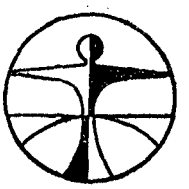
Solid Waste Management Series No. 3

Solid Waste and Sustainable Livelihoods

ENDA-Ethiopia–WEDC Training Workshop



enda-ethiopia

Addis Ababa, Ethiopia
June 2001

Solid Waste and Sustainable Livelihoods

ENDA-Ethiopia–WEDC Training Workshop

January 22nd-27th 2001

Addis Ababa

Facilitator: Dr Mansoor Ali, Loughborough University, U.K.

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Enda-Ethiopia (Environmental Development Action in Ethiopia) is the Ethiopian national office of the international organisation Environmental Development Action in the Third World, based in Dakar, Senegal.

Enda-Ethiopia conducts an urban programme "Living healthily in a clean and green city" with activities in environmental sanitation and urban agriculture. At community level, Enda-Ethiopia's approach is to initiate and support action to fight poverty and upgrade the environment.

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Content

Introduction

In January 2001, as part of its Integrated Solid Waste Management Programme, Enda-Ethiopia organised a 6-day training workshop on "Solid Waste and Sustainable Livelihoods". Participants were invited from the three weredas in Addis Ababa where Enda-Ethiopia is initiating community-based waste management schemes. The workshop was facilitated by an expert from the Water, Engineering and Development Centre (WEDC) of the Loughborough University and very much followed a participatory approach.

The "proceedings" of this workshop aim at giving an account of the different sessions but should also serve as a training handbook for groups and organisation wishing to launch solid waste management activities in their areas. For this reason the exercises given to the participants are included, but not the answers given by the participants. It is left to those using this document to make the exercises and think out their own answers.

The workshop was essentially interactive and based on exercises and discussions. There was little theoretical input in the form of lectures. Only the more general points made by the participants are reproduced here. When required, and for the sake of clarification and better understanding, definitions have been taken from the WEDC Synthesis Notes and inserted in the report.

The case study on solid waste management in Karachi, Pakistan was the backbone for several exercises. It is included here, as situations described present many similarities with cases in Addis Ababa. We also believe that there is educational value in confronting and comparing situations.

Finally, the local case studies show there is good reason to hope for betterment of the sanitary situation of Addis Ababa.

Enda-Ethiopia hopes that this report will provide new ideas for improving solid waste management in the urban centres and contribute to the upgrading of the urban environment.

Tadesse Amera
Solid Waste Management Project Officer
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1. Background to the Workshop: Towards people-centred solid waste management

Solid waste has appeared as a problem in Addis Ababa fairly suddenly (*see Box 1*) Institutions and organisations are caught unprepared and have little experience in dealing with the problems generated by solid waste.

Box 1

The dimensions of the problem

Addis Ababa is a city of 2.6 million people, which generates about 700 tons of solid waste per day, with a density of 275 kg/m^3. Addis Ababa has a fairly developed infrastructure in the commercial and high- and middle-income residential areas. The main roads are paved, with footpaths and drainage. There are no obvious piles of wastes on main roads and in appearance the city is cleaner than many similar cities in low-income countries. The Health Bureau, responsible for waste collection, transportation and disposal has budgeted 9.6 million Birr for waste management, for the year 2000-2001. The Bureau claims a 60% collection-rate and would like to increase the coverage on modern principles.

The Health Bureau, the municipal organisation officially charged with solid waste management, is trying its best, but the problem is complex and support is needed from all sectors of the city's population.

Solid waste is seen as a threat to health, and its disposal an essential step in protecting the health of the citizens. All efforts are therefore put into removing the waste and bringing it to the landfill, using approaches and technologies from the industrialised countries.
This results in

- a high cost for the City Council,
- poor adaptation to the situation and conditions of a third world city,
- doubtful efficiency.

Today, the municipal institutions, local authorities and other organisations recognise the shortcomings inherent in this approach. They are aware of the potential income and employment generation aspects in solid waste management, and have come to see **recycling,** including informal recycling, as part of waste management. They realise the need to involve the city's residents in keeping neighbourhoods clean. **But how to go about this? Where and how to start? What are the implications and potential stumbling blocks?**

While solid waste management in the city has been topical in the last few years and many interesting initiatives have taken place (*see Box 2),* these questions remain largely unanswered and new waste management approaches are viewed with much uncertainty.

Box 2

Recent Initiatives in Solid Waste Management

- Solid waste workshop in 1998
- Formation of a beautification committee by the Addis Ababa City Council
- Use of new vehicles by Health Bureau
- A popular singer has stimulated community participation in cleaning and beautifying public areas
- A street-cleaning campaign run by the Health Bureau programme in Wereda 5
- Regular meetings and activities of Urban Waste and Urban Agriculture group
- Initiatives by youth groups, environmental clubs and others.

2. Aim of the Workshop

The purpose of the training workshop "Solid Waste and Sustainable Livelihoods" was to acquaint concerned bodies and organisations with **alternative solid waste management approaches, based on the use of waste as a resource and on making people the primary actors in the provision of collection and disposal services.**

Integrated Solid Waste Management (ISWM) considers the technical, social, financial and environmental factors, with the equal importance in planning, designing and operations of solid wastes systems. The ***"Sustainable Livelihoods Approach" (SLA***) is a way of looking at development through a people-centred approach, it seeks to make maximum use of people's human, social, natural, physical and financial assets to improve their means of living.

Waste is such an asset. It can be sold and bought, used and re-used, cleaned, cut, and given new shapes and purposes. In this process, it sustains the life of a large number of people (*see Box 3*).

Box 3

It is increasingly recognised that urban solid waste management is also a livelihood for a very large number of poor. The most notable activity is the waste picking and recycling by the informal sector. This activity is thriving with the increase in waste quantities and improvement of skills in recycling and reuse. In some places community groups or activists have also initiated activities of waste collection, composting, cleanliness campaigns, etc.

A municipal waste management system that encourages the use of waste as an asset will not only result in sanitary and environmental benefits, it will also generate income and employment, thereby contributing to improving the livelihood of some of the less privileged parts of society.

With the main aim of the workshop to expose concerned departments and other organisations to alternative approaches to improve solid waste management, the workshop objectives were identified as:

- To discuss issues and share knowledge on integrated solid waste management and livelihood approach.
- To share experiences and lessons learned from other places.
- To think about future actions using the acquired knowledge and building on motivation gathered.
- To form and sustain a network on solid waste management.

3. Workshop Participants

A critical point in integrated solid waste management is that all concerned groups are taken into account. Stakeholders in solid waste management comprise all groups that are important in keeping the city environment clean and could influence collection and disposal. This includes municipal and local authorities as well as the private sector (both formal and informal), sweepers, truck drivers, waste pickers, sanitary guards and households. Integrated solid waste management is based on the participation of each of them. Clearly, the better each group's interest is recognised, the more efficiently the solid waste management system will operate. Of the 26 participants in the workshop (*see Box 4*), approximately half were from local authorities and half from NGOs. Several journalists also observed the workshop.

Box 4

Workshop Participants

Name	Organisation
Local and municipal authorities	
Bekele Dinka	Solid Waste Management Department, Health Bureau
Fikru Tessema	Solid Waste Management Department, Health Bureau
Desalew Berihun	Addis Ababa Health Bureau, Planning Department
Mesfin Tesfaye	Zone 2 Health Department
Mistir Lingerew	Zone 6 Health Department
Nadew Abebe	Zone 4 Health Bureau
Endale Teshome	Wereda. 26 Health Bureau
Mekonon Arai	Wereda 26 Administration
Getachew Shifaw	W.oreda 22 Education Office
Tsegaye Sebhat	Wereda 12 Administration
Dejene Dibu	Wereda 22 Health Centre
Shambel Debela	Wereda 12 Health Bureau
Agaje Mekonnon	Environmental Protection Bureau
Demissie W/Giorgis	Wereda 5 Health Bureau
Rahel Seife	Wereda 21 Health Bureau
Non-governmental organisations	
Tariku Tafere	NACID
Alemu Legesse	Ethiopian Red Cross Society
Abebe Lemma	Women Aid, Ethiopia
Trufat Feleke	Community-Based Sustainable Integrated Devt. Organisation
Aster Tefera	Ethiopian Wildlife and Natural History Society
Tedla Negash	Concern Ethiopia
Mulunesh Yilma	PLAN International
Abiye Alemu	ENDA-Ethiopia
Tadesse Amera	ENDA-Ethiopia
Business	
Wegene Tadesse	Addis Ababa Chamber of Commerce – Merkato Committee
Eden Melke	Dynamic Youth Enterprise

4. The Content and Structure of the Workshop

4.1 INTRODUCTION

The purpose of the workshop, taking place in a context of growing interest in Solid Waste Management in Addis Ababa, was to increase participants' understanding of how to proceed in setting up and operating effective solid waste management schemes at community level. Throughout, the value of taking two approaches was stressed: looking outwards to see what useful lessons can be learnt from international experience, and looking towards each other to share experiences of how, in Addis Ababa, we are beginning to deal with waste management issues.

Starting from the notion that the solid waste management can be decentralised and that a number services can be taken over and handled at community level, topics covered in the workshop turn on ways to involve concerned groups effectively, make use of available resources to create employment and income, combine environmental protection and income generation, and develop enterprises for waste collection.

4.2 LEARNING THROUGH TASKS AND 'LEARNING LOGS'

The overall approach of the workshop was participatory, with a focus on learning through active thinking. In each session a topic was presented and this was followed by an exercise or structured discussion, further reinforced by video or slides. Examples from Pakistan, Bangladesh, Albania and the UK supported the presentations.

Throughout the training, participants were encouraged to apply the knowledge they have acquired to a case study of the 'real-life' situation in Karachi, Pakistan (*see Appendix 3*). Working in groups of two, they prepared concise 'learning logs'. These learning logs are important for revision, feedback and application of the required knowledge.

The tasks in the learning logs parallel the themes explored in workshop discussions:

- Learning Log 1: Motivation, Stages and Livelihood
- Learning Log 2: Stakeholders, Micro-enterprise and Lessons Learned
- Learning Log 3: Recycling
- Learning Log 4: Municipal Approaches - Privatisation
- Learning Log 5: Disposal Options

The performance of a role–play exercise based on a case-study situation, the fictitious city of 'Hareen' is included, to heighten participants' understanding of the perspectives of different stakeholders (*see Appendix 6 and 7*).

A fact–finding visit to the Merkato was also included in the programme. Participants divided into five groups to initiate discussions with recyclers of different kinds of waste, finding out from their informants factual information about their work, and adopting the SLA approach, gain an understanding of their assets, livelihood goals, threats and opportunities.

4.3 PARTICIPANT ACTION PLAN APPROACH (PAPA)

At the end of each day, the workshop adopted a **Participant Action Plan Approach (PAPA), to further encourage participants to translate what is learned to a practical situation.** The objective of the PAPA is to provide participants with a method for active reflection on the course contents. The method consists of two stages. The first stage is to note down systematically, during the training programme, any new or interesting idea that participants feel they would like to try out in their own job. One session may not reveal anything that is immediately relevant, another may give several new ideas to note down. Ideas can be noted on the handouts, at the end of the session, or after discussion with other participants.

The second stage is the writing of an 'action plan' – a list of activities related to the course that participants plan to try out when they return to their workplace. In writing their action plans, participants were encouraged to be specific, and to include only activities that are possible. They received a list of questions to help them in doing so.

In drawing up action plans participants first prepare a preliminary plan, then after discussing with a partner finalise and prioritise their list of action items. They report their action plans and make copies for trainers and their fellows.

PAPA formats are given in Appendix 8.

4. 4 LOCAL CASE STUDIES

An important component of the workshop was a series of local case studies of waste management operations and community projects presented by the Health Bureaux and NGOs *(see Appendix 9).*

- Solid Waste Management Programme by Women Aid Ethiopia
- Dynamic Youth Enterprise Programme
- Wereda 5 Programme
- Municipal Solid Waste in Addis Ababa City: Environmental Health Office, Addis Ababa Health Bureau

Two ways of recycling waste were also presented (composting, by ENDA-Ethiopia and briquettes from paper waste, by NACID).

4.5 SUBJECT MATTER

The nine key issues of the workshop were

- Solid Waste Management
- Livelihoods and Solid Waste Management
- Community-based Programmes
- Stakeholders
- Micro-enterprises
- Gender Issues
- Recycling
- Role of NGOs
- Disposal.

i) Solid Waste Management

What is integrated solid waste management?

- Solid waste management is more than health and environmental improvements. It is an important livelihood asset for the poor.
- Integrated Solid Waste Management (ISWM) is not based just on technical or financial viability, but also on social, cultural environmental and political factors. It is important to create a balance between these factors, so that one should not dominate the other.
- ISWM projects can be assessed on the basis of the level of integration of the different factors. In case of any contradiction between the factors, the project objectives will decide what is more important and what is less so.

Exercise : Motivation (based on Karachi case study, Appendix 3)
What may be the motivation to improve Solid Waste Management in Karachi?

ii) Livelihoods and Solid Waste Management

What do we mean by livelihood?

Livelihoods involve income earning, as well as a wider range of activities required to sustain a means of living. These include gaining and retaining access to resources and opportunities, dealing with risk and negotiating social relationships. Urban poor pursue livelihoods from waste often to overcome their vulnerability. They do so by deploying both tangible assets , such as material resources and skills, as well as intangible assets, such as rights of access or social resources. (WEDC Synthesis Note No. 4)

Examples of livelihood goals can be found in the answers given by some of the inhabitants of Addis Ababa's Merkato district to the question :

What do you want to do with your life?

- Get more income
- Get an education
- Be in big business
- Be a political leader
- Stay the same
- Train, and use others
- Move out of the Merkato.

Waste is an important livelihood asset for the poor. The Sustainable Livelihood Approach (SLA) for a Community Based Activity can be shown in the example of waste-collection.

Waste Collection	
Social Assets:	Network, Mutual Support
Human Assets:	Skills to run the system
Physical Assets:	Technology, Infrastructure
Natural Assets:	Rains make work heavy
Financial Assets:	Micro-credit

Common livelihood activities involving waste are based on re-cycling: Waste-picking and re-use and separation at source.

Exercise: Livelihoods and Waste

Meko and his brother are waste pickers in a large city. Their father was a farmer who migrated to the city ten years ago. They collect waste from streets and communal bins and take it home, where their father and sister separate it into various categories. Waste dealers then collect the separated waste. They buy it by weight and payment is made weekly. The price of waste fluctuates. A number of other households in the area also provide waste to the dealer. The dealer sometimes pays cash advances to the pickers' families.

Imagine you are working on a 'Livelihood and Waste' programme for an NGO, please think about the following:

1. What livelihood opportunities do you see? Why?
2. What knowledge and information could enhance the pickers' livelihoods?
3. How could such information be provided?

Exercise (based on Karachi case study, Appendix 3)

What livelihood assets could be developed at different stages of solid waste management in Karachi?

iii) Community-based Programmes

Primary Collection Schemes

In most low-income countries, door-to-door collection of solid waste is not provided by the municipality. It is the householder's responsibility to convey waste from the point of generation to transfer points located throughout residential areas. The waste is then collected from these points by the municipality. However, the municipality is frequently understaffed and under-financed, resulting in a poor service. Transfer points are often sparse, resulting in the build up of waste in local areas, on streets and open plots, presenting a hazard to local residents. In many cases in low-income countries, primary solid waste collection schemes have been developed by NGOs , community groups, micro-contractors and local politicians to address this problem. They provide door-to door collection of waste and convey it to the nearest municipal transfer point. Typically a service charge is collected from the users for this type of service. (WEDC Synthesis Note No. 6)

What is a Community-based Organisation (CBO)?

Community-based organisations are groups formed within a local community. These can include neighbourhood committees, youth and women's groups, religious groups etc. However they are often formed for a specific reason, to find a collective solution to a problem they face as a group. In low-income countries, they frequently exist in order to address a poor service provided by the official or government agencies. For example, a number of households may come together to initiate a waste-collection programme. (WEDC Synthesis Note No. 3).

What can communities do, both as organised groups and individuals?	What organised activities can the community undertake?
Raise demands	Present collective demands
Assist local authorities	Share some responsibilities
Pay the fees	Do the entire work
Do the work	Take a contract
Produce less waste	Raise awareness
Make complaints	Pay collectively
Bring the waste	Monitor/enforce
Maintain storage	
Separate and recycle	

Exercise : Community-based programmes

Based on text in Appendix 4

Task: What are the major threats to this community-based programme ? Why ?

Success and Sustainability Indicators: Why do we need them ?

Indicators of the success or sustainability of an activity are needed to help assess performance. A list of indicators of, for example, a primary solid waste collection scheme, draws attention to the various aspects of the project which contribute in some way to its success or sustainability. They provide a checklist which can be used to make a detailed analysis of a project, and can be used to compare the success and sustainability of one project with another.

Indicators can be grouped to reflect the perspectives of the different groups which are stakeholders in the project. An indicator of success from one perspective may be seen as a disadvantage by another group, so it is important that the views of all major stakeholders are considered carefully. This will help each group evaluate the present scheme and develop ways of improving it. (WEDC Synthesis Note No. 6)

Exercise : Performance Indicators

A community-based organisation is planning to organise a waste collection programme in a middle income area. The programme will operate for 1,000 houses and a daily collection service is intended. Hand and animal carts will be used to collect waste from houses. Households will be asked to pay Birr 25 per month to the community-based organisation. The community-based organisation will also organise the street sweeping and drains cleaning, at least once a month. A complaints system will also operate for the residents.

Task: Based on the information given above and your assumptions, prepare a list of performance indicators, in a three column table.

Indicator	Description	How to measure it

vi. Stakeholders

What is Stakeholder Analysis?

Stakeholder analysis is a way to enhance participation and include different perspectives in the project management.

Why is stakeholder analysis conducted?

- To identify stakeholders' interest in, importance to, and influence over the operation
- To identify local processes and institutions upon which to build
- To provide a foundation and strategy for participation.

How is it conducted?

Step 1 : Identify key stakeholders. Stakeholders are people, groups and institutions likely to be affected by a proposed intervention.

Step 2 : Assess the interests of the different stakeholders, and the potential impact of these interests on the project.

Step 3 : Assess the influence and importance of the stakeholders

Step 4 : Outline a Stakeholders' Participation Strategy.

Using the results of the Stakeholders' Participation Strategy

In each cell of the table, indicate the stakeholders who will be involved:

Stage	Information sharing	Consultation	Collaboration	Empowerment
Project Identification				
Project Appraisal				
Implementation Monitoring				
Evaluation				

Exercise : Stakeholder Analysis (See text in Appendix 5)

Task :

a) Identify the major beneficiaries of this programme. What information did you need to identify them?

b) Who are the major stakeholders in the programme (both individuals and organisations)?

c) For each stakeholder you have identified, write the potential to influence the programme, and the importance of the activity.

v) Micro-Enterprises

What is a Micro-Enterprise ?

A micro-enterprise (ME) is defined here as a service delivery or production business, usually low capital intensive, and consisting of an individual or up to about 20 persons, either formally registered, or operating informally in an area. The organisations or individuals assume all the risks for the sake of profit. These enterprises can be workers, co-operatives, self-organised, community–based or promoted by non-governmental organisations. MEs work from the perspective of income generation and hence, their main purpose is to be financially sustainable. (WEDC Synthesis Note No. 1)

What can Micro-Enterprises do in Solid Waste Management?

- ***Primary Collection.*** *This commonly involves door-to-door collection of domestic waste. In low-income countries, this service is rarely provided by the municipality. Many MEs provide this service and are financed directly by the households receiving the service.*
- ***Sweeping.*** *This involves the sweeping of streets and collection of waste that may have been dumped there. In some cases where primary collection is not done, this may include the collection of a substantial quantity of waste. It is likely that these MEs will be contracted by the municipality, although some community-based systems have developed.*
- ***Resource recovery.*** *This involves the collection of waste for re-use or recycling. Micro-entrepreneurs can make money through the buying and selling of waste. In many low-income countries, an extensive market exists for paper, glass, metals etc.*
- ***Waste transportation.*** *This involves the transport of waste, either between transfer stations or to the final disposal site. MEs have developed where a micro-entrepreneur owns a single truck, which is used for this transportation. He/she is then paid for the quantity of waste transported.*
- ***Disposal site operation.*** *This is usually a large-scale activity, which involves the development, control and operation of a final disposal site.*

(WEDC Synthesis Note No. 1)

What range of Micro-Enterprises is there ?

Type 1 Area-based system – paying sweepers individually

A group of households or an activist decides to introduce or improve a waste collection programme in their area by hiring a waste collector, introducing him/her to other households and fixing a minimum collection fee. The households pay the sweeper directly.

Sweepers are people involved in street cleaning and primary waste collection. Usually employed by municipalities, private waste collection agencies or self-employed, small-scale operators they make a living by charging households a fee for providing a primary collection service.

Example: There was no organised waste collection system in the Charaon Nagar area of Dhaka. A female activist introduced a sweeper to 100 households and asked each to pay Taka[1] 10 per month directly to the sweeper

Type 2 Area-based system- paying sweepers collectively

A group of households or an activist decides to introduce or improve a waste collection programme in their area by hiring sweepers, introducing them to other households and charging fees. This enables the sweepers' salaries to be paid collectively. Some expenses, such as buying equipment, repairs etc. are also borne

[1] A *Taka* is the local currency in Bangladesh.

by the organisers, who perform this work on a voluntary or non-profit basis, but may receive support from external agencies.

A related system is one whereby the activist is the elected representative for the area. She/he may decide not to charge fees, but to use government funds instead.

Type 3 Small-scale contractors

An individual or contractor starts a waste collection programme as a business. S/he employs sweepers, introduces them to the households and charges fixed collection fees. The sweepers' salaries plus all capital and running costs are paid by the contractor, who tries to make a profit.

Ways to integrate micro-enterprises with municipal and official systems include:

- The creation of space
- Transfer of funds and staff
- Provision of waste transfer
- Enabling laws and regulations
- Community contracts
- Consultation
- Competition with local politicians

WASTE BUSTER

An example of a Micro-Enterprise

WASTE BUSTER is a company with an official trade license. They have their own staff and equipment to collect and transport waste.

WASTE BUSTERS generally market their services to community-based organisations. They charge monthly fees of TK15-20 per household from community organisations. WASTE BUSTERS do not have any link with the municipal authority. They run the service as a business. Sweepers (waste collectors and cleaners) market their services directly to households. They make a verbal agreement to collect waste and charge money. Sweepers carry the waste to the nearest transfer point (i.e. primary collection).

Exercise – based on Karachi case study (Appendix 3)

Task

The KMC intends to privatise the solid waste management service. What type of privatisation would you promote and why?

vi) Gender Issues

What do we mean by 'gender issues'?

Men and women have different physical characteristics and attributes on the basis of their biological sex. Gender *refers not to their physical biology, but rather to the different socially ascribed responsibilities of women and men, and the social relations between them. The gender division of labour (GDL) refers to the different tasks conventionally performed by women and men, and the value accorded these tasks. For example, in many societies, unpaid housework is not valued as highly as paid work outside the home.* (WEDC Synthesis Note No. 5)

Exercise: Gender Issues

In the city of Korail, women are extensively involved in waste collection work (as sweepers) and waste pickers (scavengers). In both cases they work in groups or with family members. It is usually the male member of the family who deals with the municipal supervisors or waste dealers. Women bring the collected recyclable waste to homes, where it is further separated by other household members. The municipal authorities in Korail are planning to gradually mechanise the city waste system in the next 10 years. The improved system will have closed containers in middle income and commercial areas and house-to-house collection in high income areas.

Task

You are appointed as the consultant to develop strategies for equal gender participation in the new system. Please perform the following tasks:

1 Identify the traditional role of women in waste management.
2 Say whether the women's traditional roles are vulnerable to change. If yes, why do you think so?
3 Decide what strategies could be developed to protect women's livelihoods in the new system.

vii) Recycling

What is 'informal recycling'?

The informal system of waste recycling is a market-based system in which materials are separated for recycling and reuse through a chain of unregulated activities. The separated materials ultimately reach large and small-scale recycling industries.

In Karachi, a typical city of a low-income country with a population of 8 million, more than 90% of households separate waste for selling. The waste is separated by 20,000 waste pickers on the streets. A total of 50,000 poor get their livelihood from the informal waste recycling systems. These practices reduce waste by about 20% in weight.

Recycling: Constraints and Benefits

Constraints

- Cost of recycling
- Availability of materials
- Knowledge
- Small scale > Large scale
- Skills
- The market
- Social unacceptability

Benefits:

1. **To people**: income, jobs, energy, affordable items, risk reduction, compost, improved environment, health, satisfaction.
2. **To the environment:** less air pollution, conservation of resources, no containers, increased consciousness.
3. **To solid waste management**: less waste, easy transportation, longer life of landfill, ease of operation.

Practical Activity : Visit to the Merkato

Task

You will make an afternoon visit to the waste dealers and recyclers in the Merkato area. You will work in groups to look at five different areas (waste tyres, plastic bottles, used building materials, metals, glass bottles or other waste). Initiate a discussion with the recyclers (or their key informants). Find out first general information:

- sources of waste
- types of waste
- quantities of waste
- buying and selling rates
- what processing they do
- where they sell
- number of dealers in the area.

Using the SLA approach find out the following:

- What are their assets ?
- What are their livelihood goals ?
- What threats are there ?
- What benefits are there ?

Prepare your findings on overhead transparents and present them to the workshop. One person from each group will speak. Use 3-4 overheads in a 10 minute presentation.

Special Note: The SLA approach is about changing attitudes and learning from below. Please take extreme care while talking to the recyclers. Do not let them feel insulted through your body language, language, questions, etc. If they are reluctant to answer a question, just leave it.

Exercise – What opportunities exist for promoting recycling activities? How could these activities be financed?

viii) The role of NGOs

Typical NGO activities include the following:

- awareness creation
- provision of training
- formation of pressure groups
- networking
- provision of technical advice and resources

ix) Waste disposal

The options available for municipal waste disposal can be assessed in terms of their effectiveness with regards to the following features:

Feature	Effectiveness measure
Technical	Efficient and effective operation of technology used according to composition and quantities of waste
Institutional	Ability and willingness of local agency to operate and manage the system
Financial	Ability to finance the implementation, operation and maintenance of the system
Social	No adverse social impacts
Environmental	Positive environmental impact

Source: *Down to Earth.* 1999. Ali M., Cotton A. and Westlake K. WEDC, Loughborough University, Leicestershire, UK.

Exercise: Disposal Options

Task

- Consider land filling as a disposal option in terms of the sustainable livelihood approach (differentiation of types of waste, appropriateness of site, protection of human beings, environment, water).
- Land filling has been proposed as the disposal option for Karachi. Comment on the choice of this options (manpower, skills, costs, etc.).

5. Workshop Outcomes and Evaluation

Increased understanding

At both the beginning and end of the workshop participants were asked to identify the issues in Solid Waste Management, based on their knowledge, experience, reading etc. A comparison of the two lists clearly shows that as a result of the workshop participants have acquired a broader perspective of solid waste management. Issues of concern raised by many participants at the end of the workshop included:

- The absence of a clear policy on solid waste management
- How to include women in solid waste management
- Lack of supervisors to monitor management projects
- Lack of integration on solid waste management between government, NGOs, private sector, and community-based organisations.

Formation of a network

Participants at the workshop agreed to form the nucleus of a network of agencies and institutions concerned with solid waste management.

To sustain the momentum of this workshop and other recent initiatives and to continue to build on upon past efforts, Enda-Ethiopia's action will focus on developing collaborative links among partners and stakeholders, supporting viable community-based waste management activities in three pilot weredas through training, planning, management and technical support to local groups, and promoting waste recycling and recovery.

Special attention will be given to encouraging and facilitating partnership between municipal authorities, local authorities, NGOs, community groups and the private informal sector, as this is considered a key factor of success. Many of the future actions will depend on the interest and ideas of participants and any other person/group interested in these issues.

Participants' evaluation

Evaluation questionnaires completed by the participants assessed the training programme as excellent in terms of the relevance of its content and its usefulness. Overall, the most relevant sessions were judged to be those on the sustainable livelihood approach, stakeholders, community-based programmes, waste and the environment, and the local case-studies. Privatisation was the most frequently mentioned among the areas on which participants would have liked to have spent more time.

When asked to summarise what they had appreciated most in the workshop, the participative approach and the interaction stimulated by the facilitator, the choice of training

topics, the introduction to the integrated sustainable livelihood approach were most frequently mentioned.

There was a much wider variation in identifying sessions as 'least relevant', the role-play and the discussion of gender issues being, however, those most frequently named. In suggesting elements which they would have liked to have seen included in the programme some participants again emphasised their wish for the study of local issues – an exercise based on a case study of Addis Ababa –, an additional facilitator familiar with the realities of the situation in the city, means of facilitating reuse and recycling in schools. Other focus areas included discussions of biomass reuse, biogas generation, landfill disposal treatment and water and sanitation. Other suggestions for improving the workshop were making materials available before the workshop for prior study and choosing an easily accessible venue.

Workshop facilitator's evaluation and recommendations

Evaluation

Addis Ababa is undergoing a transition in solid waste management, both in terms of dealing with the increasing quantities and changing nature of waste. The issues in solid waste management lie in a broad range because of different perspectives of different stakeholders. The workshop has been successful in bringing together a large group of municipal officers and NGO persons and conveying the concepts and use of sustainable livelihoods approach. The workshop has also broadened the point of view of participants on solid waste management. However, the sustainable changes in the city will depend on the efforts and activities of the network. A number of issues identified in the workshop need external resources, which may or may not be available. However, Addis Ababa is fortunate to have municipal support and dedicated NGO staff to initiate and sustain changes in solid waste systems.

Recommendations

1) Information and database

In Addis Ababa, like any other developing country city, there is no information and data base to support the decision making process. The network could form a database of such information and database. This database could be up-graded from time to time. The essential data required is about waste quantities, composition, municipal budgets, workforce, refuse vehicles, populations, wards, etc. The database hosting organisation could also keep all the past publications and reports on solid waste management for Addis Ababa.

2) Consultations

The network could be an important link between the population (users of the service) and the Health Bureau. The Health Bureau could conduct the consultations with all stakeholders. All the major changes in solid waste systems must be consulted at two levels: a) experts consultation with specialists; b) general consultation with all.

3) Pilot Projects

The network could plan, launch and monitor pilot projects. The successful pilot projects could also be documented for the benefit of others. The network could also publish guidelines on certain popular initiatives, e.g. cleanliness campaign, buying and managing small carts, running community education campaigns etc.

4) Support to NGOs

A number of NGOs and community groups are interested in running solid waste programmes. They have motivation and strong links with the community, but they lack skills to develop proposals, conduct evaluation, document the work and develop technology. The network could share such skills with the network.

5) Human capacity building

Human beings play an important role in introducing and sustaining changes. All human beings are not equally active and work in different organizational contexts. However, they are given the equal resources and powers to act in structured organisation. It may be a good idea to identify active individuals and support them to bring about and sustain changes. Criteria could be developed to identify individuals for support. Some of the following indicators could be used:

- a desire to challenge the status quo
- a desire to do something different
- past record of doing something different
- availability of voluntary time
- presentation of concrete ideas.

Appendix 1

INTRODUCTORY ADDRESS

- There have been **several activities** related to solid waste management in the last years, including awareness creation and mobilisation, workshops, cleaning campaigns, initiatives by
  - ◊ Gashe Abera Molla
  - ◊ the Health Bureau project in Wereda 5
  - ◊ Lem Ethiopia
  - ◊ the Chamber of Commerce
  - ◊ the Merkato Committee
  - ◊ Dynamic Youth Enterprise and the Yohannes Tsedat Agelgelot
  - ◊ the Urban Waste and Urban Agriculture Group and
  - ◊ other NGOs like Women Aid, Nacid, CBSIDO, Plan International.

- **So, this new workshop has to be seen, not as an isolate event, but as adding to the many efforts that have already been made** towards solving the waste problem in Addis Ababa.

- From top to bottom, everyone in Addis Ababa complains about the waste situation in the city. Most people **expect the City Council** to handle the situation. But waste disposal is **costly**, and the City Council cannot do everything, especially if there is **little collaboration from the public**. The idea of having **waste managed at community** level seems an **appropriate** response. But how do we go about this?
  - → **how** can the city's residents **efficiently collaborate** in making their city clean?
  - → What do they need to do?
  - → **How** can they be **mobilised**?
  - → **How** should they be **organised**?

- Waste is **generated every day**. Therefore, it must also be properly **disposed of every day**. Not just one day in the month, on the occasion of a cleaning campaign.
  - → How, in our kebeles and weredas, do we manage to have a **functional system** that caters permanently for the waste?
  - → What are some of the **mechanisms** that provide a **long-lasting solution** to the waste problem in our neighbourhoods?

- Waste can also be a **resource** and create **employment**. We know that and yet, in this city where so many people are looking for a job and for an income, there are - except for a few noteworthy attempts - **very few jobs and income** generated from waste management at community level. Actually, we **do not very well know how to proceed**. There are some **risks** involved which only the boldest are not afraid to take.

- Most of us are **not "waste experts"** and do not have easy answers to the questions waste management at community level raises. This workshop aims at giving you **some answers** so that by the end, you will have clearer ideas on how **effective solid waste management services at community level** can be set up and operated.

- In **Ethiopia**, the waste management has always been almost entirely in the hands of the Government. There is **no experience** in community-based waste management; there are hardly any local models or best practices to refer to. On the other hand, there is **international experience** in community-based waste management that has been studied and evaluated and from which useful lessons have been drawn.

- Today's workshop is to help us **gain knowledge** from those experiences, and find out whether and how to **use this in our own context**, here in Addis Ababa.

The workshop has another purpose. There is an Amharic saying that says **ሃምሳ ሎሚ ለአንድ ሰው ሻከሙ ለሃምሳ ሰው ጌጡ**. Enda-Ethiopia strongly believes that it is by **working together**, sharing experience, regularly **communicating** with each other, that we can have a real **impact** on the waste situation in the city. This workshop is also intended to bring people dealing with waste management

together, make them **interact** with each other and **reinforce links** we have with each other. All of you are one way or another involved in waste management. This workshop aims at helping give a **wider scope** to each one's experience and ideas.

- Let us not forget there is a **whole city** to **make** and to **keep clean**. Therefore, if the purpose of this training workshop is to learn, to share, to link, to create synergy, I would like to propose a challenge and say that the goal of the workshop is that, **within the next 5 years**, Addis Ababa is a city that is kept clean by all its residents.

Appendix 2

WORKSHOP PROGRAMME

Day and Date	Topic	Remarks
22nd January Monday	Welcome (ENDA-Ethiopia) Purpose of the Workshop (ENDA-Ethiopia) Introduction to the Workshop Introduction of Participants and Expectations Other Arrangements (ENDA-Ethiopia) Issues Identification and Discussion Why do we need improved solid waste management? What is Integrated Solid Waste Management? What is Sustainable Livelihood Approach? LUNCH 1:00 pm Introduction to Learning Logs International Differences Solid Waste Stages: From Generation to Disposal (plus slides) Stakeholders in solid waste management (General) Slides Video on solid waste management a Global Problem AFTERNOON TEA What is a Community Managed Project? [Our Context] Scope and Importance of Community Programmes Slides Time for Learning Logs, Reflecting Back and Creating Links with SLA (1 hour)	Start 10:30 am End 5:00 pm
23rd January Tuesday	Sustainable Livelihoods Approach (SLA) Livelihoods and Solid Waste Management Exercise (Livelihood and Waste) MORNING TEA Models of Community Based Programmes in solid waste management Stakeholders in Community Based Programmes Video Basic Elements of Community Based Programmes LUNCH What is 'Stakeholders' Analysis' ? Stakeholders' Analysis (Exercise) Feedback AFTERNOON TEA Micro-enterprise Development for Waste Collection Lessons from South Asia and Latin America Video Time for Learning Logs, Reflecting Back and Creating Links with SLA (I hour)	Start at 9.30 am End 4.30pm

24th January Wednesday	Solid Waste Recycling Informal Sector Recycling Waste-Picking and its Links with SLA Community Based Recycling Ethiopian Case Studies LUNCH Visits Time for Learning Logs, Reflecting Back and Creating Links with SLA	Start 9.30 End 4.30
25th January Thursday	Institutional Aspects in solid waste management (Processes and Structures) Municipal Strategies to provide Services in Low Income Areas MORNING TEA Privatisation of solid waste management Services and its Linkages with Community Based Programmes (Scope of Community Contracting) Financing and Cost Recovery Improving Waste Transfer LUNCH Role of NGOs and community-based organisations Gender Issues in Waste Management Exercise Feedback Slides AFTERNOON TEA Waste Collection Vehicles Time for Learning Logs, Reflecting Back and Creating Links with SLA	Start 9.30 am End 4.30 pm
26th January Friday	Waste and the Local Environment Waste and the Global Environment (Enhancing Natural Capital) MORNING TEA Overview of Disposal Options Land filling LUNCH Strategic Planning using SLA Role Play Time for Learning Logs, Reflecting Back and Creating Links with SLA	Start 9.30 am End 4.30 pm
27th January Saturday	Feedback from Learning Logs Revisiting Issues Preparing Personal Action Plans Preparing Organisational Action Plan Discussion: What Next ? Training Evaluation	Start 9.30 am End 3.00 pm

Appendix 3

CASE STUDY: KARACHI, PAKISTAN

With a present population of 8.5 million, Karachi is Pakistan's largest city and its only port, being located on the country's southern coast. Karachi Metropolitan Corporation (KMC) is responsible for waste collection and disposal in the city. The solid waste management department of KMC deals with planning and major procurement while operational responsibility rests with five District Management Offices (DMO's). Municipal waste (domestic and commercial) is collected by sweepers (waste collectors), brought to transfer points, loaded into vehicles and transported for disposal. At present there is no proper disposal facility in the city; instead waste is taken outside the city limits and dumped on open land.

The following are key facts regarding solid waste management services in Karachi:

- Surveys indicate that users regard the solid waste system as inadequate.
- Only 70% of the waste generated is removed via municipal transportation.
- Neither the government nor NGO's have made a concerted effort towards waste reduction, so far.
- A large scale compost plant was installed in the early 1980's by a private company, but operated for only a few months before being abandoned.
- Transportation of waste by railways was started in 1997 but abandoned after only a few days.

KMC is currently formulating plans for the development of landfill disposal sites. The Corporation has acquired two sites, each measuring 500 acres, to the south-west of the city. Funding is available for development of one site. Some access roads have been constructed to these sites though a loan obtained from the Asian Development Bank.

In addition KMC has obtained 100 acres of land from Karachi Development Authority (KDA) to the east of the city centre, at Korangi.

Waste composition and quantity in Karachi varies by income group and with the season. Accurate data is difficult to obtain as most recent studies used an insufficient number of samples (i.e. less than 500 houses) but the consensus is that the city generates about 6,000 tones of household waste daily. The per capita generation varies from 0.224 to 0.371kg/capital/ day.

During collection and transportation, this waste undergoes a number of physical and chemical changes, including:

a) The removal of a large amount of saleable components such as paper, glass bottles, plastics etc.
b) The addition of street sweepings to the waste stream, which increases the quantity of inert materials such as dust, silt, clay etc.
c) Biodegradation and the loss of moisture due to the hot climate and an unreliable collection system which leaves waste in the open air for long periods.

Table 1 compares the results of a waste composition analysis at a Karachi disposal site with waste composition at source. It indicates that waste reaching the disposal sites contains a very high proportion of non-separable components such as dust and clay.

It is common for waste pickers to burn waste at the disposal site, leaving 50% of he total as un-burnt material.

Table 1: Waste composition as percentage of wet weight at source and disposal sites

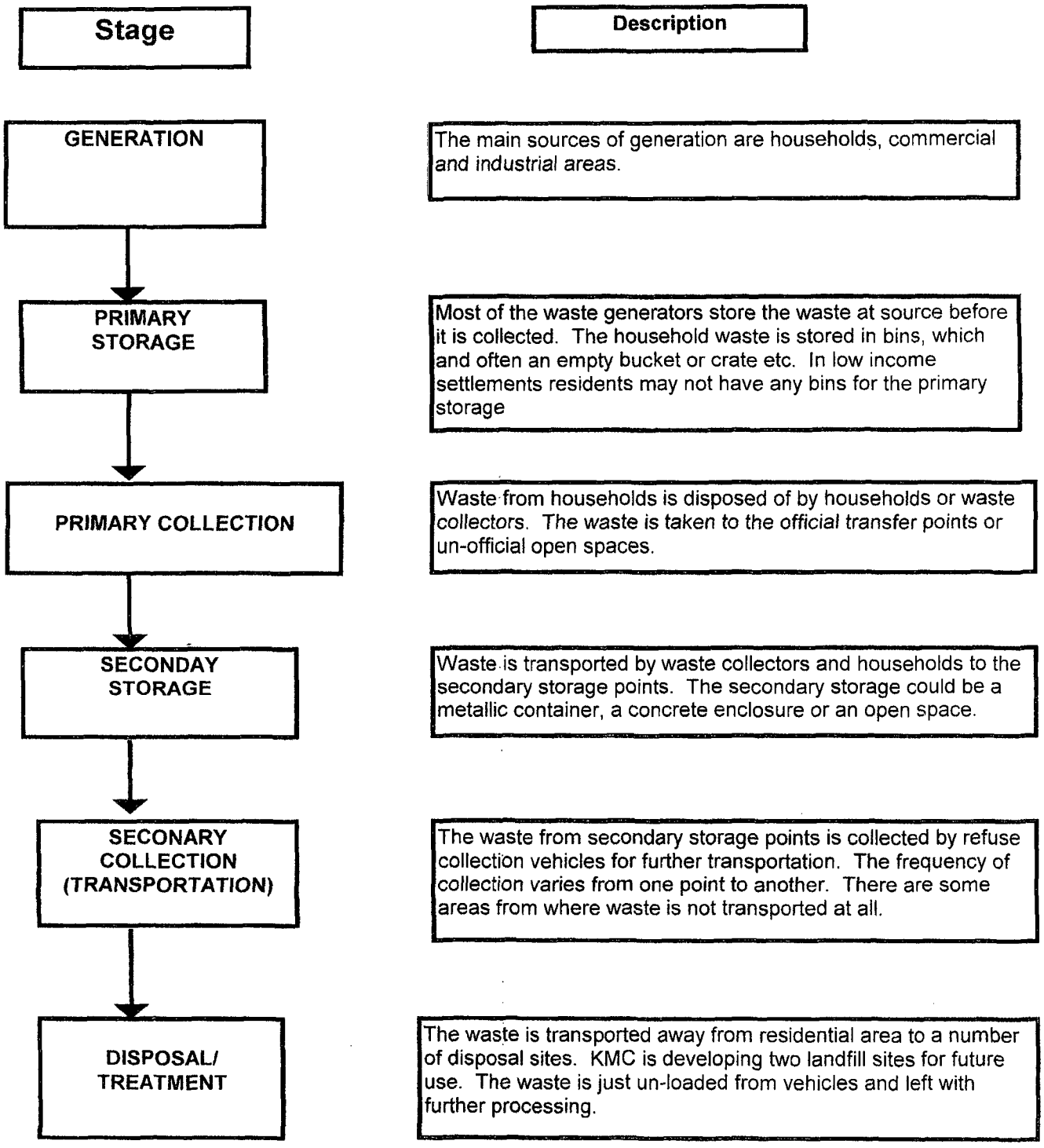
Waste component	At source	At disposal site	Comments
Plastics	6.37%	6.9%	No picking of plastic (including plastic bags), helps in waste burning by pickers.
Paper and Cardboard	13.84%	2.0%	Waste picking removes much of this material.
Textiles	7.98%	6.9%	No picking
Garden Waste	18.99%	Negligible	Animal scavenging at transfer points and disposal site.
Wood	0.25%	1.4%	
Ceramics, Clay, stones etc.	10.55%	8.3%	
Rubber and Leather	1.58%	1.4%	
Food Waste	22.93%	11.0%	Reduction in moisture and through animal scavenging.
Metals	2.68%	Negligible	
Glass	2.62%	Negligible	
Non-separable	12.21%	62.1%	Bio-degradation and addition of street sweepings.

The flow chart of waste collection and transportation system in Karachi is given in Figure 1. The domestic waste is collected together with commercial, industrial and hospital waste. The waste is accessible to pickers who separate re-saleable components such as paper, plastics, glass bottles etc.
It is estimated that 15% of domestic waste (by wet weight) in Karachi is removed for recycling at household level, and a further 10% at transfer points. This practice provides employment or additional income for many people, though it is informal and takes place outside of official municipal procedures. The motivation for these operations comes from the thriving market for separated materials and the opportunity or additional income for householders. Table 2 gives a brief description of the complex network of actors involved in waste separation activities and where they occur in the solid waste management stream in Karachi.

Table 2: Summary of actors and activities in the informal recycling process.

Stages	Actors	Activities
Source	Householders	Separate and store saleable waste components then sell to itinerant waste buyers
Source	Domestic Servants	Separate and store the saleable waste components in high income areas then sell to itinerant waste buyers from low-income areas.
Source Primary Collection	Sweepers	Collect waste from various sources, separate and sell saleable components during primary collection. The remaining waste is disposed of at transfer points or open plots.
Streets Transfer Points	Street Pickers	Separate saleable components in the street and at transfer points and sell to their group leaders or dealers
Source	Itinerant Waste Buyers	Purchase separated waste from households and other sources and sell to middle dealers.
Source, Streets and Transfer Points	Middle Dealers	Purchase materials from itinerant buyers and sell to main dealers. Also process some materials to reduce transportation costs.
Source, Streets and Transfer Points	Main Dealers	Purchase bought waste from middle dealers and sell it to the recycling industry. Process and sometimes categories materials for further transportation.
Source, Streets and Transfer Points	Recycling Industry	Convert waste materials to other saleable products

Figure 1 Description of Waste Management Stream in Karachi



Householders store re-saleable waste separately from other components and when a sizeable quantity has accumulated, sell it to itinerant waste buyers (IWBs) who roam the streets with push carts, donkey carts, bicycles or on foot. Payment is based on weight for each type of material though there is also a small group called 'barterers' who exchange waste for goods such as tea mugs, confectionery, kitchen utensils etc.

IWB's sell their goods to middle dealers who further sell it to the main dealers (wholesalers) who buy single materials and have established contacts with recycling industries. Main dealers in paper and ferrous metals generally operate on a large scale while plastic and glass operations are relatively small.

Karachi Metropolitan Corporation (KMC) has a city-wide solid waste management department responsible for planning, land filling, foreign aided projects and international procurement. The Corporation is also responsible for major administrative matters, financial allocations and the drafting and approval of local legislation.

In addition to municipal operations there are a number of informal private operations in the city outside of government regulation and control. The most notable of these are waste recycling as discussed and the primary collection of waste by sweepers - some of them municipal staff undertaking private work. Both occur on a large scale and it may be neither possible nor desirable to stop them. Both could affect, or be affected by, the operation of possible disposal systems.

The obligation to provide a solid waste management service arises from the Local Government Ordinance (1979) which identifies 'sanitation' as a compulsory public health function of metropolitan and municipal corporations. Under this legislation:

> *"A corporation, municipal committee or town committee shall make adequate arrangements for the removal of refuse from all public streets, public latrines, urinals, drains and all buildings and lands vested in the council concerned and for the collection and proper disposal of such refuse".*

This is far from adequate to motivate municipalities to establish safe waste disposal facilities. The 1983 Environmental Ordinance created Pakistan Environmental Protection Agencies (PEPA) but these have so far been ineffective and there is no other regulatory body applying pressure on KMC to provide a better service.

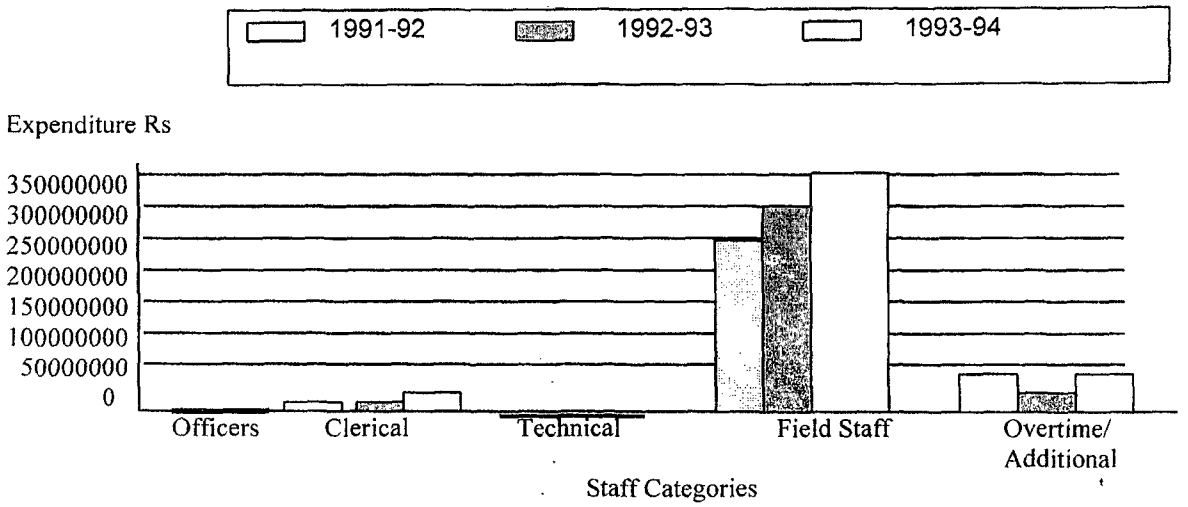
Generally, the country lacks appropriate institutions with staff skilled in environmental monitoring, evaluation, regulation and enforcement.

An analysis of municipal records reveals the financial management of solid waste management services and potential obstacles to securing safe disposal. KMC does not make any specific charges for its waste collection service; revenue comes mostly from the combined conservancy/sewerage charges collected by Karachi Water and Sewerage Board, based on property values assessed about 25 years ago. Cost recovery for these charges is very poor: in 1995 Rs. 141 million was billed but only half of it collected.

KMC spend money according to an annually published budget and set procedures. In 1996-97 expenditure on solid waste management operation and maintenance was in the order of Rs. 500 million and increasing by 20% per annum. Most of it is spent from the public health department budget which also funds health centres, promotional campaigns and provision of birth and death certificates. Engineering department budgets covered the cost of vehicle repair and maintenance.

The largest proportion of public health expenditure is on staff costs: this accounted for 84% of the budget between 1991-94. Within this amount, the greatest expenditure is on field staff, including sanitary inspectors, supervisors and sweepers - see Figure 2.

Figure 2 **Expenditure on staff broken down into categories Karachi Metropolitan Corporation, Health Department 1991-94**



Waste picking at dumping sites in Karachi is limited to the recovery of metals, since most other re-saleable components are removed earlier in the solid waste management system. The social impact of an improved solid waste system will therefore depend more on changes in collection and transportation.

There are a number of established NGOs and community-based organisations in Karachi which are active in promoting a better municipal service and / or indirect service provision. However, they tend to focus an primary collection and secondary storage. One NGO actively promotes composting and recycling but it is very small and again, focuses on activities as household level and the sale of recoverable items to the recycling industry.

Appendix 4

EXERCISE: COMMUNITY-BASED PROGRAMMES

The situation regarding the management of solid waste was extremely poor before 1987, when the programme started. The organiser (Mahbub Ahsan) initially considered starting something with a single lane. The City Corporation provided bins but locating space to place the bins was a major problem. Nobody wants a dustbin near their house and they were continually moved from one place to another. Initially a once a week collection system was considered by Mahbub, but the waste soon begins to smell because of the high temperatures. Then it was thought to buy a collection van for waste collection from the whole area and removal to a far away place. Finally the programme started with 250 houses and once cycle rickshaw (tricycle) was purchased.

There are also a number of flats in the area and the residents liked to have a collection service from their doors. They pay an additional amount of money (tips) to the sweepers (waste collectors) so that they will go upstairs and collect waste. The programme has gradually expanded and now collects waste from 700 houses, which are on the register. A number of shops do not pay, but are usually asked to hand over waste, otherwise they will throw garbage into the street. Now two rickshaw vehicles operate, each with a team of three sweepers, making about 3 to 3.5 trips each day. Each trip carries waste from 100 to 120 houses. There is a daily waste collection .

The rickshaws are modified to have steel wheels and a metallic box (size 6ft x 3.5 ft) at the back. Sweepers just pull and push the rickshaw. Sweepers working on the programme are either municipal employees or their relatives. The main advantage of employing municipal sweepers is that they know the area as they already collect waste from a number of houses. There is also a stand-by sweeper and a salaried person to collect money from the houses. There are many problems in money collection , over 10% of residents and tenants continually ask the money collector to return later.

A number of visitors come to visit the programme. The German cultural centre in Dhaka made a video of the programme and another was made by CIDA, which has been shown on television. It appears on television twice a week. CIDA prepared the video and the Ministry of Information sponsored it for television.

Now the programme has replaced the old rickshaws with new ones. These cost Tk18,000 each. They have used a 16 gauge metallic galvanised iron sheet, but it is frequently damaged while waste is being loaded with a scraper. Painting also needs to be done frequently. Vehicles are smelly, and it is difficult to park them outside the house. The Programme is popular and Mahbub gets a lot of requests on a lane basis everyday. Sweepers separate paper, plastics, bottles etc. from the waste for resale.

Secondary collection from containers has been a problem. Mahbub has the capability to go to the Chief Engineer's office directly (other people from low income areas may not do this). The main road the container is placed in is a 'VIP' road, so the city corporation does not like to keep a container on that road. Consequently the city corporation asked them to take waste to a concrete enclosure in another place.

The Ward Commissioner (local politician) did not view the programme positively. One occasion the Ward Commissioner stopped the rickshaw and said that since he did not have a trade licence, he could not collect waste. Mahbub arranged the trade licence the next day. Fortunately the Chief Engineer of the City Corporation is in the same area and has assisted Mahbub in resolving such conflicts.

Since 1987 the collection fee charged was Taka 10 per month, but in April 1996 it was increased to Taka 15 per month. Mahbub pays the sweepers a salary of Taka 1,200 per month. The conservancy inspectors (supervisors) in the area are happy, since they claim that now their area is cleaned by Mahbub's programme.

Now Action Aid, an NGO working in the Mohammed Pur Area would like to start a similar programme. Other people in adjacent areas are also operating similar programmes. Some areas are difficult, since there are a number of shops and other commercial activities. A number of waste pickers

were interested in working with the system, but it is difficult since the sweepers do not want to share their income. All the sweepers are male, they have problems entering the houses. A number of residents ask them to collect construction debris and garden waste, but it is often difficult to dispose of such wastes.

Mahbub emphasises that the size of the project must be small (for example, not more than 1000 houses). If it is a large-scale contract, it will become another municipal corporation according to Mahbub. He is willing to train other people in setting up small scale waste collection programmes.

Appendix 5

EXERCISE: STAKEHOLDER ANALYSIS

The waste collection programme, using Suzukis (a type of small truck common in Karachi) was initiated in 1988 by a local activist. In 1988 he was a member of the *Mushawarat Council* (advisory council) an alternative representation from the area instituted by the military government to replace elected local councillors. Later, however, the activist was elected as a councillor for the same area.

According to the activist, there was a great demand by the residents at that time for a cleaner neighbourhood environment. He had been receiving complaints about scattered waste and uncollected waste piles in the area. People were also requesting the shifting of transfer points from their vicinity, which could only be removed if all the waste was brought by vehicles to a single point.

As a first step, the programme organiser distributed letters to all the 1,000 houses in the area, informing them about the proposed programme and the monthly fee that they would have to pay. In response, he reports having received a 'go ahead' letter from about 950 families of the 1000 families contacted.

Two used Suzuki vans were purchased, one for Rs20,000 and the other for Rs25,000, and the bodywork was adapted for use as waste collection vehicles. The collection service was started some time in 1988.

In the beginning the Suzuki system was not used by all the residents, but received waste from 650 houses of the 950 families who had agreed in the first instance. Gradually almost all the houses in the area joined the service. Some families were reluctant to pay a monthly fee for the waste services (initially Rs 15 and increased to Rs 25 in 1994). The programme organiser instructed the collection crew to collect waste from all the houses, whether they were paying the collection charge or not.

When the programme started, the Suzukis used to dispose of the collected waste at the official disposal area in the North of Karachi, about 10kms away from the project area. However, after a few months they found it expensive to dispose of the waste at the disposal site. There were also problems from traffic police on the major roads. The programme organiser therefore constructed a walled enclosure, using his councillor's funds, in a playground within the programme area.

The programme soon developed and gained popularity among residents. In this way, waste from 1,000 houses was brought to a single transfer point. Residents got a reliable service, for which they were willing to pay.

The political rise and fall of the programme organiser took place during the period 1988 to 1994, which affected the programme. However, in spite of all problems, the programme operated until 1994. The municipal sweepers lost their income because of the Suzuki programme and continued to compete with it. However, the activist has been very successful in keeping the sweepers out of the area, and asking them just to concentrate on sweeping work.

Although the programme stopped operation in 1994, citizens of Karachi got the idea how such systems could be operated. In 1998, several programmes were operating in the city on similar principles, however the Suzuki programme was stopped.

Appendix 6

ROLE PLAY

Role plays are an interesting way of understanding and learning complex situations. This role play exercise is designed to understand perspectives of different stakeholders in integrated solid waste management. This role play is based on a case study situation in Hareen (see appendix 7).

This is a three act play in which some of the participants will take part and others will observe and appreciate. Participants are requested to make their roles funny and interesting.

ACT 1

Meeting: City mayor meets two representatives from Neema squatter settlement in the presence of the Head of HMC and an NGO person. Those present:

The Mayor	Neema Activist 1	
Head of HMC	Neema Activist 2	NGO Representative.

The Mayor chairs the meeting and the two activists from Neema complain about poor solid waste management in Neema. They remind the Mayor that Neema is her electoral area and that she only comes before elections. One of the activists accuses Head of HMC of corruption and calls him lazy. The NGO person refers to GEM conference, but Mayor could not understand the technical terms, such as ozone layer depletion, leachate etc. The Mayor asks the Head of HMC but could not receive any clear answer. In the end, the Mayor informs about the loan from ADB

ACT 2

Meeting: City mayor meets two representatives from Asian Development Bank, in the presence of HMC and Director Finance of HMC. Those present:

The Mayor	ADB Representative 1	Director Finance HMC
Head of HMC	ADB Representative 2	

This is a more formal meeting than the previous one, which the Mayor chairs. The two ADB persons are in a hurry and talk in a formal way. They have to catch a flight. They are more concerned about the loan recovery and do not bother about the informal sector activities of waste pickers and sweepers. The Director of Finance reassures the ADB persons and appreciates the efforts of the present Mayor. The ADB persons hand over a number of forms to the head of HMC to fill and send to ADB. They also ask the head of HMC to appoint an ADB registered consultant.

ACT 3

Meeting: The Head of HMC explains the terms of reference to the consultants and hands over the project. Those present:

Head of HMC	1st Consultant	2nd Consultant

The Head of HMC explains that we have received a loan from the ADB and would like to initiate the solid waste management project, The consultants are more interested in large-scale and high technology changes and do not understand the users. They have no idea of issues in a low-income country. The Head of HMC tries to link problems with the issues of Neema, but the consultants do not understand it. However the consultants assure the Head that every problem will be solved with the use of high technology solutions.

Appendix 7

ROLE PLAY CASE STUDY

Background

The city of Hareen

Hareen is a fictitious city of a low-income developing country located in South Asia. The city population is about 4.5 million according to unofficial estimates as no census has taken place for 15 years. The city is also a major industrial base for the country and has got the only international sea and ports. The growth of the city has taken place without any Master Plan over the last 50 years. There is an old town area which is totally commercialised with all the major offices, banks, stock exchange etc. There are middle income residential areas, most of which are planned. About 30% of the total population live in squatter settlements, located in the periphery of the city. The largest squatter is NEEMA, located in the south west of the city with a population of 0.5 million.

Hareen city has got a basic infrastructure, which works but lacks efficiency. Most roads are paved, there are underground sewers in almost all areas except squatter settlements and electricity is supplied by a private consortium. Water is supplied for only two hours per day and just enough for basic human consumption.

Solid waste management

The solid waste management is the responsibility of Hareen Metropolitan Corporation (HMC) which, according to some estimates, is able to collect only 60% of the waste generated. Most waste in low income areas remains uncollected. In high income, middle income and commercial areas, the primary collection is undertaken as private work by HMC sweepers for which they charge unofficial but agreed fees from the households. The HMC currently employs 12000 waste collectors (sweepers, both male and female), most from the same ethnic background. In low income areas, HMC provides communal bins to which household members bring their waste. However, HMC trucks are able to collect from the communal bins only once a week. It is common to observe a number of waste pickers on the streets separating re-saleable materials such as paper, plastics, cardboard etc. to earn an income. Generally office workers and household members separate cleaner waste such as paper, plastics, bottles for further sale to Itinerant Waste Buyers.

The HMC has about 150 waste collection vehicles, including 30 new refuse trucks, which the city government has just purchased with an Asian Development Bank loan. There is only one designated disposal site for collected waste which receives 25% of the total waste generated by the city. The remaining waste is taken out of the residential areas and disposed of in depressions or burned by pickers. On some sites waste pickers burn almost all the waste to recover metals.

Other information:

The city mayor is a dynamic person and wants to make changes in the shortest possible time. Her party has won all the seats in the last elections. The mayor is selected by 206 councillors representing different areas of city. Three years ago she also obtained a technical co-operation grant from a UN agency to prepare a City Master Plan up to the year 2005. The Master Plan has gathered a lot important data and information about the city infrastructure and services but failed to make any changes to the existing developmental pattern. The mayor recently met with representatives from the World Bank Head Office and wants to negotiate a major project for solid waste management. A number of Non-Government Organizations are also active in the city. Some of these recently represented the Hareen city in an international conference in Washington on Global Environmental Management (GEM). There are also a number of small community and area based organizations in the city represented by community leaders. The informal sector, consisting of waste pickers, waste buyers, dealers and the small scale recycling industry, is active all over the city. Most of the city transport, education (schools), small clinics (surgeries) are run privately. Overall, the private and informal activities create more than 60% of the total employment in the city.

Appendix 8

PAPA FORMATS

PARTICIPANTS' ACTION PLAN APPROACH (PAPA) - Ideas for Action Items

Name: _____

Function _____

Country _____

Ideas I would like to try out when I return to work , based on what I have learned during the course on Integrated Solid Waste Management and Sustainable Livelihood.

Date _____

Date _____

Date _____

Date _____

Date _____

PARTICIPANT ACTION PLAN APPROACH (PAPA) – Action Plan

Name: _____

Function _____

Country _____

Action Item	**Start to implement action plan**		
I plan to.....	After 6 months	After 2 years	As arises

Appendix 9

LOCAL CASE STUDIES

9.1 DYNAMIC YOUTH ENTERPRISE: A WASTE COLLECTION MICRO-ENTERPRISE

EDEN MELKE

Introduction

Most of the Addis Ababa city development problems form a complex of interacting constraints that form casual chains leading to urban health problems. Some of these constraints include poor sanitation, unemployment, street dwelling. Waste management services can contribute to alleviate some of these problems.

Indiscriminate waste management creates environmental problems in the city and affects the health of the population. Much of the solid waste problem in Addis Ababa is basically caused by the lack of awareness among the public and the lack of disposal areas. The one who sweeps his/her house dumps the waste on streets and road sides, in the drains or in any open space in the neighbourhood.

Also related to the solid waste problem is the livelihood of unemployed youth and street dwellers. These youth have a good potential to work, but because they are isolate and poor they end up making a living from informal work and from scavenging in solid waste containers and disposal sites, thereby exposing themselves to diseases.

It is these two interlinking problems of indiscriminate waste disposal and unemployed street youth that led W/t Eden Melke to initiate a sanitation enterprise, called Dynamic Youth Enterprise (DYE).

Background of DYE

DYE was launched in January 1998, with initial funding from the founder herself and a certain portion provided by the founder's mother. The founder herself had never been employed and was making a living from preparing and selling small food items.

The overall objective of DIY is to alleviate the poor sanitary condition of the city. More specifically, its objectives are to improve solid waste management and at the same time improve the livelihood of street dwellers by engaging them in waste management.
The major activities of the enterprise are

- ◊ providing waste collection services in different localities of Addis Ababa
- ◊ providing reproductive health services
- ◊ conducting a literacy campaign, and
- ◊ preparing small food items for sale in order to supplement the income of the enterprise.

This case study focuses on the first activity: waste collection services.

DYE was registered as a service enterprise in December 1999. The Region14 Health Bureau issued a permit which allows the enterprise to work in all six zones of the city. The cooperation from the Health Bureau was very much forthcoming, because it was a great pleasure for the Bureau to get the type of assistance DYE wants to provide. It enabled DYE to develop good working relations cooperation with some of the Bureau's officials, namely Ato Fikru Tessema and Dr. Eyob Kamil, the Head of the Health Bureau.

The members

All the members of DYE used to be street dwellers. They were living around Meskel Square, in the field nearby Estifanos Church. They came to this street life because of family breakdown, destitution of their families or migration from the rural areas to the city hoping to find a job. Their age ranges between 15 and 25 years. They were not give any formal training, rather the founder herself taught them the way to collect waste, how to treat clients, and to be disciplined and committed to their job.

Activities

After selecting the members of the enterprise and the areas where to start the service, clients were identified by introducing the enterprise's solid waste collection system.

All the clients are provided with plastic disposal bags in which they store the waste. Twice a week, the bags are collected from house to house to house. Clients hand over their bag full of waste and receive an empty one in return. The disposal bags are emptied in the containers. The enterprise hires a truck twice a week to dump the waste in distant containers.

At present, DYE is active around Wereda 17, kebele 20 in the Bole area, in Wereda 18 kebele 26, in the Wello Sefer area and in Wereda 23 kebele 10 around the Vatican Embassy. There are 10 active members who carry out the waste collection. They are divided into three teams of three, with the remaining member working in any one of the three teams, according to assignment by the leader, who is also the one supervising the work of the teams.

Clients pay 20 Birr per month for the service. Two members, who do not participate in the waste collection, collect the fees from the clients at the beginning of the month. They use cash receipt vouchers, giving one copy to the client at the time of payment and keeping the original in the pad. These two members also identify potential new clients.

Cost

DYE has no means of financing the collection, and the fee it collects from its clients should cover expenses like labour, transportation and disposal bags.

The monthly expenses for collecting and disposing the solid waste amount to 2 190 Birr.

Expenses		
Payment to members (waste collection)	(80 x 10)	800.00
Client identifiers/fee collectors	(2 x 100)	200.00
Plastic disposal bags		150.00
Transport (130 x 8)		1 040.00
Total		**2 190.00**

The waste collectors earn 50-100 Birr per month. The amount depends upon income from clients. On working days, they receive a transportation allowance and a meal allowance. On average, the enterprise spends 80 Birr per month for each waste collector.

The fee collectors/client identifiers are paid 100 Birr per month each. Transportation cost amount to 130 Birr per trip, or 1 040 Birr per month (8 trips per month).

Income

DYE has now 100 clients. Given the fee of 20 Birr per client per month, this supplies a monthly income of 2 000 Birr. This does not fully cover the expenses incurred; the supplement income is obtained from the sale of small food items.

Achievements

There are several indicators that point at the success and strength of DYE:

- ◊ the members are highly motivated and have the interest to make the organisation successful
- ◊ the organisation is legally registered
- ◊ households are interested in obtaining garbage collection service
- ◊ unemployed youth are interested in joining the organisation
- ◊ the group has gathered experience in working together as a small organisation
- ◊ the attitude towards the street dwellers is changing. As we all know, street dwellers are poorly accepted by the society. However, when they observe the effective and timely performance of the members, the DYE clients becomes highly appreciative.
- ◊ the members no longer live on the street but in three rented rooms;
- ◊ the enterprise has received wide media coverage, including ETV (Amharic youth programme, Oromifa programme and English Close-up programme) and Addis Zemen (Amharic newspaper).

As for the founder and leader of the organisation, she gets a lot of satisfaction from her clients' appreciation. As she says "Especially encouragement from women clients strengthen my career".

Difficulties

The major difficulty faced by DYE is that most of the time, disposal containers placed by the City Administration are filled up to the brim. DYE has to look for empty containers and this highly increases transportation costs. These increased transportation costs add to the expenditures and highly affect cost recovering. It is these transportation costs that cause variation in the earnings of the members and limit the possibility of expanding the waste collection service.

Future perspectives

DYE currently believes that its registration as an enterprise should be changed into NGO registration. In order to improve solid waste management, several activities are envisaged. These activities, however, need support in order to be implemented, and DYE feels they will not be able to obtain support if they remain as an enterprise. Activities DYE plans to carry out include:

- ◊ to develop close working relation with all stakeholders and enhance voluntary community participation in waste management to develop local structures such as neighbourhood committees, women groups and workers, to form the basis of waste management programmes;
- ◊ to establish an effective, integrated and participatory extension system that will introduce the concepts of waste management. This calls for strong institutional links between the community, the kebele and wereda administration and DYE;
- ◊ to promote hygiene education by having hygiene and environmental educators teams in each kebele;
- ◊ to have street cleaning teams at each site;
- ◊ to identify areas that need to be protected by sanitary guards;
- ◊ to construct latrines for severely affected households;
- ◊ to construct and maintain sewer lines;
- ◊ to introduce composting.

9.2 SOLID WASTE COLLECTION AND DISPOSAL USING HORSE-DRAWN CARTS AND SMALL DUSTBINS

WOMEN AID ETHIOPIA

Background

Women Aid Ethiopia (WAE) is a development-focused indigenous NGO founded in 1994 with the primary development objective of promoting the economic and social independence of disadvantaged / underprivileged women and their dependants, by increasing their access to and control over production factors, services and facilities.

The poverty situation prevailing in Akaki is manifested in low income levels, poor housing, inadequacy of safe and clean water supply, poor environmental sanitation conditions, and a preponderance of women-headed households. This situation called WAE to intervene in tackling the socio-economic problems of a poor community especially those that affect women.

Planning and implementing community-based, small-scale, problem-oriented activities, bringing economically deprived women within the folds of socio-economic organisation to generate productive employment, and urban slum up-grading programs will be an immediate appropriate action. Thus construction and/or maintenance of residential housing, communal latrines and kitchens, roads and drainage improvement, provision of safe water supply, improved sanitation and solid waste/garbage disposal systems etc., are believed to be basic areas to address the needs effectively.

Within such context, since its establishment WAE has implemented:-

a) Saving and credit scheme,
b) Water supply and environmental sanitation program with project components :
   - public sanitary centre with facilities of public showers, water point, clothes washing stand, toilets, etc.
   - public water distribution points
   - communal latrines and kitchens
   - open drainage canals
   - placement of garbage skips and provision of environmental health education,
c) Establishment of school tree nursery and vegetable gardening,
d) Promotion of reproductive health care and family planning service through a women-to- women approach.

Beside these achievements WAE has introduced an appropriate, local based garbage collection and disposal system using horse-drawn improved-wheel carts and small dustbins to improve the sanitation conditions in congested neighbourhoods.

Project Initiation

Lack of sanitation facilities and the solid waste disposal system in Akaki town in general and that of kebele 01, the project area, in particular is found to be a chronic problem, with poor and/or inadequate services among the other kebeles.

It is hardly surprising to observe over-accumulated garbage in the daily life of the capital city although attempts have been made towards alleviating the problem. The survey we conducted indicated that over 65% of the households live in overcrowded and dilapidated kebele-owned houses and none of them have separate compounds or any free space to be able to use pits as an alternative means for garbage disposal. Only 9% of the households use the Health Department's skip, 29% use their private dugout pits while 62% throw away their dry garbage in any open place found. The Zonal Health Department(ZHD) had provided only two garbage collection skips. These skips were even placed far away from the residential area of most of the households so that very few residents had access to the service.

In Akaki town there are more than 250 horse-drawn public transporting carts. Operating carts for public service is a common practice in Akaki to sustain the livelihood of the residents. These carts usually serve the town and the surrounding rural people as a means of transportation and for the carrying of goods. WAE conceived the idea of using horse-drawn carts to reinforce and extend the community-based sanitation service in the congested neighbourhoods of Kebele 01.

WAE shared the idea and made a series of discussions to reach consensus with all relevant stakeholders. The kebele administration and the development committee, the target beneficiaries and the ZHD were very much excited and enthusiastic in their support, as they agreed to the plan, and to play their respective role in the implementation, monitoring and evaluation of this pilot project.

Thus, principally as initially designed, the project envisages achieving the following specific objectives:

- To make a total of 350 families or 2060 individuals, in kebele 01 of Akaki town, users of an appropriate and improved solid waste collection and disposal system.
- To improve the sanitation conditions in the project area and the immediate environment and thereby reduce the spread of waste-related communicable diseases.
- To introduce an appropriate, efficient and affordable community-based garbage collection and disposal system and enhance public awareness of waste-related problems.
- To enable one poor family with 10 members to reliably earn an average monthly income of 300 Birr.

Accomplishments

This project is essentially part and parcel of WAE's water supply and environmental sanitation program. The implementation was started towards end of August 1998. WAE replicated this project in kebele 03 (adjacent to kebele 01) towards October 2000, as it had become socially accepted and successful. The major accomplishments made by WAE until December 2000 are summarised hereunder.

Selection of cart operators

Prior to the actual implementation, criteria such as background history, family size, level and source of income, personal behaviour and social value in the community, willingness and interest to serve as garbage collectors, work experience with carts and driving license, were set to recruit the appropriate operators. Two cart drivers having 10 years licensed experience in working with horse-drawn carts and who support an average of eight and ten family members were selected, jointly with the kebele Development Committee (DC) members.

In fact the plan was to assign only one cart operator. The need became so enormous and the capacity in terms of budget to manufacture the improved garbage transporting carts and small bins was in our favour. Thus we opted for employing two cart drivers then doubled this to four, and included in the plan kebele 03, to serve the low income and overcrowded neighbourhoods located outside of the ZHD's current reach.

Project Implementation Agreement

In order to put into action and facilitate the project implementation a separate and formal written agreement was concluded. The project agreement depicted the main project activities, responsibility of the two cart drivers and WAE. The kebele administration and the ZHD were involved in this agreement, as they are relevant government bodies to administer, provide technical and advisory support and transport the garbage using their trucks.

Orientation and Sensitisation

The project users have been sensitised and oriented about the overall activities, the participation, contribution and responsibility expected, the need for proper use of project materials, sanitation management, the household garbage collecting and disposing system and supervision and monitoring.

WAE organised this special orientation and sensitisation session in collaboration with the kebele administration and development committee. The education has been useful in promoting a positive attitude towards waste management and efficient disposal system.

Supply of means of project implementation

In order to carry out the waste-collection project effectively in kebeles 01 and 03, WAE has supplied the following inputs :

- 42 Solid waste collecting bins (the original plan was only for 6 bins), each having a dimension of 600 mm x 400 mm x 600 mm. The cart drivers distribute these to pre-selected location for use by residents of the project site. Each small dustbin can contain 0.14 m^3 of solid waste.
- 4 Horse-drawn improved carts, each having a metal load deck 1.2 m by 1.8 m and capacity to load 1500 kg. Each cart can hold 6 dustbins. The carts are used to transport the collected garbage from the waiting stations (off the main road villages) to the bigger garbage collection skips.
- 8 horses: given to the 4 cart drivers. Four horses are used to draw garbage transport carts and work only in the mornings. The other four horses are used to draw public transport carts during the rest of the day.
- 4 public transport carts: used to transport people and goods in the town. The carts designed as commonly used in Akaki. The four horses and four public transport carts were given as an incentive to motivate the cart operators in the project activity. This also enables them to generate and earn an income. The cash benefit is used to sustain their livelihood and the project.
- 4 horns: supplied to the cart operators to announce their arrival each morning when they go around the villages to collect and transport the household garbage.
- 4 cart plates: supplied to the public transport carts. The numbered plates enable the cart operators to operate legally in the town.
- Horseshoes: supplied to protect the feet of the horses from any damage.
- Feed supply: provided for the horses, with mixed wheat flour as the main feed stuff, for a period of six months.
- Veterinary service: provided to the horses to maintain their health status.
- Repair and maintenance: In order to ensure the continuity of the project service, repair and maintenance service is given to both the garbage and public transport carts as and when needed.

Activities in solid waste collection and disposal

A) Using horse drawn carts and small dustbins

Domestic garbage is collected from 'ketenas' 1, 2 and 3 in both kebeles. Each 'ketena' is served in rounds within a three days interval. That is to say, the waste collection program will stay for three consecutive days in one particular 'ketena'. The cart operators collect the bins 10 days per month in each ketena.

The cart operators put the 42 garbage collection bins (containers) turn by turn in each 'ketena'. Each household normally dumps its daily garbage in the small dustbins located nearby. The operators use their horns to warn the community before their arrival at the collection spots. They then collect the dustbins and load them on the improved carts designed for carrying and hauling the garbage. This garbage is then transported and dumped on to the bigger skips (dumpsters) which are placed in different strategic locations.

This daily task is carried out in the morning, starting from early 6.30 a.m. up to 10.00 a.m. The ZHD usually manages the skips. When the skips get filled up, the Department transports them using their special trucks to the final/main disposal site.

Since the inception of the implementation, 12,636 load-full small dustbins have been collected. This means, a volume of 1769 m^3 of garbage has been collected from the poor neighbourhoods and transported to the bigger skips. The Zonal Health Department hauls the skips from the transfer station to the final destination. In doing so, the truck has made on average 147 trips to dispose 1769 m^3 garbage. This locally- based sanitation service has indeed been useful to the kebeles' low-income neighbourhoods.

Beneficiaries. The current direct beneficiaries from this pilot project are the residents of the six 'ketenas' in kebeles 01 and 03 including the cart operators and their poor dependants. Since the beginning of the project (Aug.1998) till December 2000, a total of 2,967 household heads or 15,699 families have directly benefited from this community based sanitation service. The users in kebele 01 have accepted the idea they own the project.

Income generation. As per the project agreement, the operators need to generate their own daily income, to sustain their families and to ensure project continuity. This task is performed throughout the week after the morning chore of the solid waste collection. The daily earnings of the operators using the public transport carts are registered independently by WAE and the DCs. During the period between end of August 1998 and December 2000 the total income generated by the four cart operators was 19,712.00 Birr.

B) Using garbage skips

In order to complement the solid waste collection and disposal, sanitation-improvement garbage skips have been purchased and placed at strategic locations to serve the low-income target beneficiaries in kebeles 01 and 03. These skips have been turned over to Zone 06 Health Department. Each skip has a capacity to dispose of 12 m^3 of solid waste. From 1997/98 up to December 2000 WAE has supplied, in total, 7 skips for use in the congested neighbourhoods. In total these skips served to collect 5376 m^3 household waste or 448 garbage truckloads. The Health Department manages the final disposal of the garbage using their truck whenever the skips become full.

VOLUME OF WASTE COLLECTED AND DISPOSED

A. Using Carts and Dustbins

Project site	No. of bins collected & disposed	Volume (m^3)	Garbage truck-loads	Duration of service
kebele 01	10,886	1,524.04	127.00	Aug.'98 - Dec.'00
kebele 03	1,750	245.00	20.42	Oct.' 00 - Dec'00
TOTAL	12,636	1,769.04	147.42	Aug.'98 - Dec.'00

B. Using Garbage Skips

Duration of service	No. of skips placed & used	Volume (m^3)	Garbage truck-loads	Remark
July'98 - Dec.'00	3	2,784	232	
June'99 - Dec.'00	2	1,824	152	
Apr.'00 - Dec.'00	2	768	64	
TOTAL	7	5,376	448	

Stakeholders' participation

Since its initiation, the relevant local partners have participated throughout the implementation, monitoring and evaluation of this pilot project. They co-operated with the cart operators in safely keeping and loading the garbage dustbins on the horse-drawn carts. They contributed their labour whenever an occasional breakdown occurred, by carrying the dustbins all the way to the central skips and dumping the garbage, and controlled the service.

Residents. A monthly cash contribution (Birr 2.50/household) to maintain and to sustain the project is already accepted and has created a healthy relationship with cart operators. This implies that these facilities help users to develop their attitudes towards improving garbage disposal management and their environment.

Development Committees (DCs). The kebele DCs took the responsibility of supervising the day-to-day activities of the collection and disposal of the garbage. The DC selected the operators and

registered the daily performance of volume of garbage disposed and income generated by the cart operators. If any dispute occurred between users and cart operators while monitoring the DC arbitrated locally through advising. It has participated in a joint periodical review conducted with kebele 01 administration, Zonal Health Department, WAE, cart operators, users, etc. The DC has also taken over the administration of the project representing the beneficiaries.

Zonal Health Department (ZHD). As this community-based garbage disposal system is intended to be healthy and environmentally sound, the ZHD has committed itself to haul the garbage skips from the transfer stations to the final destination when they become full. The ZHD has also assigned sanitation workers, besides co-operating in the provision of technical and advisory supports while monitoring the project.

Local authorities. The 'wereda' administration and the traffic police offices, which were impressed with the project idea and benefit, have facilitated the obtaining of the public transport cart plates. Although the authorisation of new licensed plates for carts is stopped, this innovative appropriate technology is a conscientious action that captured the attention and concerns of all relevant local stakeholders.

Others. There are a number of favourable conditions/opportunities which also contribute for the success of the project, such as :

- Presence of carts and metal products garage/workshop of the older persons association, which advised us in the design and also manufactured the public transport carts and provide repair and maintenance service in kebele 03.
- Akaki Spare Parts and Hand Tools Factory helped in the design and manufacture of the garbage skips.
- Presence of horse dealers, feed suppliers, private veterinary clinics in Akaki, and the location of the project sites near the open market of Akaki.
- Zone 06 and Weredas' Agriculture offices for professional veterinary service.
- Selam Technical and Vocational Centre for the design and manufacture of special carts and dustbins.
- Institute for Sustainable Development co-operates in waste separation, production of compost/natural fertiliser, and for future networking.

Problems encountered

The major problems/constraints observed during the implementation of the project were as follows:

- **Shortage of small dustbins:** Since the project is a pilot one, WAE has introduced it on a small scale. However, the 12 dustbins, which were placed at three days interval in one ketena, were far from enough to benefit the families residing in the congested village. This forces the operators to make more rounds to collect the garbage as the beneficiaries are getting used to dumping in the small bins. This means the need for transferring the smaller dustbins on to the central skips is rising and indicates that the number of garbage collecting bins and horse-drawn carts should be increased. WAE has provided an additional 10 dustbins to kebele 01 and introduced 22 new dustbins in kebele 03 but this does not satisfy the six neighbourhoods in both kebeles.
- **Shortage of ZHD garbage dumper trucks**: Sometimes, due to mechanical breakdown of the truck, the filled up skips stayed without being emptied for a long time, so that the cart drivers faced difficulties in removing the garbage on schedule. The ZHD has only one lifter truck, with long years of service, to haul 33 garbage skips (WAE has handed-over seven skips) and serves 11 urban kebeles in Akaki without any interval. Thus this shows that additional truck is needed for efficient waste disposal management. Beside this the distance of the final disposal on the outskirts of the town, influences efficiency.
- **Dumping/disposing of liquid waste** in the small bins by some of the residents was a big challenge for the cart operators. They were exposed to bad smells and health problems. Now it has been improved much through environmental health education.
- **Inefficient mobilisation of the contribution collection** in a form of service charge, by the DC. This charge is expected from the beneficiaries to sustain the project.
- **Attitudinal change is a challenge** since the level of awareness and educational status of the users is very low. A lot more needs to be done in this regard.

- **Lack of skill/professional expertise in the areas of environmental sanitation** among the WAE staff as well as the cart operators.
- **Delay in the project take-over process** on behalf of the DC in kebele 01, at the initial stage after project duration was completed.

Improvements

The project is now more than two years old. A year after its infantile stage, it started signalling its popularity in neighbourhood coffee-break hours, traditional get-together gatherings, religious ceremonies and public meetings. As WAE intensified its sensitisation and health education program, the pilot project went on deepening its roots. WAE's strict follow-up and site monitoring alongside with the kebele DC members, the ZHD and the users, has resulted in many positive improvements and great impact. Since the start of the implementation of the project the major improvements achieved can be summarised as follows:

- The facilities provided for household garbage collection have increased over time. For example, the number of dustbins increased from 6 to 12 then 22 and finally to 42, each of the garbage and public transporting carts from 1 to 2 and to 4, and the number of horses from two to four and to eight.
- The service coverage has been increased in terms of beneficiaries and project sites. The number of household beneficiaries increased almost eightfold (from 350 to 2967) and the project has operated in two kebeles in the six 'ketenas' every day of the week.
- The quantity of domestic garbage collected from poor over-crowded neighbourhoods has increased (see table above).
- The multiplication of insects, vectors and infestation due to other various agents of household rubbish/garbage has declined.

  Wherever the dustbins and the carts serve, one can certainly observe the much-minimised household garbage around homesteads and the surroundings compared to other neighbouring kebeles where such facility has not been introduced. The difference is more than encouraging. The vulnerability of the residents (especially the women and the children) to communicable disease hazards has been reduced. Thus it has become a meaningful service to improve the sanitation, the environment as well as the health status of the congested village and low-income residents.

- The cart operators are still interested; they serve their community and have found the project to be a economically very self-supportive as they earn a regular income to sustain their livelihood. In addition the cart operators supplement the government revenue through income tax (Birr 20/year).
- WAE has handed over the project to the kebele 01 development committee.
- The technology is so compatible that no negative impact is observed on the social or physical environment. The project is cost effective, manageable and socially accepted. The level of the participation, the awareness and the attitude of the users have been enhanced towards attentively managing the disposal of waste.
- WAE has been able to develop its experience and internalise the system and paid due consideration to ensuring sustainability and impact promotion.

The pilot project has been locally tested in terms of application and acceptance. The practice is peculiar to WAE. It is an innovative and replicable project activity.

According to our current knowledge, the expected service tenure of the horse, given the traditional poor management, is 10 years. But with proper management and know-how, feed, veterinary service, etc. it can be expected to render continued service for about 15 years. With a minimum saving of Birr 2.50/household/month from the users' contribution and a deposit of 5% from the cart drivers' monthly income, the project cost can be recovered within a certain period of time. Besides the project not only can sustain itself but also enable WAE to extend and replicate the project in other neighbouring kebeles.

The technology is appropriate, community-based and effective, in that it has proved to be manageable. With the increase of horses and carts, it can very well serve the congested and destitute neighbourhood but also other families and individuals within any high, middle or low income brackets. In Akaki, there

is no other solid waste collection system except that of WAE. Neither the government nor even the private sector is yet aware of the advantage of engaging itself in this apparently lucrative business. Therefore, this project is not only accorded admiration, but it also stimulates the government to think in that line and is sensitising the private sector to explore this area.

In addition the pilot project has proved to have dual advantages: one is its social aspect in that it alleviates health problem, the second is that economically it supports some families with income security.

Lessons learnt

- The community members have found that the technology of the garbage collection and disposal system is easy to utilise.
- The success of the project depends, among others, on:
  - Involving operators in horse selection, in the design and manufacture of carts/bins.
  - Unreserved collaboration, healthy and smooth relationship with the project owners and relevant stakeholders.
  - The willingness and interest of the cart operators to serve the users.
  - Sustained income collected from and for the service.
- No technological constraint is reported, after the weight of the dustbins was reduced. The 12 small dustbins were initially made from steel having 1.5 mm thickness, which proved to be heavy for an operator to carry and mount on to the cart when filled up with garbage. The other 30 dustbins were made from a 1 mm thick steel. This was advantageous not only because it is easy to handle but because the price of the bins with the same dimension was reduced almost by half.
- As the horses are well-fed and well-handled no major medical problems have so far been observed.
- Locally organised continuous orientation and training, workshops and other experience sharing forums associated with regular meeting and close monitoring by DC, Health office, users' committee, WAE, etc. is necessary for efficient and effective extension and management of the garbage collection disposal activity.
- Maintaining motivation of the cart operators through enabling them to own the horses after three years service and using public transports carts for income generation has provided unimpeded continuity of the operation.
- A number of WAE's donors, interested groups from government, public and community based organisations have visited the pilot project and WAE has shared its experiences. The experience gained has encouraged and inspired WAE to see that that this pilot project can serve as a demonstration for governments, NGOs, private, public and community-based organisations, etc with relevant development activities.
- The project, which shows good prospects for replication, has even attracted the interest of a few newly emerging and incoming NGOs. This has helped in persuading WAE to replicate the project in other neighbouring kebeles.
- Behavioural change is so important to bring about and ensure sustainable development.
- There will be a room to improve the local based solid waste collection and disposal methodology/system through time.
- WAE has learnt that solid waste (not all types collected and disposed) has value through separation/recycling for job and skill/income generation, household use, compost/natural fertilizer production, etc.
- It is better to start such project as a pilot on a small scale. It helps to learn more and also to do more.
- Networking is essential among the practitioners to address this big issue properly and effectively through pooling all the resources we have and we get.

Out of the 252 licensed public transporting carts WAE uses only four so far. Therefore, taking into account the lessons learnt, in Akaki there is great potential for utilising horse-drawn carts for community based garbage collection and disposal.

9.3 MUNICIPAL SOLID WASTE MANAGEMENT IN ADDIS ABABA CITY: SOLID WASTE DISPOSAL AND ITS MANAGEMENT

FIKRU TESSEMA (ADDIS ABABA HEALTH BUREAU)

INTRODUCTION

Solid waste is an inevitable and metabolic product of our daily life. The primary purpose of solid waste management (solid waste management) in a city is:

- to keep the city clean by promptly eliminating filthy, unsanitary residual materials
- to protect public health and the urban environment.

Today's cities have survived by somehow managing the increasing generation and removal of their own solid waste materials. Some cities are simply taking out and dumping solid waste at sites available near the city. From environmental and economic and health points of view, it is important to develop a standardized waste management system.

BACKGROUND

Institutional Arrangements

- ***Public Sector***
  - Addis Ababa City Health Bureau has been engaged in the handling of municipal solid waste since 1994.
  - At regional level, under the Environmental Health Department of the Health Bureau, there is a team in charge of solid waste management in the city.
  - At zonal and wereda level there are solid waste management Coordinators.
- ***Micro enterprises***
  - Some micro enterprises involved in primary collection of household wastes. These need up-grading to bring a significant change to municipal solid waste management (MSWM) service coverage.
- ***Community Based Programmes***

  1) **Public Sector**

  Wereda-5 Integrated Solid Waste Management (ISWM) Pilot Project
  (initiated by the Health Bureau, monitored by Wereda-5 Project Coordinating Committee)
  Project components: street cleaning, watching over polluters, community education (on hygiene and environment) and greenery.

  Out puts:
  - Reduced environmental pollution
  - Raised community awareness
  - Increased the involvement of different stakeholders
  - Job opportunity (221 workers)

  2) **NGOs**
  - Enda-Ethiopia (ISWM in Wereda-12, 22 & 26)
  - Plan International (Provision of dustbins for 400 households in Wereda-12 & 13 and
  - Women Aid-Ethiopia (Primary collection in Wereda-26).

Manpower

- In the public sector there are 1072 crewmen out of which 60% and 33% are particularly engaged in municipal solid waste management and public toilet service respectively.
- In micro enterprises there are also 54 crewmen participating in the MSWM.

Quantity of Solid Waste Generation

- The population of Addis Ababa is estimated at 2.7 million (1994 Census Projection).
- The unit of domestic waste generation of per capita per day is 0.35 kg, 0.28 kg and 0.17 kg for high, medium and low income group respectively (1995 Study) and its density is 370 kg/m^3 (1982 Study).
- The amount of waste that is transported to the landfill is estimated to reach 444 – 450 tones daily, and increased by 50% in the last 6 years.

- The municipal waste collection service coverage is estimated at 60-65% of the total generation in the city.

Physical Composition

- The percentage composition of the solid waste of Addis Ababa City (1995) by weight:

for combustible materials (leaves, grass, etc)	22%
for non-combustible (stone, etc)	3%
for fines greater than 10mm size (food waste, straws , etc)	34%
for fines less than 10mm size (ashes)	28%
for recyclable materials (paper, wood, metals, plastic, etc)	13% .

- The organic components of solid waste of Addis Ababa City constitute about 66% by weight.

Hazardous Waste Situation

- Normal practice in municipal waste management is:
  to reject toxic and hazardous wastes
  to accept municipal wastes and known industrial and commercial wastes which are not likely to pose problems.
- There is no identification, registration and legislation & regulations for handling and disposal of hazardous waste.
- Some hazardous wastes are still unknowingly admitted to the landfill of Addis Ababa City for disposal.
- Hazardous wastes require special precautions in their handling and must therefore be disposed of at separate special disposal sites.

Collection Systems

- There exist four types of collection systems for the city municipal solid waste management:
  - door-to-door collection
  - block collection
  - container collections
  - street sweeping.

Frequency of Waste Collection

- The frequency of collection is based on the type of collection systems.
- For door-to-door and block collection service, it is once per week in the serviced areas.
- The average frequency of emptying of the skips is estimated to be 4-10 days for the 8 m^3 containers and on daily basis for 1.1 m^3 containers.

Transport System

- Direct hauling for block and container collection services, and both direct hauling + mini transfer station for door-to-door collection service.
- Truck routing is done at zonal level by solid waste management coordinators.
- 8 m^3 and 1.1 m^3 containers usually represent mini transfer stations at communal points of collection.

Processing (Composting and Recycling) of Solid Waste

- The public sector is not at all involved in processing solid waste.
- There is no waste recovery system or operation, composting, waste-to-energy and source reduction and separation at point of generation.
- Some scavengers practice an informal type of waste recovery. They recover plastics, rubber, bottles, metals and combustible materials that can be used as fuel.
- Some other informal groups also recover some components of solid waste at its source.

Solid Waste Disposal and Mining

- The existing disposal site called Rapid landfill is the only site for disposal of municipal solid wastes.
- The landfill operational procedure is unsanitary. It is simply spreading and levelling the waste using bulldozers and compacting by steel-studded wheel compactor.

- **There is no atmospheric emission and leachate control and soil cover.**
- There is no provision to extract the already decomposed wastes placed in the landfill for use as a fertilizer.

PROBLEM ANALYSIS

The situation of solid waste management problems in other parts of the world is to a certain extent similar, because solid waste management has become one of the most important environmental issues in terms of pollution control, finance and health.

1. ***Insufficient funds and absence of a cost recovery system to achieve and sustain a desired level of service***
   - The public sector is not organized as a profit making organization.
   - The resource available for solid waste management is not used efficiently and a cost recovery system is also absent.
   - Specific waste collection taxes are not well organized and funds are derived from the general taxes of the city government.
   - Economics of scale of equipment and facilities are seldom recognized.

   As a result, the expensive components of the system (solid waste collection and transport equipment) have started to deteriorate.

2. ***Inaccessible collection stations and disposal site to every citizen***
   - The physical layout of a city, road condition, disposal sites and increase of waste generation determine the collection system.
   - Most of the inner part of Addis Ababa is not accessible for trucks. The skips are therefore placed near/on the main roads and wastes must be carried manually from the households to the skips.
   - The location of the disposal site also affects frequency of collection.

3. ***Poor manpower development***

   Number of crewmen (only 39% of the total need) and lack of qualified professionals are problems to be addressed.

4. ***Lack of proper handling of important elements of solid waste management***
   - Truck maintenance and service are the main elements of any waste management system. This requires well-organized central or decentralised truck parking, and effective and efficient garage service.
   - With spare trucks and effective and efficient garage service, it is possible to make the collection and transport system sustainable. None of these are available in the Addis Ababa solid waste management system.

   As a result, collection and transport systems are becoming the most inefficient part of the service.

5. ***Poor cooperation of the population***
   - Irrespective of who carries and dumps waste in the skips and trucks, it requires the cooperation of the population.
   - Cooperation from the population is even more important in the collection and storage system.
   - In the case of the City of Addis Ababa, the collection and storage system of solid waste has up to now been unsatisfactory.

   As a result, open drains, spaces and rivers are the places where wastes end up. Indiscriminate dumping of solid waste could lead to environmental pollution resulting in:
   - increase in disease,
   - blockage of traffic,
   - odour and aesthetic nuisance, vermin
   - the risks of soil, surface and ground water pollution in the city.

6. ***Poor management structure and institutional deficiency***
Institutional arrangement and management structure are poorly organized and practiced. This affects resource management, work coordination, control, monitoring and evaluation mechanisms.

7. ***Absence of incentives system***
- The general and social status of solid waste management workers is still low, resulting in poor motivation. This is a barrier to good quality of service.
- Salaries for management staff and workers are also low and jobs within the organization are not attractive to most career-minded, qualified personnel.

8. ***Low level of participation of private sector***
The need to involve the private sector in the collection and disposal of urban waste .is becoming the most important factor to be given consideration. Collection, especially, is labour and equipment intensive and it is not an easy task for the public sector to carry out alone.

9. ***Poor solid waste disposal and absence of different treatment measures***
- The existing landfill is unsanitary and creates environmental pollution in the surroundings
- Formal treatment options like composting, recycling and waste to energy are absent.
- Transporting all wastes to one landfill is not economical because it incurs landfill management and transport costs.

MAIN GOALS

The main goals within the waste sector should target a system that helps develop sound waste management and is economically affordable, environmentally effective and socially acceptable services.

Overall goals in the solid waste management field
1. Solid waste management and disposal should follow an acceptable standardized system so that every citizen will have access to the service.
2. Solid waste should be recycled or re-used and composted to as great an extent as possible.
3. The quantity of waste should be minimized via measures at both production and consumption levels.
4. The admission of hazardous waste to the disposal site should be stopped through measures for handling, legislation, minimizing of content in substances, and appropriate disposal.
5. Environmental standards should apply to the disposal of solid waste that cannot be recycled, reused or changed to useful materials.

Interim goals in the solid waste management field:
1. Solid waste collection service coverage should reach 85% by the year 2010.
2. Landfill quantities of solid waste should decrease by encouraging recycling, composting, etc., both formally and informally.
3. Community awareness should reach as high an extent as possible so as to bring a high level of population cooperation at all levels of solid waste management.
4. By no later than 2006, no admission of any hazardous waste to the landfill.
5. By no later than 2010, the solid waste management system should meet environmental requirements and have achieved a uniform standard.

STRATEGY

Today, environmental protection is becoming a major issue to be considered by policy makers and administrators of urban centres because of:
- the rapid population growth that increases environmental problems
- the ever-increasing demand for the improvement of the urban environment in general and solid waste management in particular.

The City Council of Addis Ababa also:
- considers its responsibility for solid waste management among top priority issues;
- gives due attention to up-grading solid waste management; and

- reinforces the legal aspects with regard to beautification and environmental protection in the city with the involvement of private sector and community participation.

The strategic plans

1. ***Create a phased action plan for the key elements:***
   - Identify the elements that need to be addressed first (provision of necessary equipment, facilities and personnel, etc.)
   - Identify other elements (improvement of financial and institutional bases, incentive system, management structure, etc).
2. ***Determine an appropriate solid waste management system:***
   - Design an integrated solid waste management system.
   - Determine the categories of waste that are within the accepted responsibility of the municipal service.
   - Identify the portion of solid wastes that are not serviced by the public sector, i.e. hazardous waste management.
3. ***Establish an acceptable standard of service delivery:***
   - Determine the portion of waste generated in each category and set the target for collection service.
   - Identify what level of citizen convenience is acceptable in the collection technique – frequency and accessibility to collection.
   - Identify areas for private sector involvement.
4. ***Provide public education and participation programs:***
   - Provide community awareness-creation programs (on municipal solid waste handling, minimization, etc).
5. ***Develop regulatory and enforcement support system:***
   - Keep polluters in check.
   - Formulate waste policies.
6. ***Develop sound waste disposal system:***
   - Identify environmentally friendly waste treatment measures: composting, recycling and waste-to-energy.

CONCLUSION AND RECOMMENDATIONS

- Municipal waste management is very important in Addis Ababa from a health and beautification point of view and because of the city's international status.
- Residents in general and the City Council of Addis Ababa in particular should no longer ignore the issue of waste management in general and MSWM in particular.
- It is recommended to develop an environmentally effective, economically affordable and socially acceptable integrated solid waste management system. Such a system should combine a range of solid waste treatment options, source reduction, composting, recycling and waste-to-energy transformation, and involve different stakeholders. This is expected to lead towards sustainability, improved institutional bases, increased service coverage, and standard service delivery.

9.4 CLEAN STREETS: SOLID WASTE MANAGEMENT IN WEREDA 5

DEMISSIE W/GIORGIS

INTRODUCTION

Addis Ababa is one of the major centres of Ethiopia and the capital city of country. Its total population is 2.7 million and divided into 6 zones, 28 weredas and 301 urban kebeles. The Solid Waste Management Department of the Health Bureau gives solid waste service to the city.

According to the studies done by Nor Consult in 1982 and Louis Berger Consult in 1994 and 1995, per capita waste generation in Addis Ababa is 0.267 kg/day and waste density is 370 kg/m^3. Out of the total waste generated, 76% is from households, 9% commercial, 6% from street cleaning, 5% industrial, 3% from hotels, and 1% from hospitals. According to these studies, the total waste generated in Addis Ababa is 711,158 m^3/year.

There are about 400 km asphalt and 960 km gravel roads in the city. The rest are pathways. Though it is possible to clean all roads and collect wastes by wheelbarrow and carts, priority is given to asphalt roads with pavements, which is about 100 km. This represents about 25% of asphalt and 7% of all roads. The waste collected in the city is about 3000 m^3. The rest is deposited in drainage ditches along the roads. That is why roads are usually littered with dirt.

To change this picture, an integrated solid waste management (clean street) project has been formulated and implemented in Wereda 5.

BACKGROUND

Wereda 5 is located in Zone 1 administration, at the center of Merkato. It comprises 13 kebeles. The total population is about 100,000 and total numbers of housing units is 14,135, making the whole wereda a highly congested slum area.

Out of the total solid waste collected in Zone 1, 48% is from this wereda. That is why priority is given to this wereda. Before the formulation of the project, the Addis Ababa Health Bureau had allocated 2 container lift trucks, 1 side loader truck, 21 containers of 8 m^3 size, 23 containers of 1 m^3 size, 11 wheelbarrow, 11 shovel, 11 forks, 13 public toilets, 43 street cleaners and 3 foremen to the wereda. With these materials and manpower it was managed to collect about half of the 6% street cleaning waste. The remaining 3%, which is not cleaned and collected, has to be covered by different stakeholders and the community.

The project started in November 1999 under the joint agreement of the Foreign Relations and Development Cooperation Bureau, who serves as the communication channel between the World Food Programme, which provided urban food assistance and the Health Bureau of the City Government.

PROJECT COMPONENTS

The project has three components:

- Clean streets
- Watching over the polluters and greenery
- Awareness creation (hygiene education).

a) Clean Streets

It was intended to clean 40 km street and market places daily. For this job, 60 street cleaners and 5 foremen were needed. They were recruited from the 13 kebeles by the integrating committee. To collect 10m^3 solid wastes, 20 wheelbarrows, 20 shovels, 20 forks and 1042 brooms are needed. One team of street cleaners has 3 street cleaners and receives 1 wheelbarrow, 1 shovel, 1 fork and 2 brooms. The brooms are for one week.

The workers cleaned all the 40 km roads and market places daily except on Sundays, which is their rest day. All in all, they cleaned 12,680 km roads and collected 3133 m^3 of waste in the year. This equals 3.3% of the total waste generated in the wereda. It is a great support to prevent communicable diseases and provide jobs (food) for the urban poor.

The annual total cost of this component of the project was Birr 43,110.00 for materials and Birr 144,840.00 for wages. World Food Program (WFP) provided daily rations of 3 kg of wheat and 120 g of vegetable oil for each street cleaner for a period of 365 days. When the project phases out, it is intended to do street cleaning by government budget either on contractual or permanent employment.

b) - Watching over the polluters

Roads, market places, rivers, etc. are public properties. They must be kept clean in order to prevent them from becoming breeding ground for micro-organisms and vectors.

To perform this job, 26 sanitary guards were recruited from the 13 kebeles in the wereda, and trained for 7 days on keeping streets and open spaces clean, and on penalizing the polluters. They were grouped into 13 teams and given specific areas to guard. For the first six months, there was a lack of penalty receipts and the sanitary guards were only guarding and warning the polluters. Later on, a total of Birr 3,550 was collected from penalties and transferred to the Finance Bureau who is responsible for government revenues. The last three months report showed that out of 16,050 polluters, only 105 were penalized which is 0.65%. That means that the sanitary guards are more engaged in preventing pollution than in penalizing. There is a professional assessment that pollution has markedly decreased in the wereda.

Achievements in preventing pollution of open spaces convinced the City Government to extend the guarding activity to the other weredas. Budget for 276 sanitary guards was allocated to the Health Bureau and guards were hired on contractual bases and are on the job now. Unless any abortive situation arises, it can be said that this project is sustainable.

The annual cost of the project was Birr 60,736.00, which is for wages and working clothes. All their expenditures were covered by WFP.

- Greenery (Planting ornamental trees)

Main roads, parks, riverbanks should be planted with ornamental trees and flowers to make the urban environment attractive and to prevent air pollution. In Addis Ababa, however, such places are usually seen with deposits of wastes. To change this situation, a one-day greenery campaign was done and about 200 trees were planted and given to the business community to grow them.

NACID (Nazareth Children's Center and Integrated Development) joined the project and took care of the Teklehaymanot Square by fencing, planting flowers, installing water pipes and placing guards. Street children participated in this activity and were given some incentives; some of them have been hired as guards. To sustain the project and generate income, NACID intends to open flower shop.

The total annual budget allocated by NACID was Birr 89,883.16.

c) Hygiene education

Though no study was conducted on the knowledge of the urban society, it is repeatedly heard that the people lack awareness. To address this problem, the project gives hygiene education at household level, mainly targeting heads of households and focusing on solid was management, with particular emphasis on proper storage and disposal of solid waste. Heads of households were also taught about recycling and composting of solid waste and the importance of waste minimization.

For this activity, 130 hygiene educators were recruited from the kebeles. They were trained by UNICEF in how to educate the public. Each hygiene educator visits at least 5 houses in a day. Accordingly, they visited 650 houses in a day and 206,050 houses in the year.

The total annual cost of the project was Birr 283920.00 and it was covered by WFP under food-for-work program. Propride, a local NGO present in the area, monitored the activities. To sustain the project there is an intention to convert the hygiene educators into community health agents.

COST

To implement the project the following items or activities were given or done by different stakeholders.

Items / activities	Unit	Qty	Cost (Birr)	Source
Cost of working materials and cloths	Person	91	56 110.00	WFP
Grains	Ton	241 995		WFP
Vegetable oil	Ton	9 682	491 544.00	WFP
Care of Teklehaymanot Square	Person	15	79 178.21	NACID
Fencing main roads & Decorating			20 000.00	Selam Baltina
Greenery & fencing	Person	3000	27 417.33	Community H. Bureau
Workshop	Person	47	3 692.00	Heinrich Böll Foundation
Hygiene educators training	Person	130	17 000.00	UNICEF/WIBS
Sanitary guards training	Person	26	3 883.75	Health Bureau
Total			698 825.29	

PROBLEMS

A launching workshop had been organized at inception of the project and this had made it simple for different stakeholders to join in and understand what the project was about. There was no marked problem encountered, but there was a lack of regular evaluation, and a lack of involvement of government organizations such as the Road Authority, the Environmental Protection Bureau, the Park Administration Bureau and others.

CONCLUSION

The project intended to integrate different stakeholders and involve the community (dwellers and businessmen). Even if the expected integration of different stakeholders was less than expected, the activities done in the year made it possible to fulfill the project's objectives.

The business community of wereda 6 and 7 have started the same activities. This is a clue towards replication of the project in other weredas. The involvement of NGOs, dwellers and the business community is highly appreciated.

RECOMMENDATIONS

Street cleaning is one of the major duties of the city government.

1. To clean all roads, the number of street cleaners must be increased. The city government should allocate budget to the Health Bureau for this activity.
2. The project is exemplary in showing how to integrate different stakeholders in the urban context and should be replicated in the other weredas of the city.
3. Specific activities like greenery and road and drainage construction should be done on agreement with the respected governmental organizations.
4. Involvement of the business community should be through the Chamber of Commerce rather than through individual businessmen.

Appendix 10

VOTE OF THANKS BY THE WORKSHOP PARTICIPANTS

I feel great pleasure and honour to speak on the organisation of the Solid Waste Management and Sustainable Livelihoods Training, on behalf of the participants in the programme.

Here we would like to thank ENDA-Ethiopia for its initiative and endeavours in organising this workshop which enables us to share experience and gain knowledge. Above all, bringing such diverse groups from different sectors has provided us with a very important social asset. Our relationships and getting to know each other paves the way for future work.

I would like to lay emphasis on the core of the training. The important knowledge that we have shared during the training underlines that solid waste management is more than the improvement of health and environment. The experience in the Merkato showed the necessity of thinking about the Sustainable Livelihood Approach, which leads to integrated solid waste management. The entire point here is the solid waste management needs to be people-centred, considering not only the health and environment aspect but also social, cultural, technical and financial liabilities. Therefore it has enabled us to widen the scope of our thinking, to establish sustainable development by which environmental and human needs are in harmony and sustainable and risks are minimised.

Finally the participants in the workshop would like to stress the necessity of networking to prepare fertile ground to implement what has been gained during the training. Here I would like to remind you of the Amharic proverb ድር ቢያብር አንበሳ ያስር. By uniting our resources to create awareness, mobilise the community and initiate the needy in solid waste management, we can create a clean city.

It is the Health Bureau who had better take the mandate and establish networking, as it is close to the policy makers and to every one of us here. We hope we will soon meet, develop strategic plans and be able to see a clean and green city, Addis Ababa.

Last but not least, we also thank our excellent facilitator, Dr Mansour Ali, who has devoted himself to us and given unreserved knowledge and the sharing of experience from abroad. We hope he has also learned from our experience.

Thank You !

The Final Lesson

Integrated solid waste management is not only the management of various stages of waste but also protecting and building livelihood assets.

The system should serve the people: not the people serve the system.