



**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
**INSTITUTE OF DEVELOPMENT STUDIES**

**NATURE, CHALLENGES AND OPPORTUNITIES OF DOOR -TO- DOOR  
SOLID WASTE COLLECTION SERVICE PROVIDING COOPERATIVES: THE  
CASE OF ARADA SUB CITY**

**BY**  
**HIWOT WORSA**

**March, 2012**

The  
H3N2  
2012

B8177

**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
INSTITUTE OF DEVELOPMENT STUDIES**

**NATURE, CHALLENGES AND OPPORTUNITIES OF DOOR-TO-DOOR  
SOLID WASTE COLLECTION SERVICE PROVIDING COOPERATIVES: THE  
CASE OF ARADA SUB CITY**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT  
OF THE DEGREE OF MASTER OF ARTS IN DEVELOPMENT STUDIES,  
ENVIRONMENT AND DEVELOPMENT**

**BY**

**HIWOT WORSA**

**March, 2012**

The  
H3112  
2012

**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
INSTITUTE OF DEVELOPMENT STUDIES  
(IDS)**

*Title*

*Nature, Challenges and Opportunities of Door-To-Door  
Solid Waste Collection Service Providing Cooperatives in  
Arada Sub-City.*

By  
**Hiwot Worsa**

ADDIS ABABA UNIVERSITY  
AKAKI CAMPUS LIBRARY

**DEVELOPMENT STUDIES**

APPROVED BY THE BOARD OF EXAMINERS:

SIGNATURE

**Dr. Belay Simane**

CENTER HEAD



**Dr. Abdulhamid Bedri**

ADVISOR



**Dr. Workneh Negatu**

INTERNAL EXAMINER

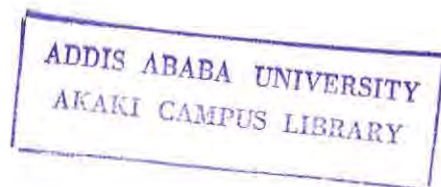


## Acknowledgements

First and my most acknowledgements goes to God that helped me in the all process of my activity. I am also very grateful to my advisor Dr Abdulamid Bederi for his patience, continues encouragement, and valuable comments throughout the paper from the very start.

I also owe special thanks to all coordinators from woreda sanitation office and informants for their kindly cooperation and all the study respondents who generously shared their, time, experiences and insight: without them study would not have been realized.

I also want to express my deepest gratitude to all my family members who helped me in one and another ways. Finally, to all other persons who in diverse ways have contributed to the success of this study.



# Table of Contents

	<b>Page</b>
Acknowledgments.....	i
Table of contents .....	ii
List of figures.....	vi
List of boxes .....	vi
List of tables .....	vii
List of annexes.....	viii
Lists of acronyms .....	ix
Abstract .....	x
<b>INTRODUCTION .....</b>	<b>1</b>
1.1 Trends of solid waste management in Addis Ababa .....	1
1.2 Statement of the problem .....	3
1.3 Objective of the research study.....	5
1.4 Research questions .....	5
1.5 Significance of the study.....	6
1.6. Scope and limitation of the study .....	6
1.7. Organization of the paper.....	7
<b>METHODOLOGY.....</b>	<b>7</b>
2.1 Research design .....	7
2.2 Data sources .....	8
2.2.1 Primary data Sources .....	8
2.2.2 Sources of secondary data .....	10

2.3. Sampling techniques and sample size .....	10
2.3.1 Selection of the sub city .....	10
2.3.2 The selection of cooperatives.....	10
2.3.3 The selection of members.....	10
2.3.4 The selection of clients and key informants.....	12
2.4 Data analysis methods.....	12
2.5 Description of the study area.....	13
2.6 Theoretical framework of factors determining the outcome of involvement of coops in waste collection activity. ....	15
<b>LITERATURE REVIEW .....</b>	<b>18</b>
<b>3.1 Definitions and concepts.....</b>	<b>18</b>
3.1.1 Solid waste.....	18
3.1.2 Municipal solid waste.....	19
3.1.3 Waste collection.....	19
3.1.4 Solid waste management.....	20
3.2 The functional elements of solid waste generation.....	20
3.3. Types of Micro and Small Enterprises in Solid Waste Collection.....	22
3.4 Characteristics of Micro and Small Enterprises Involved in Waste Collection.....	24
3.5 Solid waste collection coverage of some African cities.....	26
3.6 Impacts of improper solid waste management .....	32

<b>RESULTS AND DISSCUSSION.....</b>	<b>37</b>
<b>4.1 Regulatory and policy frame work.....</b>	<b>37</b>
<b>4.2 socio- Demographic characteristics .....</b>	<b>39</b>
4.2.1 Sex Composition of members .....	39
4.2. 2 Age composition of members.....	40
4.2.3 Educational Back ground of workers .....	41
4.2.4 Reasons for joining in solid waste collection activity.....	41
4.2.5 Year of staying in the service.....	42
<b>4.3 Nature of the service provided by the cooperatives .....</b>	<b>43</b>
4.3.1 Payment for the service.....	45
4. 3.2 Awareness creation program .....	45
4.3.3 Contractual Arrangement.....	46
4. 3.4 Effectiveness and efficiency of direct contracting for waste collection.....	47
4.3.5 Composition and source of waste.....	49
4.3.5.1 Source of solid waste .....	49
4.35.2 Composition of solid waste .....	49
4.3.6 Division of labor.....	49
4. 3.7 Monitoring and supervision.....	50
4.3.8 Institutional support.....	51
<b>4.4 Users satisfaction, cooperation, and willingness.....</b>	<b>52</b>
4.4.1 Users satisfaction with the service .....	52
4.4.2. Solid waste situation.....	54
4.4.3 Users cooperation in solid waste collection.....	55

4.4.4 Clients' willingness to pay for sanitation fee .....	57
<b>4.5 Opportunities.....</b>	<b>58</b>
4.5.1. Benefits to the workers.....	58
4.5.1.1 Employment .....	58
4.5.1.2. Income .....	59
4.5.2 Benefits to clients.....	59
4.5.3 Benefits to the municipality .....	61
<b>4.6 Major Challenges faced the cooperatives-.....</b>	<b>62</b>
4.6.1 Technical resources.....	62
4.6. 1.1 Containers.....	62
4.6.1.2 Waste transporting vehicles.....	64
4.6.1.3. Lack of equipments.....	65
4.6.2 Lack of access to safety cloths and medical service .....	66
4.6.3 Inadequate payment .....	67
4.6.4 Delay in payment.....	69
4.6.5.Source of capital .....	70
4.6.5Attitude towards solid waste members .....	71
<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>73</b>
5.1 Conclusion .....	73
5.2 Recommendations .....	76

References

Annexes

**Lists of figures**

Figure-2 Map of the study area.....14.

**Lists of Boxes**

Box-1 Theoretical frame work of challenges of door-to -door solid waste collection services providing cooperatives .....15

## Lists of Tables

### Page

Table-1 Sample distribution from the cooperatives. ....	11
Table -2 Sex compositions of members.....	39
Table- 3 Age composition of members. ....	40
Table -4 Sampled members' Educational background.....	41
Table- 5 Reasons for joining the waste collecting activity by members .....	42
Table- 6Criteria for the division of labor in cooperatives. ....	50
Table-7Employment opportunity by sex .....	58
Table-8 Responses to adequacy of waste containers by members.....	63
Table-9 Responses to satisfaction with the payment by members .....	69
Table-10 Responses to the timely payment by members.....	70
Table-11 Responses to attitude of the society by members. ....	72

## **List of Annexes**

Annex-1 Questionnaire scheduled for (solid waste collectors) members of Door – to – Door solid waste collection services providing cooperatives.

Annex-2 Check list for door -to -door solid waste collection service recipients.

Annex-3 Guiding questions for interview and discussion with sampled co – operatives' chairpersons.

Annex-4 Guiding questions for interview and discussion with official at Arada sub-city sanitation Department.

Annex-5 Check list of field observation.

## Acronyms and abbreviations

**AMA:** Accra Metropolitan Authority

**AMA:** Accra Metropolitan Assembly.

**ART:** Article.

**CFF:** Christian Children Fund.

**CGAASBPDA:** City Government Of Addis Ababa Sanitation, Beatification and Park Development Agency.

**COOPS:** Cooperatives.

**EPA:** Environmental Protection Authority.

**GOV'T:** Government.

**ICA:** International Cooperative Alliance

**MRFS:** Material Recovery Facilities.

**MSES:** Micro and Small Enterprises.

**MSESDA:** Micro and Small Scale Enterprises Development Agency.

**MSWM:** Municipal Solid Waste Management

**NCA:** Nairobi City Council.

**NGOS:** Non Governmental Organizations.

**SBPDA:** Sanitation, Beatification and Park Development Agency.

**SW:** Solid Waste

**SWCPCS:** Solid Waste Collection Private Contractors

**SWM:** Solid Waste Management.

**UNDP:** United Nation Development Program.

## Abstracts

*Poverty and urban unemployment are the major economic challenges to the city of Addis Ababa. To solve these problems, emphasis is placed on creating job opportunities in five core areas, waste collection activity, being one of the concerns of the municipality gained due attention. Consequently, the city government empowered Micro and small scale enterprises organizing office at woreda level with mandate to organize people who are supposed to be poor and willing to work in solid waste collection. Thus, the offices register those people willing to engage in waste collection.*

*This study was conducted so as to investigate the salient features of door-to-door primary solid waste collection service provided by cooperatives in Arada sub-city .And most importantly to identify the challenges faced the coops and opportunities occurred due to the involvement of cooperatives in waste collection activity. The required data were gathered through document inspection, survey questionnaire, interviews, and case study and observation list.*

*Cooperatives under study faced many challenges in their activities. Absence of vehicles and lack of equipment were the major challenges to deliver the services frequently and effectively. Inadequate payment, delay in payment, lack of access to safety clothes and medical service affected their operation.*

*The engagement of cooperatives in waste collection activity contributed a lot to the workers, municipality and the service recipients. Their participation in the activity increased the employment opportunity and became income source for the poor. The municipality also benefited due to their involvement in municipal solid waste collection .Their role bridged the gap, in waste collection between the service recipients and the municipality{municipal containers}and increased the service coverage and waste collection frequency in the study area. The service recipients also confirmed that there is improvement in solid waste situation of their surrounding due to the involvement of the cooperatives in waste collection services. They can also save their time and labor.*

## **INTRODUCTION**

### **1.1 Trends of solid waste management in Addis Ababa city**

Sanitation service was introduced for the first time in public notice No. 148/1958 by the Minister of Health. This notice identified sanitation services as the surveillance of food stuffs, beverages, buildings, factories. (Selamawit, 2007). Upto 1994 solid waste management was the task of the department of Environment, Health and social services of the municipality. The department was responsible for all solid waste management activities ranging from collection to disposal. From 1994 to 2003, the mandate was transferred to Addis Ababa Health Bureau. (Zelalem, 2006). The city administration has transferred the provision of dry waste management to the newly established Addis Ababa city Sanitation, Beautification and park Development Agency since 2003 with objective to make the city naturally balanced, Green and favorable environment through integrated Management and urban recreational area development (Tadesse, 2004)

Until the end of 2003 solid waste pre collection service in the city of Addis Ababa was operated by informal Solid waste collectors, private formal enterprises and municipality. Although the informal waste collecting sector was providing door-to-door solid waste pre – collection service in the city, this activity had for long remained less attractive to the government officials or simply ignored until the appointment of the provisional city government led by mayor Arkebe Equaby in 2003. It is since then that the government officials became more conscious about the informal sector as one of the employment generating arenas (zelalem, 2007)

In the early period of the new provisional city administration, the situation seemed quite friendly to the informal solid waste collectors. They were in fact in advantageous position while the city government restored to with draw from the pre collection service in particular and the solid waste management activity in general. As the result of this block collection practiced earlier by the municipal truck fleets was almost abandoned and containers were placed in locations facilitating the work of informal house to house waste collectors this was based on the defacto informal arrangement between the informal waste collectors and the municipality. (Zelalem, 2007), this agreement presupposes that the government must re – launch the block collection service as far as the informal waste collectors are failed to provide appropriate sanitation service within the neighborhood they are supposed to collect.[ zelalem,2006]

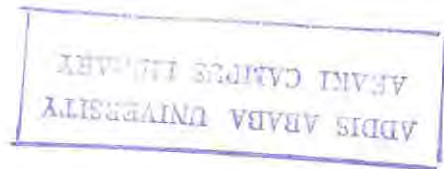
Government officials explained that they adopted this oral arrangement just for the sake of two reasons. In the first place, the officials recognized that it is possible to reduce the cost of waste collection operation by abandoning the block collection service and emphasizing only transporting the containers to the final dump site, secondly the informal waste collectors were capable to collect more waste than the municipal trucks could do. In the third place it was viewed as a kind of creating job opportunities to the individuals engaged in the sector.

After a few months the new city administration gradually developed an interest to fully control the pre – collection component of solid waste management. Hence, by the end of the year 2003 it started to advocate the need for formalizing the pre existing informal solid waste collecting enterprises. Thus, the government intervened in to the sector by institutionalizing and integrating anew actor of micro and small scale enterprises

(MSSSES) with out any king of preliminary consultation and consensus with pre existing actors. Government sponsored micro and small enterprises whose members were selected among the unemployed by local authorities, therefore, appeared as rivals to the pre existing informal and even to already established formal private solid waste colleting enterprises. (Zelalem, 2007)

until recent time the payment for the collection service was collected by the solid waste collectors .But a few years later government has directly contracted out the service to the cooperatives ,thus sanitation service fee is collected by the government which is based on water consumption rate of the service users.

## 1.2 Statement of the problem



In 2001 according to a report of Addis Ababa Health Bureau, the office in charge of solid waste management at that time house hold waste accounted for about 76% of the total waste generation. The average waste generation per person in the city was estimated at 0.17/ kg /person per day. The collection system was carried out using 16 side loaders, 10 compactors trucks and 38 container lifter trucks. Taking the total population of the city as 3.3 million and the average family size of household as 5, one truck served about 10.313 families or to about 51,562 people. This implies that the geographical coverage and frequency of disposal was by far below expectation (Yirgalem, 2001:75).

The serious deficiencies in sanitation services and inadequate sewerage infrastructure and random defection in urban area have created dangerous health and environmental problems.” (Environmental Policy of Ethiopia, 1997).

As stated on Green paper series, 1995 open dumping of solid and hazardous waste without any controls clearly poses a much greater problem in some developing countries than modern well regulated land disposal facilities. Open dumps are not only sources of air and water pollution, but they are breeding grounds for vermin and contribute to public health problems .If solid waste is not managed properly and timely it has negative impacts on human and animal health. Solid waste illegally dumped in to open grounds, rivers and sewerage cause many problems on human health by creating suitable ground for disease vectors. Poor management of solid waste is also dangerous to animal health and life as animals can eat hazardous waste disposed carelessly. Solid waste thrown in to sewerage line block drainage and affect environment (soil, water, air).

Among the positive implication of proper management of solid waste improving human health and safety condition, resource conservation through recycling, reduction in environmental pollution level are the first ones to be mentioned. Despite a lot of investigations have been made on challenges of private formal and informal solid waste collectors, the researcher could not have the chance to look at more study on solid waste collection service providing cooperatives Therefore, to make the service sustainable and more successful in depth assessment of challenges that coops solid waste collection initiative may face is very important. And identifying the opportunities that have resulted due to their involvement in the service help to acknowledge the initiative.

### **1.3 Objectives of the study**

The general objective of this research is to assess the nature, challenges and opportunities of door- to- door solid waste collection service providing cooperatives in Arada kifleketema.

#### **Specific objectives**

1. To assess the nature of door- to -door solid waste collection service delivered by cooperatives in the study area.
2. To identify the major challenges faced the cooperatives.
3. To asses the opportunities accrued from the involvement of cooperatives in the service.
4. To recommend solution to the existing problems of the cooperatives

### **1.4 Research questions**

- 1.What is the nature of door- to door -solid waste collection service delivered by cooperatives in the study area?
- 2.What are the major challenges faced the cooperatives?
- 3.What are the opportunities accrued from the involvement of cooperatives in waste collection services?

## **1.5 Significance of the study**

In this paper an attempt is made to identify those challenges faced door- to- door solid waste collection service providing cooperatives in Arada kifle-ketema and opportunities accrued from the involvement of the coops in the waste collection activity.

Thus, it is believed that the research findings are expected to help solid waste collectors(members of the coooperatives) who have and will involved in the activity in the future to ease those problems and improve their livelihood.The research finding is also expected to be used by policy makers in the area ,this is because it is assumed that the research findings help them to be aware of the challenges faced the cooperatives and give due attention in adapting better policies that promote the success of the cooperatives. . Besides adding a brick to the body of knowledge on the subject, the output of the study could also be informative for development practitioners, donors and non governmental organizations interested to operate in the area. Furthermore the findings of this study may also serve as a spillover for further research in the area.

## **1.6 Scope and limitation of the study**

The scope of this study is limited to ases the nature, major challenges and opportunities of door-to-door solid waste collection service providing cooperatives in Arada kifle-ketma. Hence the undertaking of this research is expected to be exhaustive of issues related to these. However, this study is subjected to the following limitations:

- Lack of transparency to give actual information on complimentary job and amount of waste collected

-Further expectation of support from the researcher and from government which has resulted from deep rooted dependency for long years.

## **1.7 Organization of the Paper**

This research paper is organized into five chapters. The first chapter deals with background, statement of the problem, objectives of the study, research questions to be addressed, and significance, scope and limitations of the study. The second chapter dwells on review of conceptual as well as empirical literatures pertinent to objectives of the study. While, chapter three exclusively deals with general features of the study area and the research methodology pursued, chapter four dwells on some, major findings and discussion. Finally, the conclusion and priorities ahead are presented in chapter five.

## **METHODOLOGY**

The methodology of the study focuses on the over all research process including research design, data sources and data collection instruments, method of sampling and sample size and description of the study area.

### **2.1 Research design**

Both qualitative and quantitative methods of data collection were used, as both methods were required for the study.

## **2.2 Data sources**

Source of data for the study consists of both primary and secondary data. Primary data was collected using a multitude of data collection techniques, which includes structured questionnaire, key informant interviews, casestudies and direct observation.

### **2.2.1 Primary data Sources**

#### **A. Structured Questionnaire**

In this tool (instrument) the selected solid waste collectors from sampled cooperatives participated. Hence, data was gathered from solid waste collectors through structured questionnaire. The questionnaires include close- ended and open-ended items, and the questions were drafted using the insight that was gathered from the review of related literatures. The researcher also developed some items by her self. All the items were consulted with some representatives of sampled cooperatives and the investigator translated them in to Amharic in order to make them understandable to all participants .Based on the comments given by consulted representatives of the sampled cooperatives and adviser of the researcher some improvements were made. Selected solid waste(members) collectors were asked questions to obtain data on challenges they face in their operation and their activites.

#### **B. observation**

Observation was used as one method to collect primary data that triangulated with data gathered from other sources. In this technique activities of the Cooperatives, location, type and size of communal containers, transfer points and solid waste sorted at individual

house hold and the various area which are highly affected by illegal dumping of solid waste were intensively observed by the researcher.

### **C. key informant interview**

So as to augment and cross tab data collected through questionnaire, key informant interviews was held with knowledgeable informants, which include ten chairpersons of the selected cooperatives, and one official at sanitation department of the sub-city. This instrument has been used to obtain data on the nature of the collection services render by the cooperatives under study and challenges and opportunities of the cooperatives. When possible, “English” was used as medium of communication. However, the majority of the interviews had to be done in “Amharic” the foreign language may have caused loss of information.

### **D. Case studies**

Case studies on three selected service users in the study area was conducted. Here in depth investigation was conducted to generate data regarding their participation in solid waste collection related activity, their willingness to pay for sanitation service, their satisfaction up on the service provided by the coops and benefits accrued from the involvement of cooperatives in waste collection activities. Checklist was used to facilitate the data collection process.

## **2.2.2 Sources of secondary data**

Secondary data was collected from library sources, which included books, journal articles and research reports. Internet websites were also the chief sources of secondary data.

## **2.3. Sampling techniques and sample size**

### **2.3.1 Selection of the sub city**

The selection of Arada sub city was made purposely. The fundamental reason for the selection of this area is the presences of many big educational and financial institutions .Moreover, the palace of the country or national place is located in this area. So these make the area central place for the city. And the researcher believes it is reasonable to give priority to this area.



### **2.3.2 The selection of cooperatives**

In Arada sub-city there are ten weredas, in these weredas a total of thirty five door-to-door solid waste collection services providing cooperatives were established and were rendering solid waste collection service in the area. For the purpose of sampling, lists of all cooperatives rendering such type of service were collected from the respective weredas. And then ten cooperatives were drawn randomly (one cooperatives from each woreda).

### **2.3.3 The selection of waste collectors (members)**

From the selected cooperatives, 46 (30%) solid waste collectors out of a total number 153 were selected by employing proportinate random sampling technique. In order to select members (waste collectors) from each coops for the study first the value of proportion ( $n/N$ ) was calculated, that is  $46/153=0.3$ . Then multiplying the total number of waste collectors (members) from agiven cooperatives by this value gives the sample size that

has to be selected proportionally from that cooperatives. For instance, in Ethio-star the total number of members is 21, then  $0.3 \times 21 = 6$ . The same steps were followed to select the members from all the sampled coops as the distribution of the total number of members in each cooperatives.

Rational for deciding the sample size was based the factors like homogeneity of the cooperatives, cost and shortage of time .Random sampling was chosen here; because it provides all the respondents with equal chance of being included in the sample.

**Table -1 Sample distribution from the respective cooperatives**

No	Name of selected coops	Woreda	Total No of members	No of selected members
1	Ethio-star	01	21	6
2	Godanaw begna yebeka	02	10	3
3	Biru tesfa	03	9	3
4	Biruna tesfa	04	10	3
5	Ketena-3	05	20	6
6	Kideste- mariam	06	20	6
7	Biru -tesfa	07	30	9
8	mudie	08	11	3
9	Trit ledget	09	12	4
10	Fekate be -piassa	10	10	3
Total	10	10	153	46

Source: Arada sub city Cooperatives organization and promotion office , 2011

#### **2.3.4 The selection of service recipients and key informants**

door- to -door solid waste collection service recipients were also one source of primary data. Service recipients to be participated in the study were drawn randomly. Key informants for this study were chairpersons of the selected cooperatives and official from sanitation department of the sub city. Thus, interview was conducted with them for the purpose of gathering first hand data.

#### **2.4 Data analysis methods**

Data collected in the field and secondary data collected from various sources were organized in a way suitable for analysis using computer. Both quantitative and qualitative methods of data analysis were employed using Statistical Package for Social Studies (SPSS).

The process of analysis has been carried out by using descriptive statics and qualitative description. The portion of data that was from close- ended questions of the questionnaire has been entered in to the spss program and the out put has been discussed using tabulation, frequencies, and percentages. The non- quantifiable data (information from open ended questions of the questionnaire) and information from key informant interview,case study and researcher personal observation have been discussed through qualitative description.

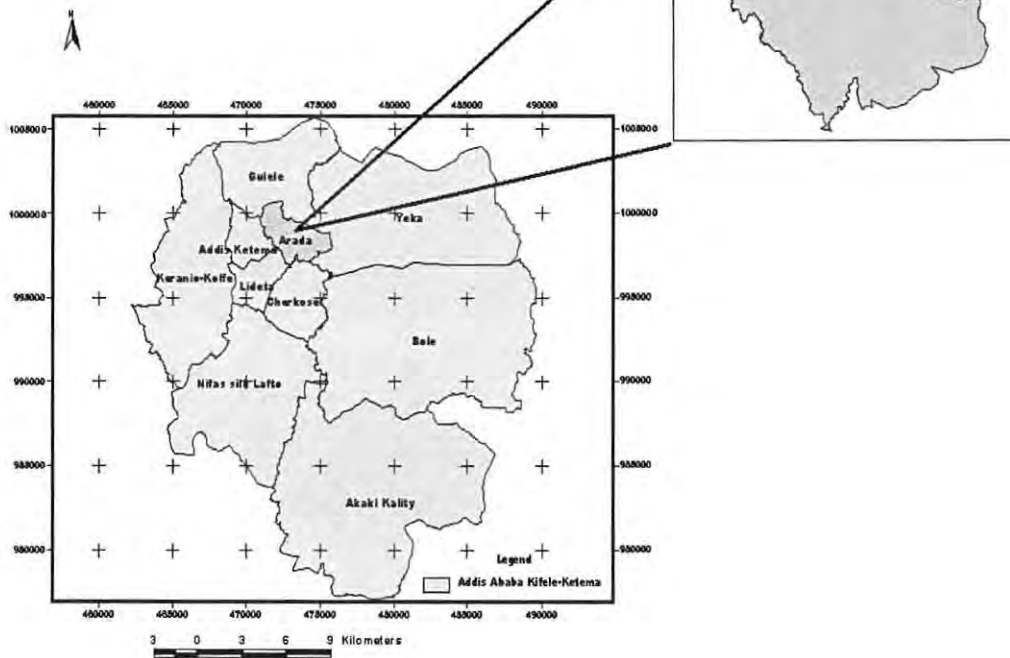
## **2.5 Description of the study area**

The city (Addis Ababa) has an area of 540 square kilometers and situated between 9 degrees latitude and 38 degrees east longitude in a plateau ranging from 2200-2800 meters of altitude above sea level. [Zerayakob, 2002]

The city has ten sub-cities one of which is the Arada sub-city. The sub city is bordered in the South by Gulele sub-city, in the East by Yeka sub-city in the west by Addis Ketema sub-city; in the North by Kirkos sub-city and in the North-west by Lideta sub-city and it possesses a total area of 994.71 ha. This part of the city was founded together with the establishment of Addis Ababa during the reign of emperor Menilik II when the Arada St. George Church was built and the Menilik monument was erected. Therefore, it is one of the earliest settlements in the city.

Studies indicate that during the establishment of Addis Ababa, many foreign merchants like the Armens, Turks etc settled in Arada and started business activities. Arada has been the nucleus of the city since the establishment of Addis Ababa and hence became the heart of the city where most of its frontal land could be used for business activities and is now becoming a Central Business District area, which is a feature of urbanization (Arada sub city information bureau, April, 2006 cited in solomon,2006 ). Today with the fast growth of population in Addis Ababa, the total population of Armadas is estimated to be 330,057. Such a rapid change in the growth of population has forced the sub-city to provide additional service to its residents. (Solomon, 2006)

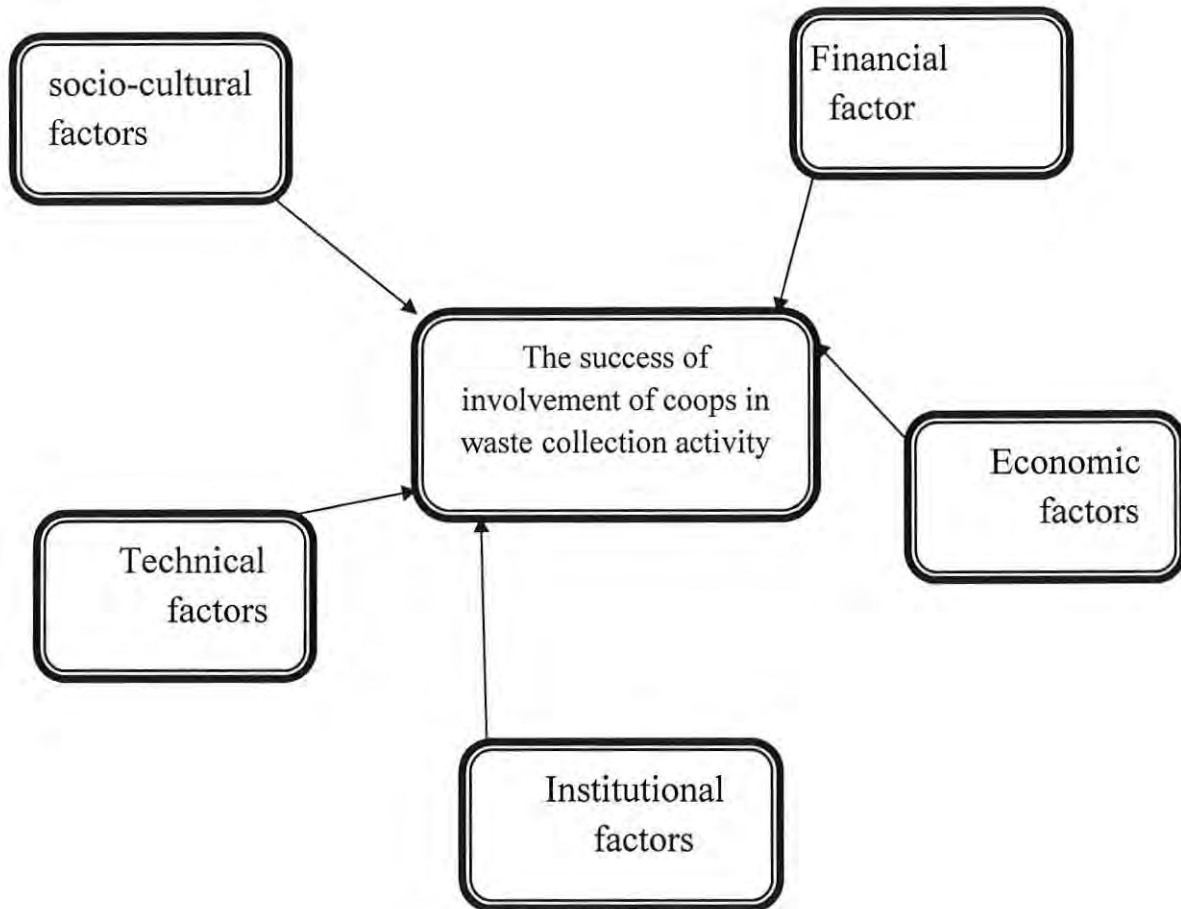
## Location Map of project Area



Sources: Solomon, 2006

## 2.6 Theoretical framework of factors determining the success of the involvement of cooperatives in door-to-door solid waste collection services.

As it is stated in figure 1, below a number of factors determine the success of the involvement of cooperatives in door-to-door waste collection activities. These are technical, economical, socio-cultural, institutional, financial factors.



Source:Own formulation

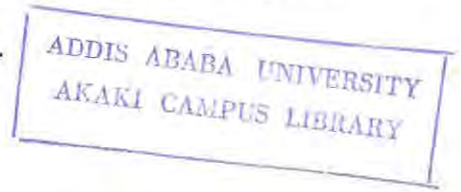
### **2.6.1 Technical factors**

**Inadequate number and frequent breakdown of waste trucks** - Inadequate number and frequent breakdown of waste trucks are the major problem of cooperatives providing door-to-door waste collection services, due to these factors, waste collectors are unable to provide adequate services regularly and more frequently, as the result their livelihood is directly affected.

**Inadequate number and frequent breakdown of equipment**-Working equipment like: pushcart, fork, hoe, broom etc., are essential in waste collection

activities. push cart is mostly used by waste collectors for transporting waste from the place of collection to the location of communal containers or temporary transferstation. Frequent break down and inaduate number of equipment specially push cart adverslly affect the operation and health of waste collectors,in most cases when push cart breaks down waste collectors are obliged to carry waste on their back and due to this they are exposed to health problem because the waste constitutes materials that are hazardous to their health.

*Remote location of tranfer stations and waste containers-In the absence of waste containers waste collectors accumulate the waste they collect in temporary transfer stations. In most of the time location of transfer station is too far to be reached by the collectors.Therefore, waste collectors are expected to cover quite long distance to accumulate the waste collected.Due to this they get easilly tired and unable to collect the waste what they supossed to.*



### **2.6.2 Economic factors**

**Inadequate payment and delay in payment**-Inadequate and delay in payment are the major economic factors that can affect the livelihood of waste collectors and inturn their success in waste collection services.

### **2.6.3 Institutional factors.**

**Lack of access to safety clothes and medical services**-Safety materials like gloves, masks, gown and protective shoes are needed to be possessed by cooperatives engaged in waste collection activities. However, solid waste collection services providing cooperatives can not purchase safety materials as frequent as needed due to financial problems. In most of cases local and international Ngos provide safety material to the cooperatives, but such provisions is rare. Moreover, the materials provided are not durable and low in standard. So that, cooperatives are obliged to do their activity with out safety clothes this expose them to injury and deases in their operation .

### **2.6.4 Socio-cultural factors**

**Negative attitude toward solid waste activity and solid waste collectors** -Negative attitude toward waste collection activity in general and waste collectors in particular result in low level of cooperation and participation in solid waste management related activities. Negative attitude toward waste collection activity can also result in lack of acknowledgement and loss of social respect to individual who involved in waste collection activities .Due to negative preception toward the activity solid waste collectors face criticism from their family ,neighbourhood and the society as a whole.

### **2.6.5 Financial factors**

**Inadequate sources of capital**-Inadequate sources of capital is one of the most challenges to cooperatives engage in waste collection activities. Due to many reasons the cooperatives can get loan from different sources, for instance, to cover maintenance cost

when equipments are frequently brokedown and to diversify their live lihood to complement their income.

## **LITERATURE REVIEW**

### **3.1 Definitions and concepts**

#### **3.1.1 Solid waste**

Waste includes all items that people no longer have any use for which they either intend to get rid of or have already discarded. Additionally, wastes are such items which people are required to discard, for example by lay because of their hazardous properties. Many items can be considered as waste e.g., household rubbish, sewage sludge, wastes from manufacturing activities, packaging items, discarded cars, old televisions, garden waste, old paint containers. Thus all our daily activities can give rise to a large variety of different wastes arising from different sources. (Solomon, 2006).

Solid wastes can be classified into different classes based on either their origin (sources) or on the nature of their components. On the basis of the nature of items that solid wastes constitute (composition), solid wastes can be classified into organic or in organic. Moreover, according to the sources from which they emanate, solid wastes are usually classified as domestic (household, commercial, industrial, institutional, street sweepings and construction and demolition waste. But sometimes scholars classify solid wastes in terms of their origin into three general classes: municipal waste (which includes domestic waste, street waste, commercial waste, market waste and hospital waste), industrial waste, and agricultural and animal wastes (Edelman, 1997).

### **3.1.2 Municipal solid waste**

Municipal solid waste (MSW), also called urban solid waste, is waste type that include predominantly household waste (Domestic waste) with sometimes the addition of commercial wastes collected by a municipality with in a given area (<http://en.wikipedia.org/wiki> as cited in the free encyclopedia).

According to zurbrug the term municipal solid waste, refers to solid wastes from houses, streets and public places, shops, offices, and hospitals, which are very often the responsibility of municipal or other governmental authorities. According to him Solid waste from industrial processes are generally not considered "municipal" however they need to be taken into account when dealing with solid waste as they often end up in the municipal solid waste stream.

### **3.1.3 Waste collection**

Waste collection is the component of waste management which results in passage of waste material from the source of production to either the point of treatment or final disposal (<http://en.wikipedia.org> cited in the free encyclopedia). The functional elements of collection include not only the gathering of solid waste and recyclable materials, but also the transport of these materials, after collection, to the location where the collection vehicles is emptied. This location may be materials processing facility, a transfer station or a landfill disposal site.

### **3.1.4 Solid waste management**

“Solid waste management” means the collection , transportation, storage, recycling or disposal, of solid waste or the subsequent use of a disposal site that is no longer operational(solid waste management proc. No. 513/2007). The term usually relates to materials produced by human activity, and is generally under taken to reduce their effect on health, the environment or aesthetics. Waste management is also carried out to recover resources from it. Waste management practices differ for developing and developed nations, for urban and rural nations areas, and for residential and industrial producers .Solid waste management involves many activities among these collection is the primary

### **3.2The functional elements of solid waste management collection**

The function elements of collection include not only the gathering of solid waste and recyclable materials, but also the transport of these materials, after collection, to the location where the collection vehicles is emptied. This location may be materials processing facility, a transfer station or a landfill disposal site.

#### **Waste handling and separation, storage and processing at the source**

Waste handling and separation involves the activities associated with management of waste until they are placed in storage container for collection. Handling also encompasses the movement of loaded containers to the point of collection. Separation of waste components is an important step in the handling and storage of solid waste at the source.

## **Separation and processing and transformation of solid wastes**

The types of means and facilities that are now used for the recovery of waste materials that have been separated at the source include curbside collection, drop off and buy back centers. The separation and processing of wastes that have been separated at the source and the separation of commingled wastes usually occur at a materials recovery facility, transfer stations combustion facilities and disposal sites.

### **Transfer and transport**

This element involves two steps:

- i. The transfer of wastes from the smaller collection vehicle to the larger transport equipment.
- ii. The subsequent transport of the wastes, usually over long distances, to a processing or disposal site.

### **Disposal**

Today the disposal of wastes by land filling or land spreading is the ultimate fate of all solid wastes whether they are residential wastes collected and transported directly to a landfill site, residual materials from materials recovery facilities (MRFS), residue from the combustion of solid waste compost or other substances from various solid waste processing facilities. A modern sanitary landfill is not a dump: it is an engineered facility used for disposing of solid wastes on land without creating nuisances or hazards to public health or safety, such as the breeding of insects and the contamination of ground water.

## Energy Generation

Municipal solid waste can be used to generate energy. Several technologies have been developed that make the processing of MSW for energy generation cleaner and more economical than ever before, including landfill gas capture ,combustion, pyrolysis ,gasification, and plasma arc gasification. While older waste incineration plants emitted high levels of pollutants, recent regulatory changes and new technologies have significantly reduced this concern, EPA regulations in 1995 and 2000 under the clean Air Act have succeeded in reducing emissions of dioxins from waste-to-energy facilities by more than 99 percent below 1990 levels, while mercury emission have been reduced by over 90 percent<sup>(3)</sup>.

[http://en.wikipedia.org/wiki/Municipal\\_solid\\_waste](http://en.wikipedia.org/wiki/Municipal_solid_waste)

ADDIS ABABA UNIVERSITY  
AKAKI CAMPUS LIBRARY

### 3.3. Types of Micro and Small Enterprises in Solid Waste Collection

1. Service-based MSEs: these are enterprises which get their income from performing a service paid by clients, beneficiaries or a combination. The unit of payment is done by the hour, day and month; by district or Street or by the quantity of waste. The major services done by these MSEs are waste collections, park maintenance, street sweeping and industrial or commercial cleaning (Scheinberg, 2000:7)
2. Commodity-based MSEs- such type of MSEs are set up by local entrepreneurs (or small businessmen) who perceive the delivery of waste services as a business opportunity. These enterprises are entirely 'demand-led', seeking to fill a gap and generate income. They bring some capital (or funds borrowed from friends and relatives and, probably relevant technical and management skills). The operators

are profit-driven and motivated to continue the delivery of the service, and if possible, steadily improve the efficiency and size of the operations and the quality of the service Fasika and Daniel (1997: 140) and Haan, Coad and Lardinois (1998: 13, cited in Abebaw, 2006). As Scheinberg, Klundert and Rudin (2000: 7-10) commodity based enterprises get their income by selling at a profit materials or products which they have salvaged, produced or bought. Unit of payment is by weight, volume, or item such as kilos of paper, cubic meters of compost or a lamp made from a tin can. Examples of such activities are recyclers, junk shops, tire retreaders, small scale manufacturers and compost businesses.

3. Value-based MSEs: enterprises which serve a social, religious, environmental, or cultural purpose, whose primary goal is some form of social or cultural change or strengthening or environmental protection, and who see involvement in urban waste management as either an economic activity to support their promotion of values, or as a means to raise awareness and consciousness in their chosen areas of focus (Scheinberg, 2000: 13). These services are mostly set up by external agencies for social purposes usually to provide employment

(Haan, Coad and Lardinois, 1998: 13, cited in Abebaw, 2006)

4. Private MSEs: a private MSE is basically a small private company, in which an owner or entrepreneur organizes employees and resources to generate a profit from waste activity. The owner chooses to work in the field of waste management because he sees an opportunity in this form of work or because he has particular resources, skills, experience or contacts in the field. A private MSE is concerned

about profit, not about the needs of the community and the protection of the environment. As a result they tend to work in the areas where their profits will be greatest that is, the middle-and high-income areas Fasika and Daniel (1997:140)and Haan, Coad and Lardinois 1998: 22-23,cited in Abebaw,2006)

5. Co-operatives: many forms of MSE contain an element of ‘collective’ action. One model in this in which self-employed waste workers, previously working independently, decide to work together (e.g. in Brazil and Colombia). Workers are often motivated to join together because of outside threats such as from government or “middlemen “dealers (Haan, Coad and Lardinois, 1998: 23 ,cited in Abebaw,2006)

### **3.4 Characteristics of Micro and Small Enterprises Involved in Waste Collection**

Small firms have some special characteristics that set them a part and make the process of management different from that of large firms. The main characteristics of small enterprises set by Burns (1996: 5) are:

1. One person- the owner manager has an overwhelming influence on the firm. Their views and values influence all aspects of its activities. Business decisions become personal decisions and there is also the risk of over-dependency upon one individual for the well-being of the firm.

2. Most small firms are unlikely to be able to exert much influence on their market.

They are likely to face significant competition, which makes the risk of failure high.

3. Small firms are likely to be over-reliant on a small number of customers. They are particularly vulnerable to losing any one customer and the effect on the firm of such a loss will be disproportionately large.

The following identifiable criterion was developed by Ali, Cotton and Beall (1998: 5) to elaborate the characteristics of micro enterprises, however, entrepreneurship' may change from one group to another:

1. The service provider is profit-motivated and so the service is charged and non-payers may be excluded.

2. The service is marketed by an individual or a small group to a small area such as a neighborhood, or group of houses with a total number of units not more than 1000.

3. The service provider will manage the service and invest in the organization, keeping in view all the market risks.

4. The service provider may take the triple role of laborer, manager and owner of the enterprise.

5. The service provider has the major role in hiring and firing the workers, fixing their remuneration, negotiating new contracts and subcontracts.

(Haan, Coad and Lardinois 1998: 12-13,cited in Abebaw,2006) mentioned that solid wastes MSEs have the following characteristics:

1. MSEs often use low-cost and labor intensive equipment and machinery, such as hand carts or donkey carts. Other MSEs also use tractors and trucks.
2. MSEs characteristically employ few regular workers. Often labours are hired on a casual or short-term basis. Many MSEs rely on family workers who are often not paid for their work.
3. There is often limited division of labor in that most of the workers doing most of the tasks with little specialization.
4. MSEs may work without written contracts. MSEs in some areas are mostly in the informal sector in that they are not legally registered and operate without a license, without paying tax, and without conforming to labor legislation (such as minimum pay laws, provision for pension and insurance, and safety requirements). But in other places they are registered and conform to all legal requirements.
5. The wages of employees are often low, irregular and insecure.

### **3.5 Solid waste collection coverage of some African cities**

In many developing countries solid waste management has become a serious challenge. High urbanization rates and changes in the life styles and steady rise in living standards have resulted in the increase of solid waste both in type and volume. Some studies, for example, Palczyński (2006) estimated that with the existing level of urbanization in

developing countries, there would be two fold increase of solid waste generation in the current decade. Municipal solid waste management constitutes one of the most crucial health and environmental problems facing governments of African cities. This is because even though these cities are using 20-50 percent of their budget in solid waste management, only 20-80 percent of the waste is collected. The uncollected or illegally dumped wastes constitute a disaster for human health and the environmental degradation. Not only the quantities increasing but also the variety, both a consequence of increasing urbanization, incomes, and changing consumption habits fuelled by globalization.

This scenario places the already-desperate urban councils in difficult situation especially as they have to develop new strategies to deal with increasing volumes as well as strange varieties of wastes .More serious threat is the disposal of this waste. According to the report by (UNIDO 2006,cited in selamawit,2007) ), i.e. United Nations Environmental Program Division of Industry, Technology and Economics. In most African cities on average only 50% of the total generated solid waste is collected. Nevertheless, 95% of the collected waste is indiscriminately thrown away at land fill sites without proper measures to control silts or hazardous gas emission. The open dumping sites are excellent breeding places for rodents and insects which can cause or transmit some deadly diseases. Moreover, as the existing dumping sites are filled quickly, finding other new sites becomes more and more difficult. Hence, the cost of disposing solid waste increases. This in turn brings about additional strain on the already marginal budget of local authorities (UNIDO, 2006,cited in selamawit,2007)

Solid waste management has merged as one of the greatest challenges facing state and local government and environmental protection agencies in Nigeria. The volume of solid

waste be generated continues to increase at a faster rate than the ability of the agencies to improve on the financial and technical resources needed to parallel this growth. (Ogwueleka, 2003)

In Kano metropolis, like most cities in the developing world, several tons of municipal solid waste is left uncollected on the streets each day, clogging drains, creating feeding ground for pests that spread disease and creating myriad of related health and infrastructural problems. A substantial part of the urban residents in the old city and suburban informal settlements of Kano metropolis also have little or no access to solid waste collection services. This is due to lack of proper land use planning which resulted in the creation of informal settlements with narrow streets that make it difficult for collection trucks to reach many areas. The results is that a large portion of the population is left with out access to solid waste management making the particularly vulnerable (Nabegu, 2008a). Nabegu (2008a) investigated the operations of the state agency responsible for waste management in kano and reported that a significant portion of the population, 80%, does not have access to waste collection services, only 20% of the waste generated is actually collected and vast majority of users of the service 92% consider the service very poor.

Only about 25 per cent of the estimated 1,500 tones of solid waste generated daily in Nairobi get collected. Yet, until the mid 1970s the Nairobi City Council singly collected over 90 per cent of the waste. Broadly, the Western part of the city is well serviced by the private firms and the NCC, while the Eastern part is hardly serviced High-income and some middle-income residential areas together with commercial areas are well serviced

by private companies and even the NCC. Small private firms are increasingly servicing some of the relatively better-off low-income areas. The core low-income areas (slums and other unplanned settlements) where 55-60 per cent of Nairobi residents live, however, receives no waste collection service save for localized interventions by community-based organizations (CBOs). The 1998 JICA study found 26 per cent of households in high-income areas 16 per cent of those in middle-income areas, 75 per cent of those in low-income areas, and 74 per cent of the surrounding area do not receive any service.([www.unep.org/pdf/keneya-waste-management-sector](http://www.unep.org/pdf/keneya-waste-management-sector))

Accra generates between 1500-1800 tons of waste per day, but it has the capacity to collect only 1200 (66%) tons per day. Poorly maintained equipment and inefficiencies in road design and urban settlement all lower the AMA collection capacity. At all the various levels of waste management, (sorting, collection, transportation, and disposal), there exist disruptions that pose a threat to the environment and public health. These inefficiencies in waste management are exacerbated by the AMA's indifference to the complaints of the public poor. (Ian , )

According to the Government of Ghana (2003), the Accra Metropolitan Assembly spends about two billion Cedis per month (about \$227,000) on waste collection alone and about 12 billion Cedis per year on urban solid waste management. This amount does not however cater for about 30 per cent of solid waste in the metropolis (EPA, 2002, cited in Edward, 2004)

The inadequate information on quantification and characterization of waste; health, social, economic and environmental impact of municipal solid waste management is a common occurrence in Ghana. The problem is only compounded by insufficient funding.

The waste management system so far in Ghana has not properly integrated other solutions as collection, treatment, and supply for re-use, reprocessing and final disposal. The system has also not delivered the optimum economic and environmental result for now and has not provided enough room to adapt to future pressures (increases in waste quantities and composition). From the observations of the Ghana Landfill Guidelines (2002), municipal solid waste disposal practices in the country have not been environmentally friendly

In Yaoundé City, Cameroon. Current figures show that the current population is estimated at 1.2 million people, up from 600 000 in the 1960s. Not only have the quantities, of the waste increased from about 300 to 1 200 tons per day but also the variety. The collection rate have fluctuated over the history of the city from near zero percent collection in the 1990s to the present 40-50 percent execution by HYSACAM, the municipal solid waste management company in Yaoundé. Management in Bamenda is in the hand of the urban council. Collection rate is about 70 percent. (Eric ,2003)

Collection of municipal solid waste is the responsibility of local municipalities in Egypt. However, in Cairo and in the big cities, waste collection is subcontracted to local “zabaleen” (garbage collectors), and in recent years to private local and multinational companies. The average collection rate in urban areas is 30-77 %, in Cairo it ranges between 0% in the slums and the poor neighborhoods and 90 % in the Private residential compounds. (Amin , 2010)

In Tanzania it is estimated that the quantity of municipal solid waste generated countrywide amounts to more than 10,000 tones per day. The indicative generation rate ranges from 0.1 – 1.0 kg/cap/day. As much as 80-90% of solid waste generated in urban

areas is not collected and most of the domestic waste, which accounts for about 60 % of the total solid waste generated daily, is disposed of by burning or burying.

The three municipalities of Ilala, kinondoni, and temeke; and the solid waste collection private contractors carry out collection and disposal in Dare –se- salaam. The SWCPCs also include non-governmental organization (NGOs) and community- based organizations (CBOs). (Kaseva and Mubuligwe, 2003). The study conducted in 2003 indicates that total solid waste collection by these three city municipalities is 230.8 tones/day or equivalent of 9.5% of the total waste generated in the city daily. Ilala municipality collects 97.1 ton/day(4.0%), while Kinondoni and temeke collect 3.9% and 1.6 respectively. The 9.5 % total collection during the period of this study is much higher than 5% reported by Halla and Majani, 1999, cited in Kaseva and Mubuligwe, 2003). but it is within 10% value of waste collection before the private sector involvement as reported by Kaseva and Gupta(1996).

This spatial distribution of the population and the high urbanization rate (65%) has generated great pressure on the environment, particularly in the management of municipal solid waste in Algeria . On the ground, this has resulted in the appearance of thousands of uncontrolled landfills and dumps and created difficulties for local communities to take responsibility and ensure the cleanliness of towns. Collection coverage of MSW in Rural areas is 60% and in Urban is 85%.

*[www.sweepnet.org/ckfinder/userfiles/\(2010.\)./RA%20Alegeria%20ANGdpf](http://www.sweepnet.org/ckfinder/userfiles/(2010.)./RA%20Alegeria%20ANGdpf)*.

Addis Ababa the metropolitan city of Ethiopia ,like many others towns and cities of developing countries has series problem in the provision of adequate solid waste

management services .efficiency is low and a wide geographical area is not adequately covered. [Haan,coad,lardinois,1998:9]

According to the study made by Tessema in 2010 the City of Addis Ababa generates a solid waste of 0.4kg/c/day.More than 200,000t are collected each year. About 550t/day, 80% of the total waste collected The municipality increased the collection rate from 60% to 80%.Commercial institutions, industries, hotels and hospitals are identified as the major generators of solid waste by source type. However, households are by and large the dominant sources, accounted for 71 per cent of the total waste generated (CGASBPDA, 2003; Tadesse, 2004).

### **3.6 Impacts of improper solid waste management**

Municipal solid waste management constitutes one of the most crucial health and environmental problems facing governments of African cities. This is because even though these cities are using 20-50 percent of their budget in solid waste management, only 20-80 percent of the waste is collected. The uncollected or illegally dumped wastes constitute a disaster for human health and the environmental degradation. Not only the are quantities increasing but also the variety, both a consequence of increasing urbanization, incomes, and changing consumption habits fuelled by globalization. This scenario places the already-desperate urban councils in a difficult situation especially as they have to develop new strategies to deal with increasing volumes as well as strange varieties of wastes.

In urban areas, especially in the rapid urbanizing cities of the developing world, problems and issues of municipal solid waste management (MSWM) are of immediate importance

(Zurbrügg, 2008). Systems for transfer, recycling and disposal of solid waste are almost always unsatisfactory from the environmental, economic and financial points of view. Unfortunately, this situation leads to heavy consequences for public health and well-being, and for the quality and sustainability of the urban environment (Diaz et al., 1999)

Proper management of solid waste is critical to the health and well-being of urban residents (World Bank, 2003). If solid waste is not collected, it ends up in any convenient place that can be found. The largely organic waste is dumped in backyards, public spaces, alongside roads or pathways and in watercourses, or is burned. This matter: the DHS (demography and healthy survey) data shows significant increases in the incidence of sickness among children living in households where garbage is dumped, or burned, in the yard. Typical examples include twice as high diarrhea rates and six times higher prevalence of acute respiratory infections, compared to the areas where waste is collected regularly. Uncollected solid waste clogs drains and causes flooding and subsequent spread of water-borne diseases. Blocked storm drains and pools of stagnant water provide breeding and feeding grounds for mosquitoes, flies and rodents. Collectively, these can cause diarrhea, malaria, parasitic infections and injuries. The annual floods in Kampala and other East African cities are blamed, at least in part, on plastic bags, known as 'buveera' in Uganda, blocking the drains. In response to annual flooding in Mumbai, the State of Maharashtra in India banned the manufacture, sale and use of plastic bags, in 2005. Poor enforcement means that the ban has so far been ineffective. In West Africa, the floods are blamed on the small plastic pouches for drinking water (Lilia, et al., 2009)

Important factor in the relationship between SWM and environmental pollution are reflected in the deterioration effect of waste management on the quality of environment

and on human health, which are brought about through environmental media, i.e. air, water and soil. Similarly, in the waste management functional elements, namely discharge, collection, transport, treatment and final disposal, and illegal dumping may result in the pollution of air, soil and water bodies. Kaseva & Gupta, 1996; Kaseva, Mbuligwe, & Kassenga, 2002 cited in Mengiseny E. Kaseva\*, Stephen E. Mbuligwe, 2003). .Waste materials like toxic if consumed by animals can be very dangerous to life and worse still if these wastes are dumped in water bodies. They are dangerous to aquatic life.

Some of the wastes can also be very harmful to the atmosphere. These wastes when improperly dumped into the atmosphere can lead to the destruction of the ozone layer and may cause diseases such as cancer. As a result, there is problem in global warming. Air pollution can also lead to formation of acidic rain, which is dangerous to crop life since it fastens the removal of soil fertility from the surface of the ground.

It also affects drainage. When solid wastes are dumped in drainage channels and gutters, they block the flow of the sewerage. This may cause flooding. At the same time, solid wastes also affect soil drainage.

Uncollected waste has economic costs for a city. A dirty and unhealthy city will make it difficult to attract businesses. In Tangier, Morocco, pollution of beaches by solid wastes was cited in the late 1990s as the leading cause of tourism decline that cost hotels in the area \$23million/year in lost revenues. (Lilia, et al.,2009)

Solid waste management has a far-reaching impact on the urban development and overall economy. As urban economy grows so do industries of different sizes and other business

grow. Increase in volume and types of waste (including toxic and other hazardous waste) demands fast removal, treatment and safe disposition. This costs a lot. However, failure to deliver the service would adversely affect citizens' health, which leads to an increase in the health service expense as well as a decrease in the people's productivity. High solid waste management cost, in the other side, is again a burden on the economy (Cointreau, 2004:3 cited in selamawit , 2007)

Most adverse environmental impacts from solid waste management are rooted in inadequate or incomplete collection and recovery of recyclable or reusable wastes, as well as co disposal of hazardous wastes. These impacts are also due to inappropriate siting, design, operation, or maintenance of dumps and landfills. (USAID, 2009). Generally improper waste management activities can:

- Increase disease transmission or otherwise threaten public health. Rotting organic materials pose great public health risks, including, as mentioned above, serving as breeding grounds for disease vectors. Waste handlers and waste pickers are especially vulnerable and may also become vectors, contracting and transmitting diseases when human or animal excreta or medical wastes are in the waste stream risks of poisoning, cancer, birth defects, and other ailments are also high.

- Contaminate ground and surface water. Municipal solid waste streams can bleed toxic materials and pathogenic organisms into the leachate of dumps and landfills. (Leachate is the liquid discharge of dumps and landfills; it is composed of rotted organic waste, liquid wastes, infiltrated rainwater and extracts of soluble material.) If the landfill is

unlined, this runoff can contaminate ground or surface water, depending on the drainage system and the composition of the underlying soils.

Many toxic materials, once placed in the general solid waste stream, can be treated or removed only with expensive advanced technologies. Currently, these are generally not feasible in Africa. Even after organic and biological elements are treated, the final product remains harmful.

- Create greenhouse gas emissions and other air pollutants. When organic wastes are disposed of in deep dumps or landfills, they undergo anaerobic degradation and become significant sources of methane, a gas with 21 times the effect of carbon dioxide in trapping heat in the atmosphere.

Garbage is often burned in residential areas and in landfills to reduce volume and uncover metals. Burning creates thick smoke that contains carbon monoxide, soot and nitrogen oxides, all of which are hazardous to human health and degrade urban air quality. Combustion of polyvinyl chlorides (PVCs) generates highly carcinogenic dioxins.

- Damage ecosystems. When solid waste is dumped into rivers or streams it can alter aquatic habitats and harm native plants and animals. The high nutrient content in organic wastes can deplete dissolved oxygen in water bodies, denying oxygen to fish and other aquatic life form. Solids can cause sedimentation and change stream flow and bottom habitat. Sitting dumps or landfills in sensitive ecosystems may destroy or significantly damage these valuable natural resources and the services they provide.

- Injure people and property. In locations where shantytowns or slums exist near open dumps or near badly designed or operated landfills, landslides or fires can destroy homes

and injure or kill residents. The accumulation of waste along streets may present physical hazards, clog drains and cause localized flooding.

- Discourages tourism and other business. The unpleasant odor and unattractive appearance of piles of uncollected solid waste along streets and in fields, forests and other natural areas can discourage tourism and the establishment and/or maintenance of businesses. (USAID, 2009)

## **Results and Discussion**

This chapter deals with the presentation and discussion of the data obtained through the inspection of the documents on the solid waste management proclamations and policies, survey questionnaire, key informant interview, case studies and observation. It presents the findings in six major sections. The first section discusses regulatory and policy framework on solid waste management. The second part deals with socio-demographic characteristics of solid waste collectors (members). And the third section, discusses the nature of the services rendered by the cooperatives. The fourth section deals with clients' cooperation in solid waste management, clients' satisfaction up on the service provision and clients' willingness to pay for waste collection service. The fifth section devotes to identifying the opportunities accrued from the involvement of cooperatives in door -to door- solid waste collection activity. Whereas the last section tries to asses and identify the major challenges faced the cooperatives.

### **4.1 Regulatory and policy frame work**

There are regulations and policies with regard to Environmental protection and hygiene. The constitution of federal democratic republic of Ethiopia Art No. 44.1 states,

“everybody has the right to live in Clean and healthy environment”. Moreover, in article No. 92 on the other hand indicates, “Every Ethiopian citizen should work for the betterment of healthier environment”

To protect the environment, the federal Environmental Protection authority has also issued Solid Waste Management Proclamation No. 513 \2007. The objective of this proclamation is to enhance at all level the capacity to prevent the possible adverse impacts while creating economically assets out of solid waste.

The next federal level legal instrument governing the waste mgmt is the environmental policy of Ethiopia. The policy was approved in 1997. Sanitation service and environmental protection aspects are given attention in part 3 and 4 of the policy. The City Government of Addis Ababa has also played a paramount role in municipal solid waste management. At city level, different solid waste management policies and regulations have been issued. Sanitation, Beautification and Park Development Agency, which is responsible to design policies and regulations for solid waste Management services, was established. The agency further decentralized its mandate and duties to the local authorities at the sub city and kebele levels. In response to this, all sub cities use their own budget and resources; organize themselves to execute their duties and responsibilities. At woreda level, SWM is the responsibility of sanitation office. Different departments such as code enforcement services, Micro and Small Scale Enterprises Organizing offices at woreda level and trade and industry departments, and traffic and regular police are also expected to execute their duties.

## 4.2 Socio- Demographic Characteristics

### 4.2.1 Sex Composition of members

Open membership is one of the principles of cooperatives approved by ICA. This principle states that membership in cooperatives organization is open to all people without any kind of discrimination in sex, ethnic, religion, political affiliation, economic status etc. Consistent with the principle, the result of the study verify that both males and Females do participate in the sampled cooperatives. Amongst the total respondents of this study, about 52.1 % of members in the cooperatives were found to be female .while the rest, 47.9% of them were males as depicted in Table- 2 below. This clearly indicates that though men dominate in formal business activities, waste collection activity has become one of income generating activity to many women than men. However, as the researcher attested in the field observation, there are some cooperatives exclusively run and managed by either sex.

Table -2: Sampled members' Sex composition

<i>Sex composition of sampled members</i>	<i>frequency</i>	<i>Percentage</i>
Female	24	52.1%
Male	22	47.9%
Total	46	100%

Source: Computed from surveyed data (2011)

#### 4.2. 2 Age composition of members

The study found out that there is a variation in age composition among sampled members. As clearly shown in table- 2 , 8.7 % of members are lie between the age of 16- 20. However, 28.3% of them and 37.9% of them lie between the age of 21 – 30 and 31 – 41 respectively.while 28.3% of them lie between the age of 41-63.

As results of the analysis of interview conducted with chairpersons of the cooperatives, age of the members matters a lot on the performance and smooth management and strength of the cooperatives established in waste collection activities. Consistent with the aforementioned data, some of the members confirmed their strong positive stand on the performance of youngsters as compared to the aged once. Willingness to take responsibility and cooperate for change, accepting orders positively and acting accordingly, energetic to load and unload wastes from vehicles are some of the major reasons mentioned for the aforementioned response.

Table – 3: Age compositions of members

Age of members	Frequency	Percentage
16 – 20	4	8.75%
21 – 30	13	28.3%
31 – 41	16	37.9%
41 - 63	13	28.3%
Total	46	100%

Source:computed from surveyed data [2011]

### 4.2.3 Educational Back ground of members

As results portrayed in the table 4 revealed, a sizable portion of the members( 87%)of them joined secondary level education. Whereas 13% of them achieved only primary level education. Never the less, none of them joined technical and vocational training institute and college. Key informant interviewee also confirmed that none of the cooperatives request educational status as an entry requirement for membership

Table – 4: Sampled members' educational level

Educationl levels of the members	frequency	Percentage
Primary level (1-6)	6	13%
Secondaryleve(17-12)	40	87%
Total	46	100%

Source: Computed from surveyed data [2011

### 4.2.4 Reasons for joining solid waste collection activity.

Though poverty and unemployment is the main driving factors for most of individuals to engage in solid waste collection activity, the prevailing high cost of living and lack of other livelihood meanness are the major reasons pinpoint out by waste collectors for joining the coops. As clearly shown in table-5, the majority, 50% of waste collectors(members) joined the activity to meet with high cost of living, While 21.7% them motivated by the success of others who work in solid waste collection activity.

Whereas 13% of them joined the activity attracted by the market. Nevertheless, 15.3% joined the activity recommended by others to earn their own income from the activity

Table- 5: Reasons for joining the solid waste collection activity by workers.

<b>Reasons for joining the solid waste collection activities by members</b>	<b>Frequency</b>	<b>Percentage</b>
To meet with high cost of living	23	50%
Motivated by the success of others	10	21.7%
Attracted by the market	6	13%
Recommended by others	7	15.3%
Total	46	100%

Source: Computed from surveyed data [2011]

#### **4.2.5 Year of staying in the service**

The reviewed document revealed that until recent time solid waste collection service was provided by the city government (block collection), informal waste collectors and some private solid waste collecting enterprises. However, by the end of year 2003 the government institutionalized the sector and integrated anew actor of micro and small scale enterprises (MSES) since then micro and small scale enterprises organizing office of the woreda is organizing those individuals who are willing to work in solid waste collection .Most of the waste collectors in the sampled cooperatives have started the

service provision in 2003. So that, they have been in the cooperatives for about nine years even though some of them have already joined before a year. As stated by members of the cooperatives, the pre existing cooperatives were reorganized in 2002 and new members joined the cooperatives.

### **4.3 Nature of the service provided by the cooperatives**

As stated in Solid Waste Management Proclamation No 513/2007, urban administration shall ensure the participation of the lower administrative levels and their respective local communities in designing and implementing their respective solid waste management plans. The same document also states that urban administration shall create enabling conditions to promote investment on the provision of solid waste management services.

For the implementation of this, Provisional City Administration provided MSSEDA with mandate to organize and register group of individuals who are willing to work in waste collection activity.

According to the chairpersons, waste collectors (members) are recruited based on a call made by each kebele to people supposed to be unemployed, poor and willing to work in solid waste collection and in response to this call, individuals who are interested in the activity apply to the office and are registered and granted certificate. The information obtained from the reviewed document revealed that, the official criteria pertinent to recruiting members in order to establish a solid waste collecting cooperatives association indicate applicant shall be above the age of fourteen, not organized in a similar association, Capable and willing to work in cooperation with others. The Cooperatives

also entered in to an agreement with woreda sanitation office to provide the following services within their jurisdiction:

- Organizing educational campaigns and creating public awareness programs aimed at encouraging and stimulating public to separate waste and to prepare material for this purpose;
- Bringing to sanitation office or justice those who are held committing illegal dumping;
- Providing door – to – door waste collection services and transporting the waste to communal containers;
- Participating in regular and emergency sanitation campaigns within their jurisdiction; and
- Working harmoniously with different departments for the fulfillments of the above mentioned responsibilities.

Cooperatives in the study area are expected to deliver collection service two days per week to residential areas and all days to commercial premises within their jurisdiction.

However, some users were complaining that waste collectors had failed to deliver the collection service as per the schedule .According to them, due to this they had been left unserved for more than weeks. The Collectors attached the problem with the absence of vehicles in adequate number. Official at sanitation department also attested this fact. Despite this there was also a tendency from the side of collectors to give due emphasis to

the commercial area where they could collect huge amount of waste, thereby increase their income.

In the field survey, it was also found out that solid waste collectors participated in cleaning campaigns. However, in most cases members of cooperatives do not full fill the rest of the responsibilities they are expected to do. The low level of earning from waste collection activities was mentioned as a key reason they tend to spend the rest of the time doing other extra income generating activities rather than fulfilling their duties.

#### **4.3.1 Payment for the service**

Currently, the payment for waste collection service is directly collected by the government and the government pays waste collectors monthly for their services. The payment is determined based on waste collected, which is 30 birr/m.<sup>3</sup> As indicated by chairpersons of sampled cooperatives, on average they collect 20 – 24 of containers of waste per month. In addition, the volume of waste collected varies based on the absence or presence of waste vehicles. It is observed that the size of waste containers ranges from 8m<sup>3</sup> to 10m<sup>3</sup>. According to members, they are paid 240 birr per container if the size of container is 8m<sup>3</sup>, and 300 birr if the container is 10m<sup>3</sup>.

#### **4. 3.2 Awareness creation program**

The attitudes and behavior of waste generators can have significant impacts on solid waste management for example, they may cooperate and segregate waste or they may dump mixed waste indiscriminately on the streets. Awareness raising campaigns can be used to change attitudes and modify behavior amongst householders and businesses.

According to the interview made with chairpersons of the cooperatives, they did not face difficulty to make the people benefit from their service. As they explained, this is because the service has been already customized through informal collectors and the business was not at its infancy stage.

However, as explained by some of the waste collectors, influencing the public to benefit from the service was the toughest challenge for solid waste collectors at the starting point of the business.

An official from the sub- city sanitation office stated that to enhance the awareness level of the people and thereby to manage the solid waste activity effectively, some efforts have been made by the office using different media. For instance, brochures and pamphlets have been distributed to change the attitudes of the society towards solid waste and to develop their interest in solid waste reduction, minimizing and sorting of waste ,and to increase their awareness about the adverse consequences of in discriminately dumping of waste.

### **4.3.3 Contractual Arrangement**

Prior to 2007, open competition was the commonest contractual arrangement to provide door – to – door waste collection service .Due to lack of accountability and conflicts among the business actors in the same area, the agency forced to come up with a new business arrangement by revising the previous one .Thus, since 2006/2007 the cooperatives have been providing door – to – door municipal solid waste collection service through the defacto franchising arrangement. In this type of arrangement, the

payment for sanitation service and frequency of service delivery were determined based on agreement made between cooperatives and service recipients.

As stated by the chairpersons following the reorganizing of door – to – door municipal solid waste collection service providing cooperatives, the government directly contracted out the service to the cooperatives. Now the government has started collecting the service fee from users and waste collectors are paid by the government for their services.

Unlike competition, in both types of arrangements waste collection service providers are supposed to deliver the service only in a specified area assigned by responsible body. In light of some of the waste collectors, this kind of service arrangement is not advantageous for them. According to them, in the previous type of arrangement where government allowed them to charge their respective clients directly for the service provided, they used to earn higher income than the amount of money the government is paying them now. They further indicated that they suffered because the payment from the municipality delayed .On the contrary, some of them stated that this kind of arrangement enabled them to avoid resistance from service recipients for monthly payment.

#### **4.3.4 Effectiveness and efficiency of direct contracting of waste collection**

Provision of solid waste collection service through direct contracting has many advantages over the other types of arrangement. It is also more efficient and effective.

## **A. Effectiveness**

### **Waste collection coverage**

In contractual arrangement, government pays waste collection service providing cooperatives for the provision of the services to residents in specified area. In this arrangement, it is mandatory for all residents to take and or pay for refuse collection service. According to the chairpersons being mandatory to take and pay for collection service contributes significantly to increase the number of service recipients, there by the wider coverage of the service provision than when the service was provided through franchising arrangement.

### **The frequency of service delivery**

When the service was provided through franchising arrangement payment for waste collection service was determined based on the types of waste and affording capacity of the service users rather than the amount of waste collected. However, as stated by the members under contractual arrangement, the service receivers pay based on the amount of waste collected. This motivates waste collectors to provide the service more frequently to their customer so as increase their earning, and consequently more waste can be collected.

## **B. Efficiency**

### **Waste collection services fee**

In the franchising arrangement, service-providing cooperatives were allowed to set price for their services and charge users directly for their services. Due to this, waste collectors

used to charge their customers unreasonably, as there was no government intervention. As stated by the chairpersons, the amount of money the clients are charged now for the service is very low compared to the service fee they were paying under franchising arrangement.

#### **4.3.5 Composition and source of waste collected by the cooperatives.**

##### **4.3.5.1 Source**

Service area of the cooperatives under study constitutes residential houses, business and commercial premises, industries and institutions. As it was observed from the field survey and also attested by members, the majority of waste is collected from residential houses. The second, third and the fourth, contributors are commercial and business premises, institutions, like Hospital, schools and industries respectively.

##### **4.3 5.2 Composition**

Concerning the composition of waste collected by the cooperatives, the findings of the research revealed that much of the waste is organic household waste, while the inorganic constituents is less. According members organic constituents are vegetable residues, grasses, ash, chat leaves, sticks, and animal bones etc. Composition of inorganic waste includes plastic bag, broken bottles, paper and plastic bottle etc.

##### **4.3.6 Division of labor**

The survey also assessed whether or not there is division of labor in the sampled cooperatives. Based on the field survey, there is a division of labor in all cooperatives. The members of cooperatives were also asked the bases used in division of labor .As

table-6 below show the majority, 45.7 of the members said that the division of labor was based on sex. However, 28.3% of them said that division of labor was based on age. Whilst 26% of them said that preference was the base for division of labor among the members.

Table-6: Criteria used in division of labor among the members

Criteria used for division of labor	Frequency	percentage
Sex	21	45.7%
Age	13	28.3%
Physical strength	-	-
Education	-	-
Preference	12	26%
Total	46	100%

Source: Own data [2011]

#### 4. 3.7 Monitoring and supervision

Unlike franchising arrangement, there is strong and regular monitoring and supervision on solid waste collection service providing cooperatives in the case of direct contracting. As stated by members, in the previous period when solid waste collecting services had been provided through franchising arrangement, monitoring and supervision was limited to controlling clandestine dumping by the business and the public at large to the service agreed.

According to an official at sanitation department, now the monitoring and supervising activity also pays attention to controlling the regularity of service delivery. The same official explained that the assigned supervisors at the sub city level visit the cooperatives regularly to check and follow the provision of the service in the respective zone as per the schedule. He also said that, there is house-to-house survey conducted by case team once in a month for gathering clients' satisfaction upon the service provision. In my field observation, I also attested this.

#### **4.3.8 Institutional support**

Like any other type of small business, solid waste collection activity needs external assistance in different aspects. As different documents revealed, solid waste collection service providing cooperatives are assisted by, NGOs, Government and good will peoples.

For instance, the municipality allowed micro and small enterprises engaged in solid waste collection service to use the city communal containers and disposal site for free. The municipality also provides vehicles freely for cooperatives to transport solid waste collected from their respective clients.

As stated in regulation No 13/2004 those engage in sanitary service shall be exempted, for a limited period from any profit tax and custom duties imposed by city government on input imported in accordance with the directive issued by the concerned bodies.

The document inspected by the researcher revealed that NGOs working in health, poverty reduction and employment creation and environmental protection areas are assisting solid waste collection service providers in different ways .According to the same document

NGOs indirectly involved in solid waste management in Addis Ababa are ENDN Ethiopia, Plan Ethiopia, CCF, Gashe Aberaa Mola and Clean and Green Addis Society.

The information obtained from the interview made with some of chairpersons and the official at the sub city sanitation department revealed that CCF and Action for Environmental Advocacy provided the cooperatives with some working equipment and safety materials.

#### **4.4 Users' satisfaction, cooperation, and willingness**

Solid waste collection concerns individuals as service users. Accordingly, the group of service users includes households, small and big institutions, industries, business organization etc.

The service recipients were questioned about their satisfaction with the service provision, solid waste situation of their area, their willingness to pay for the waste collection service and their cooperation in waste separation.

##### **4.4.1 Users' satisfaction with the service**

The case studies have found out that service recipients are satisfied with the service provided by waste collectors except some complain on the irregularity of the service provision.

##### ***Case -1***

*One of the service recipients complained about the irregularity waste collection services provided by cooperatives. I always see a lot of waste collectors in my way while*

*collecting and transporting wastes from business areas by using push cart and poly bag. However, they visited me not more than once in a month. I guess that, this is because they are irresponsible to their duties and want only to increase their earning by concentrating in the area like, butcher houses and fruit shops where they can collect huge amount of waste.*

Asked about the reason for the irregularity of collection service, some of solid waste collectors associated it with unpunctuality and inadequacy of waste transporting vehicles. Nevertheless, the information obtained from the case studies revealed that it is because of irresponsiveness of some of solid waste collectors (members).

#### **Case-2**

I want to appreciate the cooperatives members who provide door –to –door waste collection services in our residing area. They even cleaned sewages choked by bulky of garbage without giving any care to their health. I recommend that government should provide them with health extension services.

#### **Case -3**

Thanks to them now I do not worry about the place where I dispose my waste despite, some interruption in the service provision.

In spite of the above complaints, the service users agreed to continue getting the collection service from the cooperatives.

#### **4.4.2 Solid waste situation**

Service users were also asked about the solid waste situation of their surrounding now at the time of interview. Accordingly their view is narrated in the following cases.

##### **Case-1**

*I do not want to undermine the role played by the cooperatives in managing urban environment, I mean that Solid waste situation in our residing has changed. Before their involvement in the waste collection services, very few number of the society used to get the collection service because many sources of waste could be reached with roads which are inaccessible to certain type of transportation due to their width, congestions, or surfaces. But now all of the households in our village are getting waste collection service in door- to –door basis. Hence, our area is kept cleaned, unless some illegal action of dumping is done by someone.*

##### **Case -2**

*I have not seen significant change in solid waste situation in my residing area even after the cooperatives have involved in the solid waste collection service provision. If you look at sewages in this residing area they are still choked with rubbish disposed by some of the villagers who are environmentally insensitive and irresponsible.*

*Though the cooperatives are delivering door – to – door waste collection service, due to lack of punishment and irresponsibility some members of the society are not still refraining from dumping their waste into unauthorized places.*

### **Case-3**

*Waste has become money now .Do you know that waste collectors are paid based on amount of waste they collect from every one house? So that, they collect waste from any sources or places, even from rivers. Because waste is money now. This means they are playing a great role in keeping our village cleaned, thus, I can say that solid waste situation in our area has been improved.*

Sub – article, 1a and 1b of the Solid Waste Collection, Management and Disposal, Regulation 13/2004 also prohibit discharging solid waste in ditch, sidewalk, public place, fields and rivers.

The regulation also states that any person who disposes waste is to be penalized and should collect the waste with his own expenses. However, the regulations are not obeyed at all by the public.

#### **4.4.3 Clients' cooperation in solid waste management**

*Waste generators are important stakeholders in solid waste management. The success of solid waste management systems also depends on the crucial support and cooperation of users. Sorting of waste by type is one of the activities practiced by service users for proper and sustainable solid waste management.*

*The service receivers were also asked whether they separate waste by type at their home.*

### **Case-1**

*To tell frankly I have never separated waste by type at my home. This is because I do not consider waste as worth thing and some important things can be recovered from it. As*

*you see I stored all of my wastes in this madaberia (poly bag) like piles of potato and onion, ash, paper, festal (plastic bag) etc. This is my all day practice.*

### **Case-2**

*I always separate waste by type at my home. Valuable materials like, used shoes and clothes can be used for exchange with new house hold utensils and tin cans, glasses, plastic bottles etc, for sell. I separate waste this is because I get benefit out of it; otherwise I would not do it.*

*From the case study it was found out that those inorganic materials like tin cans, glasses, plastic bottles etc, are separated for sell, used clothes and shoes for exchange with new household utensils. This indicates that clients separate those solid wastes, which they consider beneficial (important) to them. However, other constituents of waste such as pointed materials, personal and medical products, and animal bones etc., which are hazardous for the health of waste collectors, stored together with other types of wastes.*

*Separation of waste plays a vital role in waste management system and natural resource conservation.*

### **Case-3**

*The woreda sanitation office in my area gave me education and training on how to reuse my domestic waste. After attending the training I have come to know that all waste should not be disposed as unwanted material; rather some important resources can be recovered from it .For instance, the pile of banana can be used for fire after it gets dried.*

#### ***4.4.4 Willingness to pay for collection services provided by the Cooperatives***

*Now days, the payment for waste collection services is collected by the city government .Hence, the government is charging indirect tax for sanitation services. Door – to – Door waste collection service users were also asked their willingness to pay sanitation fee.*

##### ***Case-1***

*I am satisfied by the collection service provided by cooperatives and willing to pay for it.*

##### ***Case-2***

*Do you know how much they are paid for their service? , it is 30 birr per meter cube of waste they collect. Is it fair? , I do not think so. When I compare the type of service they provide the amount of money they get is very low.*

##### ***Case-3***

*In spite of the irregularity of the service provision, the payment is very low and fair. I pay ranging from five birr-twelve birr per month for the services. I am willing to pay for the service.*

*Users are willing to pay for waste collection services. The study also found out that price of the services provided by Cooperatives is affordable to users.*

## 4.5 Opportunities

### 4.5.1. Benefits to the members (waste collectors)

#### 4.5.1.1 Employment

The provisional city government identified unemployment as a major economic challenge. Thus, emphasis was placed on creating job opportunities in five core areas: food processing, the textile, wood work and furniture production; small constructions and municipal facilities. So, waste collection activity gained attention, as it was one of the municipal facilities. Consequently the city administration intervened in to door-to-door Primary solid waste collection through institutionalizing and integrating micro and small scale enterprises into the waste collection system, which was originally exclusively run by informal waste collectors.

The study also intended to map out employment opportunity accrued from door – to – door primary solid waste collection service providing cooperatives.

Table -7 below clearly indicates the total number of members in sampled solid waste collection service providing cooperatives.

Table-7 Employment opportunity by sex

Sex	Frequency	Percentage
Female	93	60.8 %
Male	60	39.2 %
Total	153	100%

Source: Own data (2011)

Table-7 also shows that of the total employees absorbed by the cooperatives 60.8 % are female .While 39.2% are male. Females dominant the cooperatives according to members, this is because, solid waste collection activity is highly associated with women as the function carried out by women in side home.

According to the document reviewed by the researcher, unemployment and poverty are the prominent driving factors for most of the individual engaged in solid waste collection activity. When we also look into the background of sanitation workers they are among the ones who are not able to join formal employment sector and earn income due to low educational status. Hence, to overcome their vulnerable position and in the struggle for survival they engaged in solid waste collection activity.

#### **4.5.1.2 Income**

The information obtained from the waste collectors reveals that, apart from spending their day on other extra income generating activity, their main source of income is driven from waste collection activity, so all of the members (waste collectors) in the cooperatives are regularly paid by the government for their service. According to the information the researcher obtained by interviewing chairpersons of the cooperatives, the income earned by each members (waste collectors) across the cooperatives varies based on number of members, amount of waste which is collected and loaded in to the municipal vehicles per week or a month and the working area (zoning).

#### **4.5.2 Benefits to clients**

Communal collection has been the predominate system of waste collection in Arada sub-city. Despite its predominance, the communal collection system suffers from low

frequency of monitoring, and emptying containers, and inadequacy in the number and the spatial distribution of containers.

The study also intended to assess how the introduction of such door - to -door waste collection service benefited the service recipients in the study area.

#### **Case-1**

*Because of the absence of containers near to my residing area I used to dispose my waste in to open lots and nearby rivers. But now I refrained from disposing waste indiscriminately because, I get collection services from the cooperatives. Therefore, the involvement of coops in the service contributes a lot in managing urban environment.*

Absence of containers near to their residential area encouraged people to dump waste indiscriminately into open spaces, rivers and drainage system.

#### **Case-2**

*Before I have started using collection service from cooperatives I used to look for someone who could dispose my waste and I used to pay them range from 1birr -3birr. The problem was it is difficult to get them at appropriate time and convenient place. Due to this I used to accumulate waste in my back yard for longer period of time .Now thanks to the cooperatives all of wastes in my back yard are collected regularly.*

Due to the remoteness and absence of containers from their home, people cover quite long distance to dispose their wastes. In the case of some households, servant disposed household wastes.

### **Case-3**

*Before the involvement of cooperatives in door -to -door waste collection services I used to dispose my waste by myself by traveling long distance. But now I can get the services from one of the cooperatives in my woreda. Thus, I saved my time and labor.*

Users associated the involvement of cooperatives in waste collection service provision with urban environment management, time saving and labor saving.

#### **4.5.3 Benefits to the municipality**

Waste management is the responsibility of government but the complexity of the service and the requirement of high level of organizational, technical and managerial capacity make it difficult to be handled by local governments alone. Thus, participation of private actors is crucial to make the collection service more effective, efficient and frequent.

According to official from municipality before the door-to-door solid waste collection system, communal container and block collection were the two systems of waste collection in Arada sub city. He stated that under block collection system, the residents are expected to bring the waste they stored in the predetermined route and time of municipal waste truck. He added that this type of collection system entirely depends on vehicles availability. Due to this, the collection hours are not regular. Moreover, the system is not efficient, because of frequent breakage of waste vehicles and high cost related to waste collection operation and fuel consumption. As he explained because of door- to -door solid waste collection service by cooperatives, the municipality can save money and provide the service regularly and more effectively. As explained by

chairpersons ,when the waste collection service was provided through block collection, very large numbers of the residents were left un served because many sources of waste could be reach by roads ,which are inaccessible to certain type of transport due their width ,slope, congestion or surface. Thus, according to them, after the cooperatives involved into the service, every household could get the service.

As it was also stated by members (waste collectors) in Container collection or communal collection system, residents are responsible to dump their waste into containers. This system of waste collection can serve wide area, however, most of the time containers are placed in inaccessible points and the number of containers is inadequate. This encourages illegal dumping by some of community members. Thus, they stated that the involvement of cooperatives into municipal solid waste collection is very important in preventing such illegal act and in protecting the environment. The Cooperatives are also contributing in absence of transport link between households and the sparsely located municipal containers.

ADDIS ABABA UNIVERSITY  
AKAKI CAMPUS LIBRARY

## **4.6 Major Challenges faced by the cooperatives**

### **4.6.1 Technical resources**

The main technical resources used in the solid waste collection activity are communal containers and waste transporting vehicles.

#### **4.6. 1.1 Containers**

As one of the major technical resources, collectors were asked about the adequacy of available containers in their service area. Though ,15.5% of them consider it as their

major problem, the study revealed that in adequacy of waste containers is not a problem for most, 84.5% , of waste collection service providers.

As the researcher attested from the field observation, some of the cooperatives do not use containers at all. Rather they use designated lots to store wastes temporarily until they are transported and disposed by municipal trucks in to the Repi landfill. According to members, the remoteness of the location transfer point and communal container is the major challenge to their activity. They also said that due to this they cover quite long distance to dispose their waste to communal containers. According to one of the collectors, transporting waste to a place where containers are located is the most challenging of all activities, and this is aggravated by inaccessibility of containers.

**Table -8 Responses to adequacy of waste containers by the members**

<b>Responses to adequacy of waste containers by members(solidwaste collectors)</b>	<b>Frequency</b>	<b>percentage</b>
Yes	39	84.5%
No	7	15.5%
Total	46	100%

Source: Computed from surveyd data[2011]

#### **4.6.1.2 waste transporting vehicles**

Transporting of waste from where the waste is generated to designated transfer point or to the location of communal containers is carried out by solid waste collectors. Although transporting waste from communal containers into final disposal site is the responsibility of municipality.

Waste truck is the major technical resource on which the sanitation of the city in general and solid waste collection service in particular depends.

The data obtained from interview conducted with an official at sanitation office of the sub city revealed that waste collecting capacity is highly dependent on the adequacy of waste trucks. The same official also said that in adequate number of waste trucks is the major factor that affects the frequency of collection service and collection coverage.

The chairpersons of the cooperatives also stated that the frequency of the service provision highly relies on the capacity of the municipality to transport the solid waste from collection sites to the landfill, which in turn depends on the adequacy and operational capacity of waste trucks. Members also attested this. According to the official from the municipality, there are six waste trucks deployed to the sub city. As he explained, the number of trucks is very low as compared to what is needed to provide collection service as frequently as needed and in effective way.

Inadequacy of waste transporting vehicles has also far – reaching implication on the livelihood of members. Waste collectors (members) explained that shortage and frequent break down of waste truck are their major factor for the irregularity of the collection service. They commented that as long as the payment is based on the volume of waste

they collect shortage of waste trucks and unpunctuality of waste truck drivers have highly affected their livelihood.

Absence of vehicles has also environmental impacts .Some of members associated illegal dumping with irregularity of the service provision.

#### **4.6.1.3. Lack of equipment**

As observed the working equipment of the cooperatives includes small and big pushcarts, brooms, forks, hoes and poly bags and wheel borrow etc. However, according to some documents the equipment that a single small enterprise is expected to possess is at least two appropriate trucks each having a minimum carrying capacity of 8m<sup>3</sup> wastes and communal waste containers with the carrying capacity between 7 to 8m<sup>3</sup> of waste' in the case of delivering communal service. In case of delivering service to households, the small enterprise is expected to supply plastic or other type of containers of appropriate sizes.

Members are suffering from difficulties to do their work effectively due to frequent breakdown and lack of working equipment. Members also stated that they purchased some of equipments such as brooms, forks, shovel and other materials with some capital contributed by members.

According to official from the municipality, CCF supported the cooperatives to win initial inefficiency by providing some equipment such as wheelbarrows, poly bags, Push charts etc. However, collectors were complaining about the inappropriateness and low standard of the equipment. According to them the equipment especially wheel barrows

have been encountered with frequent breakdown .As a result, large part of their income is going to cover maintenance cost. Due to this, they prefer to carry waste on their back.

The interviewed Chairpersons said that cooperatives are expected to cover 10% of the cost of the equipment provided by the NGOs. The payment is deducted from monthly salary of each member.

Though they did not deny the fact that they were supported by the NGOs, members stated that they were unable to cover the cost they were expected to.

The members also commented that, compared to the service life and operational capacity of the tools, the amount of money they incurred was unreasonable, and this made them in -debtors.

#### **4.6.2 Lack of access to safety cloths and medical service**

Waste collection activity requires much care as waste constitutes different types of hazardous materials. Therefore, safety materials like gloves, shoes, and masks are expected to be possessed by cooperatives engaged in the activities.

However, from the field survey the researcher found out that only a few members were undertaking their activities with safety materials, particularly gowns and gloves.

According to members and chairpersons most of the times safety materials were provided by NGOs. They also stated that the materials were provided by Action for Environmental Advocacy to the whole woredas of the sub city. However, many of the workers had complained about the materials. They said the materials they got from these

NGOs were not durable and breakdown frequently, so that they started doing their job without them.

Though waste collection has some adverse health impact, the information obtained from members revealed that, none of them got medical service neither from their cooperatives nor from government. Some of the members said that when they encountered with disease related to their jobs or were injured they visited health institutions and covered the cost by themselves. There were also certain cases waste collectors (members) treated themselves with indigenous medication.

Members recommended that as they are exposed to injuries and infectious diseases, the government must provide them with free regular medical services. They also explained that under the previous city mayor, Arkeb Ekuby, they used to get free medical service but nowadays they are not getting the service.

According to some of the respondents, it is the responsibility of government to provide them with free medical service to emergency cases. There were also some members who recommended that they should get an opportunity to get check – up at least once in a month.

#### **4 .6.3 Inadequate payment**

Until recent time, apart from indirect taxes that are imposed on some service providing organizations such as hotels, restaurants, shop and factories, the sanitation service was delivered free of charge. The Payment for waste collection service has started a few years ago and solid waste collectors had been collecting service fee directly from users. According to the reviewed documents and members of cooperatives, previously service

charge was determined by taking into account the number of family members, volume of waste, and household income. As of recent time the payment for the service is collected by the government. Hence, the city government is charging indirect tax for the service calculated at 5% of households' water bill, and the municipality pays members. According to the members the payment is on the bases of waste collected which 30 birr/m<sup>3</sup> of waste collected.

Asked about their satisfaction with the payment for the service, almost all, 91.3% of members responded that, they were not satisfied with the amount of money they were paid by the government. Only 8.7% of them said they were satisfied with the payment.

Moreover, some members said that the amount of salary they are paid for the service is not fair in relation to the activity they are undertaking and the hazardousness of the activity They also stated that the promise made by the government to raise the payment has not been implemented yet.

According to the document, the researcher inspected the charge for waste collection services is collected by the city and transferred to the city. Therefore, Sanitation, Beatification ,and Park Development Agency which is responsible for the day to day delivery of sanitary services is not directly in control of the revenue sources.

Members recommended that service payment to be 40/m<sup>3</sup> of waste collected.

**Table-9 Responses to satisfaction with the payment by members**

<b>Responses to satisfaction with the payment by sanitation workers</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	4	8.7%
No	42	91.3%
Total	46	100%

Source : Computed from surveyd data [2011]

#### **4.6.4 Delay in payment**

The government pays waste collectors monthly for their service. As the information obtained from the interview conducted with chairpersons of the cooperatives reveals, the monthly payment to members is made following this procedure .According to them, first, coordinators at woreda level cross check the number of containers reported by the cooperatives with the one at the sub city sanitation department provided by waste truck drivers .Then coordinators prepare payroll based on the number of containers loaded on to the municipal trucks in a month .After this payroll is sent to the sub city. After being signed by officials at the sub city sanitation office, it is sent to the Agency. Finally, the agency made the payment through woreda finance offices or bank.

Waste collectors were also questioned whether they got payment as per schedule. As clearly indicated in Table -10, all of members said that they did not get monthly payment as per the schedule. Asked about the reason for the delay, some of members and

chairpersons explained that it was due the irresponsiveness of coordinators at woreda sanitation office.

Officials from the municipality also associated the problem with delay in the preparation of payroll by coordinators at woreda sanitation offices .During the field survey, the researcher observed some members complained saying they were suffering due to the delay in payment. The researcher also found out that members of the cooperatives borrowed money from their relatives and close friends to cover some of their expenses until receiving monthly salary. According to them, the payment would delay up to 8 or 12 days from the normal schedule. They also recommended that as long as they provide the service to their clients, they must be paid as per the schedule.

**Table-10 Responses to timely payment by the members**

<b>Responses to timely payment by workers</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	-	-
No	46	100%
Total	46	100%

Source : Computed from surveyed data [2011]]

#### **4.6.5. Source of capital**

Like any other small business activities, solid waste collection activity requires capital to acquire working equipment such as wheel borrows, push carts and to cover running costs.

According to the interview made with chairpersons of the cooperatives, members' contribution from monthly paid wages is the main source of capital for the cooperatives to finance the running costs such as, maintaining carts and purchasing other equipment. In addition to members' contribution, cooperatives are also saving part of their income for the some purpose. The cooperatives are required to deposit their saving in micro saving and credit institutions at woreda level.

The cooperatives also derived their capital from material support extended from NGOs. Despite, micro financial institutions are supposed to provide credit services to micro and small-scale enterprises, the information obtained by interviewing chairpersons revealed that the cooperatives did not want to take loan from this formal institution due to the reason that they were not confident enough about their ability to pay back the loan. The Chairpersons also stated that more than half of their members are street dwellers, so that they do not have identity cards, and this made them refrain from taking loan from such kind of institution.

#### **4.6.5 Attitude towards members**

Negative attitude towards solid waste collectors has negative impact on workers' livelihood, environment and municipal solid waste management efforts. According to the coordinators, in the very inception of the service, individuals engaged in waste collection had faced several criticisms from public. They stated that, as the informal waste collectors are the pioneers in the activity, they have paid ultimate price ranging from changing their own attitude to altering the outlook of the community.

The field survey has found out that 54.3% of members were much comfortable with people's attitude towards them, whilst 19.6% of them were half hearted. However, 10.9% of them were completely dissatisfied by peoples' attitude towards them. The remaining 6.5% had no knowledge about it.

Some of the members explained the experiences they had confronted from their family, neighbors and service users due to their engagement in solid waste collection activity. Some of the waste collectors said that although our children were able to eat bread and attend schools because we worked in this business, they did not respect the job at all. The other members stated that because they worked in waste collection, their neighbors expected them to keep cleaned their surroundings too. Some of members also bitterly said that, the service users conceived that it was only they (members) who benefited from the service provision. So had negative outlook toward them.

**Table-11 Attitude towards members**

Attitudes	Frequency	Percentage
Extremely good	25	54.3%
Very good	-	-
Good	13	19.6%
Bad	5	10.9%
I don't know	3	6.5%
Total	46	100%

Source: Computed from surveyed data (2011)

## CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusion

The main objective of this study was to assess the nature of solid waste collection services delivered by cooperatives in Arada sub-city and to identify their opportunities and challenges. Ten cooperatives that are located in Arada Kifle-ketema were selected for the purpose of the study. From these cooperatives 46 members(waste collectors) were selected randomly. Structured questionnaire was developed and used to collect data from sampled members. Key informant interview, case studies and observation were also used to collect qualitative data.

As assessment results of this study revealed all the study cooperatives that were rendering door-to-door solid waste collection services in the study area were found organized by the woreda micro and small scale enterprises organizing office. The cooperatives made an agreement with the woreda sanitation office to provide the following services within their jurisdiction:

- Providing door – to – door waste collection services and transporting the wastes to communal containers;
- Organizing educational campaigns and creating public awareness program aimed at encouraging and stimulating public to separate waste and to prepare material for this purpose;
- Bringing to sanitation office or justice those who are held committing illegal dumping;

- Participating in regular and emergency campaigns within their jurisdiction; and
- Working harmoniously with different bodies for the fulfillments of the above stated responsibilities .

The Cooperatives are expected to deliver door –to -door waste collection services with in their respective zone once in a week in residential areas and all days in business areas. However, in some of cases they fail to collect waste from their clients as per the schedule. This is due to frequent breakdown and inadequate number of waste transporting vehicles and also because of a tendency from the side of waste collectors to concentrate on the business areas where they can collect huge amount of waste and thereby increasing their income

The method of involvement in solid waste activity in the study area is contractual arrangement

It was also found that the payment for the service is made by the government which is 30 birr per metercube of waste collected. And not satisfactory to the memebers.

To obtain Information concerning their satisfaction with the service provided by the cooperatives, and their cooperation in solid waste management and willingness to pay for collection service, case study on three selected service recipients was conducted. The following are the findings derived from the case studies.

- ❖ Users are willing to pay for sanitation service.
- ❖ Sorting of waste by type was practiced by a very few of service users (recipients).

- ❖ Except complaints on the low frequency and irregularity of the collection service, users are satisfied by the service provided by the coops.

The participation of cooperatives in municipal solid waste collection has positive implication on the quality and sustainability of urban environment. The cooperatives also created job opportunities and income for the poor, hence reducing poverty and being example to others that waste collection is one source of income.

The clients also benefited from the services provided by the cooperatives. Because of the cooperatives, all wastes generated in their yard are removed paying fair price. Besides they can save their time and labor. Further more, the role of cooperatives has expanded from environmental sanitation and poverty reduction objectives to better solid waste collection coverage in the study area. This is because, the cooperatives have begun to play a role in increasing access to the service to large number of people.

The cooperatives under study faced many constraints in their activity. Inadequacy and frequent breakdown of waste transporting vehicles were the major problems that hindered the regularity of the service provision, which in turn affected the livelihood of workers. Lack of working equipment is also one of the constraints for their operation. Delay in payment and inadequate service payment, and remoteness of the location of communal containers and transfer points, and negative attitude of the society were found to be the major challenges of the cooperatives in their order of priority.

## 5.2 Recommendations

Although solid waste collection service providing cooperatives play a very significant role in environmental management, poverty reduction and employment creation, there are lot constraints that hinder their success. Hence, based on the findings of the study, the researcher wishes to make the following recommendations.

Both the municipality and service users benefit from the provision of the services. Hence, cooperation, recognition, acknowledgment and support are expected from these stockholders. The municipality shouldn't consider waste collection only for the sake of keeping environment clean, the issue goes beyond this, for the livelihood improvement of workers. So ,it should inform the city government and increase the number of waste transporting vehicles.

Micro and Small Scale Enterprises Organizing Offices of the respective wereda should also take their responsibilities of facilitating and supporting cooperatives.

Proper monitoring and evaluation must be also implemented by the supervisors so as to check the delivery of service as per the schedule.

In some cases service recipients consider waste collection activity as an obligation to waste collectors. Due to this, they do not cooperate in waste related activities and show no respect to waste members of cooperatives . Hence, raising public awareness through house- to -house educational campaigns is preferable to resolve the problem.

Members should also be encouraged involving in other jobs to complement their minimum monthly income after they complete waste collection.

The researcher also recommend that further researchers should be encouraged to work on related issues like challenges of other actors participated in the provision of the same services

## **Annex-1**

### **Questionnaire to be filled by Door – to – Door solid waste collection services providing Cooperatives in Arada sub city**

**Addis Ababa University**

**Institute of Development Research**

The researcher is a final year student of environment and development master programme in Addis Ababa University. She is carrying out a research entitled “nature, challenges and opportunities of door – to – door solid waste collection service providing cooperatives” in Arada kifle-ketema. Therefore, information has given is only for this purpose and confidential.

#### **Instructions**

Dear respondents

-Circle your choice letter for multiple-choice questions.

-Some questions will require you to write down a text.

1. Sex

A. Female

B. Male

2. Age

A. 16- 20 years

C. 31-40 years

B. 21-30 years

D. 41-63 years

3. Educational background

A. Literate

B. Illiterate

4. If your response for Q.3 is "A", what is your status?

A. Primary

B. Secondary

C. Vocational completed

D. One year college and above

5. What motivates you to join this co-operative?

A. To meet with high cost of living

D. To get extra income

B. Experience from others

E. Recommendation from others

C. Better market for the service

F. Others, please specify

6. For how long have you been in this co-operatives?

---

7. How did you get the community for your service?

---

8. How many male and female members are there in your co-operatives?

---

9. What are the major types of wastes do you collect mostly, by ranking its significance in the space provided?

A. Organic house hold waste \_\_\_\_\_

B. Non organic waste \_\_\_\_\_

10. Is there a work division in your co-operatives?

A. Yes

B. No

11. If your response for Q. 10 is 'A,' what is the criteria used in the division of works among the members?

A. Gender

D. Physical strength

B. Age

E. Preference

C. Educational background

F. Other, please specify

12. To which area your working zone belongs to?

\_\_\_\_\_

13. Have you encountered with hazardous waste while delivering collection services?

A. Yes

B. No

14. If your response is 'A' for Q. 13, what types of hazardous wastes?

\_\_\_\_\_

15. Are you provided with regular medical services?

A. Yes

B. No

16. If your response is 'B' for Q. 15, what is your recommendation?

\_\_\_\_\_

17. What types of equipment do you use to deliver the services?

---

18. How do you describe the level of client's co-operation in your job?

A. Extremely good

D. Bad

B. Very good

E. very bad

C. Good

F. do not know

19. If your response is 'D' or 'E', for Q. 18, what do you think are the possible reason(s)?

---

20. How do you perceive peoples' reaction towards you due to your engagement in this job?

A. Extremelly good

D. Bad

B. Very good

E. Do not know

C. Good

21. If your response is 'D' for Q. 20, what experience do you have?

---

22. How many containers are available in your working service area?

---

23. Do you think that the amount of waste containers in your working zone is adequate?

A. Yes

B. No

24. If your response is 'B' for Q. 23, how much is required?

---

25. Do you think that inadequate number of containers is the major problem in your enterprise?

A. Yes

B. No

26. Are waste containers access able to you?

A. Yes

B. No

27. Do you receive your monthly payment as per the schedule?

A. Yes

B. No

28. If your response is 'B' for Q.27, would you mention the reason?

---

29 Are you satisfied with your monthly salary?

A. Yes

B. No

30. If your response is 'B' for Q. 29, what is your recommendation?

---

*Thank you for willingly allocating your time and for responding!*

## **Annex-2**

### **Checklist for case study door -to -door solid waste collection service recipients in arada sub -city**

**Addis Ababa University**

**Institute of Development Research**

The researcher is a final year student of environment and development master programme in Addis Ababa University. She is carrying out a research entitled “nature, challenges and opportunities of door – to – door solid waste collection service providing cooperatives”.in Arada kifle-ketema. Therefore, information has given is only for this purpose and confidential.

1.Are you satisfied with the services provided by cooperatives?

- If yes, why?

- If ,no, would you explain your reason?

2.Are you willing to pay for collection services?

-If No ,what do you think the possible reason(s)?

3.Do you separate your waste by type at home ?

-If your response is ‘No’ for Q. above, what do you think the possible reason?

-If yes ,what type of waste do you separate mostly?

4. How much do you pay per month for the service?

5. What advantages have you got due to the existence of such services ?

6. How do you describe solid waste situation of your residing area now ?

7. Are you interested to continue getting the service?

-If your response is 'no' for Q. above, would you mention your reasons (s)?

*“Thank you for willingly allocating your time and for responding”*

### **Annex-3**

**Guiding questions for interview and discussion with official at Arada kifle ketema**

**sanitation Department**

**Addis Ababa University**

**Institute of Development Research**

The researcher is a final year student of environment and development master programme in Addis Ababa University. She is carrying out a research entitled “nature, challenges and opportunities of door - to – door solid waste collection service providing cooperatives” in Arada kifle-ketema .There fore, information has given is only for this purpose and confidential.

*Thank you in advance for your co-operation!*

1. What are the major responsibilities of your office in provision of solid waste management service?
2. What are the current status of solid waste handling, transportation, and disposal in the sub city?
3. How does your office inspect and supervise the cooperatives?

4. How do you explain the benefits accrued due to the participation of co- operatives in solid waste collection services in Arada kifle- ketema?
5. What do you think are the major challenges of municipal solid waste management in general and solid waste collection service providing cooperatives in particular?
6. What measures does your office take to resolve the challenges?
7. How do you explain the role of cooperatives on municipal solid waste management services in Arada kifle –ketema?
8. Did your office organize educational campaigns aimed at encouraging awareness among the public and stimulating the community to participate?
9. If the response for Q. 8 above is ‘Yes’, what were the approaches used?
10. Does your office get supports (s) from the city government, NGOs or external body?
11. If the response for Q. 10 above is “Yes” what kinds of support (s)?
12. What kinds of experience does your office come across in the course of monitoring and supervising co - operatives?

## **Annex- 4**

### **Guiding questions for interview and discussion with sampled co – operatives’ chairpersons**

**Addis Ababa University**

**Institute of Development Research**

The researcher is a final year student of environment and development master programme in Addis Ababa University. She is carrying out a research entitled “nature, challenges and opportunities of co-operatives solid waste collection service providing cooperatives ” in Arada Kifle Ketema. Therefore, information has given is only for this purpose and confidential.

Instructions

Dear/respondents

-circle your choice letter for multiple-choice questions

-Some questions will require you to write down a text.

1. How do you describe the role of co – operatives in municipal solid waste management effort?

---

2. How do you select service recipients group in your working zone?

---

3. Did you get the willingness of the public easily to receive the service of your co – operatives?

A. Yes

B. No

4. If your response is 'B' for Q. 3, would you mention some of the challenges you faced?

---

5. What did motivate you to join the co- operatives?

---

6. Is there any agreement to start the service?

A. Yes

B. No

7. If your response is 'A', for Q. 6, with whom have you made an agreement?

---

8. How did you get the line of agreement to do this job?

---

9. What are the sources of capital for your cooperatives?

---

10. On what basis the service fee is determined?

---

11. How do you evaluate the service charge you receive for the service?

---

12. What is the amount of waste does your enterprise collects per month?

---

13. How many times per week your co – operative is required to provide the service?

---

14. Do you think that the amount of waste containers provided by the municipality is satisfactory?

A. Yes

B. No

15. If your response is 'B' for Q. 21, how much is required?

---

16. Is there adequate number of vehicles for your operation?

A. Yes

B. No

17. Are the vehicles maintained when ever necessary?

A. Yes

B. No

18. If your response is 'B' for Q. 17, would mention the reason (s)?

---

19. In your opinion among the following what are the major challenges to your co –  
operatives?

A. Inadequate number and frequent breakdown of vehicles. \_\_\_\_\_

B. Poor co-ordination of clients \_\_\_\_\_

C. Lack of incentives \_\_\_\_\_

D. Lack of credit facilities \_\_\_\_\_

E. Faced physical and health problem \_\_\_\_\_

F. In adequate payment for the service \_\_\_\_\_

G. Lack of skilled personnel \_\_\_\_\_

H. Lack of access for safety cloth and medical services \_\_\_\_\_

I. Lack of participation \_\_\_\_\_

J. Lack of adequate equipments \_\_\_\_\_

K. Delay in payment \_\_\_\_\_

20. Did you get any support from other institutions?

A. Yes

B. No

21. If your response is 'A' for Q. 21, what kinds of support?

---

*Thank you for kindly co – operation!*

## **Annex-5**

### **Check list of field observation**

**Addis Ababa University**

**Institute of Development Research**

1. The major constituents of solid waste generated in the research setting?
2. Illegal dumping sites in the area {if any}.
3. Wastes stored and sorted at service recipients' house
4. The availability and adequacy of communal waste containers in the research setting
- 5 Environmental condition of the area in relation to solid waste.
7. Equipment used by the collectors
8. Transfer points located in the research setting.

## List of References

- Abebaw Tegegne.(2006).The involvement of micro and small scale enterprise in solid waste management service in Addis Ababa: The case of Bole and Arada sub-cities.Master thesis, AAU,Addis Ababa,Ethiopia.
- Addis Negari Gazeta. (2004) . Regulation, no 13\2004, solid waste management, collection, and disposal regulation of the Addis Ababa city government. Birhanena selam.Addis Ababa,Ethiopia.
- Addis Negari Gazeta.(2007). Proclamation no. 513/2007, Solid waste management proclamation of the Addis Ababa city government .no 13.Birhanena Selam .Addis Ababa,Ethiopia.
- African Studies Association of Australia and the Pacific community participation in solid waste management .(2003). Conference Proceedings African on a Global Stage.
- Aliyu Baba Nabegu. (2010). An Analysis of Municipal Solid Waste in Kano Metropolis, Nigeria ,*Department of Geography.Kano University of Science and Technology.kano,Nigeria.*
- Amin Zayani .(2010). Solid Waste Management: Overview and current state in Egypt Short Paper Series Short paper # 5 edited by: Maggie Riad <http://www.trioceanenergy.com/upload/PDF/SW%20Egypt%20.pdf> accessed on 11/04/2011

[http://www.sweepnet.org/ckfinder/userfiles/\(2010.\)/RA%20Alegeria%20ANGdp](http://www.sweepnet.org/ckfinder/userfiles/(2010.)/RA%20Alegeria%20ANGdp)  
f. Accessed on 12/05/2011

Arada sub city Cooperatives Organization and Promotion Office . (2011).Lists of the name of door-to-door solid waste collection services providing Cooperatives in Arada sub city.

Burns, P. (1996). The Significance of Small Firms: Small Business and Entrepreneurship, 2nd edition, 1996.

CGAASBPDA –City Government of Addis Ababa Sanitation, Beautification and Park Development Agency.(2003). 'Solid Waste Management Status Report of Addis Ababa',Addis Ababa,Ethiopia.

Derege, Direb.(2009).House hold solid waste generation, rate, composition and content analysis for disposal and resource recovery: in two selected kebles of Hawassa town .Master Thesis, A.A.U .Addis Ababa, Ethiopia,

Diaz, L.F., Savage, G.M. and Eggerth, L.L.,(1999).Overview of Solid Waste Management in Economically Developing Countries. In: Proceedings of Organic Recovery and Biological Treatment, ORBIT 99, Part 3, Rhombos, Berlin, pp. 759–765.

Edward, d.,Anomanyo.(2004). Integration of Municipal solid waste management in Accra (Ghana): Bioreactor treatment technology as an integral part of the managmnet process. Master thesis, Lund University, Lund, Sweden

[http://www.lumes.lu.se/database/alumni/03.04/theses/anomanyo\\_edward.pdf](http://www.lumes.lu.se/database/alumni/03.04/theses/anomanyo_edward.pdf) accessed on 2/06/2011.

Eric Achankeng.(2003). Globalization, Urbanization and Municipal Solid Waste Management in africa: African Studies Association of Australasia and the Pacific, 2003 Conference Proceedings - African on a Global Stage 1, University of Adelaide.

<http://www.inclusivecities.org/pdfs/achankeng%20Globalization%20Urbanization%20and%20MSW%20Mgmt%20in%20Africa.pdf>.>accessed on 14/09/2011.

EPA, MES, MLGRD .(2002). *Ghana Landfill Guidelines: Best Practice Environmental Guidelines*.

Fasika Damte and Daniel Ayalew, (1997). Financing Micro and Small Scale Enterprises in Urban Ethiopia. Addis Ababa, November, 1997.

Federal Negari Gazeta of the Federal Democratic Republic of Ethiopia .(1997). Enviromental policy of Ethiopia.Birhanena selam.Addis Ababa,Ethiopia.

Federal Negarit Gazeta of the federal democratic republic of Ethiopia. (1995). the FDRE constitution 1<sup>st</sup> year. Berhanena selam printing press.Addis Ababa,Ethiopia.

Government of Ghana, Ministry of Local Government and Rural Development (2003): Second Urban Environmental Sanitation Project (UESP II). Environmental and Social Assessment volume 1, pp 48 – 110.

Haan, H.C., Coad, A. and Lardinois, I. (1998). Involving Micro and Small Enterprises in Municipal Waste Management: Guide Lines for Municipal Managers, Co-publication with GTZ, SKAT and ILO, 1998.

[http:// en .wikipedia.org/wiki/ municipal solid waste](http://en.wikipedia.org/wiki/municipal_solid_waste).(accessed on 2/11/ 2011).

<http://en.wikipedia.org/wiki> as cited in the free encyclopedia). Accessed on 12/03/2010

Jan A. Thompson. ( ) Domestic Waste Management Strategies in Accra, Ghana and Other Urban Cities in Tropical Developing Nations.

Joel s. Hirschhorn: (1996) managing solid and Hazardous waste, Green paper series No.5.

Kaseva, M. E., & Gupta, S. K. (1996). Recycling—an environmentally friendly and income generation activity towards sustainable solid waste management. Case study Dar es Salaam city. *Resource conservation and Recycling*, 17,299–309.

Lilia ,Casanova. Sonia, Dias. Sanjay, K., Gupta. Michael ,H., Simpson.Portia, M., Sinnott. Reka ,Soos. Andrew, Whiteman. (2009). *Solid Waste Management in the World's Cities* Pre-publication presentation. On behalf of UN-HABITAT by: WASTE, Advisers on urban environment and development, Gouda, the Netherlands.

Mengiseny E. Kaseva\*, Stephen E. Mbuligwe.(2003). Appraisal of solid waste collection following private sector involvement in Dar es Salaam city, Tanzania ,University College of Lands and Architectural Studies (UCLAS), Dar es Salaam, Tanzania *Habitat International* 29 (2005) 353–366.

<http://www.bvsde.paho.org/bvsacd/cd43/dar.pdf>. Accessed on 07/03/2011/.

M.E. Kaseva, S.E. Mbuligwe.(2005).Appraisal of solid waste collection following private sector involvement in dar-es-salaam city ,Tanzania,University College of Lands and Architectural Studies (UCLAS), Dar es Salaam, Tanzania.

Nabegu .A .B. (2008a). An assessment of refuse management and sanitation board (REMASAB)'s waste management in Kano metropolis. *Techno-science Africana Journal*, 1: 101-108.

Ogwueleka, T.C., (2003). Analysis of urban solid waste in Nsukka, Nigeria. Journal of Solid Waste Technology and Management, 29 (4): 239-246

Over view of solid waste management in kenya.

[www.Unep.org/PDF/kenya-waste\\_management-sector/chapter\\_3.pdf](http://www.Unep.org/PDF/kenya-waste_management-sector/chapter_3.pdf) accessed on 07/30/2011/

Palczynski, Richard J. (2006), 'Study On Solid Waste Management Options for Africa',

Scheinberg, A., Klundert, A. and Rudin, V., (2000). MSEs in Urban Environmental Improvement: Panacea, Strategy or Transition Stage, the Netherlands, May, 2000.

Proceedings of International conference "Ricerca e applicazione di tecniche sanitarie appropriate nei Paesi a risorse imitate (Research and application of appropriate sanitary technologies in Developing Countries)", Brescia, Italy, 20th December 2007, published by Aracne, Rome. <http://www.afdb.org>, accessed on 10/10/2011/.

Selamawit Alem. (2007) .New partnership for local Government service delivery: solid waste management in Addis Ababa, Master, Thesis ,University of Technology. Berlin, Gemen.

Solomon Asrat .(2006). Solid Waste Management: A Case Study of Household Solid Waste Management in Arada Sub-City, Master, Thesis , A.A.U. Addis Ababa ,Ethiopia.

Tadesse Kuma .(2004). 'Dry Waste Management in Addis Ababa City, Ethiopia.' Paper given at Teaching Workshop on Accounting for Urban Environment ,Addis Ababa, Ethiopia, January 5th – 16th, 2004.

Tessema, \_\_\_\_\_ .(2010).Over view of Addis Ababa city solid waste management system.

United Nation Environmental Program Division of Industry, Technology and Economics –UNIDO. 2006. <<http://www.unep.org>>

USAID.(2009).Enviromental guide lines for small scale activities in Africa.

WorldBank.(2002).DatabycountryWebsite<http://www.worldbank.org/data/countrydata/countrydata.html> (accessedonJune11,2011).

World Bank 2003. *Thailand Environmental Monitor2003*. A joint publication of the Pollution Control Department, Royal Thai Government. The World Bank, US Asia Environmental Partnership.

Yirgalem Mahiteme ,Axel Baudouin, Camillae jerik, Frank Mugagga, and Zelalem Fanta Chekol. (2008) .Quetioning the integration of the informal sector: The case of solid waste management, working paper on population and land use change in central Ethiopia, nr.15series B,no14, Foredrag,tronthiem, 2008,Uppsala ,Sweden.


Zelalem Fenta. (2006). 'Controlling the Informal Sector: Solid Waste Collection and the Addis Ababa City Administration, 2003-2005', Master thesis, Norwegian University of Science and Technology. Trondheim, Norway.


Zerayakob Belete. (2002) .Analisis and developepment of solid waste management system  
of Addis Ababa.Master thesis ,AAU, Addis Ababa, Ethiopia

Zurbrügg, C. (2008). Solid Waste Management and Recycling in Developing Countries.,

## Declaration

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

Name of participant Hiwatworo Signature  Date 15/03/2012

Name of Advisor Abdulhadi Bedri Signature  Date 15/03/2012