SOLID WASTE MANAGEMENT IN KIRKOS SUB CITY: CHALLENGES AND ISSUES

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DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any university, and all sources of materials used for the thesis have been duly acknowledged.

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Abstract

With increase in urbanization, the issue of SWM has become one of the serious concerns in the cities of developing countries. Kirkos sub city plays key role as an important national and continental center by hosting many key international and national institutions and giant hotels. However, it confronts the challenges of in appropriate dumping of solid wastes, lower capacity to provide SW collection and transportation service. This poor SWM system in the sub city negatively affects health, aesthetic values, as well as reputation of the sub city in particular and the city in general.

The main objective of this study is to investigate the SWM practices in Kirkos sub city, with a special emphasis on assessing level of key stakeholders' participation. It is hoped that the study contributes to improvement in SWM system of the sub city. The study is based on primary and secondary data collected from 104 households, 13 sanitation MSEs, Idirs, and relevant public offices.

In Kirkos sub city poor SWM system is manifested by low solid waste collection and transportation frequency; dumping of solid waste every where, over flown garbage collection containers, and low practice of solid waste reduction, and separation at source. Causes of poor SWM in the sub city includes shortage of finance to provide necessary materials for solid waste management like dust bins, containers, and vehicles used for transportation; lower human resource capacity in responsible public offices; lack of awareness as well as lower level of participation by key stakeholders. Contribution of all stakeholders in the activity of solid waste management has potential of solving the above challenges. However this study found that except some beginnings with micro and small enterprises only in some aspects of solid waste management, contribution by other stakeholders in the sub city by small and medium enterprises, NGOs, and CBOs is limited.

In conclusion it is recommended that NGOs and other community organizations have to be mobilized to cover the gaps in awareness, finance, and needs for research and new techniques and technology of SWM. The existing institutional arrangements also need to be revised in such a way to practically bring a system of better participation, accountability, efficiency and effectiveness in the ultimate pursuit clean, healthy and attractive Addis Ababa.

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Acronyms

CBO	***Community Based Organization***
ISWM	***Integrated Solid Waste Management***
MSE	***Micro and Small Enterprises***
MSWM	***Municipal Solid Waste Management***
NGO	***Non Governmental Organizations***
SW	***Solid Waste***
SWM	***Solid Waste Management***

Chapter One

Introduction

1.1 Background of the Study

With its prospects of providing 'the diversity and energy for human pursuits', rapid urbanization has become a global phenomenon. On the other hand, urban centers of African countries are facing the challenges of environmental degradation. Poor solid waste management (SWM) system is one of the leading causes for deterioration of urban environment, the spread of pathogenic organisms, the degeneration of scenic beauty and increase in pollution (AASBPDA,2008:5). Hence, municipal solid waste management (MSWM) has become a major environmental issue in urban centers of developing countries including Addis Ababa city. By its nature solid waste management is a practice which involves participation of all stakeholders (FDRE, 2003: 76).

Addis Ababa plays key national, continental and global importance; and Kirkos sub city of Addis Ababa is bestowed with carrying out much of these respected roles than other sub cities. As a national center, Kirkos sub city hosts Federal Government Offices and giant institutions including the national palace. As an international and continental center it hosts offices of the African union (AU), African Economic commission (AEC), embassies, international NGOs and more than 40 international and national hotels, which include Sheraton Addis, Hilton, Ghion, and Ethiopian Hotels. However, this status of Addis Ababa city in general and Kirkos sub city in particular, is often challenged with poor solid waste management practices (Kirkos, 2008).

It is the role of effective local government to make cities more attractive, healthy, competitive and efficient for its residents, visitors and investors.

Solid Waste Service is a very crucial public service, to achieve these objectives. However, local governments could and should not carry out the responsibility alone without an effective participation of stakeholders concerned.

In many urban centers of Africa the bulk of solid waste is either left uncollected or irregularly collected, and where it is collected it is transported with an inappropriate mode of transportation, and the disposal site and methods are often inappropriate. Addis Ababa, the capital city of Ethiopia, is not an exception to this fact. In Addis Ababa the practice of solid waste collection and disposal has been carried out for over 50 years. Nevertheless, the management system and practice is far from being satisfactory (FDRE, 2003:76).

In Addis Ababa, residence is the major source of solid waste (75%), followed by business institutions (9%), street (Road) sweeping (6%), industry (5%), hotels (3%), and hospitals (1%). In terms of content 60 to 70% of the solid wastes generated in the city can be collected and transformed into compost and biogas; whereas 15% can be recycled or reused (AASBPDA,2008:2).

Hence the content of SW generated in Addis Ababa implies the existence of opportunity for private sector participation in the activity of SWM, *i.e.* SW collection, processing for re-use and recycling, as well as transportation and disposal. In addition to employment opportunity creation, the activity of recycling and re-use helps to reduce the cost of managing solid wastes by reducing the amount of solid wastes to be finally disposed.

There are many stakeholders which could and should play their role in SWM. Often the most successful initiatives for solving local environmental problem spring from the community that face the challenge of degradation on daily basis (FDRE, 2003: V). In general, actors and partners concerned with SWM are service users, service providers, intermediaries and/or regulators, which include local governments, private formal and informal sector, non-governmental organizations (NGOs) and community (World Bank and UNCHS, 1996).

Currently, there is a wide spread belief that the role of the state as a provider of services has to be transformed into a warrantor, facilitator and coordinator of public services (Gilbert et al., 1996). Both in developing and developed countries private formal and informal sectors, local governments, NGOs and CBOs are parts of every SWM system (Arnold, 1995). An effective participation of these stakeholders is very important to improve the existing solid waste management problem in the study area.

1.2 Statement of the Problem

Efficient solid waste management is one of the key elements for the creation of healthy and attractive urban Environment. Addis Ababa Clearness Management Agency is mandated to ensure the collection, transportation and disposal of solid wastes in the city. Currently there are efforts to participate the private sector and other community actors in SWM practice.

However; inefficiencies in solid waste management in Kirkos Sub City is clearly observable from the accumulation of solid wastes around residential area, along street and foot paths, illegally dumped on open areas and river courses resulting in pollution of the neighborhoods. Out

of the total solid waste generation in Addis Ababa only 65 percent is estimated to be collected and dumped to the Repi dumping site (Kiflom, 2007:28).

The major causes of poor SWM in Addis Ababa include lack of adequate technical, financial and human capacity on the part of government bodies; inadequate stakeholders' involvement; low level of public awareness, lack of enforcement of rules and regulations. In general, there is a weak institutional and structural arrangement, where all concerned stakeholders play their respective roles to provide an effective SWM system (Solomon, 2006; Elleni, 2001: Abera, 2001).

Poor SWM in Addis Ababa in general and Kirkos sub city in particular has been affecting the socio-economic lives of the residents by denying their right to healthy living environment, as well as aesthetic values and reputation of the city.

Changing the current weak SWM practice in the city requires a careful assessment of the current SWM practices. It also requires much effort to identify an appropriate mechanism to enhance an efficient and effective mobilization of efforts of all stakeholders. Above all, assessment of levels of stakeholders' participation and mechanisms that have been employed to realize participation, investigation of the prevailing enabling and constraining factors for participation are basic issues for the purpose.

1.3 Objective of the Study

1.3.1 General Objective

The main objective of this study is to investigate the SWM practices in Kirkos sub city, with a special emphasis on assessing level of key stakeholders' participation.

1.3.2 Specific Objectives

The specific objectives of this study are to:

i. to assess the current SWM practice in the study area

ii. identify mechanisms that have been employed to realize participation of all stakeholders in SWM

iii. assess the level of participation by each stakeholders at different stages of solid waste management (SWM) in the study area;

iv. Identify the factors that enable as well as hamper stakeholders' participation in the study area; and

v. Ultimately, to provide possible solutions as recommendation in order to enable effective participation of all stakeholders and better SWM practice in the study area.

1.4 Research Questions

i. What is the current SWM practice in Kirkos sub-city?
ii. What is the current level of participation of each stakeholder in Kirkos sub city?
iii. How does the effort to participate the key stakeholders in SWM in Kirkos sub city has been carried out?
iv. What are the prevailing enabling and constraining factors for an effective participation of all stakeholders?
v. How is it possible to win an effective participation of all stakeholders in Kirkos sub city?

1.5 Significance of the Study

The study hopes to have academic and practical significance. The study hopes to improve the practice of SWM system by serving as a ground to mobilize participation of all stakeholders in the sub city. It also hopes to contribute for the creation of additional employment opportunity, by identifying potential areas for participation of MSEs in SWM practice.

Above all, it contributes to the creation of clean and healthy urban environment by providing applicable recommendations. The findings of the research may also serve as an input for further research.

1.6 Scope and Limitation

The scope of the research is limited only to municipal solid wastes. That means it does not cover non-municipal solid wastes, like wastes from industrial and health care activities. SWM is a discipline associated with the control of generation, collection, transfer and transportation, processing and disposal of solid wastes. More than others, the concern of this study is the aspect of stakeholders' participation at each of these stages. The shortage of finance and time, lack of willingness of some respondents to providing the enough and accurate information were some of the limitations to carry out the study with as much detail as needed. However the researcher tried to use different methods of data collection to overcome the limitation.

1.7 Research Methodology

1.7.1 Data sources and types

The study used both primary and secondary types of data. Primary data were collected from relevant governmental bodies including Clearness Management Office, human resource management supportive process of Kirkos Sub City; and non-governmental stakeholders in SWM of Kirkos Sub City which include sample private solid waste management service providers, households, an NGO, and *Idirs*. In addition, the secondary data were gathered from different documents which include books, magazines, annual and monthly reports of governmental actors and internet web sites.

1.7.2 Sample Size and Sampling Techniques

The sample household respondents were selected using a multi stage sampling and random sampling methods. Currently Kirkos sub-city is divided in to 11 *Kebeles*. For the purpose of detailed study, three *kebeles* namely Kebele 05/06/07, 11/12 and 15/16 were chosen at the first stage using random sampling techniques. Each of the three *Kebeles* is comprised of 2-6 sub–*Kebeles* or 'old *Kebeles'*. Subsequently, as a second sampling Stage, one sub-*Kebele* was selected randomly from each of the *kebeles*. Finally sample of 5% households were chosen from the sub-*kebeles* on the basis of N/n.

Where:

N= *total population of house holds in the sub-Kebeles, and*

n= sample size (which is 5%)

Accordingly questionnaires were administered to 104 households. The population and sample size of households is summarized in the table 1 below.

Table 1 Summary of population and sample size of households in the study area.

Kebeles	**Sample Sub-Kebele**	**Population/N(No. of households)**	**Sample Size (n)=5% of N**
Kebele 05/06/07	Sub-Kebele 01	680	34
Kebele 11/12	Sub –Kebele 23	790	40
Kebele 15/16	Sub- Kebele 16	600	30
Total		2,070	104

In addition data were collected from representatives of relevant governmental offices through questionnaire and interviews and review of

important documents. The offices contacted are Kirkos Sub City Clearness Management Office; Human Resource Management Supportive Process; and Finance Management Supportive Process. The response rate for the questionnaires administered is 100 percent.

The private sector, NGOs and CBOs are also key stakeholders in the SWM practices. This study contacted 13 MSEs (27% out of the total 48 MSEs in the sub city) participating in the activities of SWM in the study area. In addition representatives an NGO called Life in Abundance and three Idirs in the study area were contacted.

1.7.3 Data Collection Methods

Data collection methods include structured and unstructured interviews, questionnaires, and personal observation by the researcher depending on circumstances.

1.7.4 Data Analysis

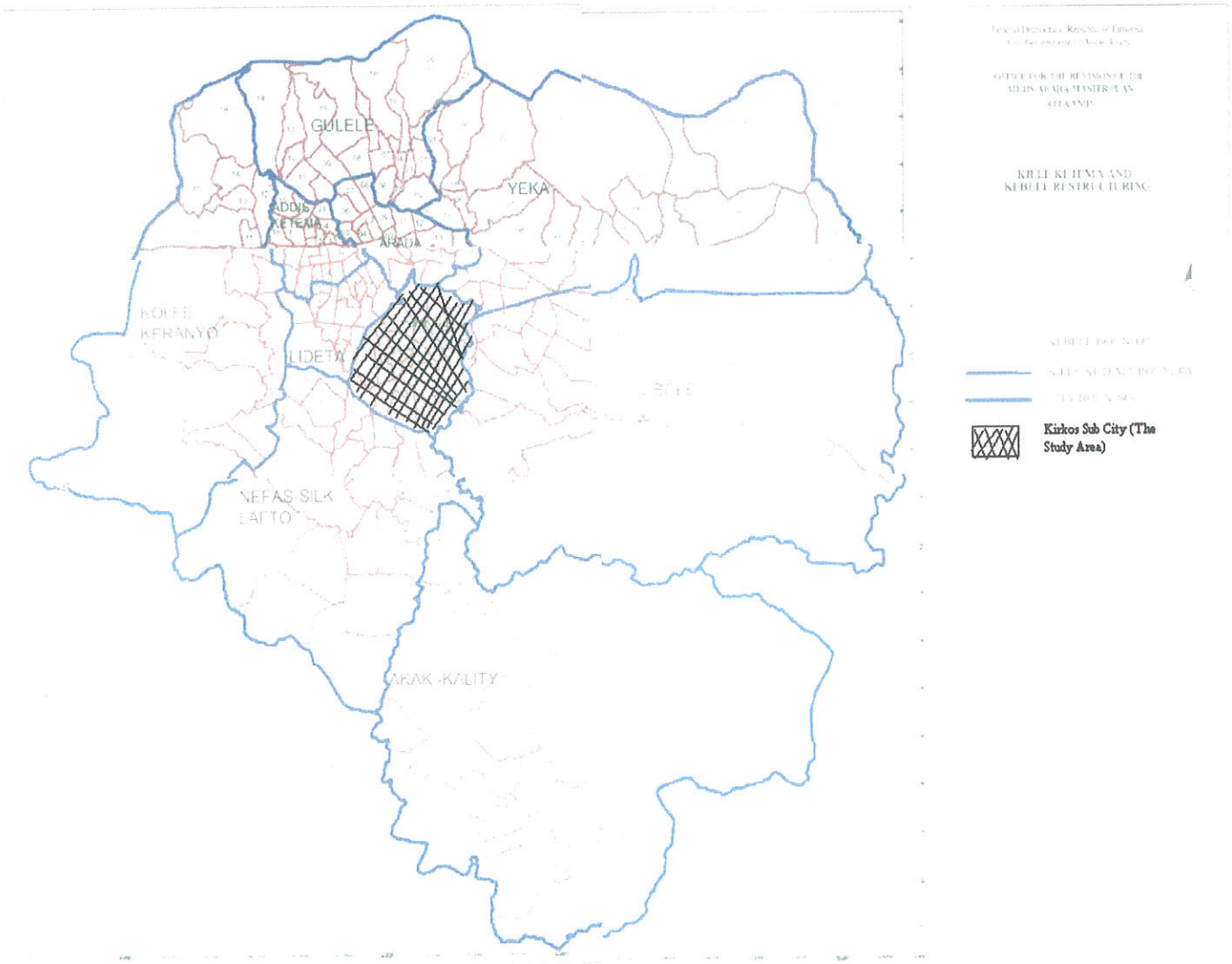
The collected data were processed and analyzed in line with the study objectives, and research questions. Analysis of the data is carried out after the data are categorized and disaggregated into appropriate descriptive statistics. Cross tabulation from the descriptive statistics for some key variables of the study were constructed. Finally the output were analyzed and interpreted in the way that answers the research questions raised from outset.

1.8. Organization of the paper

The thesis is organized into four chapters. Chapter one is an introductory part which describes background, problem statement, objectives, significance of the study, scope and limitation, and methodology. Chapter two presents review of relevant literatures focusing

on clarification of issues and concepts relevant to solid waste management as well as stakeholders' participation. Chapter three is concerned with the presentation, analyses and interpretation of the collected data. Finally, conclusion and recommendation follows.

Map of Kirkos Sub City



Chapter Two

2. Review of Literatures Relevant to Solid Waste Management

Introduction

The production and consumption activity of human beings involve utilization of solid materials, soil, air and energy. These activities result in residual waste materials, either in the form of liquid or solid or gas. In this part of the thesis it is attempted to clarify issues relevant to solid waste management (SWM) in general; role of different stakeholders in Solid Waste Management, as well as the overall condition of Solid Waste Management (MSWM) in Addis Ababa.

2.1 Clarification of Issues Relevant to Solid Waste Management

2.1.1. Waste, Solid Waste and Municipal Solid Waste Management

Solid waste is defined by some authors as a variety of discarded materials produced from human and animal activities that are deemed as unwanted or useless and lacking sufficient liquid content to be free flawing (Kail, 2005; Law Encyclopedia, 1998). However today there is a shift in awareness to regard wastes as resources for further use. Some authors, as in the case sited bellow emphasize the importance of maintaining the environment through waste reduction, reuse, and recycling.

> *In natural systems, there is no such thing as waste. Everything flows in a natural cycle of use and reuse. Living organisms consume materials and eventually return them to the environment, usually in a different form, for reuse.* Solid waste *(or trash) is a human concept. It refers to a variety of discarded materials, not liquid or gas that is deemed useless or worthless. However, what is worthless to one person may be of value to someone else, and solid wastes can be*

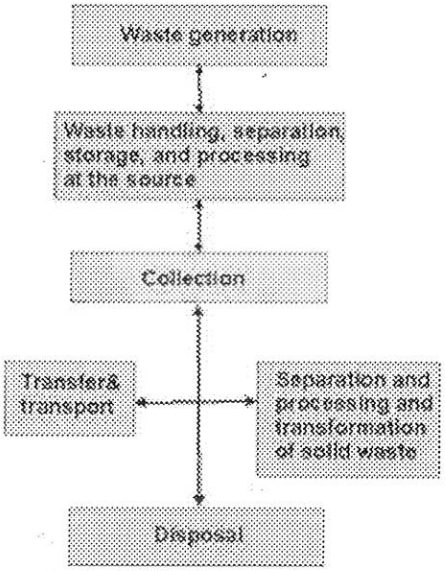
considered to be misplaced resources. Learning effective ways to reduce the amount of wastes produced and to recycle valuable resources contained in the wastes is important if humans wish to maintain a livable and sustainable environment (University of California College Prep, 2009).

Municipal solid waste (MSW) is a type of waste that includes predominantly household waste (domestic waste) with sometimes the addition of waste generated in commercial establishments. Municipal solid wastes (MSW) are wastes in either solid or semi solid form that a municipality accepts responsibility for managing (Municipal solid waste, 2004). MSW includes used paper, discarded cans and bottles, food scraps, and other items. Industrial wastes, agricultural wastes, mining wastes, and sewage sludge are generally excluded from MSW (Purdue, 2005).Municipal solid wastes are also further differentiated as organic and inorganic, clean or hazardous, recyclable or non-recyclable.

Municipal Solid Waste Management

Municipal Solid waste Management (MSWM) is a process which involves the control of generation, collection, transfer and transport, processing and disposal of solid wastes generated in the municipal area in a manner that is in accordance with the best principles of health, economics, engineering, conservation, aesthetics and other environmental consideration (Tchobanglous *et al.*, 1993:7). According to Tchobanoglous *et al.* (1993) an efficient solid waste management system has six functional elements. These include: 1) waste generation; 2) waste handling and separation, storage, and processing at the source; 3) collection; 4) separation, processing, and transformation of solid waste; 5) transfer and transport; and 6) disposal (See Figure 1, below).

Figure1. **The Functional Elements in Solid Waste Management System and Their Interrelationships**



Source: Tchobanoglous et al. (1993)

Waste Generation encompasses activities in which materials is identified as no longer of value and are thrown either away or gathered together for disposal (Koli and Mahamuni, 2005:24). Several researches contend that global waste production is exacerbated by growing population, fast urbanization, rising incomes and changing consumption patterns. On the other hand the ability to manage these wastes lags behind the rate of their production and accumulation (Municipal Solid Waste Generation, 2004; Population Summit, 1993).

Solid waste Collection is the process of picking up wastes from residences, businesses, or a collection point, loading them into a vehicle, and transporting them to a processing, transfer, or disposal site. Waste collection methods involve some or all of the following steps: collection from households or other premises; consolidation in temporary storage sites; transport to a transfer station; and transport to a final disposal site (UNESCO, 2006).

Transportation of wastes implies transference from the point of collection to the point of disposal. If the wastes are not removed quickly and allowed to deteriorate, it causes trouble. Hence, method of transportation forms the back bone of solid waste management (Koli and Mahmuni, 2005:113). Collection and transportation of sold wastes from residential, commercial, industrial facilities as well as streets, parks, and vacant area is a difficult activity. It requires higher cost than other activities in SWM (Law Encyclopedia, 2009).

Disposal of solid waste refers to the final handling of solid waste, following collection, processing, or incineration. Disposal most often means placement of wastes in a dump or a landfill. The disposal of solid waste is also another serious issue. Inadequate SW disposal methods causes aesthetic trouble, spread of pathogenic organic as well as increase in pollution. Methods of solid waste disposal methods include the following: open dumping, sanitary land filling, incineration with or without power generation, composting, compaction, biogas generation, recycling/reuse (Koli and Mahamuni, 2005:113-115).

2.1.2. Integrated Solid Waste Management (ISWM)

ISWM is the plan and mechanism of tackling SWM problems, in such way which leads to the protection of public health and the environment, conserves natural resources, and contributes to the over all sustainable development. ISWM addresses the root causes of waste problem. Developing an integrated solid waste management (ISWM) system requires that all of the functional elements of a solid waste management system have been evaluated for use, and all of its interfaces and connections have been matched for effectiveness and economy (Tchobanoglous *et al.,* 1993).

The main pillars of this strategy are:

1. *Pollution prevention:* including waste minimization at the source in terms of pollution quantities and/or risks
2. *Resource conservation*: including environmentally-sound reuse, recycling and recovery (e.g. composting or energy recovery).
3. *Sound treatment*: including rendering wastes harmless and/or achieving safer and products and
4. *Ultimate Disposal*-including incineration and/or land filling

The strategy of ISWM implies an implementation hierarchy accomplished by ranking operations in accordance to their priority of favorability as follows: Waste minimization→ Reuse→ Recycling→ Recovery→ Treatment and reduction →waste Disposal in environmentally sound manners (McDougall, 2001:15).

2.1.3. The Impact of Improper SWM

Impacts of improperly managed Solid Wastes are:

a) Creation of an aesthetic nuisance or an 'eye sore'
b) The production of odor
c) Hosts disease–carrying agents that transmit bacteria to the near by human populations
d) Causes fire hazard
e) Creation of gas pollution from incineration of SW
f) Ground water and soil pollution (Koil and Mahamuni, 2005:63; Law Encyclopedia, 2009).

2.1.4. Problems and Factors Influencing MSWM in Developing Countries

Municipal Solid waste Management (MSWM) is an important public service; however, it has not been efficiently performed by the municipal bodies of developing countries. In these countries solid waste collection is irregular and the coverage is limited. Causes of this unsatisfactory solid waste management include lack of financial resources, institutional weaknesses, and improper selection of machineries, vehicles and disposal options. More over, citizens' apathy towards cleanness; lack of public awareness and good governance; poor socio-economic status of the residents; and inadequate stakeholders' involvement are the frequently cited causes of poor solid waste management service in developing countries (Ogawa, 2009; Yoseph, 2008).

2.2. Stakeholders' Involvement in Solid Waste Management

There are various methods to deliver municipal and local services. The methods range from complete public provision to complete private provision or a mix of these two, including public private partnerships (Kitchen, 2005: 117).

Public sanitation and the safe disposal of wastes are essential for public health and environmental protection (Levine, 1994).This makes MSWM an essential public service. In addition, it is not feasible to exclude from the benefit of the service those who did not pay for it. Due to such reasons, few may consider the task of managing solid wastes as a responsibility of municipal governments.

Municipalities lacked the capacity to efficiently manage solid wastes generated with in their domain in an environmentally sound and

technically feasible method. According to many researchers this is due to weak financial, technical, human and institutional capacity of the government or the formal structure. On the other hand, lack of adequate participation on the part of various stakeholders in SWM activity of cities in developing countries is also another critical cause for weak SWS system as identified by many literatures (Ogawa, 2009). Relevant actors in MSWM include governmental actors, different parts of the community (NGOs, CBOs, and other community organizations like schools, churches, mosques), and research institutions.

Agenda 21, an important environmental document, stresses the critical importance of partnerships, commitment and genuine involvement of all local stakeholders for effective environmental governance (United Nations Conference on Environment and Development, 1993). Major Stakeholders in SWM and their Roles are briefly discussed under the following sub sections.

2.2.1 The Role of Local Authorities

As indicated above solid waste management is considered as an essential public service and the burden of managing SW has also being carried out dominantly by governmental actors with out significant participation from other stakeholders. The role of local authorities is critical as the problems and solutions of SWM have their roots in local activities. Since local authorities are closer to the people they can play vital role in educating, mobilizing, coordinating efforts of all stakeholders for effective SWM system (Mukerjee, 2004).

Local authorities/municipalities of developing countries are facing the challenges of unclean urban environment; especially due to poor solid waste collection, transportation and disposal systems. These problems are mainly attributed to low level of stakeholders' participation and weak

legal, institutional, financial, technological, and human capacity of the municipalities (Ogawa, 2009).

This implies the need to adopt the concept of 'warrantor state' in SWM service delivery. The concept of 'warrantor state' implies the transformed role of public sector from a sole service producer towards service facilitators and enablers (Gilbert et al., 1996). In other words the state ensures the implementation of tasks rather than implementing the tasks by itself. 'Warrantor state' shares responsibilities for implementation and if necessary financing with civil society and the business community. The state also cooperates with a third party in fulfilling its tasks. Therefore, this transformed role of the state as guarantor of public service than a provider has a big implication on the efforts to improve municipal solid waste management system by systematically mobilizing inputs from various stakeholders (Gilbert et al., 1996).

In the past, local authorities have focused almost exclusively on the residue disposal end of integrated waste management. Emphasis now needs to be placed on a total waste reduction program. Local authorities play an important role by encouraging better solid waste management practices like composting, recycling, and reuse; develop proper guidelines and relevant legislations (Srinivas,2009).

Local authorities need to measure the effects of their waste management program. Informing the public about costs and expected benefits of different solid waste management activities, and provision of opportunities for the public to be part of decision-making on waste management program is also the major role of local authorities. In consultation with the community, local authorities should introduce or encourage the principle that local 'generator pays' waste management charges.

2.2.2 The Role of the Private Sector

Despite the important role of local government and special government agencies in management of cities, the momentum of urban development has been so fast that a number of urban services have had to be privatized. Among others, participation of the private sector in the provision of key urban services such as sewerage, transportation, and solid waste management has increased (ESCAP, 2009).

The increasing cost of municipal solid waste management (MSW) has led local governments in numerous countries to examine the relative advantage of providing the service by the private sector. Accordingly, public-private partnerships have emerged as a promising alternative to improve MSW management performance with privately owned enterprises often outperforming publicly owned ones (Baud *et al.*, 2001).

Many literatures cite more of advantages and successful implementations of public private partnerships (PPPs) in SWM (Ministry of Municipal Affairs, 1999:6; Massoud and El-Fadel,n.d). Some of the advantages are that private sector plays a role in SWM by improving the efficiency of resource use, minimizing wastes and protecting human health and environmental quality. This includes increasing re-use and recycling of residues, developing or introducing techniques and technologies that reduce harmful environmental impacts of Solid Wastes.

On the other hand, an article by Awortwi (2004) argues that simply turning over public service delivery to private agents without ensuring that the fundamentals that make them successful are put in place leads to a worse situation than portrayed in literature about the benefit of public private partnerships (PPPs). Therefore, the effort to create an efficient system of SWM service through private public partnership shall

be based on appropriate feasibility studies that consider various methods of public private partnerships (PPP) and appropriate follow up upon implementation.

2.2.3 NGOs, CBO and Other Community Organizations

There are many types of community organizations that can be mobilized for environmental management activities. Local environmental problems are most successfully solved when the community takes the initiatives for solving the challenges of environmental problems in their localities (Serageldin, 1994: V). Participation of the community in SWM does not only serve the purpose of garbage reduction, but also a way of community empowerment through self-reliance, establishing new relationships of more equality and less dependence, between poor communities and the municipal administration (Habitat International,2003).

Flexibility in law enforcement, incentives and good cooperation with local formal and informal leaders contribute much to the successful and sustainable Community Based solid waste management Systems. There is also a prospect for the sustainability of Community Based solid waste management Systems if there is a high political will and government regulations that support community based efforts (Desa and Judd, n.d). The existence of enabling environment like rules and regulations are crucial to encourage the participation of various stakeholders in SWM. Moreover, more formal structures and institutional frameworks needs to be developed to encourage ongoing dialogue, negotiation and participation of communities with governments (Serageldin, 1994:13).

NGOs may serve by facilitating community efforts, providing technical assistance and strengthening community organizations for the activity of

SWM. Even though NGOs are often active in community many other actors such as churches, schools, and mass media can mobilize the community and serve as change agents in communities (Serageldin,1994:13).

2.3 Municipal Solid Waste Management (MSWM) in Addis Ababa

2.3.1 Some Relevant Facts

Addis Ababa is the capital city of Ethiopia. With the increase in population growth in the city the amount of waste is increasing from time to time. The population of Addis Ababa which was amounted to 2.1 million in the 1994 population census has now reached 3.65 according to the 2007 National Population Census. Annual population growth rate of Addis Ababa is 2.9 percent (Enda Ethiopia, 1999: 4, CSA, 2007).

The amount of waste generation in the city is also increasing from time to time. The amount of waste generated in the year 2003 is double of the amount generated in1983 (AASBPDA, 2003:1). SW generation per day is 5, 821 m 3. Table 2.1 shows some relevant facts to SWM in Addis Ababa.

Table 2.1 Some Relevant Facts to SWM in Addis Ababa

1	Population (207/8)	3.65 Million
2	Annual population growth rate	2.9 percent
3	SW generation /day/person	0.4 kg /person/say
4	Average weigh of SW per cubic meter (Waste density)	330kg
5	SW generation /day source 5.1 From house holds (76%) 5.2 Others (24%)	5,821 m3

Source: Addis Ababa city administration business process reengineering study document (2009).

Composition of SW generation in the city is dominated by organic garbage. It is estimated that 70% of the waste can be transformed in to compost and bio gas, while 15% can be recycled or reused (AASBPDA, 2003:1).

2.3.2 Actors and their Roles in SWM of Addis Ababa City

Actors in SWM of Addis Ababa includes several governmental actors, the private sector (especially micro and small scale enterprises), civic associations, media, religious and cultural institutions, donors and research institutions (AASBPDA Strategic Plan, 2007:10).

Governmental Actors

Even though the activity of SW collection and disposal has been carried out in Addis Ababa for over 50 years, it had been denied sufficient attention for several years. In order to solve the problem of SWM of the city, autonomous institution called Addis Ababa Sanitation Beautification and Parks Development Agency (now Addis Ababa Sanitation Administration Agency) is established in 2002

(AACSAA,2009). To improve the sanitation of the city the agency has been carrying out several activities by preparing different regulations and working manuals.

Sanitation Administration Offices established in the 10 sub-cities of Addis Ababa have been carrying out the activity of house to house SW collection, managing public containers, transportation of wastes to the dumping site and street cleaning services. The offices are accountable to sub-city managers. They communicate with the Addis Ababa Sanitation Administration Agency (city level) regarding only technical issues and plans (Addis Ababa city administration business process reengineering study document, 2009).

The agency is responsible for administering Repi land fill. Repi dumping site, which is established in 1964, is the only dumping place for the SW collected and transported for final disposal. However, the site lacks appropriate infrastructure and facility, and the mode of disposal used is very backward. Both hazardous and non-hazardous wastes are disposed together at the site. Since, the site is surrounded by ring road and residences; and lacked appropriate fence it poses enormous environmental problem for the nearby society. Therefore construction of another sanitary land fill is very critical to solve the problems (Taddese, 2004).

Households

Residence is the major source (76%) of SW generated in Addis Ababa. As a result they need to be considered as a very critical stakeholder in the process of SWM. In order to improve SWM in the city relevant rules and regulations by Addis Ababa city Sanitation Administration expects from households and other establishment the following points.

1. Wastes should not be disposed every where inappropriately
2. SW shall be placed in bags or other materials appropriately closed until it is transported or taken to the disposal site or other sites
3. Solid Wastes shall be disposed only in legal containers or given to legal SW collectors
4. House holds are accountable for SW found disposed in the radius of 20 miters from their house
5. Residents shall participate in local sanitation campaigns; to clean wastes inappropriately disposed in their neighborhood, to clean river courses, to protect the dumping of SW in rivers, to plant trees and beautify their locality (Waste Management Collection and Disposal Regulation of the Addis Ababa City Government, Regulation No.13/2004)

The Private Sector

In Addis Ababa the private sector has been participating in SW collection, transformation for re-cycling, reuse and transportation. Micro Enterprises are business establishments with paid up capital of less than 10,000 Ethiopian Birr engaged in the process of SWM. The role of this sector in SWM in Addis Ababa is increasing from time to time. They are engaged in activity of house to house collection of Solid Wastes and dumping of them to the collection containers.

3.3.3 Relevant Policies Rules and Regulations in Ethiopia

The objective of the SWM proclamation of Ethiopia is to enhance capacities to prevent the possible adverse impacts at all levels, while creating economically and socially beneficial assets out of solid waste. The proclamation also provides that urban administration shall create enabling atmosphere to promote investment on the provision of solid waste management services. Any person shall obtain a permit from the concerned body of an urban administration prior to engagement in the collection, transportation, use or disposal of solid waste.

A number of rules regulations and manuals are prepared by AASBPDA. Regulation No.13/2004 (Waste Management Collection and Disposal Regulation of the Addis Ababa City Government) among other things specify powers and functions of different organs. It also states the manner of providing private sanitary services. Working manual for kebele level monthly weekly and daily local sanitation activities, campaigns and regular works also exists. It lists various communities of different levels with the objective to make the task of local sanitation sustainable and community based.

Conclusion

To sum up, Municipal Solid Waste Management (MSWM) requires the due contribution of all the stake holders to arrive at a technically feasible, cost effective, revenue generating, environmental friendly and pollution free system. The traditional approach to solid waste management leaves all the burdens of solid waste service delivery on local governments (municipalities) to be carried out using their own staff, equipment and finance. However, it proved unsuccessful due to low level

of key stakeholders' participation, weak financial, organizational and institutional capacity on the part of governmental actors.

Even though literatures on solid waste management of Addis Ababa identified lack of stakeholders' participation as one of the causes for poor SWM in the city, there is research gap in assessing the level of participation of key stakeholders and in identifying the potential roles each could play. The available researches are also relatively outdated. Filling these research gaps would be the attempt of this research.

Chapter Three

3. Data Presentation and Analysis

Solid Waste Management in Kirkos Sub City: Challenges and Issues

Introduction

In chapter one it has been highlighted that Kirkos sub-city is bestowed with carrying out much of the respected roles that Addis Ababa plays as a key national, continental and global center. However poor solid waste management in the city has been compromising the prestige of the sub-city in particular and the city in general. Kirkos sub city is sub divided into 11 *Kebele* administrations. About 354,000 people live on the total geographical area of the sub city which is about 1626 hectares. This shows that the residents of the sub city lives congested with a population density of 218. Accordingly 305m3 (88.5 tones) of SWs are generated only from the residents of the sub city.

With the objective to assess the current SWM practice in Kirkos sub-city, a variety of questionnaires are administered to Kirkos Sub City Clearness Management Office, 104 households, 13 Micro and Small Enterprises engaged in providing sanitation services, and 3 'Edir" leaders and an NGO in the study area. Under this chapter the data obtained are presented and analyzed in a way that answers the research questions posed in chapter one.

The collected data are presented and analyzed so as to assess the general SWM system in the city, mechanisms employed to involve key stakeholders, the level of participation by various stakeholders, as well as the enabling and constraining factors for the contribution of stakeholders in solid waste management are the major focus areas.

Kirkos Sub-City Clearness Management Office acknowledges the existence of solid waste management problem in the sub city. The major causes of poor SWM practice in the sub city as identified by various respondents are lack of public participation, lack of awareness, inappropriate policy, and shortage of trucks, containers, and man power. In the following sections, the role of each actor is assessed following the overall appraisal of SWM in the sub city.

3.1 Appraisal of Solid Waste Management System in Kirkos Sub City

Subjects of this study or respondents were asked to identify major environmental concerns in their neighborhood; to evaluate the level of SWM problem, as well as the status of the existing SWM system. Majority of households (43%) identified the problem of SWM as a first ranking environmental concern in their neighborhood; followed by sewerage problem (28.8%).

Table 3.1 Major Environmental Concerns as Identified by Sample Respondents

Concerns	No. of Respondents Assigning the Rank				Remark
	1st		2nd		
	Frequency	%ge	Frequency	%ge	
Sound pollution	8	7.69	9	8.65	6th
Sewerage problem	30	28.84	51	49	2nd
air pollution	9	8.65	7	6.73	4th
Solid waste problem	45	43.26	28	26.9	1st
Water contamination	12	11.53	9	8.65	3rd
Total	104	100%	104	100%	

Source: Field Survey.

The main problems regarding SWM in Kirkos sub city include irregularity of SW collection services from households and other premises, shortage of communal refuse storage containers, delay in removing the full containers, poor sanitary condition around the containers; illegal dumping of SWs along streets, in ditches, open spaces, and river banks.

According to interviews with Kirkos sub city sanitation administration officials, SW collection system from households and other premises have been greatly disorganized than it is now. There was weak system to control over the collection system. Households use various methods to dispose SWs from their households. Some households pay formal MSEs where as others hire informal SWs collectors. Some directly dispose the refuse by one of the members of the households. Accordingly it was difficult to control the points of disposal.

Addis Ababa city Administration has taken some measures to solve these problems. Some of the major areas of focus are reforming the payment system for SWM services and revising the contribution by MSEs. In order to change the payment system which have been previously disorganized SWM fees has been collected with water bill. Along with the payment system the operation system of the MSEs have undergone some changes. Operation of the legally organized MSEs is limited by the zoning system.

The MSEs collect the SWs in the zones they are assigned to, and transfer the SWs to communal refuse collection by pushing carts; and the full containers are lifted by the container lifting vehicles of the sub city. At some places where there are shortages of containers, the MSEs load them on the covered vehicles of the sub city, which directly transport the refuses to the dumping sites. The whole process of SWM and the role that the main actors in the sub city are playing will be assessed in the following sections.

3.2 The Role of the Private Sector in SWM System of Kirkos Sub City

In Addis Ababa city the SWM service have been dominantly provided by the public sector with a very little participation of the private sector. The five years strategic plan for Industry and Urban Development Package (1998-2010) identifies the role of outsourcing some governmental activities and projects that are useful and value adding in employment creation. Accordingly Addis Ababa City Administration has identified SWM service as one of services with out sourcing potential.

Based studies and action plan developed the activity of door to door collection of SW collection was identified as an easy get way to launch the idea. This activity has been performed since 2002 by creating job opportunity for thousands of unemployed citizens of the city. The role that the private sector has been playing in solid waste management has increased from time to time.

In Kirkos sub city a total 48 micro and small scale sanitation enterprises and 4 private companies are currently engaged in the activity of solid waste management. The micro and small scale sanitation enterprises are engaged in providing sanitation service for residences and establishments with a paid up capital of more than 10,000 Ethiopian Birr; where as the four private companies provide solid waste management service to enterprises with a paid up capital of more than 10,000 Ethiopian birr.

All of the MSEs in Kirkos sub-city are engaged in door to door collection of SWs. The collected data shows that residential establishments are the main customers of the MSEs.

Table 3.2 Number of Private Actors by Type and Aspect of Involvement

S/n		Number of private actors by aspect of involvement			Total Number
		House to house collection	Transportation	Recycling and reuse	
A	MSE	48	0	0	48
B	Private company	0	4	0	4
	total	48	4	0	52

Source: Kirkos Sub City Sanitation Administration Office.

On the other hand the level of participation by the small and medium sanitation enterprises appears to be lower. There are only four such a private sanitation enterprises operating in the sub city. These enterprises are responsible to collect wastes from institutions with a paid up capital of more than 10,000 Ethiopian Birr. They use their own vehicles to transport the garbage to the Repi disposal site.

Even though SW collection from bigger institutions is reserved for small and medium scale sanitation enterprises, MSEs collect wastes from these institutions. Kebeles also collaborate in this act which breaks the rule. Beyond limiting the development of small and medium scale sanitation enterprises this act is also responsible for overburdening the already few SW transportation vehicles and communal garbage containers.

The ways of operation by the private sector as well as relevant rules have undergone various changes since the beginning of formally involving the private sector in SW collection. Each of the methods tried also had their own strengths and weaknesses. Involvement of the private sector in the

SWM service delivery is a good beginning in the way to better SWM system in the city. During the beginning years some youngsters used to collect SWs once or twice a week having paid some money based on agreement with the customers. However most of the groups have disbanded just from the beginning due to some problems.

The areas to be covered by the MSEs were not clearly delimited. They provide services randomly only for interested customers rather than taking responsibility of some specific zone or area. Sub city vehicles collect SWs generated from the establishments that did not use the collection services by the private sector. Consequently the customers of the MSEs deny them.

Rather than allowing competition some individuals monopolize some areas and hinder others to provide the service. Some *Kebele* administrations authorize only some MSEs and advertise them as sole service providers against others. There were confusions on the body responsible for licensing and canceling licenses. There were areas and *Kebeles* not covered by private solid waste collectors but they were not identified clearly. More over there was dumping of solid wastes by the MSEs in illegal spaces.

According to interviews with the Kirkos Sub City Clearness Management Officials, during the beginning years the sanitation MSEs lacked clear operation system; and the areas of their operation are not in a way that creates responsibility and accountability. Moreover there were frequent clashes and taking of each others' customers among the sanitation MSEs. In general, due to weak coordination and lack of appropriate contracts which puts a system of accountability at place the effort did not bring encouraging results in terms of job opportunities creation and sanitation of the city in previous years.

Considering the potential roles the MSEs play in improving the poor SWM condition in the sub-city the root causes that constrained the effective contribution of the sector should be identified. Since the beginning of effort to participate the MSEs sector formally in SWM service, various efforts have been made to solve the challenges. However, challenges still persist.

The major causes of the problem include lack of coordination between *Kebele* municipal management office, which is the primary responsible body for SWM; and the Micro and Small Enterprises Development offices. Some sanitation MSEs were disbanded due to lack of operation spaces. Because they start operation before contacting the Clearness Management Offices instantly after being registered and organized by the MSE Development Departments.

Zoning regulation and other codes to regulate service by MSEs are not implemented properly. The regulation provides that MSEs have to collect SWs from customers' house twice a week. But in practice wastes stay in houses uncollected for more than a week. Sometimes MSE operators providing the sanitation services disrespect the customers; operate with incomplete safety tools; use inappropriate carts to transport SWs. Name and address of the enterprises are not written on equipments like carts and uniforms, which limited ability to distinguish between the legal and illegal operators.

MSEs are allowed to deliver service for institutions with the capital of less than 10,000 birr. But in practice they provide beyond the allowed level, which caused: (1) Overflowing of communal containers and poor container area sanitation. (2) Putting pressure on SW transportation capacity of government (3) limiting the growth of private companies that

use their own vehicles to transport SWs to the dumping site by reducing their market (4) Lack of coordination between the MSEs and sub-city sanitation administration office.

Some of the weaknesses include: piling garbage on streets (roads) when vehicles are absent; not keeping garbage in containers or bags; making no protection for the garbage. On the other hand, there was failure among the sub-city to inform the MSEs when there are no vehicles or when 'Repi' is not giving service. By providing collection service at an inappropriate time, the MSEs often make barrier to traffic flow. According to the regulation MSEs are allowed to use streets to transport garbage to transfer stations with carts only until 7:30AM, or 9:00 – 11:00PM or after 6:00PM.

The base of payment was based on number of customers. Consequently, MSEs were often engaged in illegal practices. The MSEs were paid by their customers no matter where they dump or how much volume they collect. As a result the MSEs used to dump at inappropriate places. Households and establishments who do not pay sanitation fee also did not receive SW collection service. Therefore they were also responsible for illegal dumping.

But recent reform has brought some improvements in this regard. Among the major reform measures are SWM finance system. Modality of payment for the service delivered by MSEs which was based on the number of customers has been shifted since the year 2010 to payment based on the volume of SWs collected by the MSEs. Moreover SWM fee has been collected along with water bill. (The detail about SWM finance is presented in section 3.6).

However challenges that limit capacity of the private sector in delivering the SWM service still persist. This includes shortage of communal containers, irregularity and delay of container lifting vehicles. Shortage of hand push carts, poor design and capacity of carts forks, spades and gloves. The existence of these challenges call for assessment of the roles being played by other key stakeholders.

In general the efforts to participate the private sector in the SWM system of the sub city have been undergoing various ups and downs. Participation of the private sector has relatively improved primary solid waste collection (door to door collection). However some weaknesses that must be cured by active involvement and attention of various stakeholders still persist. Among which are: private sector participation is almost limited to MSEs with weak material, technical, and financial capacity. The responsibility of door to door SW collection is almost being shifted to MSEs.

However the problem is that scope of private participation is limited to primary collection. Other aspects of SWM such as solid waste transportation to landfill, compost preparation, recycling, production and maintenance of equipments and spare parts needed for SWM activities are among potential areas for involvement of the private sector. Scaling up the participation of the private sector in SWM calls for thorough study of best experience from other countries; as well as mobilization and coordination of contributions of key stakeholders.

3.3. Role of the Public Sector in SWM System of Kirkos Sub City

Governmental actors play key role in both direct SWM service delivery and in stirring participation of each stake holders coordinating activities of each stakeholders in SWM. More relevant governmental actors in solid waste management activity of Kirkos sub city includes: sub-city level and *Kebele* level Clearness Management Office, Trade and Industry Offices; Rule Enforcement Office; and Environment Protection Office. The role of governmental actors in SWM involves both direct provision of SWM service, and facilitation of SWM service delivery through other actors including MSEs, NGO, CBOs, and schools.

Clearness Management Office is the main governmental actor directly responsible for solid waste management. The responsibilities of Clearness Management Office include: SW collection from residences and institutions; provision of dust bins and containers at appropriate places and quantity; transportation of containers to land fills; cleaning main road and squares; assigning guards to containers and keeping clean areas of containers; awareness creation; supporting and coordinating activities of MSEs and other actors to ensure proper SWM system and sanitation of the sub-city.

This research tried to assess performance of the governmental actor in carrying out the above stated responsibilities. The capacity of the office to deliver these services is determined by many factors including material, financial and human resource capacity. However, this is not enough to create clean neighborhood. It is the role of sanitation administration office to provide refuse collection containers, transfer stations, and transportation of the solid waste containers to the Repi final dumping site.

3.3.1 Containers and Transfer Stations

Availability of solid waste containers is among crucial factors for clean environment. It is common to see over flown and scattered solid wastes around containers of Kirkos sub city. The fact prevailing in Kirkos sub city shows higher deviation from standard formulated by Addis Ababa City Administration about standards of containers and the way containers have to be managed.

Previously residents were either expected to dump solid wastes into communal containers or hire formal or informal solid waste collectors. But it has recently become the responsibility of MSEs to collect solid wastes door to door and dump them in communal containers. But the question is whether the containers are provided with the required quantity, placed at appropriate locations, utilized appropriately and lifted at an appropriate time. The MSEs need to have enough containers to store garbage. However the ratio of sanitation MSEs to refuse collection containers demonstrate shortage of containers (see table 3.4). MSEs who do not have containers wait for sub city vehicles to load the garbage they collected door to door.

Table 3.3 Distribution of Containers in Kebeles of Kirkos Sub City

Ser.No.	Kebele	No. of the private sanitation enterprises	Number of refuse collection containers	Ratio of containers to MSEs
1	01/19	4	2	2/4
2	02/03	6	6	6/6
3	04	3	3	3/3
4	05/06/07	5	4	5/4
5	08/09	5	3	3/5
6	10	4	4	4/4
7	11/12	4	0	0/4
8	13/14	4	4	4/4
9	15/16	4	3	¾
10	17/18	5	4	4/5
11	20/21	4	6	6/4
Total		48	36	

Source: Kirkos Sub City Sanitation Administration Office.

Garbage collection containers in the sub city show higher inadequacy in terms of number and distribution. According to sub city authorities criterions to place waste disposal containers in at a specific place are population density, centrality, availability of placement spots; and accessibility for container lifting vehicles. According to Kirkos Sub City Clearness Management Office one container costs about 20,000 Ethiopian Birr and the total number of containers is inadequate due to budget constraint to buy containers in adequate number.

The distribution of the containers both among the *Kebeles* in Kirkos sub city as well as within the *Kebeles* is uneven. The distribution of the containers ranges from none to seven per *Kebele*. The reasons for uneven distribution are resistance from the community to place containers near their houses and lack of open spaces to place the containers. There is no container in *Kebele* 11/12. The *Kebele* is characterized by congestion by

shanty houses and shortage of open spaces. Consequently selection of container placement location is dominantly based on mere existence of open spaces than other criteria. As a result majority of the containers are placed at places that are not central to users.

Communal containers shall allow separate storage of solid wastes into compost-able and non compost able. However the containers in Kirkos sub city do not allow segregation of Solid Wastes into biodegradable and non-biodegradable. Lack of conscious participation by MSEs, house holds and other actors in separate storage, lack of market for composts, and are some of the causes for not separated storage of SWs into compost-able and non-compost-able.

Sanitation around containers in the sub city is characterized by poor condition. They are often seen over flown causing severe environmental annoyance including bad odor and reducing aesthetic beauty as well as health threat. That is one of the reasons for residents to resist placement of containers in their vicinity. The causes for poor condition around the communal containers include: irregularity and less frequent transportation of the solid waste containers to the central dumping site as soon as they are full. In addition the containers in the sub city are decaying as the majorities are old in age and none of them are placed on a plat form. As a result garbage get scattered out of the containers.

Previously causes such as inappropriate dumping (often when the containers are full) by Sanitation service provider MSEs ; dumping by children (due to lack of awareness and capacity); and scavengers scattering the refuse while collecting some useful materials were among the major causes of poor sanitation condition around containers. Relatively these are not the major causes now due to reforms in the ways of SW collection service delivery system by MSEs. Now the MSEs gather

garbage as much as they could because they receive payment of 30 Birr/m3. Due to the same reason the MSEs also protect the scavengers from scattering the SWs out of the containers.

The containers need to be washed at some intervals; containers shall be lifted as soon as they are full and empty containers shall be replaced before full containers are lifted; however sub city sanitation office acknowledges that the performance is low in this regard. Moreover only few containers have container guards and environmental sanitation workers assigned to control the sanitation around the containers.

3.3.2 Transportation

Solid waste transportation service in Kirkos sub city has been dominantly provided by the Sub City Clearness Management Office vehicles. There are only four private enterprises engaged in solid waste transportation from bigger institutions in the sub city like hotels, companies and hospitals. The enterprises are namely, Dynamic, Rose, Das, and Shumeta. However the sub city has too little relation with these important actors. Embassies, prison cells and some companies in the sub city also transport their own wastes directly to the Repi disposal site

The sub city bears the burden of solid waste transportation service and the quality of the service provision suffers from several challenges. The major challenge comes from inadequacy of vehicles in terms of quantity, capacity and ways of operation. The sub city has eight vehicles with different types, capacity and condition. There are four open container lifting vehicles, the remaining four are covered vehicles with carrying capacity ranging from 8m3 to 24m3 (see table 3.5 below). Only one vehicle is new, and remaining are very old. The vehicles are more often out of service for maintenance as they breakdown frequently. By the time

of interview only four vehicles were in operations as remaining were temporarily out of use due to mechanical problems.

Table 3.4 Numbers and Type of Vehicles Used for Solid Waste Disposal Service

S. N	Type of vehicles	Number of vehicles	Crying capacity (in m3)	Age	No. of Trips required/ day	Total volume expected to be disposed/day by the vehicle	Capacity to cover the trips
1	covered	1	24m3	>15 years	4	96m3	Weak
2	covered	1	15m3	>15 years	4	60m3	Weak
3	covered	1	10m	<1year	5	50m3	Strong
4	covered	1	8m3	>15 years	5	40m3	Weak
5	Container lifting	4	8m3	>15 years	10*4=40	320m3	Weak
	total	8	81		58	566m3	

Source: Kirkos Sub City Sanitation Administration Office.

The covered vehicles make 4 to 5 trips every day, where as container lifting open vehicles cover nine to twelve trips per day. Solid waste service delivery manual of Addis Ababa city administration expect the vehicles to remove containers as soon as they are full. Because the number of the vehicles and the number of trips they could make limit their capacity in this regard. Each trip covers 24kms and 6 litters of gas every trip on average.

Efficiency of the vehicles in removing containers before they are full is very Low. The disposal containers are barely covered to avoid spillovers of wastes along the roads. The vehicles are not washed except with the personal attempt of some drivers. The drivers do not use studied route

systems to reduce cost. Even though the vehicles are supposed to operate 24 hours, this has not been implemented because of old age of the vehicles and hindrance from Koshe dumping site.

The issue of buying additional vehicles and private public partnership shall be considered to relieve the sub city from pressure of solid waste transportation. In the literature review part it was stated that the increasing cost of municipal solid waste management (MSW) has led local governments in several countries to examine the relative advantage of providing the service by the private sector.

Outsourcing of the SW transportation service could have great potential of improving SWM of the sub city though efficiently utilizing vehicles, fast repair of vehicles by replacing bureaucratic hurdles in public sector. The private public partnership arrangement shall be based on appropriate feasibility studies that consider various methods of public private partnerships (PPP) and appropriate follow up upon implementation.

3.3.3 Street Sweeping Service

The sub city daily sweeps the main roads and squares in the sub city. In addition internal roads and sewerage lines are also cleaned during special campaigns. Three road sweepers make one team to clean about 2 kilometers of asphalt roads, pedestrian ways, dust bins, open spaces and ditches. Every day 95 kilometers of asphalt road was planed to be swept and stored into the appropriate storage sites. However due to shortage of man power only 60 kilometers were swept during the regular working hours. The sweeping of the remaining 35 kilometers is carried out Sundays.

The activity of sweeping service in the sub city is challenged by many factors. Some people throw or dump wastes on cleaned areas. Street dwellers sleeping along streets and public squares bring garbage on streets and squares. Some fringe benefits are not fulfilled for the workers on time. Even though street cleaning service shall be carried out earlier before the traffic begins to be congested. However, due to lack of transport service it is difficult for the workers to start and finish cleaning early. They don't make use of modern equipments. Especially wastes are scattered by wind because the workers use small hand push carts. In addition to lack of dust bins with appropriate numbers; awareness and culture of the society in using dustbins is limited.

To solve these problems attention shall be paid to make use of modern technology and vehicles for street cleaning purposes. Since this might require huge financial capacity, it is important to mobilize participation of the private sector. More over business institution along the roads shall be mobilized to prepare dust bins and to keep the area clean.

3.3.4 Human Resource Capacity of Relevant Public Offices.

The sub city officials admit that the staff of the Clearness Management Offices both at the sub city and *kebele* levels is inadequate in terms of quantity, quality and motivation. The majority of the staff has a lower level of education. Kikos Sub City Clearness Management Office has only one degree and one diploma holders; where as educational level of the remaining staff range from grade 3 to grade 12. Moreover 61.5 % of the staff of the Sub City Clearness Management Office earns less than 800 Birr/month (see table 3.6).

Table 3.5 Monthly Salaries of Kirkos Sub City Clearness Management Office Staff

s.n	Salary	frequency	Percent
1	500 to 800	16	61.5%
2	801 to 1000	5	19.2%
3	1001 to 1300	4	15.4%
4	>3000	1	3.8%
	Total	26	100%

Source: Kirkos Sub City Human Resource Management Supportive Process of General Manager's Office.

Previously, organizational structure of Clearness Management Office does not allow enforcing rules. The task of enforcing sanitation related rules have been undertaken by different office called Rule Enforcement Office. It is an appreciable improvement that the position and responsibilities of sanitation related rule enforcement is now included in Clearness Management Office. However the weakness is that the positions are not adequately staffed with the required personnel quantity. Clearness Management Offices of the *Kebeles* is staffed with only 53.63% of the required personnel (see table 3.7).

Table 3.6 Human Resource Profiles of Clearness Management Offices of Kebeles in Kirkos Sub City

s.n	Job Title	Required Personnel	01/19	02/03	04	05/06/07	08/09	10	11/12	13/14	15/16	17/18	20/21
1	Coordinator	1	1	1	1	1	1	-	1	1	1	1	1
2	Street sweeping officers	22	17	14	10	17	17	14	11	11	14	23	11
3	Street sweeping foreman	1	1	1	1	1	1	1	1	1	1	1	1
4	Awareness creation and rule enforcement officers	6.	2	2	1	1	0	2	4	2	2	1	2
5	Office assistance	1	-	-	-	-	-	1	-	-	-	-	-
6	Total	31	21	18	13	20	19	18	17	15	18	26	15
7	Vacant Position		10	13	18	11	12	13	14	16	13	5	6
8	Percent of filled Position		67 %	58 %	48 %	64%	61 %	58 %	55 %	48 %	58 %	83 %	48 %

Source: Kirkos Sub City Human Resource Management Supportive Process of General Manager's Office.

More over, the majority of the Awareness creation and rule enforcement positions are vacant. Filling these human resource gaps may play important role in curing the problem of lower level of awareness among the community as well as to bring behavioral change in the way the community handles solid wastes.

3.4 The Role of Households in SWM System of Kirkos Sub City

Households are the primary source of solid waste generation in Addis Ababa. Out of the 596,700 kilograms of sold wastes generated in the city daily, house holds take the lions share by producing 76 percent. Hence, active and informed contribution of the households in the solid waste management of their neighborhood is extremely crucial. Dumping of solid wastes illegally on the streets, in sewerage lines, corners and along rivers is a normal practice in Kirkos sub city.

On the other hand the residents are direct victims of the improper handling of solid wastes. The colleted data from the sampled residents shows that 57 percent of them acknowledge the presence of serious sanitation problem in their neighborhood. In addition they are aware of the serious impacts of improper solid waste management on health, as well as aesthetic value of their neighborhood. But the main question is identification of what roles are expected to be played by house holds; and assessing to what extent are the house holds in the study area participating in SWM system.

As the majority of households in the sub city are in low income category materials are already recovered by the responsible household members. The responsibility of managing solid wastes in the sample households are presented in the table 3.8 below.

Table 3.7 Responsible Household Member to Manage Solid Wastes

HH member responsible for SWM	Frequency	Percentage
Servants	30	28.8
Mother	27	26
Father	5	4.8
Children	13	12.5
All of the members of the HH	29	27.8
Total	104	100

Source: Field Survey.

Members of the household with the responsibility to manage solid wastes sort the wastes to reuse or recycle as they are or by salvaging. They also use the wastes to gain some economic advantages. This is made either by selling to *'qurleos'* in cash; or exchange with some equipments to *'liwach'*. This is a good practice with the advantage of reduction in total amount of SW to be collected and transported to the dumping site.

With regard to separation of wastes into biodegradable and non-biodegradable at household level is limited. Only 13 respondents out of the 104 sample house holds separate wastes at the house hold level, to use it as fertilizer for plants in their compounds. In this regard important stakeholders including the public sector, NGOs and research institutions need to participate by making researches and conducting awareness creation programs and facilitating the condition for the practice of separation of solid wastes at source.

Note:

'Qurleos' are persons who move in the neighborhood to buy some recyclable materials like empty glass and plastic bottles and pieces of metals. 'Liwach' persons primarily carry household utensils for exchange with recyclable and reusable materials.

3.5 CBOs and NGOs

Effective SWM system requires effort to mobilize various collaborators and stakeholders in the community. Religious institutions, *Idirs*, schools, mass media, and donors are among the major stakeholders. NGOs and donor agencies can contribute by providing financial, material and technical support. In Kirkos sub city participation of NGOs and donors is limited.

Various mechanisms have been employed to make use of contribution of the community. The first of such mechanism is public sanitation campaigns. Residents of Addis Ababa city are expected to participate in sanitation campaigns up on call from relevant authorities or other mechanisms. *Kebele* administrations mobilize the community to the sanitation campaigns by making use of institutions like *idirs*, youth and woman forums.

Another effort is the so called *"Hidar sitaten"* campaign which is carried out in November every year. Abraham (2009:25) states that in the year 1918, thousands of people across Ethiopia lost their lives to pandemic. As a quick solution to the problem; it was declared that every one should clean up and burn their waste on a particular day. It is based on this history that the community makes sanitation campaigns in November every year.

Note:

"Hidar sitaten" is the name of a traditional environmental sanitation campaign carried out in November every year.

During the sanitation campaigns, especially *'Hidar sitaten'* campaign, solid waste lifting vehicles available at the sub-city becomes standby for the campaigns. However *Kebeles* complain about lack of, or delay of the vehicles during the campaigns. During these campaigns the sub-city office tries to get additional vehicles from Clearness Management Agency at city level as well as from the private owners. The sub-city and *Kebeles* make ready simple materials that can be used for the purpose. They also mobilize the community through various mechanisms banners and brochures are also used for the purpose. The key dirty spots to be cleaned are identified by the *kebeles*.

Even though participation of NGOs appears to be lower in kirkos sib city, an NGO called 'Life in Abundance' is actively participating in the sub city's sanitation activities. 'Life in Abundance' participates by providing awareness creation program for residents, sanitation administration staffs in the *Kebeles*, MSE sanitation service providers and other stakeholders. The NGO also provides material support like hand push carts, spades and forks for MSE sanitation service providers.

Idirs and religious institutions have great acceptance and capacity to mobilize the community, and serve as forums for awareness creation about better solid waste management system. Especially Idirs in the sub city play significant role in mobilizing the community during sanitation campaigns. As students are parts of the society, creating sanitation clubs in schools also help for awareness creation efforts. However adequate attention is not paid to effectively mobilize these stakeholders in SWM system of Kirkos sub city.

In short, the current level of participation by different parts of the community is far from what they would have potentially contributed. The

community must participate to improve SWM; starting from planning stage through implementation and feedbacks. If the community gets shared vision about the sanitation of their environments the community can easily contribute by keeping their neighborhood clean. Enough consultation shall be made with community on issue related to SWM.

3.6 SWM Finance in Kirkos Sub City

SWM service has been delivered in Addis Ababa since the establishment of the city's municipal administration. With the growth of the city and increase in population the service has been delivered with limited input and in incomplete ways. The costs of SWM have been covered by the municipality/government.

Addis Ababa city Administration has been spending more than 65 million birr/year only for operational costs for sanitation activities carried out by sanitation agencies and relevant offices of the city Administration, the 10 sub-city administrations and 99 *kebeles*. Moreover, about 800 million birr is required to bring a fundamental change in sanitation service and infrastructure of the city. It is difficult to cover such huge cost only from government source; and mechanism that makes the receivers of the service to share the costs based on their capacity to pay has to be in place.

3.6.1 The Earlier Payment Systems for SWM Service and their Challenges

Various methods to finance SWM service have been tried at the city level. Various agencies took the responsibility of collecting payment for sanitation services with different types of taxes and trade license services. Addis Ababa Water and Sewerage Authority has been collecting sanitation fee with water bill; and Addis Ababa Finance and Economic

Development Bureau Revenue Agency collected with taxes. Similarly even though accurate revenue amount is not known, the Revenue Agency has been collecting payment for sanitation services on different check points by levying some percent on "chat." However there is no clear information as to how much is collected, and for what service it has been going.

Kirkos Sub City Clearness Management Office it self have been collecting fees as a payment for transporting solid waste from bigger institutions to the landfill. However the revenue collected directly goes to revenue agency and not directly spent on SWM. This discourages effort to provide more service or bring more revenue.

Another aspect is payment for door to door collection service delivered by MSEs. Private participation helps to create better cost sharing for SWM services, but in practice it suffered from some weaknesses. Since 1995 Micro and Small Sanitation Enterprises has been organized and engaged in the activity of SW collection from household and institutions. The MSEs has been collecting the sanitation service fee directly from users. However this type of service delivery and payment collection mechanism suffered from various problems. Even though MSEs took the responsibility of door to door SW collection, sub city vehicles operating in some areas in door to door SW collection caused some of the households to deny the MSEs. The amounts paid ranged from 10-20 birr on average, varied from area to area.

The payment system was based on number of households receiving sanitation service, rather than amount or volume generated. It does not cover all users; it is limited only to households; was not time and cost saving and it does not allow monitoring and control. It did not consider the community's capacity to pay. It was not fair and lacks flexibility. Moreover it does not motivate the MSEs engaged in the service.

From all these information it is clear that payment for sanitation services has been collected by various (different) government institutions in disorganized way, the amount collected is not well-known; and the system to channel the collected money to sanitation service were absent. However some reform measures are taken recently to improve payment system and financial contribution for sanitation services. The details about the reform are presented in section 3.6.2.

3.6.2 Reform in SWM Finance

The reform included zoning the community for convenience (from 800-1000 house holds) and assigning MSE to each zone. Payment depends on volumes amount collected. This is based on the belief that Payment system which is based on actual tonnage of solid wastes transported or collected encourages private sector participation. Method of sanitation service charge collection is collecting it with water bill.

Document prepared to create awareness about the new method of sanitation payment lists the rational. The first rational is that the majority of the residents of the city are water service users, it is convenient to make every users pay. The document also claims that research and experiences proved that there is direct correlation between amount of water consumption and SW generation (Addis Ababa Clearness Management Office, 2009).

Addis Ababa Water and Sewerage Agency started collecting 5% sanitation fees since June 2003 from its residential customers. It makes non residential SW generators pay. It is fair, flexible and convenient collection system. Since it uses the already existing human resources of Water and Sewerage Office, it saves payment collection time and cost (Addis Ababa

City Administration Clearness Management Agency, 2009). According to the approved regulation, from public water points 5%, from residential customers 20%, from non residential customers 42.5 % of payment for water is charged as sanitation fee (see table 3.9).

Table 3.8 The New Solid Waste Collection Tariff

Ser.No	Category of Customers	Water tariff in m3	The Previous Sanitation Tariff By Water and Sewerage Agency	Customers by Percent	The New Sanitation Tariff
1	Public Water Points	1.75	0	0.6	5%
2	Residential Customers		5%	86.3	20%
	0 to 7m3	1.75			
	7 to 20 m3	3.15			
	> 20 m3	3.8			
3	Non Residential Customers	3.8	0	13.1	42.5%

Source: Addis Ababa City Administration Clearness Management Agency, 2009.

Even though it is premature to comment on the weaknesses and strengths yet, some of the respondents have commented some points as weaknesses of the new payment system. The comments include: other actors who have higher share of SW generation but lower consumption of water service are not considered. Coupled with high cost of living and inflation, the new system is considered as putting additional pressure on residents. There is also tendency from the public to expect more quality service.

On the other hand it is not yet started to use the money collected to directly spend on the matter of SWM service, because the necessary rules and regulations are not set. Kirkos sub city has been paying the MSEs by shifting from other budget titles, and they are waiting for the Clearness Management Agency to replace it for them. The sub city pays to the

MSEs an average monthly payment of 269,091 Birr. Each MSE receives an average of 5,606.06 Birr per month. As can be seen from the table 3.10 below, the amount of SW collected and the related amount of payment varies from *Kebele* to *Kebele*, and MSE to MSE within *Kebels*.

Table 3.9 Average Volume of Monthly SW Collection by MSEs and Payment for the Service.

Kebele	Average Solid Waste Collection per month(in m3)	Average Monthly Payment (30 Birr/m3)	No. of MSEs in the *Kebele*	Average Monthly Revenue/MSE	Number of Containers in the *Kebele*
01/19	741	22,230	4	5,557.5	2
02/03	1,340	40,200	6	6,700	6
04	615	18,450	3	6,150	3
05/06/07	8,50.5	25,515	5	5,103	4
08/09	705	21,150	5	4,230	3
10	659	19,776	4	4,944	4
11/12	561	16,830	4	4,207.5	0
13/14	598	17,940	4	4,485	4
15/16	895	26,850	4	6,712.5	3
17/18	361	40,740	5	8,148	4
20/21	8,969	19,410	4	4,852.5	6
Total	8,969.5	269,091	48	269,091	36
Average	815.4	24,462	4.36	5,606.06	3.27

Source: Kirkos Sub City Clearness Management Office

This new SWM payment collection system serves as a way to launch a better SWM system. As a new system it is normal to expect some limitations on implementation. These problems must be identified and cured continuously in consultation with stakeholders.

Conclusion

To sum up, a number of rules regulations and manuals to regulate the SWM system and roles to be played by different actors were prepared by the previous Addis Ababa Sanitation Beautification and Park Development Agency; and the current Addis Ababa Clearness Management Agency.

Regulation No.13/2004 (Waste Management Collection and Disposal Regulation of the Addis Ababa City Government) among other things specify powers and functions of different organs. It also states the manner of providing private sanitary services. In order to solve the problems faced by MSEs engaged in the activity of SWM as well as to encourage the flourishing of such MSEs a regulation for private sanitation service provision is also put in place.

Working manual for kebele level monthly, weekly, and daily local sanitation activities, campaigns and regular works also exists. It lists various communities of different levels with the objective to make the task of local sanitation sustainable and community based. However, the implementation is barely effective due to combined effects of weaknesses of the rules and regulations themselves; as well as poor human financial and technical capacity.

The existence of these rules regulations and standards by themselves could be considered as a potential enabling ground for better SWM system. However these institutional arrangements need to be revised in such a way to practically bring a system of better participation, accountability, efficiency and effectiveness in the ultimate pursuit clean, healthy and attractive Addis Ababa.

Summary of Major Findings

- Majority of households (43%) identified the problem of SWM as a first ranking environmental concern in their neighborhood; followed by sewerage problem (28.8%).
- The main problems regarding SWM in Kirkos sub city include irregularity of SW collection services from households and other premises, shortage of communal refuse storage containers, delay in removing the full containers, poor sanitary condition around the containers; illegal dumping of SWs along streets, in ditches, open spaces, and river banks.
- Recently reform measures are taken to improve SWM system. The major areas of the reform are:
    - Collection of SWM fee with water bill
    - Enhancing zoning system of SW collection by MSEs
    - Paying MSEs based on volume of SW collected than number of customers
- Due to these reforms there are improvements in door to door collection, container area sanitation, lower conflict between MSEs, accountability for each zone

Challenges in the implementation of the reform are:

- *The level of participation* by the small and medium sanitation enterprises appears to be lower (only 4)
- So, private sector participation is almost limited to MSEs with weak material, technical, and financial capacity.
- *Aspect of participation:* all of the MSEs in Kirkos sub-city are engaged in door to door collection of SWs
- There are no private enterprises engaged in the activity of recycling and reuse, ignoring the economic and environmental advantages
- The MSEs collect wastes from those institutions reserved for small and medium scale sanitation enterprises.

- This limited the development of small and medium scale sanitation enterprises. It is also responsible for overburdening the already few SW transportation vehicles and communal garbage containers
- It is the role of Clearness Management office to provide refuse collection containers, transfer stations, and transportation of the solid waste containers to the Repi final dumping site.
- data shows that the capacity of the office to carry out its responsibilities is lagging much behind
- Human Resource Capacity of Relevant Public Offices is inadequate in terms of quantity, quality and motivation. 61.5 per cent of the staff of the Sub City Clearness Management Office earns less than 800 Birr/month
- Previously, organizational structure of Clearness Management Office that does not allow enforcing relevant rules is now corrected. However offices of the *Kebeles* are staffed with only 53.63% of the required personnel
- It is common to see over flown and scattered solid wastes around containers of Kirkos sub city. The causes for poor condition around the communal containers include:
    - inadequacy in terms of quantity, distribution, locations, utilization and timely removal
    - containers are decaying as the majorities are old in age
    - none of them are placed on a plat form
- The sub city dominantly bears the burden of solid waste transportation service, with participation of only 4 private enterprises. The vehicles owned by the sub city are not able to cover SW generated in the sub city. Causes include shortage in quantity and capacity, oldness, poor system of operation, and bureaucratic hurdles hindering quick maintenance
- Street Sweeping Service is challenged by lack of transport service hindered workers to start and finish cleaning early; lower use of

modern equipments; lack of dust bins with appropriate numbers; and limited awareness and culture of the society in using dustbins

- Contribution of Households for waste recovery, recycling and reuse is made either by selling to *'qurleos'* in cash; or exchange with some equipments to *'liwach'*. This is a good practice with the advantage of reduction in total amount of SW to be collected and transported to the dumping site.
- However only 13 respondents out of the 104 sample house holds separate wastes at the house hold level, to use it as fertilizer for plants in their compounds.
- In Kirkos sub city participation of NGOs and donors is limited, except for Life in abundance
- *Kebele* administrations mobilize the community to the sanitation campaigns by making use of institutions like *idirs*, youth and woman forums.

4. Conclusion and Recommendations

4.1 Conclusion

Along with growth of cities and increase in urbanization cities of developing countries are confronting various environmental problems. Poor SWM system is among the major environmental problems in the cities including Addis Ababa. The study in Kirkos sub city shows existence of SWM problem. The problems are manifested in terms of lower frequency and irregularity of SW collection; both from house to house, and from communal containers and transfer stations to the final dumping site. Even though there have been attempts to improve the SWM system, the prevailing condition in the sub city calls for enormous reform measures.

The main problems regarding SWM in Kirkos sub city include shortage of communal refuse storage containers, delay in removing the full containers, placement of containers at inappropriate locations, poor sanitary condition around the containers. More over there is shortage of SW transportation vehicles and dust bins. The Clearness Management Office of the sub city lacked human resources in appropriate quantity and quality. More over there were poor enforcement of rules and regulations as well as lower effort to mobilize contributions of various actors.

SWM practice in the sub city does not follow good SWM system. There is minimal effort to reduce wastes, to separate SWs into biodegradable and non-biodegradable; to recycle SWs; and there is also dumping or throwing of wastes every where. This have compromised the economic advantages of reduction and separation of SWs which enables resource recovery, reduction in the total amount of solid wastes to be finally

disposed off, and associated costs of managing the waste. The recycling aspect requires huge amount of capital and advanced technology. Therefore the government should be engaged in the activity. More over the beginnings to recycle metal and glass in the city by factories like Akaki Metallurgy and Glass Factory must be scaled up.

The underlying causes of poor SWM system in the sub city can be categorized into financial, socio cultural, organizational and institutional problems. The result from the collected data shows that there is lower level of public participation. Since various stakeholders are not carrying out their responsibilities, poor SWM practice prevailed in the sub city. Even though there is a beginning in involving the private sector it is not efficient yet. Contribution of different actors is low; cost sharing mechanisms are not developed and the service delivery suffers from shortage of finance. There is lack of sense of ownership from the public about their neighborhood's sanitation.

The participation of the private sector in SWM system of Kirkos sub city is increasing from time to time. Some reforms like solid waste collection charges and payment system to sanitation service provider MSEs have brought some improvements in solid waste collection rates, sanitation around containers, and enabled collection of sanitation charges from the majority of the service users. However the MSEs still operate under technological and financial constraints.

The result of this study provides lessons about the need for mobilizing efforts of all stakeholders and the need to continuously revise the legal and institutional setups to make it facilitative for contribution of all stakeholders.

4.2 Recommendations

Based on its findings, this study provides some recommendations which might contribute for solving the problem of SWM in Kirkos sub city in particular and Addis Ababa in general; and hence to provide the residents healthy living environment, as well as to enhance aesthetic values and reputation of the city.

- The issue of buying additional vehicles and private public partnership shall be considered to relieve the sub city from pressure of solid waste transportation.

- The community must participate to improve SWM; starting from planning stage through implementation and feedbacks.

- Different actors must participate to increase awareness and bring behavioral change

- Transportation, processing of wastes for reuse and recycling, production and maintenance of equipments used for SWM activities are some of the potential areas of involvement by the private sector

Better attention is given to clean and beautify Kirkos sub city during Africa Union meetings and other special occasions. However there shall be ways to build the capacity of the Clearness Management Office of Kirkos Sub City and other key stakeholders to keep the sub city clean in a sustainable way. This requires continuous researches and revision of relevant institutional and legal setups; adoption of new technologies as well as experiences of other cities.

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Questionnaire I

FACULTY OF BUSINESS AND ECONOMICS

MASTERS IN PUBLIC ADMINISTRATION

(To be filled by Kirkos Sub-City Sanitation Management Office)

Introduction

The objective of this questionnaire is to gather information related with the level of participation by different stakeholders in the activity of solid waste management in Kirkos Sub city. The information will be used to write Master's Thesis in Public Management and Policy at Addis Ababa University. Your accurate and reliable answers are highly required for the achievement of the objectives of the research.

(A) General Questions

Name of the Department	
Position of the Respondent	
Date	
Interviewer	

(A-1) Please list major responsibilities of Sanitation Administration office

_____

_____

_____

(A-2) How do you evaluate the practice of the community in source Separation, recycling and reuse?

☐ Very good ☐ Medium ☐ Low

(A-3) Rank the causes of the poor SWM Practice in the sub city

		1st	2nd	3rd	4th
1	Lack of awareness				
2	lack of public participation				
3	Inappropriate policy				
4	Shortage of tracks				
5	Shortage of man power				

(B-1) how do you evaluate the current human resource capacity in terms of (3.2.1) Quantity? ☐ Adequate ☐ Inadequate

(3.2.2) Qualification?

☐ High ☐ Medium ☐ Low

(3.2.3) Motivation

☐ Motivated ☐ Medium ☐ Less motivated

(C) Questions Related with Solid Waste Management Finance

(C-1) Who were in charge of collecting sanitation fees in the previous years?

_____

_____

(C-2) What are the positive and negative sides of the collection methods used in the previous years?

_____

_____

(C-3) How the activity of solid waste management service is financed currently

_____

_____

(D) Solid Waste Disposal Containers

(D-1) ***Distribution of Containers in Kebeles of Kirkos Sub City***

Ser.No.	**Kebele**	**Number of refuse collection containers**
1	01/19	
2	02/03	
3	04	
4	05/06/07	
5	08/09	
6	10	
7	11/12	
8	13/14	
9	15/16	
10	17/18	
11	20/21	
Total		

(D-2) What is/are the criteria/s for determining the number of Solid Waste disposal containers to be assigned in each *kebele*

_____

_____

(D-3) How do you assess the sites of the containers interims of centrality for users?

☐ Very appropriate ☐ Less appropriate ☐ Very inappropriate

(D-4) How do you assess the accessibility of the majority disposal containers for container lifting vehicles in all seasons?

☐ High ☐ Medium ☐ Low

(D-5) Do the containers allow segregation of Solid Wastes into biodegradable and non-biodegradable?

☐ Yes ☐ No

(D-6) If there are two or more containers at a site are the majority painted with different colors to allow segregation /separate disposal?

☐ Yes ☐ No

(D-7) How do you assess the level of participation by MSEs, house holds and other actors in separate storage?

☐ High ☐ Medium ☐ Low

(D-8) If the answer for Question No. A-8 is Medium or low, what is/are the causes, in your opinion?

_____

_____

(D-9) How much does a disposal container cost? _____

(D-10) how often does solid waste transported from the containers to the central dumping cite?

☐ Dally ☐ Once a week ☐ Twice a week

☐ Other, indicate_____

(D-11) How do you assess the frequency of the container clearing activity?

☐ Adequate ☐ Inadequate

(D-12) Assess the level to which you think the location of containers considered the amount of solid waste generated and number of residents in each area.

☐ High ☐ Medium ☐ Low

(D-13) How many containers are placed on plat forms? _____

(D-14) How many containers in the sub city have lights to allow dumping during the night? _____

(D-15) How many of the containers in the city have steps to allow children to dispose wastes inside the containers? _____

(D-16) How often are the containers washed? _____

(D-17) How do you evaluate performance of the sub-city office in terms of lifting the containers as soon as they are full?

☐ High ☐ Medium ☐ Low

(D-18) Do the sub-city and *Kebeles* have map showing location, type and number of containers?

☐ Yes ☐ No

(D-19) Rate causes of unsanitary condition around containers (Put " " mark to indicate your answer)

S/n	List of Possible Causes	The Level of Seriousness			
		High	Medium	Low	It is not a cause at all
I	Irregularity of container lifting vehicles				
Ii	Sanitation service provider MSEs in appropriate dumping (often when the containers are full)				
Iii	Dumping by children (due to lack of awareness and capacity)				
iv	Scavengers scattering the refuse while collecting some useful materials				
V	Lack/inappropriateness of container placement spaces				

(E) Complete the table below to show the number and type of vehicles used for solid waste Disposal service.

S. N	Type of vehicles	Number of vehicles	Crying capacity (in m3)	Age	Condition	No. of Trips required / day	Time it takes for each trip	Total volume expected to be disposed /day by the vehicle	Does the truck cover the trips required ?	If No why?
1										
2										
3										
4										
5										
6										

(E-2) do you think the vehicles are adequate?

☐ Yes ☐ No

(E-3) Efficiency of the vehicles in removing containers before they are full

☐ High ☐ Medium ☐ Low

(E-4) How often the disposal containers are covered appropriately to avoid spillovers of wastes along the roads?

☐ Most often ☐ only some times ☐ Barely

(E-5} How often do the vehicles washed?

☐ Daily ☐ In two days

☐ In three days ☐ weekly or more

(E-6) Are there studied route systems to reduce cost?

☐ Yes ☐ No

(E-7) How do the drivers stick to the studied routes?

☐ High ☐ Medium ☐ Low

(E-8) What times does the vehicle collect /lift the disposal containers?

_____

_____

(E-9) Why is the time chosen? (Rationales for the schedule)

_____

_____

(E-10) Do the drivers stick to the schedule?

☐ Yes ☐ No

(E-11) List other vehicle related problems

_____

_____

(E-12) What do you recommend as solutions to solve the problems?

_____

_____

(E-13) In your opinion what will happen if solid waste transportation service are outsourced to the private sector?

_____

_____

(E-14) Is there private sector participation in Solid waste transportation in Kirkos sub-city?

☐ Yes ☐ No

(E-15) If your answer is no, go to Question No E____.

(E-16) If yes, please provide list of private solid waste transportation service providers

_____

_____

(E-17) List the primary customer categories of the private solid waste transportation service providers in the order of importance

_____

_____

(E-18) If there is supports provided to the private SW transporters in the sub-city list types of supports provided?

_____

_____

(B-19) Provide positive contributions you perceive about services provided by the private SW transporters

_____

_____

(B-20) Provide challenges you perceive about services provided by the private solid waste transportation service provider

_____

_____

(E-21) What do you think are the possible solutions for the challenges indicated?

_____

_____

(E-22) Are there other actors than the private sector engaged in transportation?

Yes ☐ No ☐

(E-23) Please provide their list

_____

_____

(F1) Assessment of Private Sector Participation in Solid Waste Management

S/n		Number of private actors by aspect of involvement			Total Number
		House to house collection	Transportation	Recycling and reuse	
a	MSE				
b	Private company				
	total				

(F-2) How do you evaluate the level of participation by the MSEs

☐ High ☐ Medium ☐ Low

(F-3) How do you evaluate the level of participation by the private companies?

☐ High ☐ Medium ☐ Low

(F-4) How do you evaluate the quality of service provide by MSEs

☐ High ☐ Medium ☐ Low

(F-5) How do you evaluate the quality of service provide by private companies?

☐ High ☐ Medium ☐ Low

(F-5) What are the main factors constraining participation of the private sector in solid waste management?

_____

_____

(F-6) What do you recommend as solution to encourage private participation in solid waste management?

_____

_____

(G) ***Assessment of Involvement by Non Governmental Organizations in SWM***

S. N	List of NGOs actively participating in SWM	Aspect of Participation						
		Transportation	Reuse	Recycle	Disposal	Awareness creation	Material support	If other, indicate
1								
2								
3								
4								

(H1) Pleas list Community Based Organizations (CBOs) actively participating in SWM

(H2) Assess involvement by Community Based Organizations (CBOs) in SWM

High ☐ Medium ☐ Weak ☐

(I-1) How do you evaluate the role played by *Kebele* Sanitation Administration office?

High ☐ Medium ☐ Weak ☐

(I-2) What are challenges related to *kebele* level office?

_____

_____

(I-3) Please list other potential governmental stakeholders and assess the current level of their participation

_____

_____

(J) What do you suggest is to be done to create effective participation of all stake holders?

_____

_____

Thank you, Very Much!

Questionnaire II

Addis Ababa University

FACULTY OF BUSINESS AND ECONOMICS

MASTERS IN PUBLIC ADMINISTRATION

(Presented to Micro and Small sanitation Enterprises)

Introduction

The objective of this questionnaire is to gather information related with the level of participation by different stakeholders in the activity of solid waste management in Kirkos Sub city. The information will be used to write Master's Thesis in Public Management and Policy at Addis Ababa University. Your accurate and reliable answers are highly required for the achievement of the objectives of the research.

General Information

1	*Name of the Enterprise*	
2	*Kebele*	
3	*Operation Zone*	
6	*Date*	

(A) Areas of Involvement

S/N	Area of Involvement	Specific Activities	Put a Mark Before the Right Choice
1	Collection	Door to door	
		Communal	
		Block	
		Curbside	
2	Transportation	to transfer station	
		to community containers	
		to land fills	
		Others (specify)	
3	Recovery/collection of Reusable		
4	Collection of Recyclables		
5	Disposal to Landfills		

(B) Supports Received from Different Actors

	Types of Support	Provider	Amount
I			
ii			
iii			

(C) Payment System

C1- What is the base of payment for the service you deliver?

☐ Monthly, Weakly, etc.

☐ Volume

☐ Frequency

C2-Who collects the payment? _____

C3- View about the method of collection

_____

_____

C4- Amount of payment_____

D- Do your customers separately store Solid Wastes into Bio-degradable and non-biodegradable?

☐ Yes ☐ No

E- What are weaknesses /challenges related with your customers?

_____

_____

F-List if there are other challenges to your activity

_____

_____

G- What do you think are solutions to the problems?

_____

_____

Thank you, Very Much!

Questionnaire III

Addis Ababa University

FACULTY OF BUSINESS AND ECONOMICS

MASTERS IN PUBLIC ADMINISTRATION

(Presented to Idir Leaders to Assess SWM Service Delivery of Different Stake Holders in their Kebeles)

Introduction

The objective of this questionnaire is to gather information related with the level of participation by different stakeholders in the activity of solid waste management in Kirkos Sub city. The information will be used to write Master's Thesis in Public Management and Policy at Addis Ababa University. Your accurate and reliable answers are highly required for the achievement of the objectives of the research.

(B) General Questions

Name of the Idir	
Position of the Respondent	
Kebele	
Total No. of House holds enrolled in the Idir	
Date	
Interviewer	

B-1-Sex

male	
Female	

B-3- Age of the respondent

Range	< 20	21-40	41-60	61-80	81 and above
Put ✓on the answer					

(C) Assessment of level of participation by different actors

(C-1) Give rank to the top three actors in terms of playing the major role in carrying out SWM activity in your *kebele.*

		1st	2nd	3rd
1	MSE			
2	Companies			
3	Sub city Administration			
4	Kebele Administration			
5	Community			
6	I don't know			
7	MSEs and sub city			
8	Sub-city and kebele			
9	MSEs, sub-city and Kebele			

(C-2) Provide your choice as a solution for an effective SWM service in your kebele

		put "✓"
1	Totally outsourcing SWM activities to private companies	
2	Partially outsourcing SWM activities to private companies	
3	Through undertaking all SWM activities by government	
4	I don't know	
5	If there is Other option, specify	

(C-3) What contribution did your IDIR made till now to improve SWM activity of your locality? _____

(C-4) What are SWM related problems in your *kebele* and what do you think are the solutions?

Problems

_____

_____

_____

_____

Solutions

_____

_____

_____

_____

Thank you, Very Much!

Questionnaire IV

Addis Ababa University

FACULTY OF BUSINESS AND ECONOMICS

MASTERS IN PUBLIC ADMINISTRATION

(To be filled by Sample Households in Kirkos Sub-City)

Introduction

The objective of this questionnaire is to gather information related with the level of participation by different stakeholders in the activity of solid waste management in Kirkos Sub city. The information will be used to write Master's Thesis in Public Management and Policy at Addis Ababa University. Your accurate and reliable answers are highly required for the achievement of the objectives of the research.

(A) General Questions

Sex	Male	
	Female	
Position in the HH	Male head	
	Female head	
	Others	
Level of education	Illiterate	
	Primary	
	Secondary	
	Territory and above	

(B) Please rank environmental concern in your neighborhood in the following table.

Concerns	Rank		
	1st	2nd	3rd
Sound pollution			
Sewerage problem			
air pollution			
Solid waste problem			
Water contamination			

(C) Please provide manifestations of solid waste problems in your neighborhood.

(D) In your opinion what are the major causes of solid waste problem?

(E) Please put " mark before the primary responsible household member to manage solid wastes in your household.

HH member responsible for SWM in the hh	
Servants	
Mother	
Father	
Children	
All of the members of the HH	

(E) Does your household separately store wastes into biodegradable and non bio-degradable at home?

☐ Yes ☐ No

(F) Does your household make use of recyclable and reusable materials?

☐ Yes ☐ No

(G) How does your household benefit from recyclable and reusable materials?

(H1) How do you pay for solid waste management?

_____

(H2)What are the strengths and weaknesses of the system being used to collect payment for solid waste management service?

Strengths:

_____

_____

_____

_____

Weaknesses:

_____

_____

_____

_____

(I) Do you participate in sanitation campaigns?

Yes No

(J1) Do you receive solid waste management service from the private sector?

☐ Yes ☐ No

(J2) What are the strong points about the solid waste management service provided to you by the private sector?

(J3) What are the weaknesses of the solid waste management service provided to you by the private sector?

(K) Please provide suggestions to improve the poor solid waste management and to increase participation of various stakeholders.

Thank you, Very Much!

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

IMPLEMENTATION OF THE NATIONAL INVESTMENT POLICY OF ETHIOPIA IN THREE SELECTED ZONES OF SOUTHERN NATIONS, NATIONALITIES AND PEOPLES REGIONAL STATE (SNNPRS): (KAFFA, GAMO GOFA AND SIDAMA ZONES)

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JULY, 2010

ADDIS ABABA

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