addis Abeba"(Aklilu Abebaw, 2002) "generation rate of solid waste and composition composition analysis "(Lemma Asefaw, 2007; Melaku Tegegne, 2008 and Abiyot Hailemeskel, 2014).given much emphasis to financial issue willingness of the community to pay for solid waste service and how much solid waste generated per year, and our research try to fill the gap in terms knowledge gap ,time and geographical gap. However, our study focused on cause of poor solid waste management and disposal practice, the participation of community and institution, challenges of solid waste management and practice and consequence of solid waste on human health and the environment in case of Wolkite, Menaharia kebele by using both qualitative and quantitative and this study aims to fill the gaps identified above and suggest possible solution that may help to minimize the problem and to create awareness in society.

1.3. OBJECTIVE OF THE STUDY

1.3.1. GENERAL OBJECTIVE OF THE STUDY

The general objective of this study is to assess solid waste management and disposal practice of solid waste by taking the case of Menaharia Kebele, wolkite town.

1.3.2. SPECIFIC OBJECTIVES OF THE STUDY

- To identify the cause poor solid waste management and disposal practice in the study area.
- To examine the participation of community and institution in solid waste management and disposal practice Wolkite town, Menaharia kebele.
- To identify challenges of solid waste management and disposal practice in the study area.
- To assess consequence of solid waste on human health and on the environment.

1.4. RESEARCH QUESTION

1. What are the causes for poor solid waste management and disposal practices in Wolkite Town, Meneharia kebele?
2. How does the community and institution involve in solid waste management and Disposal practices in the town?
3. What are the main challenges of solid waste management practices in the study area?
4. What are the consequences of solid waste on human health and on the environment?

1.5. SIGNIFICANCE AND JUSTIFICATION OF THE STUDY

Solid waste management and urban sanitation has become a major challenge in wolkite town in recent times. This deserves not only the attention of the municipal but also concerns of corporate organizations and individuals to find a lasting solution to the problem. Vital human resource could be lost through poor solid waste management and sanitation. This will affect beautification, productivity and quality in the town. The main significance of this study is for academic purpose. It also helps in giving insight for different stakeholders to participate and benefited from its outcome.

Besides this, it enables policy makers to revisit their policy about solid waste management and serve as a springboard for further study in the area.

Solis waste management is an intricate problem and current phenomena in the world wide. The research also aimed and at giving attention to a stake holders in matters of solid waste management including the level at which they have been involved on this issue.

1.6. SCOPE OF THE STUDY

The scope of this study was limited to Wolkite town in Menaharia kebele, Gurage zone in Ethiopia due to time and budget restraints. This study is also limited to year 2023. It also this study mainly focused on the assessment of solid waste management practice in Wolkite town, Meneharia kebele.

1.7. LIMITATION OF THE STUDY

The major problem that faces the researchers in the course of conducting these research work. Includes absence of sociological theory regarding solid waste management and disposal practice. Unwillingness of the respondents and the acute shortage of local research for reference and well-documented evidences in the town municipality. The key informant respondents of governmental workers are at the time of our research conducting they are adjusts on different meeting.

1.8. OPERATIONAL DEFINITION OF THE STUDY

Solid waste is waste arising from human and animal activities that are normally solid and is discarded as useless or un-wanted (Techobanglous George, 1993). Includes any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material including solid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agriculture operations and from community activities cited in (Joseph Salvato, 1984).

Solid waste management:- may be defined as the discipline associated with the control of generation, storage, collection, transfer and transport, processing & disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics, & other environmental

considerations, and that is also responsive to public attitudes" (Tchobonglous George, 1993).

Household Solid Wastes: - These wastes are mostly generates at home. Typically, this includes food wastes, packaging (bottles and cans), newspaper and other papers, and miscellaneous items that have been used up or broken and are thrown out as waste (e.g., ashes, fruit garbage, old shoes, worn out clothes, broken cooking pot, used paper, baskets, bags…etc.).

Waste recycling: - a process whereby waste materials are reuse to make the same types of product.

Waste reuse: – involves the use of a waste for the original or another purpose without pre-treatment or processing.

Industrial solid wastes: - are wastes that encompass a wide range of materials of varying environmental toxicity emanated from different types of industry typically include general rubbish, packaging, food wastes, acids and alkalies, oils, solvents resins, paints and sludge.

Hazardous solid wastes: - are wastes which contain substances that are toxic to humans, plants or animals.

Municipal solid wastes: - wastes typically include household wastes, bulky consumer wastes as well as similar wastes from small commercial and industrial firms, institutions and markets, which are collected and disposed of.

Compost: - are natural fertilizer decomposed by microorganism, from solid waste particularly from animal and plant by products and applied to the fertility of the soil.

Incinerator: - means a method and instrument that is used to burn compostable solid waste with high pressure, without causing nuisance of pollution, and that converts them to residues and ashes harmless to health.

Recycling: - means extraction of valuable materials from solid waste and use directly or entering to factories as row materials and manufacturing new products which may or may not be similar to the original product.

Transfer stations: - means temporary or facility site, where solid waste, collected by vehicles from different places is temporarily stored, that enables the dump trucks to transport the same to disposing site.

Landfill: - is a place where solid waste collected and presumed useless is stored, buried discarded, burnt and disposed, on or under the ground, in a manner not harmful to health.

1.9. CONCEPTUAL FRAME WORK OF THE STUDY

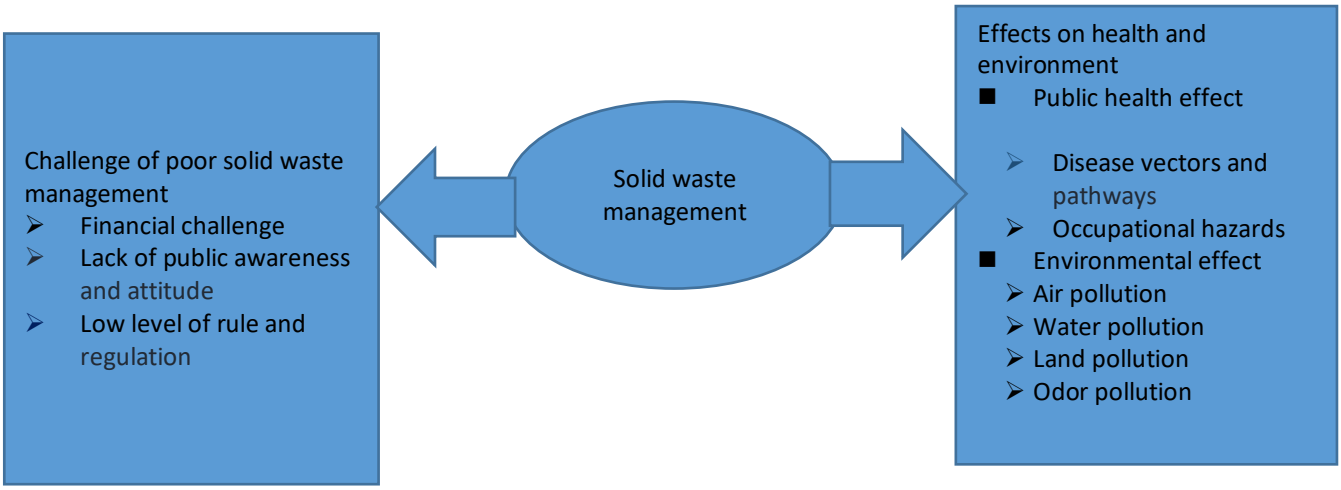

Figure 1. Conceptual frame work. Source: developed by the researchers

The above figure shows the conceptual frameworks that compare different variables. At the left ,we found that the independent variable that different challenge influence other dependents variables connected by arrows to the right such as human and environmental effects of solid waste that cause poor solid waste management.

CHATER TWO

2. LITERATURE REVIEW AND THEORETICAL FRAME WORK

2.1. CONCEPTS OF THE SOLID WASTE MANAGEMENT

Wastes arising from human and animal activities that are normally solid and are discarded as useless or unwanted are broadly defined as solid waste. It includes municipal garbage, industrial and commercial wastes, sewerage slug, waste of agricultural and animal husbandry, demolition waste and mining residues (Techobanglous, et al., 1993).

Solid waste - can be defined as "any garbage, refuse, sludge, and other discarded solid materials resulting from industrial, commercial, agricultural operations, and community activities, but does not include dissolved materials" (Samuel Shimelis, 2006,P.5).

waste is any substance which constitutes scrap materials, an effluent or other unwanted surplus arising from application of any substances or article which requires to be disposed of which has broken, worn out, contaminated or otherwise spoiled (UK Environmental Protection, 1990).

Municipal solid waste (MSW) is also known garbage, trash or domestic waste that is related to the municipality. It is defined as "Any waste generated by households, commercial and institutional activities and is not hazardous. It refers to materials discarded in the urban areas for which municipalities are usually held responsible for collection, transport and final disposal. It encompasses household refuse, institutional wastes, street sweepings, commercial wastes, as well as construction and demolition debris". (Abiyot Hailemeskel, 2014, p.9)

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 (Jamal, 2002).

Solid waste as material that been abandoned and discarded because it has no more use for the owner. This type of waste may be solid, semi-solid or liquid. It is made up of household refuse, institutional waste, constructional and demolished debris, residential ashes, street cleaning, maintenance refuse, abandoned dead animals, and bulky waste (Techobanglous et al., 1993; Eshuan, 2002; Mesfin Tesfaye, 2006).

2.2. TYPES OF SOLID WASTE

According to (Medina and Martin, 2004) three general categories of solid wastes are municipal waste, industrial waste and hazardous wastes.

Industrial wastes: - are wastes arising from industrial activities. Industrial process wastes include a very wide range of materials and the actual composition of industrial wastes in a country will depend on the nature of the industrial base. Therefore, composition of industrial waste depends on the kind of industries involved. Examples of the wastes which may be found under this category are general factory rubbish ashes, organic wastes from food processing, packaging materials, plastics, papers, acids, and alkalies, metallic sludge's, demolition and construction waste, hazardous waste and tarry residues.

Hazardous wastes: - a waste or combination of wastes that because of its quantity, concentration, or physical, chemical or pathogenic characteristics may cause an increase in serious illness, morbidity and mortality.

Municipal solid wastes: - urban solid waste (Medina and Martin, 2004) also commonly referred as municipal refuse is defines as material for which the primary generator or user abandoning the material within the urban area requires no compensation up on abandonment. In developing countries, MSW also contains numerous amounts of industrial solid wastes from small-scale industries. In these sources, there are diverse types of solid wastes. However, some of typical solid wastes of those sources are described by (Dereje Tadesse, 2001, p.36) as follows and urban solid waste materials discarded in urban areas & generally viewed as municipal responsibility includes:

Household wastes: - It is also referrers to as residential refuse or domestic waste, this category comprises wastes that are the consequence of household activities. These

include food preparation, sweeping, cleaning, fuel burning and gardening wastes. It also includes old clothing, old furnishing, retired appliances, packaging and reading matter.

Commercial waste or refuse: This category contains of wastes from shops, offices, hotels, stores offices, fuel service stations, warehouses, restaurants, etc. and typically consisting packaging materials, office supplies and food wastes (Heeramum, 1995).

Considered SW as any unwanted solid material generated from human and animal activities that have been put aside. In broad terms, solid wastes are categorized in to three main groups' namely municipal waste, industrial waste, and harmful waste. According to him, municipal solid waste can be categorize in to two broad categories. These are biodegradable or recyclable and non-degradable or non-recyclable. In other words, municipal solid waste may be partly composed organic matter that would be easily degradable and those non-organic matters such as bottles, glasses, and papers among others that go through before degradable.

2.3. SOURCE OF SOLID WASTE

The sources of SW are commercial, residential, institutional, constructional, and demolition, municipal services, industrial, treatment plants site and agricultural SW (Techobanglous, 1997). Various industrial plants generate SW s, which are mainly hazardous wastes during their raw material preparation, production or transportation processes. The waste generated from such sources is not only hazardous but also inorganic requiring special treatment before final disposal (Bilitewski Hardtle Marek Weiss back and Boeddicker, 1994).

The materials that are collects under the time SW include many different substances from a multitude of sources. Similarly, the sources of SW s are dependent on the socio-economic and technological level of a society. A small rural community in Ethiopia may have known types of SW from known sources. While a big city such as Addis Ababa may have many sources. Most people can identify SW when they empty wastebaskets. There are much more house hold SW s that are considered to be SW than understood. In this regard, in Wolkite small scale commercial and day to day human activities are found and produce significant amounts of solid wastes and the other sources in Wolkite town are mainly municipal services, residential, commercial, institutional, and small industrial solid waste sources. In all cases the following

sources are universal: - this are residential, commercial, institutional, construction and demolish, municipal services, industrial; treatment plants sites and agricultural wastes (Techobanglous, 1997).

2.4. SOLID WASTE DISPOSAL PRACTICE

Solid waste disposal (the disposal of solid or semi-solid materials) resulting from human and animal activities that are useless, unwanted, or hazardous. Most of the MSW in developing countries is dumped on land in a more or less uncontrolled manner. These dumps make very uneconomical use of the available space, allow free access to waste pickers, animals and flies and often produce unpleasant and hazardous smoke from slow burning fires. The safe and reliable long-term disposal of solid waste residues is an important component of integrated SWM (Tchobanoglous et al., 1977).

2.4.1. SOURCE REDUCTION, REUSE AND RECYCLE

Source Reduction means decreasing the amount or toxicity of the materials that we throw away. Effective source reduction promotes the use of products that generate the smallest environmental impacts. It includes:- purchasing of long lasting goods, seeking products and packaging which are as free of toxics as possible, redesigning products to use fewer raw materials in production, have a longer life, or are used again after its original use. Reusing items- by repairing them, donating them to charity and community groups, or selling them – also reduces SW. Reusing products, when possible, is even better than recycling because the item does not need to be reprocessed before it can be used again. Whereas, recycling turns materials that would otherwise become SW into valuable resources. In addition, it generates a host of environmental, financial, and social benefits. Materials like glass, metal, plastics, and paper are collected, separated and sent to facilities that can process them into new materials or products (USEPA, 2002).

2.4.2. COMPOSTING

Many cities rather than bury this valuable organic material they are turning it into useful product through composting biological degradation or break down organic matter under aerobic (oxygen –rich)conditions. The organic compost resulting from

this process makes a nutrient-rich soil amendment that aids water retention, slows soil erosion and improves crops yield (Cunningham and Saigo, 1995).

According to the data obtaining from the selected respondents in the town SW composting practices was low and they was not sufficiently with technological support.

2.4.3. INCINERATION

Solid waste incinerators are designed to burn and sterilize waste and reduce the volume of material requiring final disposal. Conventional municipal incinerators can reduce waste volume as much as 80 percent to 95 percent (Tammemagi 1999 cited in Pinderhughes, 2004).

Although most waste management planners have become convinced that incineration should be an important part of their city's waste disposal infrastructure, it can lead to air pollution unless the plant is designed, equipped and operated to comply with air pollution standards (Rao, 1996). Incinerators do not eliminate waste; they change the form of solid waste into toxic ash and hazardous air emissions, spreading hazardous contamination worldwide, contaminating air, soil, and water, and adding fly ash to a solid waste accumulation problem that has already reached crises proportions (Africano, 2003 cited in Pinderhughes, 2004).

According to the data obtained from the selected respondents in Wolkite town the community was incinerate SWs inside the compounds and outside the compounds. But the method of incineration and the places was illegal.

2.4.4. SANITARY LANDFILL

A sanitary landfill is a method of solid waste disposal that functions without creating a nuisance or hazard to public health or safety. Engineering principles are used to confine the waste to the smallest practical area and volume, and cover it with a layer of compacted soil at the end of each day of operation, or more frequently if necessary. This covering of the SW makes the sanitary landfill “Sanitary”. The compacted layer effectively denies continued access to the waste by insects, rodents, and other animals. It also isolates the refuse from the air, thus minimizing the amount of surface water entering into and gas escaping from wastes. The most significant possible hazard from a sanitary landfill is ground water or surface water pollution by leachate. Land-filling is necessary for municipal SW disposal but every landfill has its own finite capacity. The most common approach to extending the life of landfills is to introduce recycling,

composting, and incineration in to the solid waste disposal system (Chang and Nishat, 2005). According to the data that was gathered from the town municipality, the town has only one major land fill site, which is found at Gasore kebele, near to the town.

2.5. HEALTH AND ENVIRONMENTAL EFFECT

Improper handling of solid wastes is a health hazard and causes damage to the environment (Rao, 1996).

An effective solid waste management system is necessary to avoid public health disasters, spread of disease by insects and vectors, and adverse effect on water and air (Phelps et al., 1995 cited in Ram Chandra, 2006). Solid waste workers are the most exposed to the risks of parasitic infection and accidents, and therefore a solid waste management system must include proper mechanisms to avoid these incidences.

Public health concerns are related primarily to prevent the invasion of areas for the storage of solid wastes which are conducive for the production of vermin and insects that often serve as potential reservoirs of disease (Tchobanoglous et al., 1977).

The main risks to human health arise from the breeding of disease vectors, primarily flies and rat (Rao, 1996 and Ram Chandra, 1996).

The consequences of improper management and handling of solid waste:

a. Disease vectors and pathways- Wastes dumped indiscriminately provide the food and environment for flourishing populations of vermin, which are the agent of various diseases. The pathways of pathogen transmission from wastes to humans are mostly indirect through insects- flies, mosquitoes, etc...

b. Occupational hazards - Workers handling wastes are at risk of accidents related to the nature of material and lack of safety precautions. The sharp edges of glass metals and poorly constructed storage containers may inflict injuries to workers. It is therefore, necessary for waste handlers to wear gloves, masks and be vaccinated.

c. Environmental Effect -Besides causing health disorders that we have touched upon above, inadequate and improper waste management causes adverse environmental effects such as:

- Air pollution: - burning of solid waste in open dumps or in improperly designed incinerators emits pollutants to the atmosphere.
- Water and land pollution: - water pollution results from dumping in open areas and improper design, construction and/or operation of a sanitary landfill.

- Odor pollution: - obnoxious odors due to the presence of decaying organic matter are characteristics of open dumps. They arise from an aerobic decomposition processes and their major constituents are particularly offensive. Proper landfill covering can eliminates this.

2.6. CHALLENG OF SOLID WATE MANAGEMENT

The challenge of the solid waste management, which affects solid waste collection, disposal and transportation activities, is the following:

2.6.1. FINANTIAL CHALLENGES

Municipal solid waste management is gives low priority in developing countries; as a result, very limited funds are allocates to the sector by government. This problem is acute at the local government level where local revenue collection system is inadequately developed and financial base for public service including municipal solid waste management is weak. In addition to limited funds, many local governments in developing countries lack good financial management and planning. Lack of financial management and planning, particularly cost accounting depletes limited resources available for the sector even more quickly and causes solid waste management services to halt for some periods, thus losing trust of service users (Zurbugg Christian, 2003); and (Gebrie Kassa, 2009).

Information obtained from the interview revealed that the problem of finance is very acute. There is inadequate and in-equal distribution of annual budget for the sectors. The finance source of the municipality that depends on the revenue to provide public services was weak. Therefore, the factors that influencing MSWM in the town for the ineffective service delivery was the shortage of finance.

2.6.2. LACK OF PUBLIC AWARENESS AND ATTITUDES

Public awareness and attitudes to waste can affect the municipal solid waste management system. All steps in municipal solid waste management starting from household waste storage, to waste segregation, recycling, collection frequency, willingness to pay for waste management services, and opposition to sitting of waste treatment and disposal facilities depend on public awareness and participation. Thus, lack of public awareness and school education about the importance of proper solid waste management for health and well-being of people severely restricts use of

community-based approaches in developing countries and crucial factor for failure of a solid waste management practice in developing countries (Zerbock, 2003).

Therefore, lack of public awareness and attitudes creation was another challenge for the municipal solid waste management in the town. The majority of the households were not well informs about the consequences of poor solid waste handling and disposal methods.

2.6.3. LOW LEVEL OF IMPLEMENTATIONOF RULES AND REGULATION

The study have found that lack of adequate legislation makes it difficult to assign clear mandates to different sectors connected with waste management services. The rules and regulation and their implementation program of the town was weak. On the other hand, there was no little effort made to create awareness about solid waste management in the community including the rules and regulations and associated penalties.

2.7. SOLID WASTE MANAGEMENT PRACTICE IN ETHIOPIA

SWM and proper place disposal practices are becoming a major public health and environmental concern in urban areas of Ethiopia. In Ethiopia, like developing countries, increase of SW generation and illegal solid waste disposal practices are resulted from rapid urbanization, fast growth of economic development and population booming. “The average solid waste production rate is about 0.221kg per person per day and it is also estimated that only 2% of the population received solid waste management, collection and proper place disposal activity” (Zebenay Kassa, 2010, p 39).

This shows that the operational condition of SWM service and efforts made to change the situation are low. The involvement of private sectors are also very limited, but currently a number of micro and small scale enterprises are emerging to participate in primary solid waste collection i.e. collect garbage at source from HHs & transport it to the MSW containers and transfer points. To sum up the real situation of solid waste management in Ethiopia indicates that the problem of solid waste can’t be solved only by mere effort of municipal government, there should be large involvement of the private sectors in general and participation of micro enterprises and community in particular (Abebe Tegegne, 2006).

Therefore, in many towns of Ethiopia, there are many sanitation problem of which the most intractable. Moreover, SW their appeal piles of rotten vegetables and other organic SW around the street, riverbank and market place. The generated SW will have contact with human. People directly at several stages in the cycle, the ground at risk are numerous and include the population of unsaved area, the workers in facility produce infection, pre-school children and people living around waste disposal facilities. Ethiopia has experienced rapid urbanization and population booming or increasing urban population, rural-urban migration and rising per capita incomes (Federal Democratic Republic of Ethiopia PCC, 2008).

Presumably, increased demand for infrastructure and public services accompanies this growth, but this has not been the case (Sarkhel Chakrabarti, 2003). Many towns in Ethiopia lack the financial resources and institutional capacity to provide the most basic municipal infrastructures and services, including solid waste management. According to this, rapidly growing economic development, urbanization and improving living standards in cities have led to an increase in the quantity & complexity of generated waste (United Nation Development Program UNDP, 2004). According to this Wolkite town was one of the Ethiopian fast growing town and characterized by fast growing of population, industrial expansion, economic development & expansion of urbanization. Solid waste management practices in the town are poor and ineffective. This is because of many challenges it are institutional challenges, financial challenges, inaccessibility challenges, and unwillingness of the community. In this cause, the towns are faced to different problems like health problem, environmental problem, ecological problem and aesthetic problem. Therefore, we found to see the management strategy of the study area and conducting studies on solid waste management, disposal, amount generated and overall method.

CHAPTER THREE

3. METHODOLOGY

3.1. INTRODUCTION

The aim of this chapter is to describe about the area of study and tell about the research methodology. Under methodology; Research design, sampling technique, method of data collection, and types of data, Instrument of data collection, observation and ethical consideration are discussed.

3.2. DESCRIPTION OF STUDY AREA

Wolkite town is located in Gurage zone of Southern Nations, Nationalities and Peoples Regional State (SNNPRS), Ethiopia. Analysis of 30-year data from the National Meteorology Agency (NMA) (1988–2018) shows that the average annual rainfall varies from 856 to 1600 mm and the mean yearly temperature is 19.1° C with the maximum and minimum values of 22.5 and 6.7 °C, respectively (Aneseyee et al,2019).

According to Central Statistical Agency of Ethiopia (Csa, 2007), total population of the town was 28,856 of which 15,063 (52.2%) were male and the rest 13,793 (47.8%) were female. In 2013, the total population size of the town is expected to be 33,877 of which male accounts 17,684 and female accounts for the rest 16,193. The population growth rate at medium variant was 2.9%. The area is one of the densely populated areas in Ethiopia (Csa, 2007).

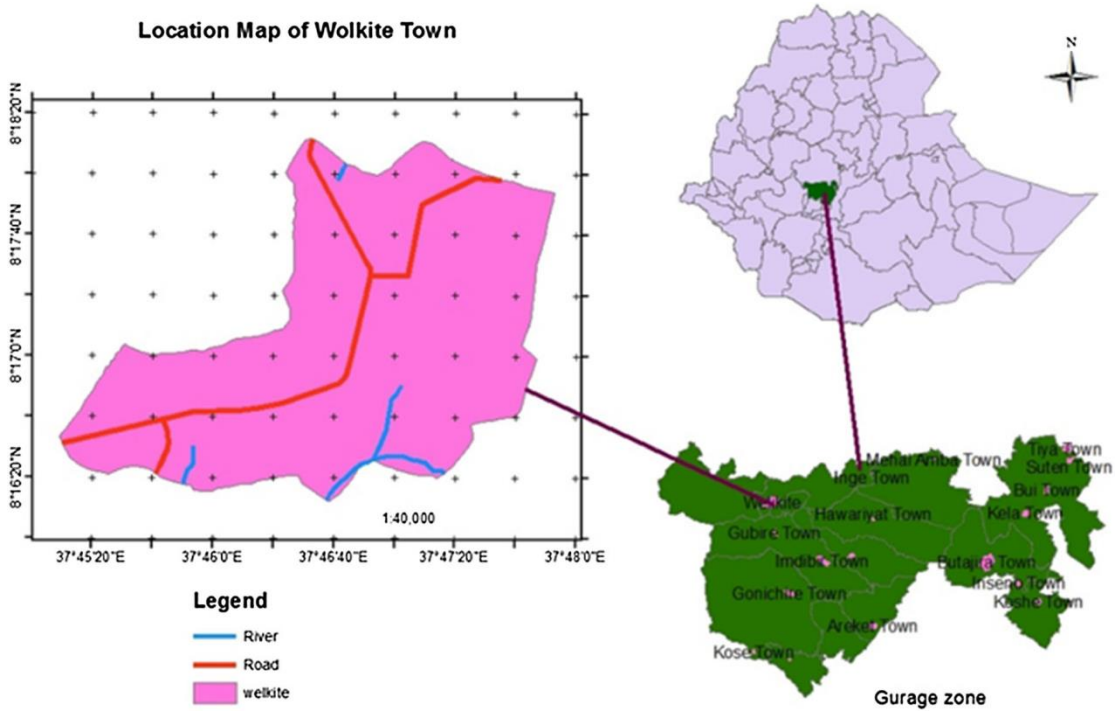

Figure 2. Location map of Wolkite town. Source: Google map

3.3. TARGET POPULATION OF THE STUDY

Population is the total collect ion of individuals to be studied and from which sample is drawn (Sekaran, 2016).Therefore, the target population of this study are residents who lived in Wolkite Menaharia Kebele merely.

3.4. RESEARCH APPROACH

There are two basic approaches of research, quantitative approach and qualitative approach. Quantitative approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis. This usually means survey research where a sample of population is studied to determine its characteristics (Kothari, 2004: p. 5).

Qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behavior. Research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative

analysis. Generally, the techniques of key informant in-depth interviews and in-depth interviews are used (Kothari, 2004: p. 5).

Triangulating both qualitative and quantitative approach (Mixed-method approach) is the most appropriate to reach at a level of truth that enables the researcher to come up with complementary and convergence of facts (Redinour & Newman, 2008). Thus, this study for the purpose of achieving the stated research objectives used both qualitative and quantitative research approaches.

3.5. RESEARCH DESIGN

A cross-sectional descriptive design was employed to gather information about the current practice of solid waste management system. Data was collected at one point in time from a randomly selected sample from the population at that time (Yeraswork Admassie, 2010: 171).

A descriptive design was used, because it is suitable for describing the existing situation, narrating facts and investigating phenomena in their natural setting (Koul, 1996). It describes what actually exists within a situation, such as current practices, situations of different aspects of the research. Since the present study is concerned with assessment of solid waste management practice in Wolkite town, the researcher assumes that the descriptive type of research is the most appropriate design.

3.6. SAMPLING TECHNIQUES

The participant was selected from the study area by using non probability and probability sampling techniques. Non probability sampling type of which is purposive sampling. The reason for choosing purposive method is to find those key informant who have available knowledge and experience that the researcher need .The researchers also uses probability sampling techniques type of simple random sampling. The reason behind selecting the simple random sampling in order to provide equal chance for all respondents, to represent the population under study fairly, to avoid any personal bias and such kind of sampling techniques is much less complicated than other method.

3.7. SAMPLE SIZE DETERMINATION

To make the sample representativeness and data quality, the researcher drowned reasonable number of representatives as a sample from the total population of Menaharia kebele household. The sample size of the study determined the formula adopted by Yemen's sampling selection formula (1967):

$n = NZ^2_{a/2}\ p\ (1\text{-}p)/Ne^2{+}Z^2_{a/2}p\ (1\text{-}p)$

Where: N = is the total population = (5333) Household

n = is the sample from the population

e = is the error term, which is 5% (i .e, at 95% confidence interval)

Using the above formula the sample size of the study is determined as

$n = 5333(1.96)^2*0.5(1\text{-}0.5)/5333(0.05)^2+ (1.96)^2*0.5(1\text{-}0.5)$

$n = 5333*3.84*0.5*0.5/5333\ (0.0025) +3.84*0.5*0.5$

$n = 5333*3.84*0.25/5333*0.0025+3.84*0.25$

$n = 5119.68/14.2925$

$n = 358$

Therefore, based on the above formula 358 population will be the researcher's respondent.

3.8. DATA SOURCE

Both primary and secondary sources of data were used to attain the objectives of this study.

3.8.1. SECONDARY SOURCE OF DATA

The secondary data are used which includes information that is obtained mainly from different reports, websites and literature, which are relevant to the theme of the study which is assess the management practice in Wolkite town, Ethiopia.

3.8.2. PRIMARY SOURCE OF DATA

The information gathered from the secondary sources is validated by the information from the primary sources. In this regard, a combination of both quantitative (questionnaire) and qualitative key informant in-depth-interviews and observation are employed to obtain firsthand information from selected respondents in Wolkite town.

Data was collected via structured questionnaire, in-depth interview with households and on-site observation.

3.9. DATA COLLECTION INSTRUMENT

3.9.1. QUANTITATIVE DATA COLLECTION INSTRUMENT

3.9.1.1. QUESTIONNAIRE

Questionnaire is the most important tool obtains quantitative information. To gather data related to the issue under this study from sample participants was a structured questionnaire that was translated into Amharic to make question simple and to communicate easily with the respondent .The questionnaire include close ended type of questions for obtaining information.

3.9.2. QUALITATIVE DATA COLLECTION INSTRUMENT

Among the number of qualitative instruments key-informant in-depth-interview and in-depth interview are employed for collecting data of this study.

3.9.2.1 KEY INFORMANT IN-DEPTH INTERVIEW

Key informant in-depth-interview was conducted with waste collecting workers in the area and key administrative staffs in the kebele administration/municipality that were selected purposively through a non-probability sampling. An interview guide was used as a check list of the issues to be covered.

3.9.2.2 IN-DEPTH INTERVIEW

In-depth interview will be the other instrument that will be used in this study. The participants for the sake of this instrument will be selected based on the researcher's desideration whom we think are knowledgeable and provide us the suited information related to the study issues will be undertaken.

3.10. METHODS OF DATA ANALYSIS

The collected data was analyzed both quantitatively and qualitatively by using descriptive statistical techniques such as numbers and percentages and descriptive narration. A descriptive statistical technique was used for data collected through questionnaires, whereas descriptive narrations were used for data collected through interview and observation.

3.11. ETHICAL CONSIDERATION

To enhance the reliability and validity of the data the researchers will take data quality assurance. In order to apply a reliable data, the researchers will take across check the data which will collect not be stored type. And the validity of the method will be improved by knowing the actual behavior of the respondents, while the data will be collected. And we were guarantee confidentiality and anonymity by Permissions letters were sought from all relevant authorities before commencing the study. This included a letter from Wolkite University, department of sociology that would authenticate the research. The purpose of the study was briefly explained for the participants and they were informed that their responses were kept confidentially and we were guarantee anonymity by not revealing any personal information. Finally the ready-made questionnaire was administered for the selected participants by the researcher.

Information was gathered on voluntary basis and ground of the respondents. The information given by the respondents was treated with the highest degree of confidentiality and privacy.

CHAPTER FOUR

4. DATA PRESENTATION AND ANALYSIS

This part mainly deals with the analysis and result obtained from the sample survey (2023) through questionnaires and qualitative data drawn from key informant in-depth interview, in depth interview and field observation. A total of 358 questionnaires were distributed by the researchers. Among these 343 questionnaires were properly filled returned, (96%) response rate, while 15 were not returned and inappropriate filled.

The key informant in-depth interview was held with 3 workers from Wolkite town, Menaharia kebele municipality officer in the solid waste management sector .The observation which was carried out personally by the researchers through walk and in-depth interview was held with waste collection workers and households of the studied area.

4.1. SOCIO ECONOMIC AND DEMOGRAPHIC CHARACTERSTICS OF RESPONDENTES

Table 1. Socio economic and demographic characteristics of respondent

No	Variable	Category	Frequency	Percent
1	Sex	Male	118	34.5%
		Female	225	65.5%
		Total	343	100%
2	Age	15-25	68	19.8%
		26-50	205	59.8%
		Above 50	70	20.4%
		Total	343	100%
3	Educational level	Illiterate	10	2.9%

		1-4 grade	54	15.7%
		5-8 grade	72	20.9%
		9-12 grade	86	25.2%
		Certificate	38	11.2%
		Diploma	52	15.1%
		1st Degree and above	31	9%
		Total	343	100%
4	Household ownership condition	Kebele rental	77	22.6%
		Private rental	190	55.3%
		Private	73	21.2%
		Other	3	0.9%
		Total	343	100%
5	Average monthly income	Low below 1000	32	9.34%
		Medium 1000-1500	70	20.4%
		High above 1500	241	70.26%
		Total	343	100%
6	Marital status	Married	203	59.18%
		Un married	99	28.8%
		Widowed	21	6.14%
		Divorce	20	5.88%
		Total	343	100%
7	Religion	Orthodox	150	43.75%
		Muslim	110	32.08%
		Catholic	11	3.2%
		Protestant	51	14.86%
		Adventist	19	5.53%
		Other	2	0.58%
		Total	343	100%

Source: Survey data, 2023

As we can see from table 1, out of the total respondents data collected from 343,225(65.5%) were females while the remaining 118 (34%) males. When we look at the age of respondents, age between 15-25,68 (19.8%) ,age between 26-50, 205 (59.8%) , and above 50, 70 (20.4%).Based on this data ,we can say the majority of respondents are age between 26-50.As to the educational status of respondent out of the total respondent 10(2.9%) responded they are illiterate ,54(15.7%) between 1-4 grade complete, 72(20.9%) between 5-8 grade complete , 86(25.2%) between 9-12 grade complete , 38(11.2%) are certificate, diploma 52 (15.1%), first degree and above 31(9%).Household condition of respondents 77(22.6%) are kebele rental,190(55.3%) are private rental ,73(21.2%) are private owners and 3(0.9%) are other household condition. Concerning the family monthly income of respondents, 32(9.34%), said that they have family monthly income less than 1000 birr, 70(20.4%) between 1000-1500 birr, 241 (70.26%) above 1500 birr. Furthermore, marital status of respondent also illustrated in table 1and categorized into four groups. Thus, dominant 203(59.18%) number of respondents are married, 99(28.8%) are unmarried, 21(6.14%) are widowed and 20(5.88%) are divorced respectively. Finally, the religion of sample respondents were 150(43.75%) are Orthodox, 110(32.08%) Muslim, 11(3.2%) Catholic, 51(14.86%) Protestant, 19(5.53%) Adventist and 2(0.58%) are other religion followers. The educational characteristics of sample respondents also resulted positive impact to get brief and different perceptions .Then socio economic and demographic characteristics of a given population have their own implication and relation with SWM and disposal practices in particular area.

4.2. THE CAUSE POOR SOLID WASTE MANAGEMENT AND DISPOSAL PRACTICE IN THE STUDY AREA

Table 2. Cause of poor solid waste management and disposal practice

Item	Characteristics of respondents	No of respondents	Percentage
What are the causes of poor solid waste management in this kebele?	Absence of SW bins	112	32.65 %
	Low community and government involvement in SWM	116	33.81%

	Operational inefficiency in SWM and disposal practices	14	4.08%
	Negligence	101	29.46%
	Total	**343**	**100%**

Source: survey data, 2023

Regarding those respondents who do not have the habit of proper solid waste management, the respondents put different reasons for this problem. Due to these reasons absence of SW bins 112(32.65%), low community and government involvement in SWM 116(33.81%) , operational inefficiency in SWM and disposal practice 14(4.08%) and the rest negligence101(29.46%).From this finding we can understand that the low community and government involvement in solid waste management is manifested as cause of poor solid waste management ,the study under taken in Patan (1999) argued that individual and families should assume responsibility for their own health and welfare and for those of community developments by contributing their own capacity in a way that could bring development so this study support our finding that the community have high share on the solid waste management and also the government. Consequently, these problems may lead them to dispose their wastes in open fields, canal side, along the road side and burning them in open air. According to key informant interview, ‘‘expression as institution they have financial problem un able to fulfill equipment such as they have only two cars that collect all the town solid waste and un able to buy other car but the community and government involvement have the lion share’’. And also the other key informant waste collector mentioned that, ‘‘ low community and government involvement is main cause of poor solid waste management because the community and the government cannot work hand to hand the problem cannot solve the government does not work alone without the community support in solid waste management. First the community must work on solid waste management strongly for their wellbeing but the community do not implement even while we are sweeping some people threw different waste, while the door to door collection time do not separate waste by its kind and sometimes the some are toward negative attitude for collection workers. so,

it requires collaboration involvement to destroy root cause of poor solid waste management.

Figure 3. Lack of waste bin obliged the community to disposed everywhere

4.3. EXAMINE THE PARTICIPATION OF COMMUNITY AND INSTITUTION IN SOLID WASTE MANAGEMENT AND DISPOSAL PRACTICE WOLKITE TOWN, MENAHARIA KEBELE

Table 3. Community cleanup campaign participation

Item	Characteristic of respondents	Percentage
Have you ever participated in a cleanup campaigns in your kebele?	Yes	45.77%
	No	54.23%
	Total	**100%**

Source: survey data, 2023

In table 3, for the question have they participate in a cleanup campaigns 157(45.77%) responded they were participate in cleanup campaigns and the rest of 186(54.23%) were did not participate in any cleanup campaigns that prepared by kebele. campaigns also inform people of their responsibilities as solid waste generators and of their rights as a citizens to solid waste management services (Schubeler, 1996).

Table 4. Sanitation agent supervision and control on illegal dumping of solid waste

Item	Characteristic of respondents	No of respondents	Percentage
Have you ever seen the sanitation agent making supervision and control on illegal dumping of solid waste on the street, open area, river side's and other areas?	Yes	18	5.24%
	No	325	94.76%
	Total	**343**	**100%**

Source: survey data, 2023

According to the survey data ,18(5.24%)respondent said they have seen sanitation agent make supervision and control on illegal dumping and 323(94.76%) not. In related to in-depth interview and survey questionnaire data they are agreed on the municipalities do not control and supervise. But, the data according to key informant in-depth interview ''the municipals make control and supervision on solid waste and check door to door in a week or two week, and health extensions mainly working with community to create awareness and the dwellers waste their rubbish by burning or by using waste collectors''. Oppositely, by the researchers observation the municipality did not make control and supervision the researchers observe in the kebele the community disposed waste on everywhere and even in-front of kebele office and in-front of municipality/Mazegaja bet/ office there is waste that the community disposed.


Figure 4. Lack of super vision and control of municipality

Table 5. Evaluation of the effort made by the municipality to provide efficient SWM service compared with other services

Item	Characteristics of respondents	No of respondents	Percentage
How do you evaluate the effort made by the municipality to provide efficient SWM service compared with other service of the town? Such as water supply, electricity, telephone etc….	Very weak	96	27.98%
	Weak	167	48.67%
	Moderate	64	18.65%
	Strong	12	3.5%
	Very strong	4	1.17%
	Total	**343**	**100%**

Source: survey data, 2023

As to the overall solid waste management in the study area there was a question raised to the respondents to evaluate it effort made by the municipality to other service of the town,96(27.98%) respondents replied that they are very weak,167(48.67%) weak,64 (18.65%) moderate, 12(3.5%) strong, 4 (1.17%) very strong. The data showed that about 167(48.67%) respondents are respond SWM service are weak compared to other service provide by the town.

Table 6. Satisfaction level with the municipal SWM service of the town

Item	Characteristics of respondents	No of respondents	Percentage
Are you satisfied with the municipal SWM service of the town which delivered by sanitation, beautification and park development of wolkite under the jurisdiction of municipality?	Very satisfactory	4	1.16%
	Satisfactory	52	15.18%
	Moderate	67	19.53%
	Un satisfactory	145	42.27%
	Very un satisfactory	75	21.86%
	Total	**343**	**100%**

Source: survey data, 2023

As to the overall solid waste management in the study area there was a question raised to the respondents to evaluate its satisfaction, 4(1.16%) respondents replied that they are very satisfied, 52(15.18%) satisfied, 67(19.53%) moderately satisfied, 145(42.27%) unsatisfied and the rest 75(21.86%) very unsatisfied by the service delivered by sanitation, beautification and park development of the municipality.

Table 7. Use service provided by MSE door to door service

Item	Characteristic of respondents	No of respondents	Percentage
Do you use MSEs for door to door solid waste collection from your residence?	Yes	135	39.35%
	No	208	60.65%
	Total	**343**	**100%**

Source: survey data, 2023

When the researchers tried to assess the number of household that get the service rendered by micro and small scale enterprises in the study areas as shown in the table

16, 135(39.35%) respondents responded that they get the service while 208(60.65%) because of low door to door waste collection access had no access to use MSE service.

4.4. CHALANGES OF SOLID WASTE MANAGEMENT AND DISPOSAL PRACTICE IN THE STUDY AREA

Table 8. Challenges for SWM and disposal practices

Item	Characteristics of respondents	No of respondents	Percentage
What are the main challenges for solid waste management and disposal practices in wolkite town Meneharia kebele?	Financial challenge	148	43.14%
	Lack of public awareness and attitude	105	30.61%
	Low level of implementation of rule and regulation	81	23.63%
	Other	9	2.62%
	Total	**343**	**100%**

Source: survey data, 2023

At the field observation, interview and key informant interview results, show that in Menaharia kebele, ‘‘solid waste disposal practice are not controlled and properly managed. It possible to understand from discussion that solid waste management and disposal practice on the town are poorly manage, and the service are clearly inadequate’’. The challenge for this are financial challenge accounts 55(16.03%), lack of public awareness and attitude accounts 198(57.72%), low level of implementation of rule and regulation accounts 81(23.63%) and other challenges 9(2.62%).

Concerning this, the key informant interviewees expression (replay) goes as follows for the reason why the sector did not provide containers at least in some parts of the town, permanently solve vehicle related problem and other necessary facilities. The municipality coordinator and leader said that, ‘‘did not have sufficient finance and strong committee coordination which can support for the improvement of solid waste

management and disposal activity and to fulfill collection equipment's''. Moreover, the key informant interviewees said that ''the budget assigned to solid waste management and disposal practices are inadequate to run the service in a proper manner and higher municipality official committees' coordination are so weak. Due to this, the sector faced lack of necessary facility in order to provide effective and quick SWM in that town''. This finding coincides what has been founds by (Zurbrügg and Schertenleib, 1998).Therefore, one of the challenges that influence SWM and disposal practice in Menaharia kebele for the ineffective service delivery was the shortage of finance. Community attitudes towards in appropriate disposal of solid wastes must be adjusts in order to avoid placing of additional burden on the collection program. In other words, the information should give an assurance about the community are aware of the negative impact of the illegal disposal practices of solid waste management (USAID, 2004).

The key informant interview of town municipality and SBPS staff members are agreed on '' the implementation of the rule and regulation are reduce the illegal solid waste disposal practice creating awareness of the society are minimize the impact of illegal SW disposal practices related problem and improve the environment quality, health and aesthetic condition. But, practically the environmental policy or the rule and regulation are not implemented''.

Table 9. Community awareness about solid wastes rule and regulation

Item	Characteristic of respondents	No of respondents	Percentage
Do you know about the rule and regulation regarding to SWM?	Yes	6	1.75 %
	No	337	98.25%
	Total	**343**	**100%**

Sources: Survey data 2023

Data in table 9, 337 (98.25%) of the respondents revealed that they did not know about the rule and regulation of solid waste management and disposal practices .The rest 6(1.75%) of the selected respondents stated that they know about solid waste management and disposal practices related rule and regulation. According to the above survey data the researchers conclude that in Menaharia kebele the

environmental policy, rule and regulation are not implemented and practiced. The community was not known and aware about the rule and regulation of proper handling, collection and managing solid wastes which regenerated from different sources. Consistently, as the key informant interview of municipality of SBPS staff members are agreed on *''the rule and regulation regard to solid waste are not known deeply by the community and not implemented by stakeholders''.* According to the researchers observation the community disposed their wastes everywhere it support researchers finding.

Figure 5. Community awareness and poor solid waste disposal practice

Table 10. Creating awareness of the community to reduce illegal solid waste disposal practices

Item	Characteristics of respondents	No of respondents	Percentage
Do you agree creating awareness of the community reduce illegal/improper solid waste disposal practices?	Agree	133	38.77%
	Strongly agree	188	54.83%
	Dis agree	19	5.53%
	Strongly dis agree	3	0.87%
	Total	**343**	**100%**

Source: Survey data, 2023

The above table shows that the result obtained from the question raised to household respondents so as to creating awareness reduce improper solid waste disposal practice, 133(38.77%)are agree, 188(54.83%)strongly agree, 19(5.53%)are disagree and 3(0.87%) are strongly dis agree. According to the key informant in-depth interview

with the Kebele's health extension workers, ‘‘ although there are some attempts have been trying by the government like awareness creation through campaign, door to door extension program to give education how to separate, handle and dispose wastes and by established safety-net program for collection waste generated from households. These days there are some changes regarding to the awareness of the community as compared to the previous but still now not sufficient .Indeed, there should a strong effort that government should exert with the collaboration of community in order to bring change’’.

Table 11. Solid waste bins

Item	Characteristic of respondents	No of respondents	Percentage
Are there community solid waste bins in your kebele?	Yes	2	0.59%
	No	341	99.41%
	Total	**343**	**100%**

Source: survey data, 2023

From the total respondent of 341 (99.415%) said that there is no solid waste bin and 2(0.59%) of respondent say there is solid waste bin.

From the point of proper solid waste management and disposal practices with regard to human health, aesthetic value and the suitability of beneficiaries to use, the type and distribution of solid waste collection container should be the main issue or concerns of responsible body of the particular area. On the other hand, absence of solid waste collection containers aggravated the problem of public health, aesthetic condition and environmental pollution of the town. The interview held with household has indicated that the ‘‘absence of SW bins/container in the town is one of serious factor that prevent from effective solid waste management and disposal practices. Also the respondents say that in the town they are not temporary solid waste storage and collection materials. In this causes now the society disposed of on unauthorized place by looking as the last alternatives. This is the causes for environmental, ecological aesthetic condition and human health problems in that kebele’’.

And the key informant waste collector said, ‘‘if the government settle bins it can minimize illegal/ improper solid waste disposal’’.

Figure 6 Solid waste bin of the kebele near to Yaberus School

4.5. CONSQUENCE OF SOLID WASTE ON HUMAN HEALTH AND ON THE ENVIRONMENT

Table 12. Improper solid waste disposal effect on human and environment

Item	Characteristic of respondents	No of respondents	Percentage
Do you know about improper solid waste disposal practices affect environment, human life and ecology?	Yes	324	94.46%
	No	19	5.54%
	Total	**343**	**100%**

Source: survey data, 2023

Awareness is one of the determinants of effective solid waste management .More specifically ,the result of this variable can be interprets as the level of respondents "awareness increases; the probability of effective solid waste management at house hold level and individual level would be essential .The finding of this study was found to be match with what has been found by (Zhu et al ,2008) ; (Kamran ,2008);and (schubeler ,1996).This view also highly strengthened by :Attitudes may be positively influences through awareness building campaigns and educational measures on the negative impacts of inadequate solid waste collection and disposal activity with regard to public health and environmental conditions, and the value of effective disposal .Such campaigns should also inform people of their responsibilities as solid waste generators and of their rights as a citizens to solid waste management services (Schubeler, 1996).

In table 12, the respondents were also asked to identify their awareness about effect of improper solid waste disposal practice on environment and human life and 324(94.46%) replied that they know about its effect and while 19(5.54%) do not know its effect. According to interview held with households ‘‘they know that improper solid waste management can expose to different illness which are hazardous for life, deplete resources, block sewerage line and makes the environment favorable for the breeding of flies and other insects that could bring diseases but there is the problem to implement their knowledge and because of many reasons they duped illegally or improperly on everywhere’’.

Table 13. Disease occur due to improper solid waste disposal practices

Item	Characteristics of respondents	No of respondents	Percentage
What type of disease most of the time occurred due to improper solid waste disposal practices?	Respiratory disease and flue	224	65.3%
	Cholera and typhoid	73	21.28%
	Malaria	44	12.84%
	Other	2	0.58%
	Total	**343**	**100%**

Source: survey data, 2023

As it is observed in table 13, from some most of them are partially caused by in appropriate solid waste disposal activity are 224(5%) exposed to respiratory disease and flue, 73(21.28%) of them exposed to cholera and typhoid, 44 (12.84%) of them exposed to malaria and also 2(0.58%) exposed to some other disease that are relate to it. According to data obtained from interview held with collection workers and households ‘‘they are most of the time exposed to high odor generate from wastes and that cause respiratory disease and flue and when summer season comes unable to properly sweep the road, the weight of waste become heavy and peoples dispose their rubbish in sewerage canals it creates the condition for breeding of some insects like malaria, cholera and some others insects that cause seasonal epidemics’’.

The other key informant’s waste collector said, ‘‘especially we are exposed to respiratory disease and flue frequently. The government does not give safety material

for the job and give low salary because of our low salary we did not visiting a doctor we treat our selves by traditional mechanism''.

4.6. THE RESPONSIBLE BODY FOR THE PROBLEM

As the key informant, household and collection workers interview said that ''each and every community have the responsibility to manage their waste, disposed only allowed area to waste, participate in campaign, respect rule and regulation regarding to solid waste management and disposal, support/ stand with government hand to hand to solve the problem and must to have the feeling of responsibility and control and give awareness each other''.

On the side of the government or the stakeholders said that ''they have responsibility to response quickly to the community question and provide adequate service. Make the service active, make the town clean, make control and supervision in the kebele, take actions on who do not respect the rule and regulation, make plan pattern for bins where to settle, removed waste on time, give awareness for the community and work cooperatively on the issue is the responsibility of stakeholders''.

4.7. FUTURE PLAN ON THE SIDE OF MUNICIPALITY TO SOLVE THE PROBLEM

According to the key informant interview held with SBPS solid waste management committee coordinator and leader, ''the issue of solid waste management is one of the 13 plans of the city. In the previous times the container/bins in the kebele settle near to the community and without plan and considering the risk comes from related to it. It exposed the community for several disease, the areas around the container are usually heavily littered and often causing air pollution and destroy aesthetic nature of the environment. Besides when the container is full of solid waste, mostly because of different reasons the containers are not removed frequently. Because of that as a municipality planed for future to minimize the problems related to it plan for where to settle the bins with supported by map and to improve the institutional capacity to disposed/ removed the waste on time and better capacity to provide good service.In addition to minimize amount of waste and its risk, the municipality planned new technology to reuse and recycle wastes and now start different activities related to

solid waste. For example the activities held by municipality give training for who want to work on compost production by using solid waste. Some youths in the city start to produce compost by using Ashes, Chat waste/geraba/ and by other compostable wastes. The municipalities give training and as soon as possible start all works and to buy the machine. And also, the municipalities have awareness creation program on FM radio once in a week to give awareness for the community''.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

Human activities create solid wastes in different ways, it is the way these solid wastes are generate from different sources, and they will be handle at a source properly, collect and disposed on selected landfill or dumpsite. They do not implement this activities the impact or risks to the human life, ecology, and aesthetic condition of the environment and in generally, affect the public health by transmission of disease like cholera, malaria, diaries and the like. Where penetrating human activities like institutional, commercial, domestic and individual activities which generates unwanted of useless materials. This un-wanted material are affect the urban centers. Solid waste management and disposal practices are complex, because it involves a multitude of scientific, economic, practical and social factors. Similarly, it is observed that lack of community involvement, absence of budget allocation, lack of institutional coordination or weakness, absence of privet sectors participation on solid waste management, lack of SW collection and transported equipment's or materials, , lack of transportation track or vehicle, lack of community solid waste bins. The other problem is social problem associated with unwillingness, awareness problem, low implementation of rule and regulation, lack of commitments of SBPS service not effective and satisfactory in the Wolkite town. So the Wolkite town administration, municipality, SBPS, local community leader's, investors, individuals & the zonal administration give serious attention for proper management and disposal practice activity of SW in the town. Because of the complication of the condition & its impacts on the human life, aesthetic condition of the town and environmental pollution aspect the consequences will be high. In generally, lack of community participation and absences of involvement regarding to SWM and disposal practices, absence of privet sector participation on solid waste management activities. Absence of coordination of responsible sectors on reducing solid waste from the town and absence of community SW bins and lack of solid waste collection and transported vehicles. And this lead to

increase illegal solid waste disposal practices in the town. Most of the generated solid wastes are dumped in road side, streets, open spaces, stadium around, back to Yaberus school and in sewerage canals and this is which affect human health disease transmission like respiratory disease and flue, malaria, diarrhea, cholera, animal health & consequence in social, economic, environmental and affect the ecology of loos of biodiversity. Moreover, in the town there is weakness of application of existing rule, regulations polices and laws on SWM and disposal practices methods. Therefore, all the objectives set were achieved and with regard to the main objective of the study it can be concluded.

Finally, the present study finding indicated that the SWM system in Wolkite town is very weak and need improvement .Furthermore, the town municipality must develop an appropriate SWM plan and technological support to minimize the amount and to can reuse the generated waste.

5.2. RECOMMENDATION

As stated or mentioned earlier, solid waste management and disposal practices which are solid waste collection, disposal or dumping and transportation practices and implementation strategies in the Wolkite town municipality, SBPS and in other stakeholders are weak or poor.

To advance or improve this, the following recommendation are specify or given

- Develop and promote option for waste recycling and reuse
- To increase the collection system and brings change in solid waste management, strengthened awareness creation campaign will have a great role. To implement this, coordinating and working together with different stake holders like media, kebele, idir, school clubs, NGOs and other associations by building their capacity has vital role. Since solid waste is one of the biggest problem which threaten the life of people, educating the people about its devastating effects and means through which the problems can easily be handled is essential. Especially, educating the people about the prevention, separation and recycling can help the community by saving them from its expected negative outcome and as the same time save time and save their resources that can be an additional income to the family.

- The Environmental Protection Agency which is the regulatory authority on sanitation should ensure routine monitoring of management of the dump site. The municipality should also give much emphasis for that dump site area because of its negative environmental impact on the lives of people in a nearby community.
- The municipality should create awareness about the specified rule and regulation about the town's and Kebele's solid waste management and about sustainable solid waste management option.
- The municipality should give adequate emphasis for solid waste management in general and requires policy priority.
- Give free health service and give fair salary and safety material support for sweeper and waste collector to minimize at-least some health risk factors.
- Residents are shall to help the collectors by storing they rubbish properly in garbage.
- The solid waste production in Wolkite town is rapidly growing, the problem of solid waste is strengthening and therefore, it requires additional strong rule and regulations of solid waste management accompanied by reasonable penalties.
- Providing support to encourage individuals and companies operating in the field of waste collection, separation and recycling by giving incentives in addition to free of tax and assisting them to market their product locally can be a motivational factor and at list this would result in better management.
- Improve solid waste collection by preparing permanent programs, increasing the number of trucks, by employing other method of collection like block and curbside collections, control and supervision field workers, increase human resource of the department, increase the number and strength of MSSEs.
- Design and construct proper final solid waste disposal site.
- Establish strong coordination and linkage between higher up to lower official's workers to solve the problem regarding to solid waste management and disposal issue.
- Solid waste management municipalities should distribute solid waste bin/ containers to decline the improper and open space disposal.

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APPENDIX 1

WOLKITE UNIVERSITY

COLLEGE OF SOCIAL SCINCE AND HUMANITIES

DEPARTMENT OF SOCIOLOGY (BA PROGRAM)

Questionnaire prepared for sample households in Wolkite town, Meneharia kebele.

This Questionnaire is prepared for an academic purpose for the fulfillment of BA degree in Sociology studies. Specifically the objective of the study is to identify the cause of poor solid waste management and disposal practice, to examine the participation of community and institution in solid waste management and disposal practice, to identify challenges of solid waste management and disposal practice and to assess consequence of solid waste in Wolkite town, Menaharia kebele. Therefore, your response is very important for the success of the study because all information that you provide determines the analysis and conclusion of the research. Hence, you are kindly requested to give your response by selecting (circling) your answer from the given alternative choice or describing your opinion. Please be informed that your response is kept in confidential and you are not required to write your name. I would like to thank you for your cooperation.

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.

1. Sex: Male☐ Female ☐

2. Age: 15-25 ☐ 26-50 ☐ above 50 ☐

3. Educational level: Illiterate ☐1-4 grade complete☐ 5-8 grades complete ☐ 9-12 grades complete ☐Certificate ☐diploma ☐First degree and above ☐

4. House ownership condition:

Kebele rental house☐ private rental house☐ private house ☐ if other ☐

5. Average monthly income 1.Low income below 500 ☐ 2.Medium income between 1000-1500 ☐ 3.High income above1500 ☐

6. Marital status 1.married ☐ 2.un-married ☐ 3.widowed ☐ 4.divorce ☐

7. Religion 1.Orthodox ☐ 2.Protestant ☐ 3.Muslim☐ 4.catholic☐

5. Adventist ☐ 6.other ☐

Part two household survey questionnaire

1. What do you think about the cause of solid waste in this kebele?

   1/ over population growth 2/commercial activities and residential waste 3/constructional and institutional waste 4/industrial waste 5/medical waste

2. Where is dumped solid waste that is generating from your house?

   1/ everywhere 2/ Land fill 3/ Open space 4/Burning 5/ other

3. Have you ever participated in a cleanup campaigns in your kebele?

   1. Yes 2. No

4. Do you agree improper solid waste disposal practices affect environment, human life and the ecology?

   1/ Yes 2/ No 3/ I do not know

5. What type of disease most of the time occurred due to improper solid waste disposal practice?

   1/respiratory disease and flue 2/cholera and typhoid 3/malaria 4/other

6. Do you agree creating awareness of the community reduce illegal/improper solid waste disposal practices?

   1/ agree 2/ strongly agreed 3/ dis-agree 4/ strongly dis- agreed

7. Do you know about the rule and regulations with regarding to solid waste managements?

   1/ yes 2/no

8. Have you ever seen the sanitation agent making supervision and control on illegal dumping of solid wastes on the streets, open areas, river side's and other areas?

   1. Yes 2. No

9. In general, are you satisfied with the municipal solid waste management service of the town which is delivered by sanitation, beautification and park development of Wolkite under the jurisdiction of municipality?

1. Very satisfactory 2. Satisfactory 3. Fair 4. Unsatisfactory 5.very unsatisfactory

10. How do evaluate the effort made by the municipality to provide efficient solid waste management service compared with other services of the town such as water supply, electricity, telephone etc.

1. Very weak 2. Weak 3. Fair 4. Strong 5. Very strong

11. What are the causes of poor solid waste management in this kebele?

1/ absence of SW bins 2/ low community and government involvement in SWM 3/ operational in efficiency in SWM 4/ negligence

12. What is the main challenge for solid waste management and disposal practices in Wolkite town Menaharia kebele?

1/financial challenge 2/lack of public awareness and attitude 3/low level of implementation of rule and regulation 4/other

13. Are there community solid waste bins in your kebele?

1/yes 2/ no

14. Do you use micro and small scale entrepreneur for door to door solid waste collection from your residence?

1. Yes 2. No

APPENNDIX 2

KEY INFORMANT INTERVIEW GUIDE

Part I:

Attention: - all the information obtained through this questionnaire shall be uses for The academic purpose only. Anyway, the data collected will be stored, handled and Kept confidentially and could not have any effects on the respondents' privacy, and The researcher is fully responsible.

Background Information

I. Name of respondent----------

ii. Sex of the respondent----------

iii. Age of the respondent----------

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

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

Part II: Key informant in-depth Interview Questions on Solid Waste Management Practice of the Town.

1. Do you believe illegal SWM and disposal practices affect human beings & environment? What type of impact occurs most of the times due to improper solid waste disposal in this area?

2.Can you explain about the rule, regulation, its implementation, and monitoring that have been propose by your bureau for efficient practice of SWM in Wolkite town?

3. Discuss about the situation of public awareness and involvement. Existing trends and practices of solid waste management and disposal practices in Wolkite town?

4. What are the main challenges for SWM and disposal practices in Wolkite Town?

5. Who are responsible body for the problem of solid waste management?

6. What is the municipality's Future plan and recommendation on improving the existing solid waste management practice in the town?

APPENDIX 3

Interview question for Household and Waste Collection Workers

Attention: - all the information obtained through this questionnaire will be uses for the academic purpose only. Always, the data collected will be stored, handled and kept confidentially and could not have any effects on the respondents' privacy and the researcher is fully responsible. To verify this, please do not give your name and any address anywhere in the questionnaire.

1. How do you see the existing situation of solid waste management & disposal practice?

2. What is the cause for illegal solid waste dumping? In addition, what are the consequences of social, environmental and human impacts of improper solid waste disposal practices?

3. Who is responsible for illegal SWM and disposal practices on everywhere?

4. Are the communities know the rule and regulation of the environmental laws and how you look the community participation on SWM and disposal practice?